

**FINAL CYCLE REPORT OF THE THIRTY SIXTH
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 first and second production cycles and molt of the 36th 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. You can view this report on our website at http://www.ces.ncsu.edu/depts/poulsci/tech_manuals/layer_reports/36_final_cycle_report.pdf

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36th NORTH CAROLINA LAYER PERFORMANCE AND MANAGEMENT TEST
Protocol Procedures Used

Entries:

A total of nine 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 36th NCLP&MT were set on March 8, 2005 at the North Carolina Dept. of Agriculture and Consumer Services, Piedmont Research Station, Poultry Unit at Salisbury, NC. The flock was hatched on March 29, 2005 and the pullets were moved to the laying facilities on July 21 to July 26, 2005 during their 17th week of age. The age of the flock at transfer was lowered to reflect 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 July 27, 2005 (17 weeks of age), through the molt period which was induced on July 5, 2006. The molt records commenced on July 5, 2005 (66 weeks of age), and ended on August 2, 2006 (70 weeks of age). The second cycle records commence on August 3, 2006 and the test ended on May 9, 2007. This report includes production data summarized from 17 to 66 weeks, molt 66 to 70 weeks, and the 2nd cycle 70 to 110 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 75 % of the house and brown egg strains occupied the other 25 % of the house. All strains were assigned to be represented as equally as possible in each room, row, and cage level.

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. Rooms 2 to 4 were used for the 36th NCLP&MT resulting in a total pullet count in House 8 of 11,232. 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 in² (310 cm²). The same numbers of pullets were grown in each replicate for both white and brown-egg strains. The room dividers were in place 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. 36, No. 2).

Layer Housing:

The hens were randomly assigned to the replicate cages with white egg and brown egg strains being intermingled throughout the houses. The white egg strains occupied 75% of the house and brown egg strains occupied the other 25%. 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 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 supply and 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. The 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 in² (413 cm²), 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.

House 7 is a standard height windowless enclosed force ventilated house with battery cages. The cages consist of 4 rows of a Tri-Deck Stacked Layer Cage System. There is 60' of cage row with each side being designated a row. Each row is divided into six 10' cage row sections consisting of 4 cages /section with a 24" space between cage sections for feed hoppers and feed recovery. The waste collection system consists of manure belt cleaning. This configuration provides for 144 experimental units each consisting of 4 - 24" x 20" cages which held 7 hens at 68 in² for a total of 28 hens/replicate and a house total of 4,032 hens. Feeder system is designed to allow for automatic feeding and individual replicate feed consumption records.

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, and levels.

First Cycle Laying House Lighting Schedules:

Age	Date	House 5 (Light Hours)	House 7 (Light Hours)
Housing Pullets	July 20-26,2005	10.0	10.0
17 Weeks ¹	July 27, 2005	11.0	11.0
18 Weeks	August 3, 2005	11.5	11.5
19 Weeks	August 9, 2005	12.0	12.0
20 Weeks	August 16, 2005	12.5	12.5
21 Weeks	August 23, 2005	13.0	13.0
22 Weeks	August 30, 2005	13.5	13.5
23 Weeks	September 6, 2005	14.0	14.0
24 Weeks	September 13, 2005	14.25	14.25
25 Weeks	September 20, 2005	14.5	14.5
26 Weeks	September 28, 2005	14.75	14.75
27 Weeks	October 4, 2005	15.0	15.0
28 Weeks	October 11, 2005	15.25	15.25
29 Weeks	October 18, 2005	15.5	15.5
30 Weeks	October 25, 2005	15.75	15.75
31 Weeks	November 1, 2005	16.0	16.0
Through 66 Weeks	July 5, 2006	16.0	16.0

Test Design:

The laying test was set up as a completely randomized factorial design. The main effects within House 5 were strain, population, and molt treatment and in House 7 the main effects were strain 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 nine white egg strains and three brown egg strains participated in the test. See the 36th Hatch Report (Vol. 36, No. 1) for details.

Density: In House 5, all individual cages within each block contained either the brown or the white egg layers. Thus each replicate included 24 hens in 30.5 x 40.6 cm cages for 8 cages with 3 hens/cage or 40.6 x 40.6 cm cages for 6 cages with 4 hens/cage. Cage densities were held constant at 413 cm² (64 in²) for the two cage dimensions to approximate the commercial animal welfare guidelines as closely as possible. The initial population sizes provided for a constant density and feeder space allocation. Therefore density and feeder space were not factors in this test.

In House 7, all individual cages within each block contained either the brown or the white egg layers. Thus the replicate consisted of 28 hens/replicate, the hens were contained in 4 cages measuring 61 x 50.8 cm (24" x 20") and each cage held 7 hens at 439 cm² (68 in²). These cage dimensions represent the commercial animal welfare guidelines. The initial population sizes provided for a constant density and feeder space allocation. Therefore, density and feeder space were not factors in this test.

Population and Density Allocations in Houses 5 and 7

Hens per Cage	Cage Size Width x Depth	Floor Space per Bird	Feeder Space per Bird	Water Nipples per Cage
House 5				
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
House 7				
7	61 cm x 80.8 cm	439 cm ² (68 in ²)	8.9 cm 3.4 in	2

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. 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.

Samples of replicates from all strains and/or treatment groups were randomly selected for monitoring weight loss as described below. The Molt Protocol indicated that when the weight loss target was reached for each sample treatment group or strain, all replicates of that strain or group were to be returned to feed based on their sister replicates weight loss. This monitoring plan was not effective and the weight loss for all of the replicates was exceeded by 5 to 7 % as shown in the molt period data tables.

Specific monitoring criteria for all of the molt programs included the following.

The goal is for the birds to attain approximately 24% body weight loss.

House temperatures were maintained at 80± 5° F with close monitoring of the birds and environment to ensure that hens did not pant.

The 1st production period lighting schedule was used as the guide for adjusting the light cycle following the molt. Actual house conditions and the flock’s reaction to the NCSU Non-Fasting Molting Program affected how the light stimulation was given.

Molting and Second Cycle Lighting Schedules:

Age	Date	House 5 (Light Hours)	House 7 (Light Hours)
Through 66 Weeks	July 5, 2006	16.0	16.0
66 Weeks	July 5, 2006	8 hr	8 hr
69 Weeks	July 26, 2006	12.0	12.0
70 weeks	August 2, 2006	13.0	13.0
71 Weeks	August 9, 2006	14.0	14.0
72 Weeks	August 16, 2006	15.0	15.0
73 Weeks through end of test (110 wk)	August 23, 2006 to May 10, 2007	16.0	16.0

The stated goal was for the hens to have ceased egg production by Day 4-6 of the molt period. The White Egg Strains ranged from 7 to 9 d, and the Brown Egg Strains went as long as 18 d to zero egg production. However, the hens were allowed to consume all of the feed provided during the molt. The molting ration was designed to keep hens out of production, and to provide for skeletal and muscle maintenance. Livability was excellent with this program. The diet is bulky, such that a full trailer load weighed about 2/3 of a normal full load. Diet E was used to bring the hens back into peak production. After the first period of the second cycle feed intake and egg size was used to determine diet progression.

Molt Program Names and Treatment Codes:

Program Name	Brief Description	Treatment Code
Full Fed Control	Not Molted	NM
Non-anorexic molt program	LP/LE Diet no fasting	NA
Non-anorexic molt program [low sodium]	LP/LE/LNa Diet no fasting	NALS

Full Fed Control (NM): 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.

Non-anorexic molt program (NA): The hens were fed a low protein, low energy diet that contained adequate Ca for maintenance. When birds in the sample replicate being weighed reached their target weight, that replicate and all sister replicates were returned to full feed. The induced molt was started at 66 wks of age. The Non-anorexic molt low energy diet was designed to keep hens out of production while providing balanced nutrition for body maintenance only.

Procedural steps:

- Day -7 Sample of birds will be weighed to determine the pre-molt weight. Target weight (24% body weight loss) will be calculated using the pre-molt weight.
- Day 0 NA program instigated with the remaining layer feed being removed and replaced with the NA molt diet and daylight hours reduced. Controlled light housing, reduce the day length to 8 hr. Remove morbid birds before feed restriction.
- Day +7 Sample of birds weighed 7 days after diet change to determine body weights.
- Day +9 Sample of birds weighed 9 days after diet change to determine body weight. Weight loss per day calculated using 7 and 9 day body weights and target date for 24% weight loss determined. When the target date for the 24% body weight loss is determined the hens will not be weighed until target date at which time they will be returned to the layer feed if body weight loss has been achieved.
- Day +28 Birds will be fed layer diet and light stimulated.

Non-anorexic molt program[low sodium] (NALS): The hens were fed a diet, which was low protein, energy, and sodium, and contained adequate Ca for maintenance. When birds in the sample replicate being weighed reached target weight that replicate and all sister replicates were returned to full feed. The induced molt was started at 66 wks of age. This Non-anorexic molt low energy and Sodium diet was designed to quickly trigger cessation of egg production and to keep hens out of production while being provided balanced nutrition for body maintenance only.

Procedural steps:

- Day -7 Sample of birds will be weighed to determine the pre-molt weight. Target weight (24% body weight loss) will be calculated using the pre-molt weight.
- Day 0 NALS program instigated with the remaining layer feed being removed and replaced with the NALS molt diet and daylight hours reduced. Controlled light housing, reduce the day length to 8 hr. Remove morbid birds before feed restriction.
- Day +7 Sample of birds weighed 7 days after diet change to determine body weights.
- Day +9 Sample of birds weighed 9 days after diet change to determine body weight. Weight loss per day calculated using 7 and 9 day body weights and target date for 24% weight loss determined. When the target date for the 24% body weight loss is determined the hens will not be weighed until target date at which time they will be returned to the layer feed if body weight loss has been achieved.
- Day +28 Birds will be fed layer diet and light stimulated.

Layer Nutrition:

Layer diets were 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. 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 as shown in the Laying House Feeding Program Table.

The diets provided during the molt, consisted of a low protein/energy diet and a low protein/energy/Sodium diet described in the Molt Diets Table which follow. The molt diets were formulated to provide the hens 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 in the 36th NCLP&MT

Production Stage	Pre-Peak > 87%	87-80%	80-70%	<70%
White Egg Layers				
Protein ¹ (g/day)	19	18	17	16
Calcium (g/day)	4.0	4.1	4.2	4.3
Lysine (mg/day)	820	780	730	690
TSAA (mg)day)	700	670	630	590
Brown Egg Layers				
Protein ¹ (g/day)	20	19	18	17
Calcium (g/day)	4.0	4.0	4.1	4.2
Lysine (mg/day)	830	820	780	730
TSAA (mg)day)	710	700	670	630

¹ If the egg production is higher than predicted values protein intake should be increased by 1%
 Note: House temperatures dictate the body maintenance demand of the hen if the house temperature is 75 to 80°F feed protein content should be increased accordingly to compensate for metabolic heat needed to maintain a homeostatic body temperature. If the house temperature is at or above 85°F no adjustment is needed.

LAYING HOUSE FEEDING PROGRAM

Rate of Production	Consumption Per 100 Birds/Day (kg)	<u>Diet Fed</u>	
		White Egg Strains	Brown Egg Strains
Weeks 17-26	< 9.52	D	D
Pre-Peak and > 87%	< 9.52	D	D
	9.57-10.39	F	E
	10.43-11.29	H	G
	11.34-12.20	I	H
	12.25-13.11	M	I
	>13.15	N	M
80-87%	< 9.52	F	E
	9.57-10.39	G	F
	10.43-11.29	I	H
	11.34-12.20	M	I
	12.25-13.11	N	M
	>13.15	O	N
70-80%	< 9.52	H	G
	9.57-10.39	I	H
	10.43-11.29	M	I
	11.34-12.20	N	M
	12.25-13.11	O	N
	>13.15	O	O
< 70%	< 9.52	H	G
	9.57-10.39	I	H
	10.43-11.29	N	M
	11.34-12.20	O	N
	12.25-13.11	O	O
	>13.15	O	O
< 60%	11.34-12.20	P	P
	12.25-13.11	Q	P
	>13.15	Q	Q

Note: Low house temperatures and egg production higher than breeder guides for any given hen age will require an adjustment to the dietary phase feeding program to ensure the hens are in a positive nutrient status.

LAYING PERIOD DIETS

Ingredients	D	E	F	G	H
Corn	866.71	925.46	997.91	1068.19	1131.97
Soybean meal	663.18	621.10	552.33	499.80	457.65
Wheat Midds					
Fat (Tallow)	110.88	102.43	87.73	74.61	64.32
Gluten Meal 60%	95.83	88.37	100.00	99.23	90.80
D.L. Methionine	3.08	2.89	2.52	2.26	2.48
Lysine 78.8%					
Soybean Hulls					
Ground Limestone	132.42	133.70	135.07	134.02	132.50
Coarse Limestone	75.00	75.00	75.00	75.00	75.00
Bi-Carbonate	3.00	3.00	3.00	3.00	3.00
Phosphate Mono/D	36.77	34.73	32.84	30.36	28.79
Salt	6.00	5.99	5.95	5.93	5.92
Vit. premix	1.00	1.00	1.00	1.00	1.00
Min. premix	1.00	1.00	1.00	1.00	1.00
Mold Inhibitor	1.00	1.00	1.00	1.00	1.00
T-Premix	1.00	1.00	1.00	1.00	1.00
.06% Selenium Premix	1.00	1.00	1.00	1.00	1.00
Choline Cl 60%	2.14	2.33	2.65	2.59	2.57
<u>Calculated Analysis</u>					
Protein %	22.0	21.0	20.00	19.00	18.0
ME kcal/kg	2926.0	2926.0	2926.0	2926.0	2926.0
Calcium %	4.45	4.45	4.45	4.40	4.35
T. Phos. %	0.71	0.68	0.65	0.61	0.59
Lysine %	1.15	1.09	1.00	0.93	0.87
TSAA %	0.89	0.85	0.81	0.77	0.75

LAYING PERIOD DIETS

Ingredients	I	M	N	O	P	Q
Corn	1199.47	1258.28	1309.81	1371.93	1420.50	1427.70
Soybean meal	406.08	363.91	340.24	333.87	286.00	226.00
Wheat Midds					63.00	117.00
Fat (Tallow)	52.26	43.80	38.85	14.71	10.00	10.00
Gluten Meal 60%	89.84	82.64	61.54	25.79		
D.L. Methionine	2.02	1.62	1.75	1.80	2.00	1.30
Lysine 78.8%						
Soybean Hulls						
Ground Limestone	158.82	160.10	161.33	167.71	185.00	186.50
Coarse Limestone	50.00	50.00	50.00	50.00		
Bi-Carbonate	3.00	3.00	3.00	3.00	4.00	4.00
Phosphate Mono/D	26.79	24.75	22.60	20.30	18.50	16.50
Salt	5.90	5.89	5.89	5.89	5.00	5.00
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
Mold Inhibitor	1.00	1.00	1.00	1.00	2.00	2.00
T-Premix	1.00	1.00	1.00	1.00	1.00	1.00
.06% Selenium Premix	1.00	1.00	1.00	1.00	1.00	1.00
Choline Cl 60%	0.83	1.02				
<u>Calculated Analysis</u>						
Protein %	17.00	16.00	15.00	14.00	12.75	11.75
ME kcal/kg	2926.0	2926.0	2926.0	2860.0	2875	2859
Calcium %	4.35	4.35	4.35	4.45	3.80	3.80
T. Phos. %	0.56	0.52	0.49	0.47	0.46	0.44
Lysine %	0.80	0.74	0.70	0.68	0.62	0.55
TSAA %	0.70	0.65	0.62	0.58	0.55	0.49

MOLT PERIOD DIETS

Ingredient	Molt Diet s		
	<u>Low ME</u>	<u>Low ME/Na</u>	<u>Resting</u>
Corn	702.50	712.00	1427.70
Corn Gluten Meal			
Soybean Hulls	1164.77	1190.80	226.00
Soybean Meal 48%			117.00
Wheat Midds	18.26		186.50
Coarse Limestone	17.78	33.00	16.50
Phosphate Mono/D	69.84	43.50	4.00
Bentonite		8.00	
Salt	9.16		5.00
Methionine	2.69	2.70	1.30
Choline Chloride		2.00	
Vit. premix	1.00	2.00	1.00
Min. premix	1.00	2.00	1.00
T - Premix	1.00		1.00
Fat	9.99		10.00
MYC-OUT 65	1.00	2.00	2.00
.06% Sel Premix	1.00	2.00	1.00
Total	2000	2000	2000
Calculated Analysis			
Protein %	9.92	9.96	11.75
Me kcal/kg	1650	1618	2859
Calcium %	1.33	1.40	3.80
T. Phos %	0.88	0.59	0.44
Lysine %	0.42	0.42	0.55
TSAA %	0.35	0.35	0.49

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 - Feed prices were based on the actual feed prices for each feed delivery which were calculated and summarized for both of the complete production cycles.

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 layer houses were sufficiently different that the data for Houses 5 and 7 were not pooled in this analysis. All data were subjected to ANOVA utilizing the GLM procedure of SAS, with main effects in House 5 of strain, population, and molt treatment and in House 7 of strain and molt treatment. 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

First cycle performance of white and brown egg strains

House 5 are shown on Tables 1 to 6

House 7 are shown on Tables 7 to 12

Molt period performance and weight loss data of the white and brown egg strains

House 5 are shown on Tables 13 to 20

House 7 are shown on Tables 21 to 24

Second cycle performance of white and brown egg strains

House 5 are shown on Tables 25 to 36

House 7 are shown on Tables 37 to 42

House 5 non-molted are shown on Tables 43 to 48

House 5 non-anorexic molt are shown on Tables 49 to 54

House 5 non-anorexic low sodium molt are shown on Tables 55 to 60

Overall performance of white and brown egg strains 119-771 days

House 5 are shown on Tables 61 to 72

House 7 are shown on Tables 73 to 78

Second cycle weight gains

House 5 are shown on Tables 79 to 82

House 7 are shown on Tables 83-84

Overall production graphs

House 5 are shown on figures 1 to 24

House 7 are shown on figures 25 to 36

Breeder (Strain):

Short identification codes of the breeder and strain of the stock were developed. See more complete information following data tables in Table 85.

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 through 462 days of age and 462 through 490 which occurred during the molt period are reported separately. Then the percentage of birds which died between 490 and 771 days of age. The overall mortality is the total percentage from 119 to 771 days of age.

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 2003 to 2006.

Three Year Regional Average Egg Prices

Grade	Size	\$\$/Dozen
A	Extra Large	0.872
A	Large	0.839
A	Medium	0.669
A	Small	0.519
A	Pee Wee	0.260
B	All	0.445
Checks	All	0.445

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:

The following size classifications were 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 ounces/doz. 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.

USDA Egg Weights Used To Establish The Egg Size Distribution Weighted for Large Eggs.

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

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.

The Average Contract Feed Price For Feed Purchases for the First and Second Cycle.

<u>Diets</u>	<u>Price Per Ton 1st Cycle</u>	<u>Price Per Ton 2nd Cycle</u>
D	198.40	
E	195.00	193.10
F	190.40	188.30
G	186.40	188.00
H	182.00	186.70
I	175.40	185.90
M	170.40	189.60
N	165.00	194.80
O	158.60	
P		195.40
Q		202.40
Molt Diet LP/LE	144.6	
Molt Diet LP/LE/LS	138.7	
Resting	153.7	

Metric Conversions:

1 lb = 453.6 g
 1 lb = .4536 kg
 1 oz = 28.35 g

1 g = .03527 oz
 1 kg = 2.204 lb
 1 g = 1000 mg
 1 kg = 1000 g

TABLE 1. EFFECT OF WHITE EGG STRAIN AND POPULATION ON PERFORMANCE OF HENS IN THE 36th NCLP&MT (119-462 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

Breeder (Strain)	Population ¹	Feed	Feed	Eggs	Egg	Egg	Mortality (%)	Age at
		Consumption (kg/100/hen/d)	Conversion (g egg/g feed)	Per Bird Housed	Production (HD%)	Mass (g/HD)		Production (Days)
LSL-Lite White	3	10.8	0.49	293.2	86.9	56.0	4.5	142
	4	11.1	0.48	290.2	87.2	56.6	5.1	141
	Average	11.0 ^A	0.48 ^B	291.7 ^A	87.1 ^A	56.3 ^A	4.8 ^{BCD}	142
Bovans White Exp.	3	10.6	0.50	286.1	84.8	55.9	4.5	144
	4	10.6	0.49	284.1	84.3	55.8	4.3	141
	Average	10.6 ^{AB}	0.50 ^{AB}	285.1 ^{ABC}	84.5 ^{DE}	55.9 ^{AB}	4.4 ^{BCD}	143
Bovans White	3	10.7	0.49	286.6	87.6	55.6	8.9	141
	4	10.7	0.48	277.0	86.2	54.5	12.7	142
	Average	10.7 ^{AB}	0.48 ^B	281.8 ^C	86.9 ^{AB}	55.0 ^{BC}	10.8 ^A	142
DeKalb White Exp.	3	10.3	0.50	290.5	85.7	55.3	3.0	142
	4	10.5	0.49	287.1	85.4	55.0	3.3	141
	Average	10.4 ^B	0.50 ^{AB}	288.8 ^{AB}	85.6 ^{BCD}	55.1 ^{BC}	3.2 ^{CD}	142
DeKalb White	3	10.7	0.50	282.0	85.7	56.9	8.8	142
	4	10.6	0.50	289.4	86.4	56.7	6.1	142
	Average	10.7 ^{AB}	0.50 ^{AB}	285.7 ^{ABC}	86.0 ^{ABC}	56.8 ^A	7.4 ^{AB}	142
Hy-Line (W-36)	3	9.7	0.50	280.1	82.0	52.0	0.7	143
	4	9.8	0.49	278.6	81.8	52.1	1.8	143
	Average	9.8 ^C	0.50 ^{AB}	279.3 ^C	81.9 ^F	52.0 ^D	1.3 ^D	143
Hy-Line (W-98)	3	10.7	0.49	285.1	83.5	54.8	1.3	139
	4	11.0	0.48	282.1	83.5	55.6	3.8	145
	Average	10.8 ^A	0.48 ^B	283.6 ^{BC}	83.5 ^E	55.2 ^{BC}	2.5 ^{CD}	142
CV-20	3	10.0	0.49	282.0	83.0	52.3	2.6	141
	4	9.8	0.51	281.2	83.4	53.2	3.0	140
	Average	9.9 ^C	0.50 ^{AB}	281.6 ^C	83.2 ^{EF}	52.8 ^D	2.8 ^{CD}	141
ISA White Exp.	3	10.0	0.51	287.3	85.3	54.7	5.6	142
	4	10.0	0.51	283.9	85.0	54.4	5.9	143
	Average	10.0 ^C	0.51 ^A	285.6 ^{ABC}	85.2 ^{CD}	54.5 ^C	5.8 ^{BC}	142
All Strains	3	10.4	0.49	285.9	84.9	54.8	4.4	142
	4	10.4	0.49	283.7	84.8	54.9	5.1	142

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

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

TABLE 2. EFFECT OF WHITE EGG STRAIN AND POPULATION ON EGG WEIGHT AND EGG SIZE DISTRIBUTION OF HENS IN THE 36th NCLP&MT (119-462 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

Breeder	Population ¹	Egg Weight	Pee Wee	Small	Medium	Large	Extra Large
(Strain)		(g egg/hen/d)	(%)	(%)	(%)	(%)	(%)
LSL-Lite White	3	60.2	0.0	1.2	7.7	28.8	61.9
	4	60.5	0.0	1.7	8.0	25.1	65.0
	Average	60.3 ^C	0.0	1.4 ^B	7.8 ^{ABC}	26.9 ^{BC}	63.4 ^{CD}
Bovans White Exp.	3	61.8	0.1	1.2	5.0	23.5	69.9
	4	61.8	0.0	0.8	5.6	21.2	72.2
	Average	61.8 ^B	0.0	1.0 ^B	5.3 ^D	22.3 ^D	71.1 ^{AB}
Bovans White	3	59.5	0.0	1.4	8.6	31.4	58.3
	4	59.3	0.0	1.3	8.2	32.1	58.2
	Average	59.4 ^D	0.0	1.4 ^B	8.4 ^{AB}	31.8 ^A	58.2 ^{EF}
DeKalb White Exp.	3	60.3	0.0	1.5	7.3	29.9	61.0
	4	60.4	0.1	1.5	7.8	27.3	62.8
	Average	60.3 ^C	0.0	1.5 ^B	7.6 ^{ABC}	28.6 ^{AB}	61.9 ^{DE}
DeKalb White	3	61.8	0.0	1.8	6.4	22.7	68.7
	4	61.3	0.2	1.5	7.9	23.2	66.9
	Average	61.5 ^B	0.1	1.7 ^B	7.2 ^{BC}	22.9 ^{CD}	67.8 ^{BC}
Hy-Line (W-36)	3	59.2	0.0	2.5	10.2	27.8	59.4
	4	59.2	0.3	3.3	8.3	31.2	56.7
	Average	59.2 ^D	0.1	2.9 ^A	9.3 ^A	29.5 ^{AB}	58.1 ^{EF}
Hy-Line (W-98)	3	62.3	0.0	0.8	6.3	21.7	70.9
	4	63.1	0.0	0.7	6.1	18.9	74.0
	Average	62.7 ^A	0.0	0.8 ^B	6.2 ^{CD}	20.3 ^D	72.5 ^A
CV-20	3	58.9	0.3	3.4	7.7	33.2	55.2
	4	59.4	0.0	2.4	8.2	32.1	57.1
	Average	59.1 ^D	0.2	2.9 ^A	7.9 ^{ABC}	32.7 ^A	56.1 ^F
ISA White Exp.	3	59.2	0.1	3.1	7.9	31.2	57.4
	4	59.3	0.1	2.8	7.4	31.8	57.6
	Average	59.3 ^D	0.1	3.0 ^A	7.7 ^{ABC}	31.5 ^A	57.5 ^{EF}
All Strains	3	60.3	0.0	1.9	7.5	27.8	62.5
	4	60.5	0.1	1.8	7.5	27.0	63.4

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

A,B,C,D,E,F - 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 36th NCLP&MT (119-462 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

Breeder	Population ¹	Grade A	Grade B	Cracks	Loss	Egg Income	Feed Costs
(Strain)		(%)	(%)	(%)	(%)	(\$/hen)	(\$/hen)
LSL-Lite White	3	97.6	1.0	1.1	0.2	20.18	7.77
	4	96.7	1.1	1.8	0.3	19.88	7.89
	Average	97.1 ^A	1.1 ^C	1.5 ^C	0.2	20.03 ^A	7.83 ^{AB}
Bovans White Exp.	3	95.9	1.5	2.5	0.0	19.74	7.61
	4	95.0	1.2	3.5	0.4	19.51	7.60
	Average	95.4 ^B	1.4 ^{ABC}	3.0 ^A	0.2	19.62 ^{AB}	7.60 ^{ABC}
Bovans White	3	95.8	2.0	2.0	0.3	19.48	7.47
	4	95.9	1.9	1.9	0.2	18.87	7.34
	Average	95.8 ^B	2.0 ^A	2.0 ^{BC}	0.2	19.17 ^{BC}	7.40 ^{CD}
DeKalb White Exp.	3	95.7	1.7	2.3	0.3	19.79	7.46
	4	95.4	1.6	2.9	0.2	19.51	7.56
	Average	95.5 ^B	1.7 ^{ABC}	2.6 ^{AB}	0.3	19.65 ^{AB}	7.51 ^C
DeKalb White	3	95.4	2.3	2.0	0.3	19.22	7.51
	4	95.8	1.9	2.1	0.3	19.72	7.58
	Average	95.6 ^B	2.1 ^A	2.1 ^{BC}	0.3	19.47 ^B	7.54 ^{BC}
Hy-Line (W-36)	3	96.2	1.2	2.4	0.2	19.02	7.09
	4	97.0	0.8	1.9	0.3	18.92	7.12
	Average	96.6 ^{AB}	1.0 ^C	2.2 ^{ABC}	0.3	18.97 ^C	7.11 ^D
Hy-Line (W-98)	3	95.7	2.0	2.1	0.2	19.60	7.80
	4	95.6	1.7	2.7	0.1	19.44	7.90
	Average	95.7 ^B	1.8 ^{AB}	2.4 ^{AB}	0.2	19.52 ^B	7.85 ^A
CV-20	3	96.0	1.1	2.6	0.2	19.06	7.24
	4	97.2	0.9	1.7	0.1	19.24	7.05
	Average	96.6 ^{AB}	1.0 ^C	2.1 ^{ABC}	0.2	19.15 ^{BC}	7.14 ^D
ISA White Exp.	3	97.0	1.0	2.2	0.1	19.62	7.20
	4	96.1	1.3	2.4	0.3	19.27	7.12
	Average	96.5 ^{AB}	1.2 ^{BC}	2.3 ^{ABC}	0.2	19.44 ^{BC}	7.16 ^D
All Strains	3	96.1	1.5	2.1	0.2	19.52	7.46
	4	96.1	1.4	2.3	0.2	19.37	7.46

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

A,B,C,D - 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 36th NCLP&MT (119-462 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

Breeder	Population ¹	Feed Consumption	Feed Conversion	Eggs			Mortality	Age at 50% Production
				Per Bird Housed	Egg Production	Egg Mass		
(Strain)		(kg/100/hen/d)	(g egg/g feed)		(HD%)	(g/HD)	(%)	(Days)
Bovans	3	11.0	0.49	290.6	86.7	57.7	5.2	142
Brown	4	11.1	0.49	291.2	86.5	57.6	4.6	141
	Average	11.1 ^A	0.49 ^B	290.9	86.6 ^A	57.6 ^B	4.9	141
Bovans	3	11.3	0.50	289.1	86.5	59.7	3.9	140
Goldline	4	11.1	0.50	291.9	86.3	58.9	2.9	142
	Average	11.2 ^A	0.50 ^B	290.5	86.4 ^{AB}	59.3 ^A	3.4	141
Hy-Line	3	10.3	0.52	286.6	85.3	56.5	3.8	142
Brown	4	10.3	0.51	287.1	84.8	56.7	2.3	143
	Average	10.3 ^B	0.51 ^A	286.8	85.0 ^B	56.6 ^B	3.0	142
All	3	10.9	0.50	288.8	86.1	58.0	4.3	141
Strains	4	10.8	0.50	290.1	85.9	57.7	3.2	142

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

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 36th NCLP&MT (119-462 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

Breeder (Strain)	Population ¹	Egg Weight (g egg/hen/d)	Pee Wee (%)	Small (%)	Medium (%)	Large (%)	Extra Large (%)
Bovans	3	62.8	0.1	1.1	4.9	20.7	73.3
Brown	4	62.8	0.0	0.9	4.7	19.6	74.4
	Average	62.8 ^B	0.0	1.0	4.8	20.2	73.8
Bovans	3	64.5	0.0	0.7	4.2	17.6	77.4
Goldline	4	63.8	0.0	0.4	5.0	18.1	76.1
	Average	64.2 ^A	0.0	0.5	4.6	17.9	76.7
Hy-Line	3	62.1	0.0	0.7	4.7	23.7	70.6
Brown	4	62.4	0.0	0.5	4.0	21.0	74.3
	Average	62.2 ^B	0.0	0.6	4.3	22.4	72.4
All	3	63.1	0.0	0.8	4.6	20.7	73.8
Strains	4	63.0	0.0	0.6	4.6	19.6	74.9

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

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 36th NCLP&MT (119-462 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

Breeder (Strain)	Population ¹	Grade A (%)	Grade B (%)	Cracks (%)	Loss (%)	Egg Income (\$/hen)	Feed Costs (\$/hen)
Bovans	3	96.2	1.5	2.2	0.1	20.17	8.00
Brown	4	96.1	1.3	2.4	0.2	20.13	8.05
	Average	96.1	1.4	2.3	0.1	20.15	8.03 ^A
Bovans	3	96.2	1.5	2.2	0.1	20.13	8.11
Goldline	4	96.2	1.2	2.6	0.1	20.26	8.07
	Average	96.2	1.3	2.4	0.1	20.19	8.09 ^A
Hy-Line	3	96.8	1.2	2.0	0.1	19.90	7.45
Brown	4	97.0	1.2	1.9	0.0	20.08	7.52
	Average	96.9	1.2	1.9	0.0	19.99	7.48 ^B
All	3	96.4	1.4	2.1	0.1	20.07	7.85
Strains	4	96.4	1.2	2.3	0.1	20.16	7.88

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

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

TABLE 7. EFFECT OF WHITE EGG STRAIN ON PERFORMANCE OF HENS IN THE 36th NCLP&MT (119-462 DAYS) IN BATTERY CAGES (HOUSE 7)

Breeder (Strain)	Feed Consumption (kg/100/hen/d)	Feed Conversion (g egg/g feed)	Eggs Per Bird Housed	Egg Production (HD%)	Egg Mass (g/HD)	Mortality (%)	Age at 50% Production (Days)
LSL-Lite White	10.2 ^A	0.52	298.7 ^A	88.1 ^{AB}	56.4 ^{AB}	3.0 ^C	141 ^B
Bovans White Exp.	10.0 ^{AB}	0.52	286.8 ^{BCD}	85.1 ^D	55.2 ^{BC}	4.5 ^{BC}	140 ^{BC}
Bovans White	10.0 ^{AB}	0.53	293.7 ^{AB}	88.5 ^A	56.3 ^{AB}	6.9 ^{AB}	139 ^C
DeKalb White Exp.	9.9 ^{AB}	0.52	293.1 ^{AB}	86.7 ^{BC}	55.3 ^{ABC}	3.2 ^{BC}	140 ^{BC}
DeKalb White	10.2 ^A	0.52	286.8 ^{BCD}	86.2 ^{CD}	56.5 ^A	9.4 ^A	142 ^B
Hy-Line (W-36)	9.3 ^C	0.52	279.7 ^D	82.0 ^F	51.3 ^D	1.4 ^C	142 ^B
Hy-Line (W-98)	10.2 ^A	0.51	283.4 ^{CD}	83.6 ^E	54.5 ^C	2.1 ^C	138 ^C
CV-20	9.3 ^C	0.53	282.6 ^{CD}	83.3 ^{EF}	51.8 ^D	2.3 ^C	142 ^B
ISA White Exp.	9.7 ^B	0.52	289.7 ^{BC}	85.9 ^{CD}	54.6 ^C	4.5 ^{BC}	146 ^A

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

TABLE 8. EFFECT OF WHITE EGG STRAIN AND POPULATION ON EGG WEIGHT AND EGG SIZE DISTRIBUTION OF HENS IN THE 36th NCLP&MT (119-462 DAYS) IN BATTERY CAGES (HOUSE 7)

Breeder (Strain)	Egg Weight (g egg/hen/d)	Pee Wee (%)	Small (%)	Medium (%)	Large (%)	Extra Large (%)
LSL-Lite White	59.8 ^B	0.0	1.5 ^{CD}	7.8 ^{BCD}	30.3 ^{BC}	60.2 ^{BC}
Bovans White Exp.	60.8 ^A	0.0	1.1 ^D	7.1 ^{CD}	26.3 ^{CD}	65.4 ^{AB}
Bovans White	59.8 ^B	0.1	1.4 ^{CD}	7.9 ^{BCD}	31.5 ^{AB}	58.8 ^C
DeKalb White Exp.	59.7 ^B	0.1	1.0 ^D	7.1 ^{CD}	31.7 ^{AB}	59.8 ^C
DeKalb White	61.0 ^A	0.1	1.7 ^{BCD}	6.4 ^D	24.1 ^D	67.6 ^A
Hy-Line (W-36)	58.3 ^C	0.1	3.4 ^A	11.1 ^A	32.6 ^{AB}	52.6 ^D
Hy-Line (W-98)	61.6 ^A	0.0	0.9 ^D	6.7 ^D	22.5 ^D	69.6 ^A
CV-20	58.2 ^C	0.1	2.7 ^{AB}	9.5 ^{AB}	35.0 ^A	52.6 ^D
ISA White Exp.	58.8 ^C	0.1	2.1 ^{BC}	9.0 ^{BC}	35.4 ^A	52.8 ^D

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

TABLE 9. EFFECT OF WHITE EGG STRAIN AND POPULATION ON EGG QUALITY, INCOME AND FEED COSTS OF HENS IN THE 36th NCLP&MT (119-462 DAYS) IN BATTERY CAGES (HOUSE 7)

Breeder (Strain)	Grade A (%)	Grade B (%)	Cracks (%)	Loss (%)	Egg Income (\$/hen)	Feed Costs (\$/hen)
LSL-Lite White	97.3	0.8 ^{BCD}	1.7	0.2	20.56 ^A	7.44 ^A
Bovans White Exp.	96.2	1.0 ^{ABC}	2.5	0.4	19.73 ^{BC}	7.29 ^{AB}
Bovans White	96.3	1.6 ^A	1.8	0.3	20.04 ^{AB}	7.14 ^{AB}
DeKalb White Exp.	96.7	1.3 ^{AB}	1.8	0.2	20.13 ^{AB}	7.19 ^{AB}
DeKalb White	96.7	1.6 ^A	1.6	0.2	19.75 ^{BC}	7.24 ^{AB}
Hy-Line (W-36)	97.9	0.4 ^D	1.3	0.4	18.94 ^D	6.73 ^C
Hy-Line (W-98)	96.7	0.6 ^{CD}	2.4	0.3	19.58 ^{BC}	7.39 ^A
CV-20	97.0	0.9 ^{BCD}	2.0	0.1	19.22 ^{CD}	6.74 ^C
ISA White Exp.	96.9	1.1 ^{ABC}	1.7	0.9	19.63 ^{BC}	7.01 ^{BC}

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

TABLE 10. EFFECT OF BROWN EGG STRAIN ON PERFORMANCE OF HENS IN THE 36th NCLP&MT (119-462 DAYS) IN BATTERY CAGES (HOUSE 7)

Breeder (Strain)	Feed Consumption (kg/100/hen/d)	Feed Conversion (g egg/g feed)	Eggs			Mortality (%)	Age at 50% Production (Days)
			Per Bird Housed	Egg Production (HD%)	Egg Mass (g/HD)		
Bovans Brown	10.5 ^A	0.51	297.5 ^A	87.7 ^A	57.0 ^{AB}	3.0	138 ^B
Bovans Goldline	10.4 ^A	0.52	293.0 ^{AB}	86.7 ^A	57.9 ^A	3.3	141 ^A
Hy-Line Brown	10.0 ^B	0.53	288.5 ^B	85.0 ^B	55.8 ^B	1.8	141 ^A

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

TABLE 11. EFFECT OF BROWN EGG STRAIN AND POPULATION ON EGG WEIGHT AND EGG SIZE DISTRIBUTION OF HENS IN THE 36th NCLP&MT (119-462 DAYS) IN BATTERY CAGES (HOUSE 7)

Breeder (Strain)	Egg Weight (g egg/hen/d)	Pee Wee (%)	Small (%)	Medium (%)	Large (%)	Extra Large (%)
Bovans Brown	61.3 ^B	0.0	0.5	4.9	26.2 ^A	68.2
Bovans Goldline	62.5 ^A	0.0	0.5	5.4	20.1 ^B	73.9
Hy-Line Brown	61.7 ^{AB}	0.0	0.4	5.0	24.2 ^{AB}	70.2

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

TABLE 12. EFFECT OF BROWN EGG STRAIN AND POPULATION ON EGG QUALITY, INCOME AND FEED COSTS OF HENS IN THE 36th NCLP&MT (119-462 DAYS) IN BATTERY CAGES (HOUSE 7)

Breeder (Strain)	Grade A (%)	Grade B (%)	Cracks (%)	Loss (%)	Egg Income (\$/hen)	Feed Costs (\$/hen)
Bovans Brown	96.6	1.1	1.9	0.4	20.64	7.70 ^A
Bovans Goldline	96.2	1.7	2.0	0.1	20.31	7.60 ^{AB}
Hy-Line Brown	97.0	0.8	2.1	0.1	20.12	7.30 ^B

TABLE 13. EFFECT OF WHITE EGG STRAIN AND POPULATION ON PERFORMANCE OF HENS IN THE 36th NCLP&MT (462-490 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

Breeder (Strain)	Population ¹	Feed Consumption (kg/100/hen/d)	Eggs		Mortality	Egg Income (\$/hen)	Feed Costs (\$/hen)	Days to 0% Production
			Per Bird Housed	Egg Production (HD%)				
LSL-Lite White	3	7.7	9.7	38.2	1.6	0.67	0.34	9
	4	7.2	9.8	37.1	1.1	0.65	0.32	10
	Average	7.4	9.8	37.7	1.4 ^{ABC}	0.66 ^{ABC}	0.33	9 ^{ABC}
Bovans White Exp.	3	7.2	9.9	36.7	0.3	0.68	0.33	9
	4	7.4	9.8	36.9	2.3	0.68	0.33	8
	Average	7.3	9.9	36.8	1.3 ^{ABC}	0.68 ^{AB}	0.33	8 ^C
Bovans White	3	7.2	9.3	38.6	2.4	0.61	0.30	9
	4	7.8	9.0	37.8	2.3	0.60	0.32	8
	Average	7.5	9.2	38.2	2.4 ^A	0.61 ^C	0.31	9 ^C
DeKalb White Exp.	3	6.7	10.2	37.6	1.1	0.68	0.30	10
	4	7.1	9.3	35.4	1.5	0.58	0.32	11
	Average	6.9	9.7	36.5	1.3 ^{ABC}	0.63 ^{BC}	0.31	10 ^A
DeKalb White	3	6.8	8.9	36.6	2.6	0.60	0.28	10
	4	7.5	10.1	38.2	1.9	0.68	0.33	10
	Average	7.1	9.5	37.4	2.3 ^A	0.64 ^{ABC}	0.31	10 ^{AB}
Hy-Line (W-36)	3	6.2	9.8	35.4	0.5	0.68	0.29	9
	4	6.4	10.1	36.3	0.3	0.70	0.30	9
	Average	6.3	9.9	35.8	0.4 ^{BC}	0.69 ^A	0.29	9 ^{BC}
Hy-Line (W-98)	3	6.9	9.8	36.0	0.0	0.65	0.32	9
	4	6.8	9.4	35.0	0.6	0.62	0.31	9
	Average	6.9	9.6	35.5	0.2 ^C	0.63 ^{BC}	0.32	9 ^{BC}
CV-20	3	6.9	9.7	36.0	0.1	0.66	0.32	8
	4	6.2	9.8	35.8	1.0	0.69	0.28	9
	Average	6.5	9.8	35.9	0.5 ^{BC}	0.68 ^{AB}	0.30	8 ^C
ISA White Exp.	3	6.5	9.8	37.3	1.9	0.66	0.29	9
	4	6.9	9.7	37.2	1.8	0.65	0.30	8
	Average	6.7	9.7	37.2	1.9 ^{AB}	0.66 ^{ABC}	0.30	9 ^{BC}
All Strains	3	6.9	9.7	36.9	1.2	0.65	0.31	9
	4	7.0	9.7	36.6	1.4	0.65	0.31	9

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

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

TABLE 14. EFFECT OF WHITE EGG STRAIN AND SYNCHRONIZED MOLT TREATMENT ON PERFORMANCE OF HENS IN THE 36th NCLP&MT (462-490 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

Breeder	Molt Program	Feed Consumption	Eggs Per Bird Housed	Egg Production (HD%)	Mortality	Egg Income (\$/hens)	Feed Costs (\$/hens)	Days to 0% Production (Days)
LSL-Lite White	NM	11.8	21.8	84.6 ^{ab}	1.3	1.46	0.54	.
	NA	5.4	3.7	13.9 ^{de}	1.6	0.25	0.23	9
	NALS	5.1	3.9	14.4 ^{de}	1.1	0.27	0.22	9
Bovans White Exp.	NM	10.2	22.2	82.2 ^{bc}	2.1	1.53	0.49	.
	NA	6.1	3.4	13.0 ^e	1.7	0.24	0.25	8
	NALS	5.7	4.0	15.1 ^{de}	0.1	0.28	0.25	9
Bovans White	NM	11.5	20.9	87.6 ^a	2.4	1.36	0.49	.
	NA	5.6	3.2	13.6 ^{de}	4.2	0.22	0.21	8
	NALS	5.5	3.4	13.4 ^{de}	0.5	0.23	0.22	9
DeKalb White Exp.	NM	10.3	21.7	80.9 ^{bc}	1.7	1.37	0.49	.
	NA	5.3	3.3	12.5 ^e	0.7	0.23	0.22	9
	NALS	5.1	4.3	16.1 ^{de}	1.7	0.29	0.22	11
DeKalb White	NM	9.9	20.8	82.1 ^{bc}	1.6	1.40	0.45	.
	NA	5.9	3.5	13.5 ^{de}	2.1	0.25	0.24	8
	NALS	5.7	4.1	16.6 ^d	3.1	0.27	0.23	12
Hy-Line (W-36)	NM	9.0	22.0	79.1 ^c	0.4	1.52	0.44	.
	NA	5.0	3.6	13.4 ^{de}	0.7	0.26	0.22	8
	NALS	4.9	4.2	15.1 ^{de}	0.2	0.29	0.22	10
Hy-Line (W-98)	NM	10.4	21.4	79.1 ^c	0.0	1.38	0.50	.
	NA	5.3	3.5	12.9 ^e	0.3	0.25	0.23	8
	NALS	5.0	3.9	14.4 ^{de}	0.4	0.27	0.22	9
CV-20	NM	9.7	21.8	80.1 ^{bc}	0.1	1.50	0.47	.
	NA	5.2	3.6	13.3 ^{de}	0.0	0.25	0.23	8
	NALS	4.7	3.9	14.4 ^{de}	1.5	0.27	0.20	9
ISA White Exp.	NM	9.5	21.6	81.9 ^{bc}	0.5	1.45	0.44	.
	NA	5.2	3.9	15.4 ^{de}	2.7	0.27	0.21	9
	NALS	5.5	3.8	14.5 ^{de}	2.4	0.26	0.23	9
All Strains	NM	10.2 ^Y	21.6 ^Y	82.0	1.1	1.44 ^Y	0.48 ^Y	.
	NA	5.4 ^Z	3.5 ^Z	13.5	1.5	0.25 ^Z	0.23 ^Z	8 ^Z
	NALS	5.2 ^Z	3.9 ^Z	14.9	1.2	0.27 ^Z	0.22 ^Z	10 ^Y

a,b,c,d,e - Different letters denote significant strain * molt program interactions (P<.01).

X,Y,Z - Different letters denote significant differences (P<.01), comparisons made among molt program average values.

TABLE 15. EFFECT OF WHITE EGG STRAIN AND POPULATION ON HENS IN THE 36th NCLP&MT (462-490 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

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)
LSL-Lite White	3	1.22	1.74	42.8	1.39	20.4	1.48
	4	1.24	1.80	46.2	1.38	23.1	1.51
	Average	1.23 ^{ABC}	1.77 ^{BC}	44.5 ^B	1.38 ^B	21.8	1.50 ^B
Bovans White Exp.	3	1.26	1.82	44.7	1.44	20.6	1.49
	4	1.24	1.74	40.8	1.41	19.0	1.48
	Average	1.25 ^{AB}	1.78 ^B	42.7 ^B	1.42 ^B	19.8	1.49 ^B
Bovans White	3	1.12	1.68	50.4	1.32	21.4	1.39
	4	1.18	1.74	46.6	1.40	19.4	1.47
	Average	1.15 ^D	1.71 ^{BC}	48.5 ^{AB}	1.36 ^B	20.4	1.43 ^B
DeKalb White Exp.	3	1.23	1.75	43.3	1.40	20.0	1.48
	4	1.21	1.77	46.9	1.39	21.3	1.47
	Average	1.22 ^{BC}	1.76 ^{BC}	45.1 ^B	1.39 ^B	20.6	1.48 ^B
DeKalb White	3	1.22	1.74	43.0	1.38	20.5	1.46
	4	1.18	1.73	48.2	1.36	21.3	1.50
	Average	1.20 ^{BCD}	1.73 ^{BC}	45.6 ^B	1.37 ^B	20.9	1.48 ^B
Hy-Line (W-36)	3	1.18	1.73	47.8	1.40	18.6	1.46
	4	1.19	1.72	44.6	1.40	18.6	1.45
	Average	1.18 ^{CD}	1.72 ^{BC}	46.2 ^B	1.40 ^B	18.6	1.45 ^B
Hy-Line (W-98)	3	1.27	2.01	58.2	1.58	21.3	1.66
	4	1.27	1.95	53.1	1.52	21.4	1.57
	Average	1.27 ^A	1.98 ^A	55.6 ^A	1.55 ^A	21.4	1.62 ^A
CV-20	3	1.18	1.69	43.5	1.37	19.0	1.42
	4	1.18	1.70	43.9	1.36	19.9	1.41
	Average	1.18 ^{CD}	1.70 ^C	43.7 ^B	1.36 ^B	19.4	1.42 ^B
ISA White Exp.	3	1.18	1.79	51.1	1.43	19.6	1.47
	4	1.21	1.71	41.6	1.36	20.3	1.42
	Average	1.19 ^{CD}	1.75 ^{BC}	46.4 ^B	1.40 ^B	20.0	1.45 ^B
All Strains	3	1.21	1.77	47.2	1.41	20.2	1.48
	4	1.21	1.76	45.8	1.40	20.5	1.48

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

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

TABLE 16. EFFECT OF WHITE EGG STRAIN AND SYNCHRONIZED MOLT TREATMENT ON HENS IN THE 36th NCLP&MT (462-490 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

Breeder	Molt Program	17 Wk Body Wt	66 Wk Body Wt	1st Cycle Wt Gain	Lowest Body Weight	Molt Weight Loss	70 Wk Body Wt
(Strain)		(kg)	(kg)	(%)	(kg)	(%)	(kg)
LSL-Lite White	NM	1.24	1.75	40.9	1.64	6.2	1.75
	NA	1.22	1.77	44.9	1.21	31.8	1.38
	NALS	1.22	1.80	47.7	1.31	27.3	1.37
Bovans White Exp.	NM	1.25	1.72	37.9	1.62	6.1	1.65
	NA	1.24	1.83	46.8	1.30	29.0	1.42
	NALS	1.26	1.80	43.4	1.35	24.4	1.39
Bovans White	NM	1.14	1.77	55.6	1.64	7.2	1.64
	NA	1.17	1.64	40.9	1.19	27.0	1.34
	NALS	1.15	1.71	48.9	1.25	27.0	1.31
DeKalb White Exp.	NM	1.21	1.73	42.8	1.63	6.3	1.67
	NA	1.20	1.80	50.4	1.25	30.5	1.42
	NALS	1.23	1.75	42.0	1.31	25.1	1.35
DeKalb White	NM	1.17	1.73	49.3	1.62	6.3	1.64
	NA	1.22	1.76	45.1	1.21	31.2	1.47
	NALS	1.20	1.71	42.4	1.28	25.2	1.33
Hy-Line (W-36)	NM	1.20	1.73	44.3	1.64	4.8	1.66
	NA	1.17	1.71	46.2	1.23	27.5	1.35
	NALS	1.18	1.74	48.1	1.33	23.5	1.35
Hy-Line (W-98)	NM	1.28	1.89	47.0	1.77	5.9	1.80
	NA	1.28	2.04	59.7	1.41	30.8	1.55
	NALS	1.26	2.02	60.2	1.46	27.4	1.50
CV-20	NM	1.17	1.68	43.5	1.57	6.8	1.59
	NA	1.18	1.69	44.1	1.25	26.4	1.38
	NALS	1.19	1.71	43.6	1.28	25.1	1.28
ISA White Exp.	NM	1.19	1.70	42.6	1.58	7.2	1.60
	NA	1.18	1.76	49.3	1.27	27.5	1.39
	NALS	1.21	1.78	47.2	1.33	25.2	1.36
All Strains	NM	1.21	1.75	44.9	1.64 ^X	6.3 ^Z	1.67 ^X
	NA	1.21	1.78	47.5	1.26 ^Z	29.1 ^X	1.41 ^Y
	NALS	1.21	1.78	47.1	1.32 ^Y	25.6 ^Y	1.36 ^Z

X,Y,Z - Different letters denote significant differences (P < .01), comparisons made among strain average values.

TABLE 17. EFFECT OF BROWN EGG STRAIN AND POPULATION ON PERFORMANCE OF HENS IN THE 36th NCLP&MT (462-490 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

Breeder	Population ¹	Feed Consumption	Eggs Per Bird Housed	Egg Production	Mortality	Egg Income	Feed Costs	Days to 0% Production
(Strain)		(kg/100/hen/d)		(HD%)	(%)	(\$/hen)	(\$/hen)	
Bovans	3	7.1	10.6	39.8	1.2	0.73	0.32	14
Brown	4	7.1	10.3	39.0	1.9	0.72	0.33	13
	Average	7.1	10.4	39.4	1.6	0.72	0.32	13
Bovans	3	7.2	10.3	40.0	2.1	0.72	0.33	15
Goldline	4	7.2	10.6	39.2	2.8	0.72	0.34	12
	Average	7.2	10.5	39.6	2.4	0.72	0.33	13
Hy-Line	3	6.6	10.1	37.1	1.6	0.72	0.31	12
Brown	4	6.4	10.5	38.8	0.2	0.72	0.30	14
	Average	6.5	10.3	38.0	0.9	0.72	0.30	13
All	3	7.0	10.3	39.0	1.6	0.72	0.32	14
Strains	4	6.9	10.5	39.0	1.6	0.72	0.32	13

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

TABLE 18. EFFECT OF BROWN EGG STRAIN AND SYNCHRONIZED MOLT TREATMENT ON PERFORMANCE OF HENS IN THE 36th NCLP&MT (462-490 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

Breeder	Molt Program	Feed Consumption	Eggs Per Bird Housed	Egg Production	Mortality	Egg Income	Feed Costs	Days to 0% Production
(Strain)		(kg/100/hen/d)		(HD%)	(%)	(\$/hen)	(\$/hen)	
Bovans Brown	NM	9.7	22.3	83.6	1.4	1.54	0.49	.
	NA	6.0	3.6	13.9	2.0	0.26	0.25	9
	NALS	5.5	5.3	20.8	1.3	0.37	0.23	18
Bovans Goldline	NM	10.6	22.3	84.4	2.4	1.52	0.53	.
	NA	5.2	3.9	14.9	2.1	0.27	0.22	10
	NALS	5.9	5.1	19.6	2.8	0.36	0.26	16
Hy-Line Brown	NM	9.1	21.4	78.5	0.1	1.50	0.47	.
	NA	5.2	4.1	15.7	1.9	0.29	0.22	11
	NALS	5.1	5.4	19.8	0.7	0.38	0.23	14
All Strains	NM	9.8 ^Y	22.0 ^X	82.2 ^X	1.3	1.52 ^X	0.50 ^Y	.
	NA	5.5 ^Z	3.9 ^Z	14.8 ^Z	2.0	0.27 ^Z	0.23 ^Z	10 ^Z
	NALS	5.5 ^Z	5.3 ^Y	20.1 ^Y	1.6	0.37 ^Y	0.24 ^Z	16 ^Y

X,Y,Z - Different letters denote significant differences (P < .01), comparisons made among molt program average values.

TABLE 19. EFFECT OF BROWN EGG STRAIN AND POPULATION ON HENS IN THE 36th NCLP&MT (462-490 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

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)
Bovans	3	1.54	2.09	35.8	1.72	17.5	1.78
Brown	4	1.51	2.08	37.6	1.67	19.4	1.74
	Average	1.53 ^A	2.08	36.7 ^B	1.69	18.4	1.76
Bovans	3	1.49	2.11	41.7	1.70	19.1	1.77
Goldline	4	1.48	2.12	43.0	1.75	17.8	1.78
	Average	1.49 ^A	2.11	42.4 ^{AB}	1.72	18.4	1.77
Hy-Line	3	1.40	2.03	45.6	1.65	18.9	1.74
Brown	4	1.40	2.08	48.6	1.71	17.5	1.73
	Average	1.40 ^B	2.05	47.1 ^A	1.68	18.2	1.74
All	3	1.48	2.07	41.1	1.69	18.5	1.76
Strains	4	1.47	2.09	43.1	1.71	18.2	1.75

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

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

TABLE 20. EFFECT OF BROWN EGG STRAIN AND SYNCHRONIZED MOLT TREATMENT ON HENS IN THE 36th NCLP&MT (462-490 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

Breeder	Molt Program	17 Wk Body Wt	66 Wk Body Wt	1st Cycle Wt Gain	Lowest Body Weight	Molt Weight Loss	70 Wk Body Wt
(Strain)		(kg)	(kg)	(%)	(kg)	(%)	(kg)
Bovans Brown	NM	1.51	2.03	34.2	1.92	5.3	1.94
	NA	1.51	2.12	40.6	1.54	27.4	1.69
	NALS	1.56	2.10	35.5	1.63	22.6	1.66
Bovans Goldline	NM	1.45	2.11	45.5	1.99	5.5	1.99
	NA	1.50	2.08	38.4	1.53	26.2	1.63
	NALS	1.51	2.16	43.1	1.65	23.6	1.69
Hy-Line Brown	NM	1.38	2.02	46.3	1.91	5.2	1.93
	NA	1.42	2.07	46.3	1.53	26.2	1.67
	NALS	1.39	2.07	48.7	1.59	23.3	1.62
All Strains	NM	1.45	2.05	42.0	1.94 ^X	5.3 ^Z	1.95 ^Y
	NA	1.48	2.09	41.7	1.53 ^Z	26.6 ^X	1.66 ^Z
	NALS	1.49	2.11	42.4	1.62 ^Y	23.2 ^Y	1.66 ^Z

X,Y,Z - Different letters denote significant differences ($P < .01$), comparisons made among molt program average values.

TABLE 21. EFFECT OF WHITE EGG STRAIN AND SYNCHRONIZED MOLT TREATMENT ON PERFORMANCE OF HENS IN THE 36th NCLP&MT (462-490 DAYS) IN BATTERY CAGES (HOUSE 7)

Breeder (Strain)	Molt Program	Feed Consumption (kg/100/hen/d)	Eggs		Mortality (%)	Egg Income (\$/hen)	Feed Costs (\$/hen)	Days to 0% Production
			Per Bird Housed	Egg Production (HD%)				
LSL-Lite White	NM	8.8	23.0 ^a	83.7 ^a	0.6	1.59 ^a	0.47	.
	NA	5.5	3.5 ^d	12.9 ^{cd}	1.1	0.24 ^d	0.24	9
	NALS	4.5	3.4 ^d	12.6 ^{cd}	0.5	0.24 ^d	0.20	10
	Average	6.3	10.0	6.4	0.7	0.69	0.30 ^{AB}	10
Bovans White Exp.	NM	9.0	21.9 ^{ab}	82.2 ^a	1.1	1.51 ^{ad}	0.46	.
	NA	5.1	3.0 ^d	11.3 ^{cd}	0.9	0.22 ^d	0.22	7
	NALS	5.4	3.7 ^d	14.2 ^c	1.3	0.26 ^d	0.23	9
	Average	6.5	10.6	35.9	1.1	0.66	0.30 ^{AB}	8
Bovans White	NM	8.9	20.5 ^{bc}	83.0 ^a	1.1	1.41 ^{bc}	0.42	.
	NA	5.1	3.1 ^d	12.3 ^{cd}	3.0	0.22 ^d	0.21	8
	NALS	4.9	3.7 ^d	13.8 ^{cd}	0.0	0.25 ^d	0.22	8
	Average	6.3	9.1	36.4	1.4	0.63	0.28 ^B	8
DeKalb White Exp.	NM	8.8	22.0 ^{bc}	81.0 ^a	1.0	1.50 ^{ab}	0.46	.
	NA	6.1	3.3 ^d	12.7 ^{cd}	3.5	0.23 ^d	0.26	9
	NALS	4.5	3.8 ^d	14.3 ^c	1.3	0.27 ^d	0.20	10
	Average	6.5	9.7	36.0	1.9	0.67	0.31 ^{AB}	9
DeKalb White	NM	8.8	20.6 ^{bc}	82.3 ^a	0.5	1.42 ^{bc}	0.42	.
	NA	5.5	2.9 ^d	12.0 ^{cd}	3.3	0.20 ^d	0.22	9
	NALS	5.4	2.7 ^d	11.2 ^{cd}	3.2	0.19 ^d	0.22	8
	Average	6.6	8.7	35.1	2.4	0.60	0.29 ^B	8
Hy-Line (W-36)	NM	9.1	19.7 ^c	73.8 ^b	1.3	1.32 ^c	0.47	.
	NA	4.4	3.5 ^d	12.5 ^{cd}	0.4	0.25 ^d	0.20	8
	NALS	4.9	3.5 ^d	12.6 ^{cd}	0.1	0.25 ^d	0.22	9
	Average	6.1	8.9	33.0	0.6	0.61	0.30 ^{AB}	9
Hy-Line (W-98)	NM	10.6	22.0 ^{ab}	79.6 ^a	0.0	1.45 ^b	0.56	.
	NA	5.6	3.0 ^d	10.9 ^{cd}	1.3	0.21 ^d	0.24	8
	NALS	4.9	3.4 ^d	12.6 ^{cd}	0.5	0.25 ^d	0.22	11
	Average	7.0	9.5	34.4	0.6	0.64	0.34 ^A	10
CV-20	NM	7.8	21.5 ^b	79.3 ^a	1.1	1.47 ^b	0.40	.
	NA	4.2	2.9 ^d	10.5 ^d	0.8	0.20 ^d	0.18	8
	NALS	4.5	3.9 ^d	14.3 ^c	0.0	0.28 ^d	0.20	10
	Average	5.5	9.4	34.7	0.7	0.65	0.26 ^B	9
ISA White Exp.	NM	8.0	20.8 ^{bc}	80.4 ^a	1.1	1.43 ^{bc}	0.40	.
	NA	6.0	3.2 ^d	11.8 ^{cd}	0.0	0.23 ^d	0.27	9
	NALS	5.4	3.7 ^d	14.0 ^{cd}	2.0	0.25 ^d	0.23	9
	Average	6.5	9.2	35.4	1.0	0.64	0.30 ^{AB}	9
All Strains	NM	8.9 ^Y	21.3	80.6	0.9	1.45	0.45 ^Y	.
	NA	5.3 ^Z	3.1	11.9	1.6	0.22	0.23 ^Z	8
	NALS	4.9 ^Z	3.5	13.3	1.0	0.25	0.21 ^Z	9

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

a,b,c,d - Different letters denote significant strain * molt program interactions (P<.01).

Y,Z - Different letters denote significant differences (P<.01), comparisons made among molt program average values.

TABLE 22. EFFECT OF WHITE EGG STRAIN AND POPULATION ON HENS IN THE 36th NCLP&MT (462-490 DAYS) IN BATTERY CAGES (HOUSE 7)

Breeder	Molt Program	17 Wk Body Wt	66 Wk Body Wt	1st Cycle Wt Gain	Lowest Body Weight	Molt Weight Loss	70 Wk Body Wt
(Strain)		(kg)	(kg)	(%)	(kg)	(%)	(kg)
LSL-Lite White	NM	1.18	1.72	46.3	1.71	0.6 ^f	1.73
	NA	1.23	1.83	48.8	1.25	31.7 ^{ab}	1.40
	NALS	1.21	1.82	49.7	1.31	27.7 ^{abcd}	1.37
	Average	1.21 ^A	1.79 ^B	48.3	1.42 ^{BC}	20.0	1.50 ^{AB}
Bovans White Exp.	NM	1.19	1.80	52.1	1.75	2.7 ^f	1.76
	NA	1.26	1.80	43.4	1.34	25.7 ^{cd}	1.42
	NALS	1.22	1.76	44.7	1.32	24.8 ^{cd}	1.35
	Average	1.22 ^A	1.79 ^B	46.7	1.47 ^{AB}	17.7	1.51 ^{AB}
Bovans White	NM	1.11	1.79	61.1	1.70	4.9 ^{ef}	1.71
	NA	1.15	1.71	49.8	1.16	32.4 ^a	1.33
	NALS	1.15	1.70	48.5	1.25	26.7 ^{bcd}	1.34
	Average	1.13 ^B	1.73 ^{BC}	53.1	1.37 ^C	21.4	1.46 ^{BC}
DeKalb White Exp.	NM	1.21	1.78	47.2	1.69	4.8 ^{ef}	1.73
	NA	1.19	1.77	48.9	1.19	32.5 ^a	1.32
	NALS	1.23	1.81	47.4	1.34	25.7 ^{cd}	1.40
	Average	1.21 ^A	1.78 ^B	47.8	1.41 ^{BC}	21.0	1.49 ^{AB}
DeKalb White	NM	1.23	1.80	45.7	1.73	3.5 ^{ef}	1.73
	NA	1.19	1.70	43.3	1.14	32.5 ^a	1.35
	NALS	1.19	1.72	45.2	1.28	25.5 ^{cd}	1.34
	Average	1.20 ^A	1.74 ^{BC}	44.7	1.38 ^C	20.5	1.47 ^{BC}
Hy-Line (W-36)	NM	1.17	1.74	48.3	1.70	2.1 ^f	1.70
	NA	1.14	1.65	44.2	1.25	23.4 ^d	1.30
	NALS	1.15	1.77	54.3	1.32	25.6 ^{cd}	1.35
	Average	1.15 ^B	1.72 ^{BC}	48.9	1.42 ^{BC}	17.0	1.45 ^{BC}
Hy-Line (W-98)	NM	1.25	1.98	58.8	1.78	10.1 ^e	1.80
	NA	1.23	1.88	53.1	1.36	27.4 ^{abcd}	1.49
	NALS	1.25	1.88	50.8	1.41	25.2 ^{cd}	1.42
	Average	1.24 ^A	1.92 ^A	54.2	1.52 ^A	20.9	1.57 ^A
CV-20	NM	1.14	1.70	49.4	1.62	4.6 ^{ef}	1.62
	NA	1.11	1.63	46.9	1.21	25.4 ^{cd}	1.26
	NALS	1.15	1.71	48.5	1.28	25.0 ^{cd}	1.30
	Average	1.13 ^B	1.68 ^C	48.3	1.37 ^C	18.3	1.39 ^C
ISA White Exp.	NM	1.19	1.71	43.7	1.63	4.9 ^{ef}	1.63
	NA	1.19	1.77	48.7	1.24	29.7 ^{abc}	1.36
	NALS	1.21	1.77	45.5	1.29	27.0 ^{bcd}	1.33
	Average	1.20 ^A	1.75 ^{BC}	46.0	1.39 ^C	20.5	1.44 ^{BC}
All Strains	NM	1.18	1.78	50.3	1.70 ^x	4.2	1.71 ^y
	NA	1.19	1.75	47.5	1.24 ^z	29.0	1.36 ^z
	NALS	1.19	1.77	48.3	1.31 ^y	25.9	1.35 ^z

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

a,b,c,d,e,f - Different letters denote significant strain * molt program interactions (P<.01).

x,y,z - Different letters denote significant strain * molt program interactions (P<.01).

TABLE 23. EFFECT OF BROWN EGG STRAIN AND SYNCHRONIZED MOLT TREATMENT ON PERFORMANCE OF HENS IN THE 36th NCLP&MT (462-490 DAYS) IN BATTERY CAGES (HOUSE 7)

Breeder	Molt Program	Feed Consumption	Eggs Per Bird Housed	Egg Production	Mortality	Egg Income	Feed Costs	Days to 0% Production
(Strain)		(kg/100/hen/d)		(HD%)	(%)	(\$/hen)	(\$/hen)	
Bovans	NM	9.0	21.8	82.7	0.5	1.49	0.48	.
Brown	NA	4.8	3.1	12.2	3.8	0.23	0.20	10 ^Z
	NALS	5.0	5.0	18.4	2.7	0.35	0.22	18 ^Y
	Average	6.3	10.0	37.8 ^A	2.3	0.69	0.30	14
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Bovans Goldline	NM	9.6	22.0	82.6	1.2	1.45	0.52	.
	NA	5.2	3.2	11.7	1.0	0.23	0.23	10 ^Z
	NALS	5.2	4.3	16.3	2.5	0.29	0.22	18 ^Y
	Average	6.7	9.8	36.9 ^{AB}	1.6	0.66	0.32	14
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Hy-Line Brown	NM	8.1	21.4	78.2	2.4	1.50	0.45	.
	NA	4.2	2.9	10.7	0.4	0.21	0.18	9 ^Z
	NALS	4.8	3.9	14.5	1.5	0.27	0.21	6 ^Z
	Average	5.7	9.4	34.5 ^B	1.5	0.66	0.28	7
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All Strains	NM	8.9 ^Y	21.7 ^X	81.2 ^X	1.4	1.48 ^X	0.48 ^Y	.
	NA	4.7 ^Z	3.1 ^Z	11.5 ^Z	1.7	0.22 ^Z	0.20 ^Z	10
	NALS	5.0 ^Z	4.4 ^Y	16.4 ^Y	2.2	0.31 ^Y	0.22 ^Z	14

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

X,Y,Z - Different letters denote significant differences (P<.01), comparisons made among molt program average values.

TABLE 24. EFFECT OF BROWN EGG STRAIN AND POPULATION ON HENS IN THE 36th NCLP&MT (462-490 DAYS) IN BATTERY CAGES (HOUSE 7)

Breeder	Molt Program	17 Wk Body Wt	66 Wk Body Wt	1st Cycle Wt Gain	Lowest Body Weight	Molt Weight Loss	70 Wk Body Wt
(Strain)		(kg)	(kg)	(%)	(kg)	(%)	(kg)
Bovans Brown	NM	1.37 ^c	2.06	50.0	1.93	6.0	1.93
	NA	1.51 ^a	1.93	27.3	1.52	20.3	1.60
	NALS	1.43 ^{bc}	2.04	42.6	1.56	23.5	1.56
	Average	1.44	2.01	40.0	1.67	16.6	1.70
Bovans Goldline	NM	1.42 ^{bc}	1.99	39.5	1.90	4.5	1.90
	NA	1.45 ^{abc}	1.89	30.8	1.50	19.8	1.59
	NALS	1.47 ^{ab}	2.05	39.4	1.60	22.0	1.61
	Average	1.45	1.98	36.6	1.66	15.4	1.70
Hy-Line Brown	NM	1.40 ^{bc}	1.96	39.9	1.87	4.9	1.87
	NA	1.40 ^{bc}	2.01	43.6	1.58	20.9	1.61
	NALS	1.38 ^c	2.08	51.1	1.62	22.4	1.62
	Average	1.39	2.02	44.9	1.69	16.1	1.70
All Strains	NM	1.40	2.00	43.1	1.90 ^X	5.1 ^Z	1.90 ^Z
	NA	1.45	1.94	33.9	1.53 ^Z	20.3 ^Y	1.60 ^Y
	NALS	1.43	2.06	44.4	1.59 ^Y	22.6 ^Y	1.59 ^Y

a,b,c - Different letters denote significant strain * molt program interactions (P<.01).

X,Y,Z - Different letters denote significant differences (P<.01), comparisons made among molt program average values.

TABLE 25. EFFECT OF WHITE EGG STRAIN AND POPULATION ON PERFORMANCE OF HENS IN THE 36th NCLP&MT (491-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

Breeder (Strain)	Population ¹	Eggs					
		Feed Consumption (kg/100/hen/d)	Feed Conversion (g egg/g feed)	Per Bird Housed	Egg Production (HD%)	Egg Mass (g/HD)	Mortality (%)
LSL-Lite White	3	12.6	0.38	173.8	72.1	47.1	16.2
	4	12.3	0.40	179.0	73.1	48.6	14.9
	Average	12.4	0.39 ^{AB}	176.4 ^{ABC}	72.6	47.9	15.5 ^{ABC}
Bovans White Exp.	3	11.8	0.39	169.9	67.7	47.6	12.8
	4	11.8	0.40	172.8	69.6	49.0	10.8
	Average	11.8	0.40 ^A	171.3 ^{BCD}	68.7	48.3	11.8 ^{BCD}
Bovans White	3	13.2	0.37	164.6	72.6	48.1	14.8
	4	13.4	0.36	157.1	72.5	47.3	17.5
	Average	13.3	0.36 ^B	160.8 ^{DE}	72.5	47.7	16.1 ^{AB}
DeKalb White Exp.	3	11.8	0.37	168.4	65.6	43.2	11.1
	4	12.0	0.35	163.5	64.7	43.0	10.1
	Average	11.9	0.36 ^B	165.9 ^{CD}	65.1	43.1	10.6 ^{CDE}
DeKalb White	3	12.4	0.37	151.8	67.1	45.9	17.3
	4	12.3	0.36	156.3	66.8	45.1	17.3
	Average	12.4	0.36 ^B	154.1 ^E	67.0	45.5	17.3 ^A
Hy-Line (W-36)	3	10.8	0.41	181.7	67.5	44.8	5.1
	4	11.2	0.40	181.3	68.6	46.1	7.3
	Average	11.0	0.41 ^A	181.5 ^{AB}	68.1	45.4	6.2 ^E
Hy-Line (W-98)	3	12.1	0.38	180.8	67.1	46.2	7.6
	4	12.0	0.39	174.4	67.8	46.9	9.3
	Average	12.0	0.39 ^B	177.6 ^{AB}	67.5	46.5	8.5 ^{DE}
CV-20	3	11.4	0.41	186.7	70.6	46.8	6.9
	4	10.8	0.42	180.7	69.1	45.4	5.9
	Average	11.1	0.41 ^A	183.7 ^A	69.8	46.1	6.4 ^E
ISA White Exp.	3	11.3	0.41	177.8	72.3	47.7	10.7
	4	11.8	0.39	174.2	71.2	47.1	9.7
	Average	11.5	0.40 ^A	176.0 ^{ABC}	71.8	47.4	10.2 ^{DE}
All Strains	3	11.9	0.39	172.8	69.2	46.4	11.4
	4	12.0	0.39	171.0	69.3	46.5	11.4

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

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

TABLE 26. EFFECT OF WHITE EGG STRAIN AND POPULATION ON EGG WEIGHT AND EGG SIZE DISTRIBUTION OF HENS IN THE 36th NCLP&MT (491-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

Breeder (Strain)	Population ¹	Egg Weight (g egg/hen/d)	Pee Wee (%)	Small (%)	Medium (%)	Large (%)	Extra Large (%)
LSL-Lite White	3	65.0	0.0	0.2	0.9	8.7	90.1
	4	66.0	0.0	0.1	0.3	4.9	94.3
	Average	65.5 ^C	0.0	0.2	0.6	6.8 ^C	92.2 ^B
Bovans White Exp.	3	68.1	0.0	0.0	0.5	3.1	95.9
	4	68.5	0.1	0.1	0.1	1.6	98.1
	Average	68.3 ^A	0.0	0.0	0.3	2.4 ^D	97.0 ^A
Bovans White	3	65.2	0.0	0.0	0.4	11.1	88.1
	4	64.9	0.0	0.0	0.6	12.6	86.7
	Average	65.0 ^C	0.0	0.0	0.5	11.8 ^{AB}	87.4 ^{CD}
DeKalb White Exp.	3	65.3	0.0	0.1	0.8	9.0	89.8
	4	65.8	0.1	0.0	0.7	8.6	90.5
	Average	65.5 ^C	0.0	0.0	0.8	8.8 ^{BC}	90.2 ^{BC}
DeKalb White	3	67.1	0.0	0.2	1.7	6.5	91.4
	4	67.1	0.0	0.0	0.1	7.9	91.8
	Average	67.1 ^B	0.0	0.1	0.9	7.2 ^C	91.6 ^B
Hy-Line (W-36)	3	65.2	0.0	0.0	0.3	8.0	91.5
	4	65.5	0.1	0.2	0.3	5.5	93.9
	Average	65.3 ^C	0.1	0.1	0.3	6.7 ^C	92.7 ^B
Hy-Line (W-98)	3	68.3	0.1	0.0	0.3	3.6	96.0
	4	68.8	0.0	0.0	0.2	2.4	97.4
	Average	68.5 ^A	0.0	0.0	0.2	3.0 ^D	96.7 ^A
CV-20	3	64.8	0.0	0.0	0.2	10.0	89.5
	4	64.8	0.0	0.0	1.0	10.1	88.8
	Average	64.8 ^{CD}	0.0	0.0	0.6	10.0 ^{ABC}	89.1 ^{BCD}
ISA White Exp.	3	64.1	0.0	0.0	1.0	13.7	85.2
	4	63.9	0.0	0.0	1.3	13.0	85.4
	Average	64.0 ^D	0.0	0.0	1.1	13.3 ^A	85.3 ^D
All Strains	3	65.9	0.0	0.1	0.7	8.2	90.8
	4	66.2	0.0	0.0	0.5	7.4	91.9

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

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

TABLE 27. EFFECT OF WHITE EGG STRAIN AND POPULATION ON EGG QUALITY, INCOME AND FEED COSTS OF HENS IN THE 36th NCLP&MT (491-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

Breeder (Strain)	Population ¹	Grade	Grade	Cracks	Loss	Egg	Feed
		A	B			Income	Costs
		(%)	(%)	(%)	(%)	(\$/hen)	(\$/hen)
LSL-Lite White	3	88.7	6.9	4.1	0.3	11.69	6.40
	4	91.4	6.2	2.0	0.4	12.18	6.44
	Average	90.1 ^{AB}	6.6 ^{AB}	3.0	0.3	11.93 ^{AB}	6.42 ^{BC}
Bovans White Exp.	3	90.8	4.7	3.2	1.4	11.51	6.40
	4	90.3	5.2	3.7	0.8	11.74	6.36
	Average	90.5 ^{AB}	5.0 ^{ABC}	3.4	1.1	11.62 ^{BC}	6.38 ^{BC}
Bovans White	3	90.9	4.5	3.8	0.8	11.16	6.35
	4	90.9	6.2	2.6	0.3	10.68	6.17
	Average	90.9 ^{AB}	5.3 ^{ABC}	3.2	0.5	10.92 ^{CD}	6.26 ^{BC}
DeKalb White Exp.	3	90.3	5.9	3.2	0.6	11.34	6.51
	4	90.7	5.1	3.6	0.6	11.10	6.56
	Average	90.5 ^{AB}	5.5 ^{ABC}	3.4	0.6	11.22 ^{BC}	6.53 ^{AB}
DeKalb White	3	88.4	6.7	4.0	0.9	10.13	5.99
	4	89.4	5.4	4.3	0.9	10.55	6.18
	Average	88.9 ^B	6.1 ^{AB}	4.1	0.9	10.34 ^D	6.09 ^C
Hy-Line (W-36)	3	92.1	4.4	2.7	0.9	12.44	6.31
	4	92.4	4.3	2.2	1.1	12.44	6.30
	Average	92.3 ^A	4.3 ^{BC}	2.5	1.0	12.44 ^A	6.31 ^{BC}
Hy-Line (W-98)	3	87.4	8.2	3.2	1.2	12.02	7.03
	4	90.4	5.4	4.0	0.2	11.92	6.69
	Average	88.9 ^B	6.8 ^A	3.6	0.7	11.97 ^{AB}	6.86 ^A
CV-20	3	91.9	3.9	3.6	0.6	12.77	6.43
	4	93.2	2.6	3.7	0.5	12.49	6.09
	Average	92.5 ^A	3.2 ^C	3.7	0.5	12.63 ^A	6.26 ^{BC}
ISA White Exp.	3	91.5	4.7	3.2	0.5	12.15	5.96
	4	90.5	4.3	4.6	0.6	11.79	6.21
	Average	91.0 ^A	4.5 ^{ABC}	3.9	0.6	11.97 ^{AB}	6.09 ^C
All Strains	3	90.2	5.5	3.4	0.8	11.69	6.38
	4	91.0	5.0	3.4	0.6	11.66	6.33

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

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

TABLE 28. EFFECT OF WHITE EGG STRAIN AND SYNCHRONIZED MOLT PROGRAM ON PERFORMANCE OF HENS IN THE 36th NCLP&MT (491-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

Breeder (Strain)	Molt Program	Feed Consumption (kg/100/hen/d)	Feed Conversion (g egg/g feed)	Eggs			Mortality (%)
				Per Bird Housed	Egg Production (HD%)	Egg Mass (g/HD)	
LSL-Lite White	NM	13.5 ^b	0.31	140.4	63.6 ^{efg}	41.9 ^{ef}	29.1
	NA	11.9 ^{cde}	0.43	191.6	77.3 ^a	51.5 ^a	8.7
	NALS	11.9 ^{cdef}	0.42	197.3	76.9 ^a	50.2 ^{abc}	8.8
Bovans White Exp.	NM	11.9 ^{cdef}	0.36	153.8	63.5 ^{efg}	42.7 ^{ef}	19.0
	NA	11.9 ^{cdef}	0.42	182.6	72.3 ^{abcd}	51.4 ^{ab}	5.0
	NALS	11.7 ^{cdef}	0.42	177.6	70.2 ^{bcd}	50.8 ^{abc}	11.4
Bovans White	NM	15.6 ^a	0.31	148.2	72.4 ^{abcd}	46.9 ^{cde}	25.7
	NA	12.4 ^{bcd}	0.39	162.0	73.2 ^{ab}	48.5 ^{abcd}	12.1
	NALS	11.9 ^{cdef}	0.39	172.2	72.0 ^{bcd}	47.7 ^{bcd}	10.5
DeKalb White Exp.	NM	12.6 ^{bc}	0.31	146.4	60.9 ^g	39.1 ^f	22.9
	NA	11.6 ^{cdef}	0.38	174.5	66.7 ^{def}	45.1 ^{de}	3.3
	NALS	11.5 ^{cdef}	0.39	176.8	67.7 ^{cde}	45.2 ^{de}	5.5
DeKalb White	NM	12.6 ^{bc}	0.32	131.2	60.6 ^g	40.2 ^f	25.7
	NA	12.4 ^{bcd}	0.38	163.8	69.6 ^{bcd}	47.1 ^{cd}	13.0
	NALS	12.0 ^{bcd}	0.40	167.3	70.7 ^{bcd}	49.3 ^{abc}	13.2
Hy-Line (W-36)	NM	11.2 ^{def}	0.35	156.8	59.8 ^g	38.9 ^f	10.3
	NA	10.8 ^f	0.44	193.7	72.8 ^{ab}	49.7 ^{abc}	3.6
	NALS	10.9 ^{ef}	0.43	193.9	71.6 ^{bcd}	47.7 ^{bcd}	4.7
Hy-Line (W-98)	NM	12.4 ^{bcd}	0.32	148.5	58.1 ^g	40.0 ^f	17.7
	NA	11.9 ^{cdef}	0.41	194.6	71.8 ^{bcd}	49.1 ^{abc}	3.5
	NALS	11.7 ^{cdef}	0.42	189.7	72.5 ^{abc}	50.4 ^{abc}	4.3
CV-20	NM	11.2 ^{def}	0.36	158.4	62.5 ^{fg}	40.2 ^f	13.2
	NA	10.9 ^{ef}	0.44	199.7	74.0 ^{ab}	48.4 ^{abcd}	2.1
	NALS	11.0 ^{def}	0.44	193.0	73.0 ^{ab}	49.7 ^{abc}	3.9
ISA White Exp.	NM	12.1 ^{bcd}	0.34	144.4	62.8 ^{fg}	40.1 ^f	23.0
	NA	10.8 ^f	0.46	193.1	77.5 ^a	51.4 ^{ab}	2.4
	NALS	11.8 ^{cdef}	0.41	190.5	75.0 ^{ab}	50.7 ^{abc}	5.3
All Strains	NM	12.6	0.33 ^Z	147.6 ^Z	62.7	41.1	20.7 ^Y
	NA	11.6	0.41 ^Y	183.9 ^Y	72.8	49.1	6.0 ^Z
	NALS	11.6	0.41 ^Y	184.3 ^Y	72.2	49.1	7.5 ^Z

a,b,c,d,e,f,g - Different letters denote significant strain*molt program interactions (P<.01).

Y,Z - Different letters denote significant differences (P<.01), comparisons made among molt program average values.

TABLE 29. EFFECT OF WHITE EGG STRAIN AND SYNCHRONIZED MOLT PROGRAM ON EGG WEIGHT AND EGG SIZE DISTRIBUTION OF HENS IN THE 36th NCLP&MT (491-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

Breeder (Strain)	Molt Program	Egg Weight (g egg/hen/d)	Pee Wee (%)	Small (%)	Medium (%)	Large (%)	Extra Large (%)
LSL-Lite White	NM	65.8	0.0	0.4	0.0	4.7	94.9
	NA	65.7	0.0	0.0	0.7	5.9	93.1
	NALS	65.1	0.0	0.1	1.3	9.7	88.6
Bovans White Exp.	NM	67.3	0.0	0.0	0.0	3.2	96.7
	NA	68.3	0.1	0.0	0.7	3.0	95.9
	NALS	69.2	0.0	0.1	0.3	0.9	98.4
Bovans White	NM	64.8	0.0	0.0	0.3	14.3	84.9
	NA	65.3	0.0	0.0	0.7	10.9	88.2
	NALS	65.0	0.0	0.0	0.4	10.4	89.1
DeKalb White Exp.	NM	64.4	0.1	0.0	1.0	11.9	86.8
	NA	66.1	0.0	0.0	0.8	6.7	92.2
	NALS	66.1	0.0	0.1	0.5	7.7	91.5
DeKalb White	NM	66.3	0.0	0.4	2.4	6.1	90.8
	NA	67.3	0.0	0.0	0.0	10.0	89.8
	NALS	67.6	0.0	0.0	0.3	5.4	94.2
Hy-Line (W-36)	NM	65.3	0.2	0.0	0.4	8.7	90.7
	NA	65.5	0.0	0.0	0.1	6.8	93.1
	NALS	65.2	0.0	0.3	0.4	4.8	94.3
Hy-Line (W-98)	NM	69.3	0.0	0.0	0.1	4.8	95.1
	NA	67.8	0.1	0.0	0.3	1.7	97.9
	NALS	68.5	0.0	0.0	0.3	2.6	97.1
CV-20	NM	64.4	0.0	0.0	0.7	13.1	86.0
	NA	64.6	0.0	0.0	0.9	10.1	88.7
	NALS	65.4	0.0	0.0	0.2	6.9	92.7
ISA White Exp.	NM	64.0	0.0	0.0	1.8	15.5	82.2
	NA	63.1	0.0	0.0	1.1	17.0	81.6
	NALS	64.9	0.0	0.0	0.5	7.5	92.1
All Strains	NM	65.7	0.0	0.1	0.7	9.1 ^Y	89.8 ^Z
	NA	66.0	0.0	0.0	0.6	8.0 ^{YZ}	91.2 ^{YZ}
	NALS	66.4	0.0	0.1	0.5	6.2 ^Z	93.1 ^Y

Y,Z - Different letters denote significant differences (P<.01), comparisons made among molt program average values.

TABLE 30. EFFECT OF WHITE EGG STRAIN AND SYNCHRONIZED MOLT PROGRAM ON EGG QUALITY, INCOME AND FEED COSTS OF HENS IN THE 36th NCLP&MT (491-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

Breeder (Strain)	Molt Program	Grade A (%)	Grade B (%)	Cracks (%)	Loss (%)	Egg Income (\$/hen)	Feed Costs (\$/hen)
LSL-Lite White	NM	87.9	10.1	2.0	0.0	9.36	6.24
	NA	92.1	4.2	3.0	0.8	13.11	6.44
	NALS	90.2	5.4	4.1	0.3	13.33	6.58
Bovans White Exp.	NM	90.2	5.2	4.2	0.5	10.47	6.15
	NA	91.2	5.3	2.5	1.0	12.40	6.55
	NALS	90.2	4.5	3.6	1.7	12.00	6.43
Bovans White	NM	87.1	8.0	4.5	0.5	9.78	6.62
	NA	92.1	4.6	2.8	0.5	11.07	5.96
	NALS	93.6	3.5	2.3	0.6	11.93	6.20
DeKalb White Exp.	NM	91.2	4.7	3.8	0.3	9.96	6.44
	NA	91.6	4.6	2.8	1.0	11.88	6.64
	NALS	88.7	7.2	3.6	0.4	11.83	6.53
DeKalb White	NM	86.6	7.8	4.7	0.9	8.61	5.75
	NA	90.3	5.4	3.8	0.4	11.11	6.35
	NALS	89.9	5.1	3.9	1.2	11.30	6.16
Hy-Line (W-36)	NM	91.9	5.0	1.9	1.2	10.68	6.27
	NA	91.9	4.7	2.4	1.0	13.26	6.30
	NALS	93.0	3.3	3.0	0.7	13.38	6.35
Hy-Line (W-98)	NM	83.9	8.9	6.3	0.9	9.66	6.78
	NA	90.6	6.0	2.8	0.6	13.23	7.05
	NALS	92.1	5.5	1.7	0.7	13.02	6.74
CV-20	NM	94.3	2.0	3.3	0.3	11.03	6.03
	NA	92.3	3.6	3.4	0.7	13.69	6.38
	NALS	91.0	4.1	4.3	0.6	13.18	6.36
ISA White Exp.	NM	89.4	6.2	3.5	0.9	9.64	5.87
	NA	92.5	3.0	4.0	0.5	13.24	5.86
	NALS	91.2	4.3	4.2	0.4	13.05	6.54
All Strains	NM	89.2 ^Z	6.4 ^Z	3.8	0.6	9.91 ^Z	6.24
	NA	91.6 ^Y	4.6 ^Y	3.1	0.7	12.55 ^Y	6.39
	NALS	91.1 ^Y	4.8 ^Y	3.4	0.7	12.56 ^Y	6.43

Y,Z - Different letters denote significant differences (P<.01), comparisons made among molt program average values.

TABLE 31. EFFECT OF BROWN EGG STRAIN AND POPULATION ON PERFORMANCE OF HENS IN THE 36th NCLP&MT (491-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

Breeder (Strain)	Population ¹	Eggs					
		Feed Consumption (kg/100/hen/d)	Feed Conversion (g egg/g feed)	Per Bird Housed	Egg Production (HD%)	Egg Mass (g/HD)	Mortality (%)
Bovans	3	12.2	0.39	177.3	70.5	47.4	7.7
Brown	4	12.0	0.39	172.1	69.0	46.4	9.8
	Average	12.1 ^A	0.39	174.7	69.8	46.9 ^B	8.7
Bovans	3	13.2	0.38	174.3	71.0	49.0	12.7
Goldline	4	12.3	0.40	183.2	72.5	49.9	10.0
	Average	12.8 ^A	0.39	178.7	71.8	49.4 ^A	11.4
Hy-Line	3	11.4	0.40	176.8	68.7	46.3	6.1
Brown	4	11.3	0.40	180.9	67.8	45.7	5.8
	Average	11.4 ^B	0.40	178.9	68.2	46.0 ^B	5.9
All	3	12.3	0.39	176.1	70.1	47.6	8.8
Strains	4	11.9	0.40	178.8	69.8	47.3	8.5

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

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

TABLE 32. EFFECT OF BROWN EGG STRAIN AND POPULATION ON EGG WEIGHT AND EGG SIZE DISTRIBUTION OF HENS IN THE 36th NCLP&MT (491-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

Breeder (Strain)	Population ¹	Egg Weight (g egg/hen/d)	Pee Wee (%)	Small (%)	Medium (%)	Large (%)	Extra Large (%)
Bovans	3	66.9	0.0	0.0	0.8	7.2	91.8
Brown	4	67.1	0.0	0.0	0.5	6.6	92.5
	Average	67.0 ^B	0.0	0.0	0.7	6.9	92.1
Bovans	3	68.7	0.0	0.0	0.4	4.2	94.6
Goldline	4	68.4	0.0	0.0	0.1	6.2	93.3
	Average	68.6 ^A	0.0	0.0	0.2	5.2	93.9
Hy-Line	3	67.4	0.0	0.0	0.3	8.2	92.1
Brown	4	67.4	0.0	0.0	0.4	5.6	93.8
	Average	67.4 ^{AB}	0.0	0.0	0.3	6.9	92.5
All	3	67.7	0.0	0.0	0.5	6.5	92.5
Strains	4	67.6	0.0	0.0	0.4	6.1	93.2

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

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

TABLE 33. EFFECT OF BROWN EGG STRAIN AND POPULATION ON EGG QUALITY, INCOME AND FEED COSTS OF HENS IN THE 36th NCLP&MT (491-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

Breeder (Strain)	Population ¹	Grade A (%)	Grade B (%)	Cracks (%)	Loss (%)	Egg Income (\$/hen)	Feed Costs (\$/hen)
Bovans	3	91.9	3.9	3.6	0.5	12.16	6.59
Brown	4	91.8	4.6	3.0	0.7	11.78	6.45
	Average	91.8	4.3	3.3	0.6	11.97	6.52
Bovans	3	91.8	4.2	3.1	1.0	11.89	6.84
Goldline	4	91.3	4.5	3.2	1.0	12.48	6.67
	Average	91.6	4.3	3.1	1.0	12.18	6.75
Hy-Line	3	91.6	5.1	2.4	0.9	12.03	6.37
Brown	4	91.8	4.6	2.8	0.9	12.38	6.49
	Average	91.7	4.9	2.6	0.9	12.21	6.43
All	3	91.8	4.4	3.0	0.8	12.02	6.60
Strains	4	91.6	4.6	3.0	0.9	12.21	6.53

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

TABLE 34. EFFECT OF BROWN EGG STRAIN AND SYNCHRONIZED MOLT PROGRAM ON PERFORMANCE OF HENS IN THE 36th NCLP&MT (491-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

Breeder (Strain)	Molt Program	Feed Consumption (kg/100/hen/d)	Feed Conversion (g egg/g feed)	Eggs Per Bird Housed	Egg Production (HD%)	Egg Mass (g/HD)	Mortality (%)
Bovans	NM	11.9	0.36	158.6	63.5	41.9	13.8
Brown	NA	12.3	0.42	187.5	74.9	51.0	7.0
	NALS	12.1	0.39	178.0	70.9	47.8	5.4
Bovans	NM	13.7	0.33	152.2	64.7	44.4	21.6
Goldline	NA	12.1	0.44	196.5	76.8	53.2	5.9
	NALS	12.6	0.40	187.5	73.8	50.7	6.6
Hy-Line	NM	11.0	0.36	157.4	59.9	39.5	9.9
Brown	NA	11.5	0.43	191.0	74.0	49.9	3.1
	NALS	11.6	0.42	188.2	70.8	48.6	4.9
All	NM	12.2	0.35 ^Z	156.1 ^Z	62.7 ^Z	41.9 ^Z	15.1 ^Y
Strains	NA	12.0	0.43 ^Y	191.7 ^Y	75.2 ^X	51.4 ^X	5.3 ^Z
	NALS	12.1	0.41 ^Y	184.6 ^Y	71.8 ^Y	49.0 ^Y	5.6 ^Z

X,Y,Z - Different letters denote significant differences (P<.01), comparisons made among molt program average values.

TABLE 35. EFFECT OF BROWN EGG STRAIN AND SYNCHRONIZED MOLT PROGRAM ON EGG WEIGHT AND EGG SIZE DISTRIBUTION OF HENS IN THE 36th NCLP&MT (491-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

Breeder (Strain)	Molt Program	Egg Weight (g egg/hen/d)	Pee Wee (%)	Small (%)	Medium (%)	Large (%)	Extra Large (%)
Bovans	NM	66.2	0.0	0.0	1.6	10.3	87.7
Brown	NA	67.4	0.0	0.0	0.2	6.1	93.4
	NALS	67.4	0.0	0.0	0.3	4.4	95.2
Bovans	NM	68.7	0.0	0.0	0.6	7.0	91.0
Goldline	NA	68.8	0.0	0.0	0.1	4.5	95.1
	NALS	68.3	0.0	0.0	0.1	4.1	95.6
Hy-Line	NM	66.2	0.0	0.0	0.6	10.8	88.4
Brown	NA	67.4	0.0	0.0	0.2	6.3	93.3
	NALS	68.6	0.0	0.0	0.2	3.4	95.9
All Strains	NM	67.0	0.0	0.0	0.9	9.4 ^Y	89.0 ^Z
	NA	67.8	0.0	0.0	0.2	5.6 ^Z	93.9 ^{YZ}
	NALS	68.1	0.0	0.0	0.2	4.0 ^Z	95.6 ^Z

Y,Z - Different letters denote significant differences (P<.01), comparisons made among molt program average values.

TABLE 36. EFFECT OF BROWN EGG STRAIN AND SYNCHRONIZED MOLT PROGRAM ON EGG QUALITY, INCOME AND FEED COSTS OF HENS IN THE 36th NCLP&MT (491-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

Breeder (Strain)	Molt Program	Grade A (%)	Grade B (%)	Cracks (%)	Loss (%)	Egg Income (\$/hen)	Feed Costs (\$/hen)
Bovans Brown	NM	89.8	6.4	3.1	0.8	10.61	6.30
	NA	92.3	2.8	4.1	0.7	12.92	6.67
	NALS	93.4	3.6	2.7	0.3	12.37	6.59
Bovans Goldline	NM	89.2	5.8	4.2	0.9	10.12	6.65
	NA	92.2	3.5	3.2	1.1	13.48	6.67
	NALS	93.3	3.7	2.0	1.0	12.96	6.94
Hy-Line Brown	NM	90.7	5.2	3.2	0.8	10.68	6.15
	NA	92.0	5.2	1.9	0.9	13.06	6.47
	NALS	92.2	4.2	2.6	1.0	12.89	6.67
All Strains	NM	89.9	5.8	3.5	0.8	10.47 ^Z	6.36
	NA	92.2	3.8	3.1	0.9	13.15 ^Y	6.60
	NALS	93.0	3.8	2.4	0.8	12.74 ^Y	6.73

Y,Z - Different letters denote significant differences (P<.01), comparisons made among molt program average values.

TABLE 37. EFFECT OF WHITE EGG STRAIN AND SYNCHRONIZED MOLT PROGRAM ON PERFORMANCE OF HENS IN THE 36th NCLP&MT (491-771 DAYS) IN BATTERY CAGES (HOUSE 7)

Breeder (Strain)	Molt Program	Feed Consumption (kg/100/hen/d)	Feed Conversion (g egg/g feed)	Eggs		Mortality (%)
				Per Bird Housed	Egg Production (HD%)	
LSL-Lite White	NM	10.4	0.40	168.8	64.9 ^{gh}	15.9
	NA	11.0	0.48	214.8	81.9 ^a	3.9
	NALS	11.2	0.46	207.6	78.9 ^{ab}	2.8
	Average	10.9 ^B	0.45 ^{AB}	197.1 ^A	75.3	7.5 ^B
Bovans White Exp.	NM	11.3	0.40	169.5	67.2 ^{fg}	10.0
	NA	10.8	0.46	190.6	72.6 ^{cdef}	5.5
	NALS	11.0	0.45	184.2	72.4 ^{def}	3.6
	Average	11.0 ^B	0.44 ^{ABC}	181.4 ^B	70.7	6.4 ^B
Bovans White	NM	11.5	0.40	153.4	72.0 ^{def}	25.1
	NA	11.6	0.45	188.8	79.3 ^{ab}	7.3
	NALS	10.9	0.47	202.3	78.2 ^{abc}	9.0
	Average	11.3 ^{AB}	0.44 ^{AB}	181.5 ^B	76.5	13.8 ^A
DeKalb White Exp.	NM	11.2	0.37	167.3	63.4 ^{gh}	7.2
	NA	11.1	0.44	188.9	75.2 ^{bcde}	5.4
	NALS	11.3	0.44	195.6	74.8 ^{bcde}	3.8
	Average	11.2 ^{AB}	0.41 ^C	183.9 ^B	71.1	5.4 ^B
DeKalb White	NM	11.8	0.36	141.0	63.2 ^{gh}	19.9
	NA	11.6	0.44	175.1	76.3 ^{bcde}	8.2
	NALS	11.6	0.44	179.4	75.8 ^{bcde}	11.4
	Average	11.7 ^A	0.41 ^C	165.2 ^C	71.8	13.1 ^A
Hy-Line (W-36)	NM	10.0	0.39	153.6	59.0 ^h	7.1
	NA	10.3	0.46	201.7	72.7 ^{cdef}	0.5
	NALS	10.5	0.45	195.7	71.9 ^{ef}	2.1
	Average	10.3 ^C	0.43 ^{BC}	183.7 ^B	67.8	3.2 ^B
Hy-Line (W-98)	NM	10.7	0.39	168.0	61.1 ^{gh}	2.0
	NA	11.0	0.47	205.7	77.2 ^{abcd}	1.5
	NALS	11.0	0.46	197.7	74.0 ^{bcde}	4.2
	Average	10.9 ^B	0.44 ^{AB}	190.5 ^{AB}	70.8	2.6 ^B
CV-20	NM	10.0	0.43	175.0	66.9 ^{fg}	6.4
	NA	10.1	0.47	193.9	72.2 ^{def}	3.6
	NALS	10.3	0.48	201.7	75.6 ^{bcde}	2.8
	Average	10.1 ^C	0.46 ^A	190.2 ^{AB}	71.6	4.3 ^B
ISA White Exp.	NM	11.1	0.39	162.2	67.3 ^{fg}	15.4
	NA	10.8	0.44	204.9	75.9 ^{bcde}	0.0
	NALS	11.0	0.47	205.2	79.1 ^{ab}	1.9
	Average	11.0 ^B	0.43 ^{BC}	190.7 ^{AB}	74.1	5.8 ^B
All Strains	NM	10.9	0.39 ^Z	162.1 ^Z	65.0	12.1 ^Y
	NA	10.9	0.46 ^Y	196.0 ^Y	75.9	4.0 ^Z
	NALS	11.0	0.46 ^Y	196.6 ^Y	75.6	4.6 ^Z

A,B,C - 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.

a,b,c,d,e,f,g - Different letters denote significant strain*molt program interactions (P<.01).

TABLE 38. EFFECT OF WHITE EGG STRAIN AND SYNCHRONIZED MOLT PROGRAM ON EGG WEIGHT AND EGG SIZE DISTRIBUTION OF HENS IN THE 36th NCLP&MT (491-771 DAYS) IN BATTERY CAGES (HOUSE 7)

Breeder (Strain)	Molt Program	Egg Weight (g egg/hen/d)	Pee Wee (%)	Small (%)	Medium (%)	Large (%)	Extra Large (%)
LSL-Lite White	NM	64.5	0.0	0.4	1.6	12.8	84.8
	NA	65.2	0.0	0.0	1.3	8.6	89.8
	NALS	65.3	0.0	0.0	0.7	11.0	88.2
	Average	65.0 ^C	0.0	0.1	1.2	10.8 ^{AB}	87.6 ^D
Bovans White Exp.	NM	66.8	0.0	0.0	0.6	9.5	89.8
	NA	67.9	0.0	0.0	0.1	3.2	96.7
	NALS	68.7	0.0	0.0	0.0	3.4	96.2
	Average	67.8 ^A	0.0	0.0	0.2	5.3 ^{CD}	94.2 ^{AB}
Bovans White	NM	64.1	0.0	1.0	2.6	16.8	79.0
	NA	65.7	0.0	0.0	0.2	8.5	90.9
	NALS	65.4	0.2	0.0	0.4	9.2	89.8
	Average	65.1 ^C	0.1	0.3	1.1	11.5 ^A	86.6 ^D
DeKalb White Exp.	NM	65.0	0.0	0.0	0.7	13.3	85.5
	NA	65.3	0.0	0.0	0.2	8.9	90.4
	NALS	65.9	0.0	0.0	0.6	6.8	92.1
	Average	65.4 ^C	0.0	0.0	0.5	9.7 ^{ABC}	89.3 ^{CD}
DeKalb White	NM	66.7	0.0	0.0	0.2	5.4	93.6
	NA	66.6	0.0	0.1	1.0	7.5	91.0
	NALS	66.5	0.0	0.0	0.2	7.4	92.3
	Average	66.6 ^B	0.0	0.0	0.4	6.8 ^{BCD}	92.3 ^{ABC}
Hy-Line (W-36)	NM	66.7	0.0	0.0	0.5	6.5	91.9
	NA	65.3	0.0	0.0	0.0	8.6	91.3
	NALS	65.2	0.0	0.0	0.2	4.5	95.3
	Average	65.8 ^{BC}	0.0	0.0	0.3	6.5 ^{BCD}	92.8 ^{ABC}
Hy-Line (W-98)	NM	68.4	0.0	0.0	0.1	3.4	95.0
	NA	66.8	0.0	0.1	2.0	4.2	93.4
	NALS	68.1	0.0	0.0	0.1	2.5	97.0
	Average	67.7 ^A	0.0	0.0	0.8	3.4 ^D	95.2 ^A
CV-20	NM	64.0	0.1	0.2	1.2	13.8	84.5
	NA	65.1	0.0	0.0	0.6	6.3	93.1
	NALS	65.7	0.0	0.0	0.3	7.6	92.0
	Average	64.9 ^{CD}	0.0	0.1	0.7	9.2 ^{ABC}	89.9 ^{BCD}
ISA White Exp.	NM	64.2	0.0	0.0	0.6	12.2	86.9
	NA	63.1	0.0	0.0	3.9	13.1	83.0
	NALS	64.5	0.0	0.0	0.5	11.3	88.2
	Average	63.9 ^D	0.0	0.0	1.7	12.2 ^A	86.0 ^D
All Strains	NM	65.6	0.0	0.2	0.9	10.4 ^Y	87.9 ^Y
	NA	65.7	0.0	0.0	1.0	7.7 ^Z	91.1 ^Z
	NALS	66.1	0.0	0.0	0.3	7.1 ^Z	92.4 ^Z

A,B,C,D - 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.

TABLE 39. EFFECT OF WHITE EGG STRAIN AND SYNCHRONIZED MOLT PROGRAM ON EGG QUALITY, INCOME AND FEED COSTS OF HENS IN THE 36th NCLP&MT (491-771 DAYS) IN BATTERY CAGES (HOUSE 7)

Breeder (Strain)	Molt Program	Grade A (%)	Grade B (%)	Cracks (%)	Loss (%)	Egg Income (\$/hen)	Feed Costs (\$/hen)
LSL-Lite White	NM	89.3	5.0	4.2	1.5	11.25	5.69
	NA	92.7	3.3	3.5	0.6	14.75	6.20
	NALS	92.4	2.9	4.3	0.5	14.29	6.32
	Average	91.4	3.7 ^{AB}	4.0	0.8 ^{AB}	13.43 ^A	6.07 ^{AB}
Bovans White Exp.	NM	89.8	2.9	5.3	2.0	11.43	6.04
	NA	94.2	1.5	3.9	0.4	13.37	6.07
	NALS	91.4	2.2	5.3	1.2	12.61	6.01
	Average	91.8	2.2 ^B	4.8	1.2 ^{AB}	12.47 ^{AB}	6.04 ^{ABC}
Bovans White	NM	87.4	5.2	6.2	1.2	10.10	5.04
	NA	90.0	4.2	4.6	1.1	12.76	5.94
	NALS	93.5	2.3	3.5	0.8	13.97	6.02
	Average	90.3	3.9 ^{AB}	4.8	1.0 ^{AB}	12.28 ^B	5.67 ^C
DeKalb White Exp.	NM	89.5	4.0	4.8	1.8	11.18	6.31
	NA	95.2	1.6	3.0	0.3	13.23	6.00
	NALS	91.8	3.0	3.7	1.4	13.33	6.32
	Average	92.1	2.9 ^{AB}	3.8	1.1 ^{AB}	12.58 ^{AB}	6.21 ^A
DeKalb White	NM	83.1	6.8	9.2	0.9	9.11	5.41
	NA	91.4	3.5	4.9	0.3	11.97	5.75
	NALS	92.0	4.2	3.5	0.4	12.35	5.82
	Average	88.8	4.8 ^A	5.8	0.5 ^B	11.14 ^C	5.66 ^C
Hy-Line (W-36)	NM	88.3	3.3	4.9	3.5	10.11	5.52
	NA	93.7	1.9	3.7	0.8	14.03	6.14
	NALS	91.4	3.4	4.6	0.6	13.46	6.13
	Average	91.1	2.9 ^{AB}	4.4	1.6 ^A	12.53 ^{AB}	5.93 ^{ABC}
Hy-Line (W-98)	NM	86.9	5.6	7.0	0.6	11.08	6.27
	NA	89.4	3.0	7.4	0.2	13.94	6.27
	NALS	91.5	3.1	5.0	0.3	13.59	6.34
	Average	89.3	3.9 ^{AB}	6.5	0.4 ^B	12.87 ^{AB}	6.29 ^A
CV-20	NM	90.8	2.8	5.9	0.6	11.90	5.58
	NA	92.7	1.4	5.8	0.2	13.47	5.81
	NALS	94.6	1.7	3.5	0.3	14.13	5.91
	Average	92.7	1.9 ^B	5.1	0.3 ^B	13.17 ^{AB}	5.77 ^{BC}
ISA White Exp.	NM	85.8	5.4	8.0	0.8	10.69	5.64
	NA	94.6	2.2	2.5	0.6	14.16	6.26
	NALS	92.7	1.7	5.2	0.4	14.22	6.12
	Average	91.0	3.1 ^{AB}	5.3	0.6 ^B	13.02 ^{AB}	6.01 ^{ABC}
All Strains	NM	87.9 ^Z	4.5 ^Y	6.2 ^Y	1.4 ^Y	10.76 ^Z	5.72 ^Z
	NA	92.6 ^Y	2.5 ^Z	4.4 ^Z	0.5 ^Z	13.52 ^Y	6.05 ^Y
	NALS	92.4 ^Y	2.7 ^Z	4.3 ^Z	0.7 ^Z	13.55 ^Y	6.11 ^Y

A,B,C - 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.

TABLE 40. EFFECT OF BROWN EGG STRAIN AND SYNCHRONIZED MOLT PROGRAM ON PERFORMANCE OF HENS IN THE 36th NCLP&MT (491-771 DAYS) IN BATTERY CAGES (HOUSE 7)

Breeder (Strain)	Molt Program	Feed Consumption (kg/100/hen/d)	Feed Conversion (g egg/g feed)	Eggs			
				Per Bird Housed	Egg Production (HD%)	Egg Mass (g/HD)	Mortality (%)
Bovans Brown	NM	10.8	0.42	177.5 ^c	69.4	45.2	4.8
	NA	11.5	0.43	183.9 ^{bc}	74.1	49.5	5.4
	NALS	11.5	0.43	200.5 ^{ab}	74.8	49.5	2.5
	Average	11.3	0.43	187.3	72.7 ^A	48.0	4.2
Bovans Goldline	NM	11.0	0.42	174.7 ^c	69.2	46.3	12.1
	NA	11.6	0.45	206.1 ^a	77.1	52.6	3.1
	NALS	11.4	0.43	179.3 ^c	70.8	48.1	5.5
	Average	11.3	0.43	186.7	72.3 ^{AB}	49.0	6.9
Hy-Line Brown	NM	10.1	0.45	182.8 ^{bc}	68.2	44.9	3.3
	NA	10.8	0.45	192.3 ^{abc}	71.0	48.1	1.8
	NALS	11.0	0.42	178.1 ^c	67.8	46.5	4.0
	Average	10.6	0.44	184.4	69.0 ^B	46.5	3.0
All Strains	NM	10.7	0.43	178.3	68.9 ^Z	45.5 ^Z	6.7
	NA	11.3	0.44	194.1	74.0 ^Y	50.1 ^Y	3.4
	NALS	11.3	0.42	186.0	71.1 ^{YZ}	48.0 ^{YZ}	4.0

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.

a,b,c - Different letters denote significant strain*molt program interactions (P<.01).

TABLE 41. EFFECT OF BROWN EGG STRAIN AND SYNCHRONIZED MOLT PROGRAM ON EGG WEIGHT AND EGG SIZE DISTRIBUTION OF HENS IN THE 36th NCLP&MT (491-771 DAYS) IN BATTERY CAGES (HOUSE 7)

Breeder (Strain)	Molt Program	Egg Weight (g egg/hen/d)	Pee Wee (%)	Small (%)	Medium (%)	Large (%)	Extra Large (%)
Bovans Brown	NM	65.5	0.2	0.0	0.2	13.5	85.6
	NA	66.5	0.0	0.0	0.5	8.3	90.7
	NALS	66.0	0.0	0.0	0.6	8.8	90.6
	Average	66.0 ^B	0.1	0.0	0.4	10.2	88.9
Bovans Goldline	NM	67.1	0.0	0.0	0.4	7.6	91.8
	NA	68.2	0.0	0.0	0.7	5.0	94.0
	NALS	67.9	0.0	0.0	1.4	4.7	93.5
	Average	67.7 ^A	0.0	0.0	0.8	5.8	93.1
Hy-Line Brown	NM	66.0	0.0	0.0	3.1	10.2	86.5
	NA	67.7	0.0	0.1	0.0	6.4	93.3
	NALS	68.5	0.0	0.1	1.5	4.3	93.8
	Average	67.4 ^A	0.0	0.1	1.5	7.0	91.2
All Strains	NM	66.2	0.1	0.0	1.2	10.4	88.0
	NA	67.5	0.0	0.0	0.4	6.6	92.7
	NALS	67.5	0.0	0.0	1.2	5.9	92.6

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

TABLE 42. EFFECT OF BROWN EGG STRAIN AND SYNCHRONIZED MOLT PROGRAM ON EGG QUALITY, INCOME AND FEED COSTS OF HENS IN THE 36th NCLP&MT (491-771 DAYS) IN BATTERY CAGES (HOUSE 7)

Breeder (Strain)	Molt Program	Grade A (%)	Grade B (%)	Cracks (%)	Loss (%)	Egg Income (\$/hen)	Feed Costs (\$/hen)
Bovans Brown	NM	88.1	5.6	5.2	1.0	11.77 ^c	5.82
	NA	92.6	3.7	3.2	0.4	12.61 ^{bc}	6.21
	NALS	92.7	2.5	4.4	0.4	13.88 ^a	6.70
	Average	91.1	3.9	4.3	0.6 ^B	12.75	6.25
Bovans Goldline	NM	89.6	4.4	4.7	1.2	11.79 ^c	5.84
	NA	91.4	3.1	4.4	1.1	14.08 ^a	6.74
	NALS	89.0	4.8	5.1	1.1	12.02 ^c	6.25
	Average	90.0	4.1	4.7	1.2 ^A	12.63	6.27
Hy-Line Brown	NM	90.5	5.2	3.9	0.5	12.33 ^{bc}	5.68
	NA	93.8	2.8	3.2	0.2	13.39 ^{ab}	6.36
	NALS	91.7	3.3	4.2	1.0	12.16 ^{bc}	6.28
	Average	92.0	3.7	3.8	0.6 ^B	12.63	6.11
All Strains	NM	89.4 ^Z	5.1	4.6	0.9	11.96	5.78 ^Z
	NA	92.6 ^Y	3.2	3.6	0.6	13.36	6.43 ^Y
	NALS	91.1 ^{YZ}	3.5	4.5	0.8	12.69	6.41 ^Y

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.

a,b,c - Different letters denote significant strain*molt program interactions (P<.01).

TABLE 43. EFFECT OF WHITE EGG STRAIN AND POPULATION ON PERFORMANCE OF HENS IN THE 36th NCLP&MT (491-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5), NON-MOLTED

Breeder (Strain)	Population ¹	Eggs					
		Feed Consumption (kg/100/hen/d)	Feed Conversion (g egg/g feed)	Per Bird Housed	Egg Production (HD%)	Egg Mass (g/HD)	Mortality (%)
LSL-Lite White	3	14.1	0.31	134.8	63.8	42.0	27.1
	4	12.7	0.32	147.9	62.9	40.8	33.3
	Average	13.4 ^{AB}	0.31	141.3	63.3 ^{AB}	41.4 ^{AB}	30.2 ^A
Bovans White Exp.	3	12.0	0.35	152.0	63.2	42.2	21.8
	4	12.0	0.35	153.5	62.1	42.4	9.9
	Average	12.0 ^B	0.35	152.7	62.7 ^B	42.3 ^{AB}	15.8 ^{ABC}
Bovans White	3	15.7	0.32	158.5	74.9	48.5	20.9
	4	15.5	0.30	138.0	70.0	45.4	30.5
	Average	15.6 ^A	0.31	148.2	72.4 ^A	46.9 ^A	25.7 ^{AB}
DeKalb White Exp.	3	12.7	0.30	147.9	60.3	38.1	24.3
	4	12.6	0.32	145.0	61.2	39.8	21.8
	Average	12.6 ^B	0.31	146.4	60.7 ^B	39.0 ^B	23.1 ^{ABC}
DeKalb White	3	12.7	0.31	126.1	59.9	39.1	23.0
	4	12.5	0.33	135.6	61.0	40.7	27.4
	Average	12.6 ^B	0.32	130.8	60.5 ^B	39.9 ^B	25.2 ^{AB}
Hy-Line (W-36)	3	11.0	0.36	163.7	60.7	39.3	7.0
	4	11.4	0.34	152.6	59.4	38.9	13.1
	Average	11.2 ^B	0.35	158.1	60.0 ^B	39.1 ^B	10.0 ^C
Hy-Line (W-98)	3	12.7	0.31	139.4	54.7	38.8	20.1
	4	12.2	0.34	150.1	59.4	40.7	17.7
	Average	12.4 ^B	0.32	144.8	57.1 ^B	39.8 ^B	18.9 ^{ABC}
CV-20	3	12.0	0.35	158.0	63.3	41.0	14.8
	4	10.4	0.38	159.6	61.7	39.3	11.1
	Average	11.2 ^B	0.36	158.8	62.5 ^B	40.1 ^B	12.9 ^{BC}
ISA White Exp.	3	11.9	0.34	143.9	63.0	40.1	22.8
	4	12.2	0.33	144.8	62.5	40.1	23.2
	Average	12.1 ^B	0.34	144.4	62.8 ^B	40.1 ^B	23.0 ^{ABC}
All Strains	3	12.7	0.33	147.1	62.6	41.0	20.2
	4	12.4	0.33	147.4	62.3	40.9	20.9

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

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

TABLE 44. EFFECT OF WHITE EGG STRAIN AND POPULATION ON EGG WEIGHT AND EGG SIZE DISTRIBUTION OF HENS IN THE 36th NCLP&MT (491-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5), NON-MOLTED

Breeder (Strain)	Population ¹	Egg Weight (g egg/hen/d)	Pee Wee (%)	Small (%)	Medium (%)	Large (%)	Extra Large (%)
LSL-Lite White	3	65.9	0.0	0.7	0.0	5.7	93.6
	4	65.1	0.0	0.0	0.0	5.7	94.3
	Average	65.5 ^{BCD}	0.0	0.4	0.0	5.7 ^{BC}	94.0 ^A
Bovans White Exp.	3	66.8	0.0	0.0	0.2	4.7	95.0
	4	68.4	0.0	0.0	0.7	2.8	96.5
	Average	67.6 ^{AB}	0.0	0.0	0.4	3.7 ^C	95.8 ^A
Bovans White	3	64.7	0.0	0.0	0.0	14.5	84.7
	4	64.9	0.0	0.0	0.6	14.1	85.1
	Average	64.8 ^{CD}	0.0	0.0	0.3	14.3 ^{AB}	84.9 ^{AB}
DeKalb White Exp.	3	63.4	0.0	0.0	1.8	16.3	81.8
	4	65.2	0.2	0.0	0.3	8.3	91.0
	Average	64.3 ^{CD}	0.1	0.0	1.0	12.3 ^{ABC}	86.4 ^{AB}
DeKalb White	3	65.3	0.0	0.8	4.5	6.2	88.5
	4	67.0	0.0	0.1	0.7	5.9	92.8
	Average	66.1 ^{BC}	0.0	0.5	2.6	6.1 ^{BC}	90.7 ^A
Hy-Line (W-36)	3	65.0	0.0	0.0	0.6	11.3	87.9
	4	65.6	0.3	0.0	0.2	6.1	93.3
	Average	65.3 ^{BCD}	0.2	0.0	0.4	8.7 ^{ABC}	90.6 ^{AB}
Hy-Line (W-98)	3	71.5	0.0	0.0	0.0	2.8	97.2
	4	68.8	0.0	0.0	0.0	4.3	95.7
	Average	70.1 ^A	0.0	0.0	0.0	3.6 ^C	96.5 ^A
CV-20	3	64.8	0.0	0.0	0.0	11.8	88.0
	4	63.9	0.0	0.0	1.5	15.1	83.0
	Average	64.3 ^{CD}	0.0	0.0	0.8	13.5 ^{AB}	85.5 ^{AB}
ISA White Exp.	3	63.8	0.0	0.0	2.0	18.7	78.9
	4	64.2	0.0	0.0	1.7	12.3	85.5
	Average	64.0 ^D	0.0	0.0	1.8	15.5 ^A	82.2 ^B
All Strains	3	65.7	0.0	0.2	1.0	10.2	88.4
	4	65.9	0.1	0.0	0.6	8.3	90.8

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

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

TABLE 45. EFFECT OF WHITE EGG STRAIN AND POPULATION ON EGG QUALITY, INCOME AND FEED COSTS OF HENS IN THE 36th NCLP&MT (491-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5), NON-MOLTED

Breeder (Strain)	Population ¹	Grade	Grade	Cracks	Loss	Egg	Feed
		A	B			Income	Costs
		(%)	(%)	(%)	(%)	(\$/hen)	(\$/hen)
LSL-Lite White	3	85.3	12.1	2.7	0.0	8.80	6.23
	4	91.3	6.8	1.9	0.0	10.11	6.27
	Average	88.3 ^{ABC}	9.4	2.3	0.0	9.46	6.25
Bovans White Exp.	3	89.6	5.0	4.6	0.7	10.28	6.15
	4	91.6	5.3	2.2	0.9	10.50	6.37
	Average	90.6 ^{ABC}	5.2	3.4	0.8	10.39	6.26
Bovans White	3	89.1	4.8	5.3	1.0	10.57	6.82
	4	85.2	11.3	3.7	0.0	8.99	6.43
	Average	87.1 ^{BC}	8.0	4.5	0.5	9.78	6.62
DeKalb White Exp.	3	92.0	4.2	3.6	0.3	10.09	6.59
	4	90.8	4.9	4.0	0.3	9.86	6.32
	Average	91.4 ^{AB}	4.5	3.8	0.3	9.98	6.45
DeKalb White	3	84.9	10.3	3.7	1.0	8.10	5.67
	4	88.0	6.0	5.2	0.8	9.05	5.82
	Average	86.5 ^{BC}	8.1	4.5	0.9	8.58	5.75
Hy-Line (W-36)	3	90.9	3.9	2.6	2.7	11.02	6.32
	4	92.8	5.7	1.3	0.2	10.51	6.22
	Average	91.8 ^{AB}	4.8	2.0	1.4	10.76	6.27
Hy-Line (W-98)	3	81.5	10.6	5.9	2.0	8.87	6.92
	4	86.1	7.4	6.6	0.0	9.98	6.60
	Average	83.8 ^C	9.0	6.3	1.0	9.42	6.76
CV-20	3	93.5	2.5	3.4	0.7	10.95	6.30
	4	95.1	1.6	3.4	0.0	11.14	5.75
	Average	94.3 ^A	2.0	3.4	0.3	11.04	6.02
ISA White Exp.	3	88.1	7.2	3.8	0.9	9.50	5.73
	4	90.6	5.2	3.3	0.8	9.77	6.00
	Average	89.4 ^{ABC}	6.2	3.5	0.9	9.64	5.87
All Strains	3	88.3	6.7	4.0	1.0	9.80	6.30
	4	90.2	6.0	3.5	0.3	9.99	6.20

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

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

TABLE 46. EFFECT OF BROWN EGG STRAIN AND POPULATION ON PERFORMANCE OF HENS IN THE 36th NCLP&MT (491-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5), NON-MOLTED

Breeder (Strain)	Population ¹	Eggs					
		Feed Consumption (kg/100/hen/d)	Feed Conversion (g egg/g feed)	Per Bird Housed	Egg Production (HD%)	Egg Mass (g/HD)	Mortality (%)
Bovans	3	12.3	0.36	164.4	65.6	43.3	12.5
Brown	4	11.5	0.36	152.8	61.5	40.5	15.1
	Average	11.9 ^{AB}	0.36	158.6	63.5	41.9	13.8
Bovans	3	15.2	0.30	133.9	64.4	44.2	24.4
Goldline	4	12.1	0.37	170.6	65.1	44.7	18.8
	Average	13.7 ^A	0.33	152.2	64.7	44.4	21.6
Hy-Line	3	11.2	0.36	162.8	60.5	39.9	9.7
Brown	4	10.8	0.37	150.2	59.4	39.1	10.2
	Average	11.0 ^B	0.36	156.5	60.0	39.5	10.0
All	3	12.9	0.34	153.7	63.5	42.4	15.5
Strains	4	11.5	0.37	157.9	62.0	41.4	14.7

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

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

TABLE 47. EFFECT OF BROWN EGG STRAIN AND POPULATION ON EGG WEIGHT AND EGG SIZE DISTRIBUTION OF HENS IN THE 36th NCLP&MT (491-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5), NON-MOLTED

Breeder (Strain)	Population ¹	Egg Weight (g egg/hen/d)	Pee Wee (%)	Small (%)	Medium (%)	Large (%)	Extra Large (%)
Bovans	3	66.3	0.0	0.0	2.1	11.0	86.4
Brown	4	66.1	0.0	0.0	1.1	9.6	89.1
	Average	66.2	0.0	0.0	1.6	10.3	87.7
Bovans	3	68.6	0.0	0.0	1.1	6.9	89.8
Goldline	4	68.8	0.0	0.0	0.0	7.2	92.2
	Average	68.7	0.0	0.0	0.6	7.0	91.0
Hy-Line	3	66.2	0.0	0.0	0.5	13.0	86.2
Brown	4	66.1	0.0	0.0	0.8	8.6	90.6
	Average	66.2	0.0	0.0	0.7	10.8	88.4
All	3	67.0	0.0	0.0	1.2	10.3	87.4
Strains	4	67.0	0.0	0.0	0.6	8.4	90.6

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

TABLE 48. EFFECT OF BROWN EGG STRAIN AND POPULATION ON EGG QUALITY, INCOME AND FEED COSTS OF HENS IN THE 36th NCLP&MT (491-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5), NON-MOLTED

Breeder (Strain)	Population ¹	Grade A (%)	Grade B (%)	Cracks (%)	Loss (%)	Egg Income (\$/hen)	Feed Costs (\$/hen)
Bovans	3	90.0	6.1	3.5	0.5	10.99	6.52
Brown	4	89.6	6.8	2.8	1.1	10.23	6.09
	Average	89.8	6.4	3.1	0.8	10.61	6.30
Bovans	3	90.0	6.0	3.2	0.9	8.84	6.59
Goldline	4	88.5	5.6	5.2	0.9	11.40	6.71
	Average	89.2	5.8	4.2	0.9	10.12	6.65
Hy-Line	3	90.5	5.6	3.1	0.8	10.98	6.45
Brown	4	91.0	4.7	3.3	0.9	10.24	5.78
	Average	90.8	5.2	3.2	0.8	10.61	6.12
All	3	90.2	5.9	3.2	0.7	10.27	6.52
Strains	4	89.7	5.7	3.7	1.0	10.62	6.19

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

TABLE 49. EFFECT OF WHITE EGG STRAIN AND POPULATION ON PERFORMANCE OF HENS IN THE 36th NCLP&MT (491-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5), NON-ANOREXIC MOLT

Breeder (Strain)	Population ¹	Feed Consumption (kg/100/hen/d)	Feed Conversion (g egg/g feed)	Eggs			
				Per Bird Housed	Egg Production (HD%)	Egg Mass (g/HD)	Mortality (%)
LSL-Lite White	3	12.0	0.42	187.7	75.8	50.2	9.8
	4	11.9	0.44	195.6	79.1	52.9	7.7
	Average	11.9 ^{AB}	0.43 ^{AB}	191.7 ^{AB}	77.4 ^A	51.5 ^A	8.7 ^{AB}
Bovans White Exp.	3	11.6	0.41	183.4	70.2	49.9	4.8
	4	12.3	0.42	181.8	74.5	53.0	5.2
	Average	11.9 ^{AB}	0.42 ^{BC}	182.6 ^{ABC}	72.3 ^{ABC}	51.4 ^A	5.0 ^{BC}
Bovans White	3	12.3	0.39	166.3	73.2	49.0	11.0
	4	12.5	0.38	157.6	73.1	48.1	13.3
	Average	12.4 ^A	0.39 ^C	161.9 ^D	73.2 ^{ABC}	48.5 ^{ABC}	12.1 ^A
DeKalb White Exp.	3	11.5	0.39	173.6	66.9	44.9	2.9
	4	11.7	0.38	176.4	66.6	45.3	4.2
	Average	11.6 ^{ABC}	0.38 ^C	175.0 ^{BCD}	66.7 ^D	45.1 ^C	3.5 ^{BC}
DeKalb White	3	12.2	0.38	162.4	69.5	47.0	13.6
	4	12.7	0.37	164.1	69.8	47.5	12.0
	Average	12.4 ^A	0.38 ^C	163.2 ^{CD}	69.6 ^{CD}	47.2 ^{BC}	12.8 ^A
Hy-Line (W-36)	3	10.6	0.44	192.2	72.0	49.5	4.2
	4	11.1	0.44	195.1	73.5	50.0	3.0
	Average	10.8 ^C	0.44 ^{AB}	193.7 ^A	72.8 ^{ABC}	49.7 ^{AB}	3.6 ^{BC}
Hy-Line (W-98)	3	11.7	0.42	198.8	72.2	49.3	1.7
	4	12.2	0.40	190.1	71.3	48.8	5.5
	Average	11.9 ^{AB}	0.41 ^{BC}	194.5 ^A	71.7 ^{BCD}	49.0 ^{AB}	3.6 ^{BC}
CV-20	3	10.9	0.45	203.3	74.8	48.5	3.4
	4	11.1	0.43	195.9	73.0	48.5	0.4
	Average	11.0 ^{BC}	0.44 ^{AB}	199.6 ^A	73.9 ^{ABC}	48.5 ^{ABC}	1.9 ^C
ISA White Exp.	3	10.7	0.47	192.5	78.7	52.3	3.2
	4	10.7	0.45	194.8	75.9	50.2	1.4
	Average	10.7 ^C	0.46 ^A	193.7 ^{AB}	77.3 ^{AB}	51.2 ^{AB}	2.3 ^{BC}
All Strains	3	11.5	0.42	184.5	72.6	48.9	6.0
	4	11.8	0.41	183.5	73.0	49.3	5.8

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

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

TABLE 50. EFFECT OF WHITE EGG STRAIN AND POPULATION ON EGG WEIGHT AND EGG SIZE DISTRIBUTION OF HENS IN THE 36th NCLP&MT (491-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5), NON-ANOREXIC MOLT

Breeder (Strain)	Population ¹	Egg Weight (g egg/hen/d)	Pee Wee (%)	Small (%)	Medium (%)	Large (%)	Extra Large (%)
LSL-Lite White	3	65.5	0.0	0.0	0.8	6.3	92.8
	4	65.7	0.0	0.0	0.7	5.8	93.0
	Average	65.6 ^C	0.0	0.0	0.7	6.1 ^{CD}	92.9 ^{BC}
Bovans White Exp.	3	68.1	0.0	0.0	1.4	3.2	94.8
	4	68.5	0.2	0.0	0.0	2.8	97.0
	Average	68.3 ^A	0.1	0.0	0.7	3.0 ^{DE}	95.9 ^{AB}
Bovans White	3	65.8	0.0	0.0	0.6	9.3	89.6
	4	64.8	0.0	0.0	0.7	12.6	86.6
	Average	65.3 ^C	0.0	0.0	0.7	10.9 ^B	88.1 ^C
DeKalb White Exp.	3	66.1	0.0	0.0	0.5	6.1	92.9
	4	66.0	0.0	0.0	1.1	7.5	91.3
	Average	66.1 ^{BC}	0.0	0.0	0.8	6.8 ^{BCD}	92.1 ^{BC}
DeKalb White	3	67.2	0.0	0.0	0.3	11.0	88.4
	4	67.6	0.0	0.0	0.0	7.2	92.9
	Average	67.4 ^{AB}	0.0	0.0	0.2	9.1 ^{BC}	90.6 ^{BC}
Hy-Line (W-36)	3	65.0	0.0	0.0	0.2	8.0	91.7
	4	66.0	0.0	0.0	0.0	5.6	94.4
	Average	65.5 ^C	0.0	0.0	0.1	6.8 ^{BCD}	93.1 ^{ABC}
Hy-Line (W-98)	3	67.4	0.1	0.0	0.5	2.3	97.0
	4	68.3	0.0	0.0	0.0	0.9	99.0
	Average	67.8 ^A	0.1	0.0	0.2	1.6 ^E	98.0 ^A
CV-20	3	64.6	0.0	0.0	0.1	10.9	88.5
	4	64.6	0.0	0.0	1.8	8.9	89.3
	Average	64.6 ^{CD}	0.0	0.0	1.0	9.9 ^{BC}	88.9 ^C
ISA White Exp.	3	63.6	0.0	0.0	0.8	15.1	84.1
	4	62.3	0.0	0.0	1.5	19.9	78.1
	Average	63.0 ^D	0.0	0.0	1.1	17.5 ^A	81.1 ^D
All Strains	3	65.9	0.0	0.0	0.6	8.0	91.1
	4	66.0	0.0	0.0	0.6	7.9	91.3

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

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

TABLE 51. EFFECT OF WHITE EGG STRAIN AND POPULATION ON EGG QUALITY, INCOME AND FEED COSTS OF HENS IN THE 36th NCLP&MT (491-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5), NON-ANOREXIC MOLT

Breeder (Strain)	Population ¹	Grade	Grade	Cracks	Loss	Egg	Feed
		A	B			Income	Costs
		(%)	(%)	(%)	(%)	(\$/hen)	(\$/hen)
LSL-Lite White	3	91.5	4.3	3.8	0.4	12.87	6.48
	4	92.6	4.0	2.2	1.2	13.36	6.38
	Average	92.1	4.2	3.0	0.8	13.11 ^{ABC}	6.43 ^{BC}
Bovans White Exp.	3	92.4	4.1	2.1	1.4	12.48	6.59
	4	90.1	6.5	2.8	0.7	12.31	6.52
	Average	91.2	5.3	2.5	1.0	12.40 ^{BC}	6.55 ^{ABC}
Bovans White	3	92.4	3.9	3.2	0.6	11.38	6.06
	4	91.9	5.2	2.5	0.5	10.75	5.84
	Average	92.1	4.5	2.8	0.5	11.06 ^D	5.95 ^C
DeKalb White Exp.	3	90.5	4.7	3.6	1.2	11.72	6.52
	4	93.2	4.5	1.6	0.7	12.14	6.76
	Average	91.9	4.6	2.6	1.0	11.93 ^{CD}	6.64 ^{AB}
DeKalb White	3	92.5	4.4	3.0	0.2	11.15	6.20
	4	86.0	7.8	5.3	0.8	10.85	6.48
	Average	89.2	6.1	4.2	0.5	11.00 ^D	6.34 ^{BC}
Hy-Line (W-36)	3	91.5	5.9	2.3	0.3	13.13	6.20
	4	92.3	3.5	2.6	1.6	13.39	6.41
	Average	91.9	4.7	2.4	1.0	13.26 ^{AB}	6.30 ^{BC}
Hy-Line (W-98)	3	89.0	7.3	2.8	0.9	13.33	7.04
	4	92.5	4.5	2.8	0.3	13.14	7.09
	Average	90.7	5.9	2.8	0.6	13.23 ^{ABC}	7.06 ^A
CV-20	3	92.6	3.9	3.1	0.6	13.95	6.35
	4	92.0	3.4	3.8	0.8	13.41	6.46
	Average	92.3	3.6	3.4	0.7	13.68 ^A	6.41 ^{BC}
ISA White Exp.	3	94.7	2.1	2.8	0.4	13.45	5.69
	4	89.8	4.4	5.3	0.6	13.04	6.02
	Average	92.3	3.3	4.0	0.5	13.24 ^{ABC}	5.85 ^C
All Strains	3	91.9	4.5	3.0	0.7	12.60	6.35
	4	91.2	4.8	3.2	0.8	12.49	6.44

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

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

TABLE 52. EFFECT OF BROWN EGG STRAIN AND POPULATION ON PERFORMANCE OF HENS IN THE 36th NCLP&MT (491-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5), NON-ANOREXIC MOLT

Breeder (Strain)	Population ¹	Feed Consumption (kg/100/hen/d)	Feed Conversion (g egg/g feed)	Eggs		Mortality (%)
				Per Bird Housed	Egg Production (HD%)	
Bovans	3	12.3	0.42	187.6	75.8	5.3
Brown	4	12.2	0.41	189.8	73.7	9.0
	Average	12.2	0.42	188.7	74.7	7.2
Bovans	3	12.2	0.44	200.0	76.7	6.6
Goldline	4	11.9	0.44	194.5	77.1	5.2
	Average	12.1	0.44	197.3	76.9	5.9
Hy-Line	3	11.3	0.44	181.4	73.0	3.2
Brown	4	11.8	0.43	198.8	74.8	3.1
	Average	11.5	0.43	190.1	73.9	3.1
All	3	11.9	0.43	189.7	75.1	5.0
Strains	4	12.0	0.43	194.4	75.2	5.8

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

TABLE 53. EFFECT OF BROWN EGG STRAIN AND POPULATION ON EGG WEIGHT AND EGG SIZE DISTRIBUTION OF HENS IN THE 36th NCLP&MT (491-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5), NON-ANOREXIC MOLT

Breeder (Strain)	Population ¹	Egg Weight (g egg/hen/d)	Pee Wee (%)	Small (%)	Medium (%)	Large (%)	Extra Large (%)
Bovans	3	67.3	0.0	0.0	0.3	6.1	93.6
Brown	4	67.7	0.0	0.0	0.0	5.5	94.0
	Average	67.5	0.0	0.0	0.2	5.8	93.8
Bovans	3	69.0	0.0	0.0	0.1	2.3	97.5
Goldline	4	68.5	0.0	0.0	0.1	6.6	92.9
	Average	68.7	0.0	0.0	0.1	4.4	95.2
Hy-Line	3	67.7	0.0	0.0	0.0	6.5	93.3
Brown	4	67.1	0.0	0.0	0.4	6.1	93.2
	Average	67.4	0.0	0.0	0.2	6.3	93.3
All	3	68.0	0.0	0.0	0.1	5.0	94.8
Strains	4	67.8	0.0	0.0	0.1	6.1	93.4

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

TABLE 54. EFFECT OF BROWN EGG STRAIN AND POPULATION ON EGG QUALITY, INCOME AND FEED COSTS OF HENS IN THE 36th NCLP&MT (491-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5), NON-ANOREXIC MOLT

Breeder (Strain)	Population ¹	Grade A (%)	Grade B (%)	Cracks (%)	Loss (%)	Egg Income (\$/hen)	Feed Costs (\$/hen)
Bovans	3	92.2	2.7	4.2	0.8	12.96	6.59
Brown	4	92.2	2.8	4.6	0.6	13.04	6.81
	Average	92.2	2.7	4.4	0.7	13.00	6.70
Bovans	3	91.2	3.6	4.1	1.2	13.67	6.89
Goldline	4	93.1	3.5	2.4	1.0	13.38	6.50
	Average	92.1	3.5	3.2	1.1	13.53	6.69
Hy-Line	3	92.1	5.2	1.9	0.7	12.42	6.10
Brown	4	92.1	5.1	1.9	1.0	13.58	6.78
	Average	92.1	5.1	1.9	0.9	13.00	6.44
All	3	91.8	3.8	3.4	0.9	13.02	6.53
Strains	4	92.5	3.8	2.9	0.9	13.33	6.70

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

TABLE 55. EFFECT OF WHITE EGG STRAIN AND POPULATION ON PERFORMANCE OF HENS IN THE 36th NCLP&MT (491-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5), NON-ANOREXIC LOW SODIUM MOLT

Breeder (Strain)	Population ¹	Feed Consumption (kg/100/hen/d)	Feed Conversion (g egg/g feed)	Eggs		Mortality (%)
				Per Bird Housed	Egg Production (HD%)	
LSL-Lite White	3	11.7	0.43	198.3	77.4	10.6
	4	12.0	0.42	196.7	76.6	7.2
	Average	11.8 ^{AB}	0.42 ^{AB}	197.5 ^A	77.0 ^A	8.9
Bovans White Exp.	3	11.9	0.41	173.3	70.0	11.5
	4	11.5	0.43	180.2	70.6	10.8
	Average	11.7 ^{AB}	0.42 ^{ABC}	176.8 ^{BC}	70.3 ^{CD}	11.2
Bovans White	3	11.7	0.40	172.6	70.8	10.9
	4	12.2	0.39	171.8	73.3	10.1
	Average	11.9 ^A	0.39 ^{CD}	172.2 ^C	72.0 ^{BC}	10.5
DeKalb White Exp.	3	11.2	0.41	183.7	69.2	6.4
	4	11.9	0.36	169.0	66.0	4.7
	Average	11.5 ^{AB}	0.39 ^D	176.4 ^{BC}	67.6 ^D	5.5
DeKalb White	3	12.2	0.41	166.6	71.9	15.1
	4	11.9	0.39	168.0	69.6	11.7
	Average	12.0 ^A	0.40 ^{BCD}	167.3 ^C	70.8 ^{BCD}	13.4
Hy-Line (W-36)	3	10.7	0.43	193.1	70.5	3.1
	4	11.2	0.43	194.8	72.6	6.3
	Average	10.9 ^B	0.43 ^{AB}	193.9 ^A	71.6 ^{BCD}	4.7
Hy-Line (W-98)	3	11.9	0.41	195.5	72.0	4.1
	4	11.6	0.44	183.9	73.0	4.4
	Average	11.7 ^{AB}	0.42 ^{ABC}	189.7 ^{AB}	72.5 ^{BC}	4.3
CV-20	3	11.2	0.43	199.4	73.6	1.7
	4	10.8	0.44	187.0	72.4	5.4
	Average	11.0 ^B	0.43 ^A	193.2 ^{AB}	73.0 ^{BC}	3.5
ISA White Exp.	3	11.4	0.43	199.6	75.5	6.5
	4	12.2	0.40	184.3	74.4	4.3
	Average	11.8 ^{AB}	0.42 ^{ABCD}	191.9 ^{AB}	74.9 ^{AB}	5.4
All Strains	3	11.5	0.42	186.9	72.3	7.8
	4	11.7	0.41	181.8	72.0	7.2

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

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

TABLE 56. EFFECT OF WHITE EGG STRAIN AND POPULATION ON EGG WEIGHT AND EGG SIZE DISTRIBUTION OF HENS IN THE 36th NCLP&MT (491-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5), NON-ANOREXIC LOW SODIUM MOLT

Breeder (Strain)	Population ¹	Egg Weight (g egg/hen/d)	Pee Wee (%)	Small (%)	Medium (%)	Large (%)	Extra Large (%)
LSL-Lite White	3	63.9	0.0	0.0	1.8	13.4	84.7
	4	66.1	0.0	0.1	0.8	6.6	92.0
	Average	65.0 ^C	0.0	0.1	1.3	10.0 ^A	88.3 ^C
Bovans White Exp.	3	69.4	0.0	0.0	0.0	1.6	97.9
	4	69.2	0.0	0.2	0.4	0.5	98.7
	Average	69.3 ^A	0.0	0.1	0.2	1.0 ^D	98.3 ^A
Bovans White	3	65.0	0.0	0.0	0.3	9.6	90.0
	4	65.0	0.0	0.0	0.6	11.2	88.2
	Average	65.0 ^C	0.0	0.0	0.4	10.4 ^A	89.1 ^D
DeKalb White Exp.	3	66.2	0.0	0.2	0.3	5.3	93.9
	4	66.0	0.0	0.0	0.9	10.8	88.3
	Average	66.1 ^C	0.0	0.1	0.6	8.1 ^{AB}	81.1 ^{BC}
DeKalb White	3	68.7	0.0	0.0	0.5	1.5	97.8
	4	66.8	0.0	0.0	0.0	8.7	91.3
	Average	67.8 ^B	0.0	0.0	0.3	5.1 ^{ABCD}	94.5 ^{AB}
Hy-Line (W-36)	3	65.5	0.0	0.0	0.1	4.8	94.7
	4	65.0	0.0	0.6	0.7	4.8	94.0
	Average	65.2 ^C	0.0	0.3	0.4	4.8 ^{BCD}	94.3 ^{AB}
Hy-Line (W-98)	3	68.0	0.0	0.0	0.0	2.9	97.2
	4	69.0	0.0	0.0	0.5	2.2	97.1
	Average	68.5 ^{AB}	0.0	0.0	0.3	2.6 ^{CD}	97.1 ^A
CV-20	3	64.8	0.0	0.0	0.6	7.6	91.4
	4	65.9	0.0	0.0	0.0	6.6	93.5
	Average	65.3 ^C	0.0	0.0	0.3	7.1 ^{ABC}	92.4 ^{ABC}
ISA White Exp.	3	64.9	0.0	0.0	0.3	5.5	94.3
	4	64.9	0.0	0.0	0.8	8.6	90.6
	Average	64.9 ^C	0.0	0.0	0.5	7.1 ^{ABC}	92.4 ^{ABC}
All Strains	3	66.3	0.0	0.0	0.4	5.8	93.5
	4	66.4	0.0	0.1	0.5	6.7	92.6

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

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

TABLE 57. EFFECT OF WHITE EGG STRAIN AND POPULATION ON EGG QUALITY, INCOME AND FEED COSTS OF HENS IN THE 36th NCLP&MT (491-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5), NON-ANOREXIC LOW SODIUM MOLT

Breeder (Strain)	Population ¹	Grade	Grade	Cracks	Loss	Egg	Feed
		A	B			Income	Costs
		(%)	(%)	(%)	(%)	(\$/hen)	(\$/hen)
LSL-Lite White	3	89.0	5.1	5.5	0.5	13.32	6.45
	4	91.4	5.5	2.9	0.2	13.37	6.69
	Average	90.2	5.3	4.2	0.4 ^B	13.34 ^A	6.57
Bovans White Exp.	3	90.4	5.2	2.5	1.9	11.68	6.46
	4	89.9	4.1	4.4	1.6	12.20	6.39
	Average	90.2	4.6	3.5	1.7 ^A	11.94 ^{BCD}	6.42
Bovans White	3	92.7	3.5	2.9	0.9	11.88	6.19
	4	94.5	3.4	1.8	0.4	11.98	6.22
	Average	93.6	3.5	2.3	0.6 ^B	11.93 ^{CD}	6.20
DeKalb White Exp.	3	88.8	8.5	2.4	0.3	12.25	6.45
	4	88.5	5.8	5.1	0.6	11.35	6.63
	Average	88.7	7.1	3.8	0.5 ^B	11.80 ^{CD}	6.54
DeKalb White	3	87.1	5.9	5.5	1.5	11.06	6.10
	4	92.1	4.2	2.7	1.1	11.51	6.23
	Average	89.6	5.1	4.1	1.3 ^{AB}	11.29 ^D	6.16
Hy-Line (W-36)	3	93.7	2.7	3.3	0.3	13.41	6.42
	4	92.3	3.9	2.7	1.2	13.35	6.28
	Average	93.0	3.3	3.0	0.7 ^B	13.38 ^A	6.35
Hy-Line (W-98)	3	91.6	6.6	0.7	1.1	13.33	7.10
	4	92.7	4.4	2.7	0.3	12.71	6.38
	Average	92.1	5.5	1.7	0.7 ^B	13.02 ^{ABC}	6.74
CV-20	3	89.5	5.4	4.5	0.6	13.44	6.66
	4	92.3	3.0	4.1	0.6	12.93	6.09
	Average	90.9	4.2	4.3	0.6 ^B	13.18 ^{AB}	6.37
ISA White Exp.	3	93.1	4.4	2.1	0.5	13.80	6.55
	4	90.0	4.0	5.7	0.3	12.54	6.58
	Average	91.5	4.2	3.9	0.4 ^B	13.17 ^{ABC}	6.57
All Strains	3	90.7	5.3	3.3	0.8	12.68	6.48
	4	91.5	4.2	3.6	0.7	12.44	6.39

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

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

TABLE 58. EFFECT OF BROWN EGG STRAIN AND POPULATION ON PERFORMANCE OF HENS IN THE 36th NCLP&MT (491-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5), NON-ANOREXIC LOW SODIUM MOLT

Breeder (Strain)	Population ¹	Feed Consumption (kg/100/hen/d)	Feed Conversion (g egg/g feed)	Eggs		Mortality (%)
				Per Bird Housed	Egg Production (HD%)	
Bovans	3	12.0	0.39	180.1	69.8	5.6
Brown	4	12.2	0.40	176.2	71.7	5.4
	Average	12.1	0.39	178.2	70.8	5.5
Bovans	3	12.6	0.40	181.3	71.8	7.9
Goldline	4	12.6	0.41	193.7	75.7	5.3
	Average	12.6	0.40	187.5	73.8	6.6
Hy-Line	3	11.8	0.42	184.3	72.8	5.6
Brown	4	11.4	0.42	191.9	69.4	4.2
	Average	11.6	0.42	188.1	71.1	4.9
All	3	12.1	0.40	181.9	71.5	6.3
Strains	4	12.1	0.41	187.3	72.3	5.0

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

TABLE 59. EFFECT OF BROWN EGG STRAIN AND POPULATION ON EGG WEIGHT AND EGG SIZE DISTRIBUTION OF HENS IN THE 36th NCLP&MT (491-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5), NON-ANOREXIC LOW SODIUM MOLT

Breeder (Strain)	Population ¹	Egg Weight (g egg/hen/d)	Pee Wee (%)	Small (%)	Medium (%)	Large (%)	Extra Large (%)
Bovans	3	67.3	0.0	0.0	0.0	4.4	95.6
Brown	4	67.5	0.0	0.0	0.5	4.4	95.0
	Average	67.4	0.0	0.0	0.3	4.4	95.3
Bovans	3	68.5	0.0	0.0	0.0	3.6	96.1
Goldline	4	68.0	0.0	0.0	0.1	4.7	95.2
	Average	68.3	0.0	0.0	0.1	4.2	95.6
Hy-Line	3	68.2	0.0	0.0	0.4	4.9	94.0
Brown	4	69.0	0.0	0.0	0.1	1.9	97.7
	Average	68.6	0.0	0.0	0.3	3.4	95.8
All	3	68.0	0.0	0.0	0.1	4.3	95.2
Strains	4	68.2	0.0	0.0	0.3	3.7	96.0

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

TABLE 60. EFFECT OF BROWN EGG STRAIN AND POPULATION ON EGG QUALITY, INCOME AND FEED COSTS OF HENS IN THE 36th NCLP&MT (491-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5), NON-ANOREXIC LOW SODIUM MOLT

Breeder (Strain)	Population ¹	Grade A (%)	Grade B (%)	Cracks (%)	Loss (%)	Egg Income (\$/hen)	Feed Costs (\$/hen)
Bovans	3	93.4	3.1	3.1	0.4	12.53	6.71
Brown	4	93.3	4.2	2.4	0.2	12.22	6.51
	Average	93.4	3.6	2.7	0.3	12.38	6.61
Bovans	3	94.5	3.1	1.5	0.9	12.62	6.89
Goldline	4	92.1	4.4	2.5	1.1	13.30	7.00
	Average	93.3	3.7	2.0	1.0	12.96	6.94
Hy-Line	3	92.1	4.5	2.1	1.3	12.55	6.49
Brown	4	92.3	4.0	3.0	0.7	13.20	6.83
	Average	92.2	4.3	2.6	1.0	12.88	6.66
All	3	93.3	3.6	2.3	0.9	12.57	6.69
Strains	4	92.5	4.2	2.6	0.7	12.91	6.78

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

TABLE 61. EFFECT OF WHITE EGG STRAIN AND POPULATION ON PERFORMANCE OF HENS IN THE 36th NCLP&MT (119-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

Breeder (Strain)	Population ¹	Eggs					
		Feed Consumption (kg/100/hen/d)	Feed Conversion (g egg/g feed)	Per Bird Housed	Egg Production (HD%)	Egg Mass (g/HD)	Mortality (%)
LSL-Lite White	3	11.5	0.43	476.5	78.4	50.8	22.8
	4	11.5	0.43	478.8	78.8	51.7	21.3
	Average	11.5	0.43 ^{BC}	477.7 ^A	78.6	51.2 ^A	22.1 ^{BC}
Bovans White Exp.	3	11.0	0.44	465.6	75.2	50.9	17.6
	4	10.9	0.45	468.9	75.9	51.5	16.2
	Average	10.9	0.45 ^{AB}	467.2 ^{AB}	75.6	51.2 ^A	16.9 ^{CD}
Bovans White	3	11.7	0.42	460.2	79.0	51.1	26.6
	4	11.8	0.42	443.2	78.2	50.1	32.5
	Average	11.7	0.42 ^C	451.7 ^{BC}	78.6	50.6 ^A	29.5 ^A
DeKalb White Exp.	3	10.8	0.43	469.2	74.9	48.7	15.3
	4	11.0	0.42	459.5	74.2	48.3	15.2
	Average	10.9	0.43 ^{BC}	464.4 ^{ABC}	74.6	48.5 ^B	15.2 ^{DE}
DeKalb White	3	11.2	0.43	442.8	75.5	50.6	28.8
	4	11.3	0.43	456.0	75.8	50.3	25.5
	Average	11.3	0.43 ^{BC}	449.4 ^C	75.6	50.5 ^A	27.1 ^{AB}
Hy-Line (W-36)	3	10.1	0.45	472.1	73.7	47.6	6.3
	4	10.3	0.45	470.3	74.1	48.2	9.2
	Average	10.2	0.45 ^{AB}	471.2 ^A	73.9	47.9 ^B	7.8 ^F
Hy-Line (W-98)	3	11.2	0.43	475.2	74.4	49.8	9.4
	4	11.2	0.43	466.0	74.6	50.4	13.6
	Average	11.2	0.43 ^{BC}	470.6 ^A	74.5	50.1 ^A	11.5 ^{DEF}
CV-20	3	10.4	0.44	478.6	75.6	48.6	9.6
	4	10.0	0.46	471.6	75.1	48.5	9.8
	Average	10.2	0.45 ^A	475.1 ^A	75.3	48.5 ^B	9.7 ^{EF}
ISA White Exp.	3	10.4	0.46	474.2	77.5	50.3	18.0
	4	10.6	0.45	467.6	77.0	49.9	17.9
	Average	10.5	0.45 ^A	470.9 ^A	77.3	50.1 ^A	17.9 ^{CD}
All Strains	3	10.9	0.44	468.3	76.0	49.8	17.2
	4	11.0	0.44	464.7	76.0	49.9	17.9

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

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

TABLE 62. EFFECT OF WHITE EGG STRAIN AND POPULATION ON EGG WEIGHT AND EGG SIZE DISTRIBUTION OF HENS IN THE 36th NCLP&MT (119-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

Breeder (Strain)	Population ¹	Egg Weight (g egg/hen/d)	Pee Wee (%)	Small (%)	Medium (%)	Large (%)	Extra Large (%)
LSL-Lite White	3	62.4	0.0	1.0	4.3	19.2	75.3
	4	63.1	0.0	1.3	4.1	15.2	79.0
	Average	62.8 ^C	0.0	1.1 ^{ABC}	4.2 ^{AB}	17.2 ^{CD}	77.1 ^{CD}
Bovans White Exp.	3	64.7	0.1	0.6	2.8	14.2	81.9
	4	64.9	0.0	0.6	2.9	12.5	83.8
	Average	64.8 ^{AB}	0.1	0.6 ^{CD}	2.9 ^C	13.3 ^{EF}	82.9 ^{AB}
Bovans White	3	62.1	0.0	0.9	4.6	22.3	71.8
	4	61.9	0.0	0.8	4.5	23.6	70.9
	Average	62.0 ^{CD}	0.0	0.9 ^{BCD}	4.5 ^{AB}	22.9 ^A	71.4 ^E
DeKalb White Exp.	3	62.5	0.0	0.9	4.2	20.6	73.9
	4	62.9	0.1	0.7	4.5	18.7	75.7
	Average	62.7 ^C	0.0	0.8 ^{CD}	4.3 ^{AB}	19.7 ^{ABC}	74.8 ^{DE}
DeKalb White	3	64.2	0.0	1.1	4.2	15.1	79.3
	4	64.0	0.1	0.6	4.0	16.0	79.1
	Average	64.1 ^B	0.0	0.9 ^{BCD}	4.1 ^{AB}	15.5 ^{DE}	79.2 ^{BC}
Hy-Line (W-36)	3	62.0	0.0	1.5	5.4	18.9	73.9
	4	62.1	0.2	1.9	4.5	19.3	74.0
	Average	62.1 ^{CD}	0.1	1.7 ^A	5.0 ^A	19.1 ^{BC}	73.9 ^{DE}
Hy-Line (W-98)	3	65.1	0.0	0.7	3.7	12.4	83.0
	4	65.8	0.0	0.4	3.3	10.9	85.2
	Average	65.4 ^A	0.0	0.5 ^D	3.5 ^{BC}	11.6 ^F	84.1 ^A
CV-20	3	61.6	0.1	1.7	4.1	22.5	71.2
	4	61.9	0.0	1.3	4.7	22.0	71.8
	Average	61.8 ^D	0.1	1.5 ^A	4.4 ^{AB}	22.3 ^{AB}	71.5 ^E
ISA White Exp.	3	61.5	0.0	1.4	4.5	22.7	71.1
	4	61.4	0.0	1.4	4.6	23.0	70.8
	Average	61.5 ^D	0.0	1.4 ^{AB}	4.5 ^{AB}	22.8 ^A	70.9 ^E
All Strains	3	62.9	0.1	1.1	4.2	18.7	75.7
	4	63.1	0.0	1.0	4.1	17.9	76.7

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

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

TABLE 63. EFFECT OF WHITE EGG STRAIN AND POPULATION ON EGG QUALITY, INCOME AND FEED COSTS OF HENS IN THE 36th NCLP&MT (119-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

Breeder (Strain)	Population ¹	Grade	Grade	Cracks	Loss	Egg	Feed
		A	B			Income	Costs
		(%)	(%)	(%)	(%)	(\$/hen)	(\$/hen)
LSL-Lite White	3	93.5	3.7	2.4	0.2	32.48	14.54
	4	94.1	3.4	2.0	0.3	32.66	14.66
	Average	93.8 ^{ABC}	3.6 ^{AB}	2.2	0.3	32.57 ^A	14.60 ^{AB}
Bovans White Exp.	3	93.7	3.0	2.7	0.6	31.91	14.33
	4	92.9	2.9	3.7	0.6	32.07	14.26
	Average	93.3 ^{BC}	2.9 ^{ABC}	3.2	0.6	31.99 ^A	14.30 ^{BC}
Bovans White	3	93.5	3.3	2.8	0.5	31.21	14.21
	4	93.6	3.8	2.3	0.2	30.15	13.89
	Average	93.5 ^{ABC}	3.6 ^{AB}	2.5	0.4	30.68 ^B	14.05 ^{BCD}
DeKalb White Exp.	3	93.2	3.6	2.7	0.4	31.81	14.29
	4	93.1	3.4	3.2	0.3	31.18	14.43
	Average	93.2 ^C	3.5 ^{AB}	2.9	0.4	31.49 ^{AB}	14.36 ^B
DeKalb White	3	92.2	4.2	3.0	0.6	29.93	13.77
	4	92.8	3.6	3.1	0.5	31.02	14.15
	Average	92.5 ^C	3.9 ^A	3.1	0.5	30.47 ^B	13.96 ^{BCD}
Hy-Line (W-36)	3	94.4	2.6	2.5	0.5	32.15	13.73
	4	95.0	2.3	2.0	0.6	32.07	13.73
	Average	94.7 ^{AB}	2.5 ^{BC}	2.3	0.6	32.11 ^A	13.73 ^{CD}
Hy-Line (W-98)	3	91.9	4.8	2.7	0.7	32.19	15.21
	4	93.1	3.4	3.5	0.1	31.98	14.91
	Average	92.5 ^C	4.1 ^A	3.1	0.4	32.08 ^A	15.06 ^A
CV-20	3	94.1	2.4	3.2	0.4	32.53	13.98
	4	95.4	1.7	2.5	0.3	32.40	13.41
	Average	94.8 ^A	2.0 ^C	2.9	0.3	32.47 ^A	13.70 ^{CD}
ISA White Exp.	3	94.4	2.7	2.7	0.3	32.43	13.43
	4	93.5	2.6	3.5	0.4	31.73	13.60
	Average	94.0 ^{ABC}	2.7 ^{BC}	3.1	0.3	32.08 ^A	13.52 ^D
All Strains	3	93.4	3.4	2.8	0.5	31.85	14.16
	4	93.7	3.0	2.9	0.4	31.70	14.12

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

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

TABLE 64. EFFECT OF WHITE EGG STRAIN AND SYNCHRONIZED MOLT PROGRAM ON PERFORMANCE OF HENS IN THE 36th NCLP&MT (119-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

Breeder (Strain)	Molt Program	Feed Consumption (kg/100/hen/d)	Feed Conversion (g egg/g feed)	Eggs			
				Per Bird Housed	Egg Production (HD%)	Egg Mass (g/HD)	Mortality (%)
LSL-Lite White	NM	12.2 ^{ab}	0.40	452.6	76.6 ^{bcdefg}	50.0	37.0
	NA	11.1 ^{cde}	0.45	486.1	79.7 ^{ab}	52.2	15.9
	NALS	11.1 ^{cde}	0.44	494.3	79.5 ^{ab}	51.5	13.2
Bovans White Exp.	NM	11.0 ^{cde}	0.44	466.8	75.6 ^{defg}	50.3	22.5
	NA	11.0 ^{cde}	0.44	471.8	76.2 ^{defg}	51.8	12.0
	NALS	10.8 ^{cdefg}	0.45	463.0	75.0 ^{defg}	51.6	16.2
Bovans White	NM	13.2 ^a	0.39	451.0	81.0 ^a	52.0	40.5
	NA	11.1 ^{cde}	0.43	448.7	77.5 ^{bcd}	50.1	27.2
	NALS	10.9 ^{cdef}	0.43	455.6	77.3 ^{bcde}	49.6	20.9
DeKalb White Exp.	NM	11.5 ^{bc}	0.41	459.7	75.1 ^{defg}	48.0	27.3
	NA	10.7 ^{cdefgh}	0.43	464.6	74.2 ^{fg}	48.9	8.2
	NALS	10.6 ^{defgh}	0.44	468.8	74.4 ^{fg}	48.6	10.2
DeKalb White	NM	11.5 ^{bc}	0.42	434.5	74.8 ^{efg}	49.2	35.4
	NA	11.4 ^{bcd}	0.42	452.5	75.6 ^{defg}	50.6	22.7
	NALS	10.9 ^{cdef}	0.45	461.1	76.5 ^{cdefg}	51.7	23.4
Hy-Line (W-36)	NM	10.4 ^{efgh}	0.43	461.9	72.5 ^g	46.3	10.9
	NA	10.0 ^h	0.46	473.0	74.6 ^{efg}	49.0	6.7
	NALS	10.1 ^{gh}	0.45	478.7	74.6 ^{efg}	48.4	5.7
Hy-Line (W-98)	NM	11.6 ^{bc}	0.41	453.6	72.6 ^g	48.7	20.8
	NA	11.0 ^{cde}	0.44	484.8	75.6 ^{defg}	50.7	5.4
	NALS	10.9 ^{cde}	0.44	473.5	75.3 ^{defg}	50.8	8.3
CV-20	NM	10.4 ^{efgh}	0.44	465.5	74.5 ^{efg}	47.3	16.1
	NA	10.2 ^{fgh}	0.45	479.8	75.6 ^{defg}	48.6	4.6
	NALS	10.1 ^{fgh}	0.46	480.1	75.9 ^{defg}	49.7	8.4
ISA White Exp.	NM	10.9 ^{cdef}	0.43	453.7	75.3 ^{defg}	48.0	29.0
	NA	10.0 ^{gh}	0.48	482.9	79.3 ^{abc}	51.4	11.7
	NALS	10.7 ^{cdefgh}	0.45	476.2	77.2 ^{bcdef}	50.9	13.2
All Strains	NM	11.4	0.42 ^Z	455.5 ^Z	75.3	48.9 ^Z	26.6 ^Y
	NA	10.7	0.45 ^Y	471.6 ^Y	76.5	50.4 ^Y	12.7 ^Z
	NALS	10.7	0.45 ^Y	472.3 ^Y	76.2	50.3 ^Y	13.3 ^Z

a,b,c,d,e,f,g,h - Different letters denote significant strain*molt program interactions (P<.01).

Y,Z - Different letters denote significant differences (P<.01), comparisons made among molt program average values.

TABLE 65. EFFECT OF WHITE EGG STRAIN AND SYNCHRONIZED MOLT PROGRAM ON EGG WEIGHT AND EGG SIZE DISTRIBUTION OF HENS IN THE 36th NCLP&MT (119-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

Breeder (Strain)	Molt Program	Egg Weight (g egg/hen/d)	Pee Wee (%)	Small (%)	Medium (%)	Large (%)	Extra Large (%)
LSL-Lite White	NM	63.0	0.0	2.3	3.2	15.4	79.0
	NA	62.9	0.0	0.8	5.1	15.2	78.6
	NALS	62.4	0.0	0.3	4.3	21.1	73.8
Bovans White Exp.	NM	64.5	0.0	1.0	2.6	15.1	81.1
	NA	64.7	0.0	0.5	3.4	12.7	83.1
	NALS	65.3	0.1	0.3	2.6	12.3	84.5
Bovans White	NM	62.2	0.0	1.5	4.3	24.0	69.7
	NA	62.1	0.0	0.4	4.9	22.3	72.2
	NALS	61.7	0.0	0.6	4.5	22.6	72.1
DeKalb White Exp.	NM	62.0	0.1	1.7	4.2	22.0	71.6
	NA	63.2	0.0	0.3	4.6	17.0	77.8
	NALS	63.0	0.0	0.4	4.2	19.9	75.0
DeKalb White	NM	63.5	0.1	1.9	5.2	14.7	77.8
	NA	64.5	0.0	0.4	3.2	16.0	80.3
	NALS	64.2	0.0	0.3	3.9	15.8	79.5
Hy-Line (W-36)	NM	61.9	0.4	2.8	4.4	22.0	70.2
	NA	62.2	0.0	1.1	5.3	18.0	75.5
	NALS	62.1	0.0	1.3	5.1	17.4	76.1
Hy-Line (W-98)	NM	65.8	0.0	1.2	4.4	10.6	83.7
	NA	65.2	0.0	0.3	3.1	11.6	84.8
	NALS	65.4	0.0	0.1	3.1	12.7	83.9
CV-20	NM	61.4	0.3	2.5	3.8	25.9	67.3
	NA	61.7	0.0	1.1	4.7	21.1	72.8
	NALS	62.1	0.0	0.9	4.6	19.9	74.5
ISA White Exp.	NM	61.3	0.1	2.1	5.2	24.6	67.8
	NA	60.9	0.0	1.3	4.7	24.6	69.1
	NALS	62.2	0.0	0.9	3.6	19.4	75.9
All Strains	NM	62.8	0.1	1.9 ^Y	4.1	19.4	74.2 ^Z
	NA	63.0	0.0	0.7 ^Z	4.3	17.6	77.1 ^Y
	NALS	63.2	0.0	0.6 ^Z	4.0	17.9	77.2 ^Y

Y,Z - Different letters denote significant differences (P<.01), comparisons made among molt program average values.

TABLE 66. EFFECT OF WHITE EGG STRAIN AND SYNCHRONIZED MOLT PROGRAM ON EGG QUALITY, INCOME AND FEED COSTS OF HENS IN THE 36th NCLP&MT (119-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

Breeder (Strain)	Molt Program	Grade A (%)	Grade B (%)	Cracks (%)	Loss (%)	Egg Income (\$/hen)	Feed Costs (\$/hen)
LSL-Lite White	NM	92.4	5.5	1.8	0.0	30.57	14.70
	NA	95.1	2.3	2.2	0.4	33.43	14.47
	NALS	93.9	3.0	2.7	0.4	33.72	14.63
Bovans White Exp.	NM	93.2	2.7	3.8	0.3	31.97	14.20
	NA	93.7	3.1	2.7	0.5	32.32	14.47
	NALS	93.0	3.0	3.2	0.9	31.68	14.22
Bovans White	NM	91.7	4.9	3.0	0.4	30.20	14.98
	NA	94.2	3.1	2.4	0.3	30.64	13.57
	NALS	94.7	2.7	2.3	0.4	31.20	13.60
DeKalb White Exp.	NM	93.1	3.5	3.2	0.3	31.03	14.55
	NA	94.3	2.8	2.4	0.6	31.84	14.33
	NALS	92.1	4.3	3.2	0.3	31.62	14.20
DeKalb White	NM	91.3	4.7	3.5	0.6	29.08	13.67
	NA	93.4	3.7	2.6	0.3	30.99	14.39
	NALS	92.8	3.4	3.1	0.7	31.35	13.82
Hy-Line (W-36)	NM	94.6	2.7	2.1	0.6	31.24	13.98
	NA	94.9	2.6	2.0	0.6	32.35	13.49
	NALS	94.7	2.0	2.7	0.5	32.74	13.72
Hy-Line (W-98)	NM	90.1	5.3	4.3	0.5	30.41	15.29
	NA	93.3	3.6	2.9	0.3	33.25	15.14
	NALS	94.0	3.4	2.1	0.4	32.60	14.75
CV-20	NM	95.3	1.6	2.8	0.2	31.71	13.61
	NA	94.8	2.2	2.7	0.3	32.85	13.76
	NALS	94.2	2.3	3.1	0.4	32.83	13.73
ISA White Exp.	NM	93.2	3.5	3.0	0.5	30.60	13.53
	NA	94.8	2.0	3.0	0.3	33.02	13.01
	NALS	93.9	2.6	3.3	0.3	32.61	14.00
All Strains	NM	92.8 ^Z	3.8 ^Y	3.0	0.4	30.76 ^Z	14.28
	NA	94.3 ^Y	2.8 ^Z	2.5	0.4	32.30 ^Y	14.07
	NALS	93.7 ^Y	3.0 ^Z	2.9	0.5	32.26 ^Y	14.07

Y,Z - Different letters denote significant differences (P<.01), comparisons made among molt program average values.

TABLE 67. EFFECT OF BROWN EGG STRAIN AND POPULATION ON PERFORMANCE OF HENS IN THE 36th NCLP&MT (119-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

Breeder (Strain)	Population ¹	Eggs		Per Bird Housed	Egg Production (HD%)	Egg Mass (g/HD)	Mortality (%)
		Feed Consumption (kg/100/hen/d)	Feed Conversion (g egg/g feed)				
Bovans	3	11.4	0.44	478.0	77.6	51.8	14.3
Brown	4	11.3	0.44	473.9	76.9	51.3	16.3
	Average	11.3 ^A	0.44	475.9	77.2 ^{AB}	51.6 ^B	15.3
Bovans	3	12.0	0.44	473.4	77.7	53.6	18.5
Goldline	4	11.5	0.45	485.5	78.3	53.5	15.7
	Average	11.7 ^A	0.44	479.5	78.0 ^A	53.6 ^A	17.1
Hy-Line	3	10.6	0.46	473.5	76.0	50.7	11.6
Brown	4	10.6	0.46	478.6	75.4	50.5	8.2
	Average	10.6 ^B	0.46	476.0	75.7 ^B	50.6 ^B	9.9
All	3	11.3	0.45	475.0	77.1	52.0	14.8
Strains	4	11.1	0.45	479.3	76.9	51.8	13.4

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

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

TABLE 68. EFFECT OF BROWN EGG STRAIN AND POPULATION ON EGG WEIGHT AND EGG SIZE DISTRIBUTION OF HENS IN THE 36th NCLP&MT (119-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

Breeder (Strain)	Population ¹	Egg Weight (g egg/hen/d)	Pee Wee (%)	Small (%)	Medium (%)	Large (%)	Extra Large (%)
Bovans	3	64.7	0.0	0.6	3.0	14.4	82.0
Brown	4	64.7	0.0	0.4	2.4	13.5	83.2
	Average	64.7 ^B	0.0	0.5	2.7	13.9	82.6
Bovans	3	66.5	0.0	0.4	2.3	11.6	85.1
Goldline	4	65.9	0.0	0.2	2.8	12.7	83.9
	Average	66.2 ^A	0.0	0.3	2.6	12.1	84.5
Hy-Line	3	64.6	0.0	0.3	2.5	16.3	80.5
Brown	4	64.6	0.0	0.3	2.4	14.0	83.1
	Average	64.6 ^B	0.0	0.3	2.5	15.2	81.8
All	3	65.2	0.0	0.4	2.6	14.1	82.6
Strains	4	65.1	0.0	0.3	2.6	13.4	83.4

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

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

TABLE 69. EFFECT OF BROWN EGG STRAIN AND POPULATION ON EGG QUALITY, INCOME AND FEED COSTS OF HENS IN THE 36th NCLP&MT (119-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

Breeder (Strain)	Population ¹	Grade A (%)	Grade B (%)	Cracks (%)	Loss (%)	Egg Income (\$/hen)	Feed Costs (\$/hen)
Bovans	3	94.3	2.7	2.7	0.3	33.03	14.91
Brown	4	94.2	2.7	2.7	0.4	32.68	14.83
	Average	94.2	2.7	2.7	0.3	32.86	14.87 ^{AB}
Bovans	3	94.2	2.8	2.6	0.5	32.67	15.30
Goldline	4	93.9	2.7	2.9	0.5	33.42	15.09
	Average	94.0	2.7	2.8	0.5	33.05	15.19 ^A
Hy-Line	3	94.6	2.8	2.1	0.5	32.68	14.13
Brown	4	94.5	2.7	2.3	0.4	33.17	14.30
	Average	94.6	2.8	2.2	0.4	32.93	14.21 ^B
All	3	94.3	2.8	2.5	0.4	32.80	14.78
Strains	4	94.2	2.7	2.7	0.4	33.09	14.74

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

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

TABLE 70. EFFECT OF BROWN EGG STRAIN AND SYNCHRONIZED MOLT PROGRAM ON PERFORMANCE OF HENS IN THE 36th NCLP&MT (119-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

Breeder (Strain)	Molt Program	Feed Consumption (kg/100/hen/d)	Feed Conversion (g egg/g feed)	Eggs		Mortality (%)
				Per Bird Housed	Egg Production (HD%)	
Bovans Brown	NM	11.3	0.44	474.6	76.5	18.4
	NA	11.4	0.44	483.7	78.6	14.5
	NALS	11.3	0.44	469.5	76.6	13.1
Bovans Goldline	NM	12.3	0.42	463.4	76.9	27.1
	NA	11.2	0.46	490.7	79.0	11.2
	NALS	11.6	0.44	484.3	78.1	13.1
Hy-Line Brown	NM	10.5	0.45	465.7	73.8	12.3
	NA	10.7	0.46	477.9	76.9	9.4
	NALS	10.6	0.47	484.5	76.4	8.1
All Strains	NM	11.4	0.44	467.9	75.7 ^Z	19.2
	NA	11.1	0.46	484.1	78.2 ^Y	11.7
	NALS	11.2	0.45	479.4	77.1 ^{YZ}	11.4

Y,Z - Different letters denote significant differences (P<.01), comparisons made among molt program average values.

TABLE 71. EFFECT OF BROWN EGG STRAIN AND SYNCHRONIZED MOLT PROGRAM ON EGG WEIGHT AND EGG SIZE DISTRIBUTION OF HENS IN THE 36th NCLP&MT (119-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

Breeder (Strain)	Molt Program	Egg Weight (g egg/hen/d)	Pee Wee (%)	Small (%)	Medium (%)	Large (%)	Extra Large (%)
Bovans	NM	64.2	0.1	0.9	4.0	16.7	77.9
Brown	NA	64.9	0.0	0.1	1.5	14.0	84.1
	NALS	65.1	0.0	0.4	2.7	11.1	85.8
Bovans	NM	66.2	0.0	0.5	3.0	13.5	82.2
Goldline	NA	66.4	0.0	0.3	2.2	11.0	86.4
	NALS	66.0	0.0	0.1	2.5	12.0	85.0
Hy-Line	NM	63.5	0.0	0.8	4.0	18.8	76.2
Brown	NA	64.8	0.0	0.0	1.8	14.3	83.6
	NALS	65.5	0.0	0.1	1.6	12.4	85.6
All Strains	NM	64.6	0.0	0.8 ^Y	3.7 ^Y	16.4 ^Y	78.8 ^Z
	NA	65.4	0.0	0.1 ^Z	1.8 ^Z	13.1 ^{YZ}	84.7 ^Y
	NALS	65.5	0.0	0.2 ^Z	2.3 ^Z	11.8 ^Z	85.5 ^Y

Y,Z - Different letters denote significant differences (P<.01), comparisons made among molt program average values.

TABLE 72. EFFECT OF BROWN EGG STRAIN AND SYNCHRONIZED MOLT PROGRAM ON EGG QUALITY, INCOME AND FEED COSTS OF HENS IN THE 36th NCLP&MT (119-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

Breeder (Strain)	Molt Program	Grade A (%)	Grade B (%)	Cracks (%)	Loss (%)	Egg Income (\$/hen)	Feed Costs (\$/hen)
Bovans Brown	NM	93.1	3.7	2.9	0.5	32.25	14.85
	NA	95.0	1.9	2.8	0.3	33.70	14.98
	NALS	94.7	2.6	2.5	0.2	32.62	14.78
Bovans Goldline	NM	92.6	3.5	3.4	0.4	31.57	15.32
	NA	94.5	2.2	2.8	0.5	34.05	14.88
	NALS	94.9	2.5	2.2	0.5	33.53	15.38
Hy-Line Brown	NM	94.1	3.2	2.4	0.4	31.95	14.01
	NA	94.8	2.8	2.0	0.4	33.16	14.22
	NALS	94.8	2.4	2.3	0.5	33.68	14.41
All Strains	NM	93.2 ^Z	3.5 ^Y	2.9	0.4	31.92 ^Z	14.73
	NA	94.8 ^Y	2.3 ^Z	2.5	0.4	33.64 ^Y	14.69
	NALS	94.8 ^Y	2.5 ^Z	2.3	0.4	33.27 ^{YZ}	14.85

Y,Z - Different letters denote significant differences (P<.01), comparisons made among molt program average values.

TABLE 73. EFFECT OF WHITE EGG STRAIN AND SYNCHRONIZED MOLT PROGRAM ON PERFORMANCE OF HENS IN THE 36th NCLP&MT (119-771 DAYS) IN BATTERY CAGES (HOUSE 7)

Breeder (Strain)	Molt Program	Feed Consumption (kg/100/hen/d)	Feed Conversion (g egg/g feed)	Eggs		Egg Mass (g/HD)	Mortality (%)
				Per Bird Housed	Egg Production (HD%)		
LSL-Lite White	NM	10.2	0.47	492.2	77.9	49.9	17.7
	NA	10.3	0.49	517.4	82.3	53.4	7.8
	NALS	10.5	0.47	507.9	80.6	52.3	7.7
	Average	10.3 ^{AB}	0.48 ^{AB}	505.8 ^A	80.3 ^{AB}	51.9 ^A	11.1 ^B
Bovans White Exp.	NM	10.5	0.47	481.1	77.2	50.3	14.7
	NA	10.1	0.48	482.2	76.7	51.5	9.8
	NALS	10.3	0.47	471.6	76.3	51.7	10.7
	Average	10.3 ^{AB}	0.47 ^{AB}	478.3 ^{BC}	76.7 ^{CD}	51.1 ^{AB}	11.7 ^B
Bovans White	NM	10.6	0.47	458.9	80.9	51.2	36.9
	NA	10.6	0.47	482.9	80.9	52.4	17.7
	NALS	10.0	0.50	509.6	81.2	52.3	12.6
	Average	10.4 ^{AB}	0.48 ^A	483.8 ^B	81.0 ^A	52.0 ^A	22.4 ^A
DeKalb White Exp.	NM	10.5	0.46	483.8	76.5	49.1	10.5
	NA	10.2	0.47	483.5	78.3	50.7	13.0
	NALS	10.3	0.47	493.1	78.4	51.3	8.1
	Average	10.3 ^{AB}	0.47 ^{AB}	486.8 ^B	77.7 ^{CD}	50.4 ^B	10.5 ^B
DeKalb White	NM	10.8	0.46	445.1	76.0	50.1	30.6
	NA	10.6	0.47	464.1	78.5	52.2	21.1
	NALS	10.6	0.46	472.1	78.6	51.8	23.2
	Average	10.7 ^A	0.46 ^B	460.4 ^C	77.7 ^{CD}	51.4 ^{AB}	24.9 ^A
Hy-Line (W-36)	NM	9.7	0.46	452.6	72.0	46.3	11.7
	NA	9.5	0.48	486.5	75.0	48.8	0.9
	NALS	9.6	0.47	477.7	74.3	47.6	3.6
	Average	9.6 ^C	0.47 ^{AB}	472.3 ^{BC}	73.8 ^E	47.5 ^C	5.4 ^B
Hy-Line (W-98)	NM	10.6	0.45	477.6	73.9	49.2	3.2
	NA	10.3	0.47	492.9	77.7	51.1	5.0
	NALS	10.2	0.47	480.2	76.1	50.6	7.4
	Average	10.4 ^{AB}	0.47 ^{AB}	483.6 ^B	75.9 ^D	50.3 ^B	5.2 ^B
CV-20	NM	9.5	0.49	483.2	76.4	47.8	9.5
	NA	9.4	0.48	475.9	74.8	48.6	6.2
	NALS	9.6	0.49	488.5	77.1	49.4	5.6
	Average	9.5 ^C	0.49 ^A	482.5 ^B	76.1 ^D	48.6 ^C	7.1 ^B
ISA White Exp.	NM	10.2	0.47	469.5	77.5	49.4	23.1
	NA	9.9	0.47	498.1	78.0	49.3	3.6
	NALS	10.2	0.48	500.1	80.2	52.7	7.9
	Average	10.1 ^B	0.47 ^{AB}	489.2 ^{AB}	78.6 ^{BC}	50.5 ^B	11.5 ^B
All Strains	NM	10.3	0.47	471.6 ^Z	76.5 ^Z	49.2 ^Z	17.5 ^Y
	NA	10.1	0.48	487.1 ^Y	78.0 ^Y	50.9 ^Y	9.5 ^Z
	NALS	10.1	0.48	489.0 ^Y	78.1 ^Y	51.1 ^Y	9.6 ^Z

A,B,C,D,E - 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.

TABLE 74. EFFECT OF WHITE EGG STRAIN AND SYNCHRONIZED MOLT PROGRAM ON EGG WEIGHT AND EGG SIZE DISTRIBUTION OF HENS IN THE 36th NCLP&MT (119-771 DAYS) IN BATTERY CAGES (HOUSE 7)

Breeder (Strain)	Molt Program	Egg Weight (g egg/hen/d)	Pee Wee (%)	Small (%)	Medium (%)	Large (%)	Extra Large (%)
LSL-Lite White	NM	62.0	0.1	0.7	4.9	21.5	72.6
	NA	62.3	0.0	0.9	4.6	20.1	74.1
	NALS	62.2	0.0	0.8	4.6	21.8	72.6
	Average	62.2 ^C	0.0	0.8 ^{CD}	4.7 ^{AB}	21.1 ^{AB}	73.1 ^B
Bovans White Exp.	NM	63.3	0.0	0.7	4.9	19.2	75.2
	NA	64.1	0.0	0.5	4.0	14.9	80.5
	NALS	64.6	0.0	0.6	3.0	15.7	80.4
	Average	64.0 ^{AB}	0.0	0.6 ^{CD}	4.0 ^B	16.6 ^C	78.7 ^A
Bovans White	NM	61.5	0.1	1.8	5.4	25.3	67.0
	NA	62.6	0.0	0.5	3.8	20.9	74.4
	NALS	62.3	0.1	0.6	4.9	20.8	73.4
	Average	62.2 ^C	0.1	1.0 ^{BCD}	4.7 ^{AB}	22.3 ^{AB}	71.6 ^{BC}
DeKalb White Exp.	NM	62.2	0.1	0.6	3.6	23.4	71.9
	NA	62.2	0.0	0.6	4.2	21.4	73.4
	NALS	62.6	0.0	0.4	4.1	20.0	75.1
	Average	62.3 ^C	0.0	0.6 ^{CD}	4.0 ^B	21.6 ^{AB}	73.5 ^B
DeKalb White	NM	63.8	0.1	0.4	3.3	15.3	80.6
	NA	63.8	0.0	1.0	3.5	14.9	80.3
	NALS	63.1	0.0	1.3	4.0	17.9	76.6
	Average	63.6 ^B	0.0	0.9 ^{CD}	3.6 ^B	16.1 ^C	79.1 ^A
Hy-Line (W-36)	NM	62.4	0.1	1.3	5.1	20.9	71.8
	NA	61.4	0.0	1.7	6.2	21.6	70.3
	NALS	61.4	0.0	2.1	6.1	19.3	72.3
	Average	61.8 ^{CD}	0.1	1.7 ^A	5.8 ^A	20.6 ^B	71.5 ^{BC}
Hy-Line (W-98)	NM	65.1	0.0	0.3	3.0	13.1	82.8
	NA	63.8	0.0	0.7	4.8	13.8	80.5
	NALS	64.7	0.0	0.4	3.4	13.0	82.8
	Average	64.5 ^A	0.0	0.5 ^D	3.8 ^B	13.3 ^C	82.0 ^A
CV-20	NM	60.6	0.1	1.8	5.3	26.4	66.2
	NA	61.5	0.0	1.3	5.2	21.0	72.4
	NALS	61.7	0.0	1.3	5.3	22.1	71.0
	Average	61.2 ^D	0.0	1.5 ^{AB}	5.3 ^A	23.2 ^{AB}	69.9 ^{BC}
ISA White Exp.	NM	61.3	0.1	1.0	4.7	24.9	69.2
	NA	60.6	0.0	1.2	6.5	26.1	65.3
	NALS	61.6	0.0	1.1	5.2	22.7	70.9
	Average	61.2 ^D	0.0	1.1 ^{BC}	5.4 ^A	24.6 ^A	68.5 ^C
All Strains	NM	62.5	0.1 ^Y	1.0	4.5	21.1	73.0
	NA	62.5	0.0 ^Z	0.9	4.8	19.4	74.6
	NALS	62.7	0.0 ^Z	0.9	4.5	19.3	75.0

A,B,C,D - 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.

TABLE 75. EFFECT OF WHITE EGG STRAIN AND SYNCHRONIZED MOLT PROGRAM ON EGG QUALITY, INCOME AND FEED COSTS OF HENS IN THE 36th NCLP&MT (119-771 DAYS) IN BATTERY CAGES (HOUSE 7)

Breeder (Strain)	Molt Program	Grade A (%)	Grade B (%)	Cracks (%)	Loss (%)	Egg Income (\$/hen)	Feed Costs (\$/hen)
LSL-Lite White	NM	93.7	2.7	2.9	0.7	33.60	13.48
	NA	95.3	1.7	2.7	0.4	35.61	13.80
	NALS	95.0	1.8	2.8	0.4	34.88	14.13
	Average	94.7	2.1 ^{BC}	2.8	0.5	34.69 ^A	13.81 ^{AB}
Bovans White Exp.	NM	93.6	2.0	3.4	1.0	32.82	13.63
	NA	95.3	1.3	3.1	0.3	33.42	13.67
	NALS	94.0	1.3	3.9	0.8	32.42	13.55
	Average	94.3	1.5 ^C	3.5	0.7	32.89 ^{BC}	13.62 ^{ABCD}
Bovans White	NM	92.7	2.9	3.7	0.7	30.92	12.41
	NA	93.3	2.9	3.2	0.7	32.81	13.38
	NALS	95.0	2.2	2.4	0.5	34.98	13.40
	Average	93.7	2.6 ^{AB}	3.1	0.6	32.91 ^{BC}	13.06 ^{CDE}
DeKalb White Exp.	NM	93.1	2.5	3.5	0.9	32.85	13.99
	NA	96.1	1.6	2.2	0.2	33.46	13.42
	NALS	94.7	2.1	2.4	0.8	33.81	13.71
	Average	94.6	2.1 ^{BC}	2.7	0.6	33.37 ^{AB}	13.70 ^{ABC}
DeKalb White	NM	90.3	4.2	5.0	0.5	30.11	12.91
	NA	94.2	2.5	3.1	0.2	31.90	13.19
	NALS	95.1	2.5	2.2	0.3	32.45	13.42
	Average	93.2	3.1 ^A	3.4	0.3	31.49 ^C	13.17 ^{BCDE}
Hy-Line (W-36)	NM	93.0	2.0	3.1	1.9	30.35	12.78
	NA	96.0	1.0	2.5	0.5	33.30	13.10
	NALS	95.4	1.6	2.5	0.4	32.60	13.01
	Average	94.8	1.5 ^C	2.7	1.0	32.08 ^{BC}	12.97 ^{DE}
Hy-Line (W-98)	NM	92.0	3.2	4.2	0.5	32.49	14.45
	NA	93.6	1.6	4.6	0.2	33.76	13.89
	NALS	94.3	1.7	3.6	0.4	33.08	13.80
	Average	93.3	2.2 ^{ABC}	4.2	0.4	33.11 ^B	14.05 ^A
CV-20	NM	94.3	1.7	3.7	0.3	32.89	12.71
	NA	94.8	1.2	3.9	0.1	32.66	12.73
	NALS	96.1	1.1	2.6	0.2	33.64	12.86
	Average	95.1	1.3 ^C	3.4	0.2	33.06 ^B	12.76 ^E
ISA White Exp.	NM	91.6	3.1	4.8	0.6	31.62	12.86
	NA	96.0	1.7	2.0	1.3	33.82	13.44
	NALS	95.0	1.3	3.4	0.3	34.35	13.56
	Average	94.2	2.0 ^{BC}	3.4	0.7	33.26 ^B	13.29 ^{BCDE}
All Strains	NM	92.7 ^Z	2.7 ^Y	3.8 ^Y	0.8	31.96 ^Z	13.25
	NA	94.9 ^Y	1.7 ^Z	3.0 ^Z	0.4	33.41 ^Y	13.40
	NALS	95.0 ^Y	1.7 ^Z	2.9 ^Z	0.5	33.58 ^Y	13.49

A,B,C,D,E - 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.

TABLE 76. EFFECT OF BROWN EGG STRAIN AND SYNCHRONIZED MOLT PROGRAM ON PERFORMANCE OF HENS IN THE 36th NCLP&MT (119-771 DAYS) IN BATTERY CAGES (HOUSE 7)

Breeder (Strain)	Molt Program	Feed Consumption (kg/100/hen/d)	Feed Conversion (g egg/g feed)	Eggs			
				Per Bird Housed	Egg Production (HD%)	Egg Mass (g/HD)	Mortality (%)
Bovans Brown	NM	10.5	0.48	495.0 ^{ab}	79.8	51.8	10.7
	NA	10.8	0.46	483.1 ^{ab}	78.4	51.6	13.0
	NALS	10.7	0.46	506.0 ^a	79.0	51.7	5.4
	Average	10.7 ^A	0.47	494.7	79.1 ^A	51.7 ^{AB}	9.7
Bovans Goldline	NM	10.5	0.48	486.3 ^{ab}	78.1	51.7	16.8
	NA	10.8	0.47	503.4 ^a	79.4	53.6	6.3
	NALS	10.7	0.47	477.7 ^b	77.3	52.1	12.5
	Average	10.6 ^A	0.47	489.1	78.2 ^A	52.5 ^A	11.9
Hy-Line Brown	NM	9.7	0.50	496.1 ^{ab}	77.5	50.2	5.7
	NA	10.1	0.48	482.1 ^{ab}	75.6	50.6	4.3
	NALS	10.3	0.46	469.9 ^b	74.5	49.8	8.3
	Average	10.0 ^B	0.48	482.7	75.8 ^B	50.2 ^B	6.1
All Strains	NM	10.3	0.49 ^Y	492.5	78.5	51.2	11.1
	NA	10.6	0.47 ^Z	489.5	77.8	51.9	7.9
	NALS	10.5	0.47 ^Z	484.5	76.9	51.2	8.7

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.

a,b - Different letters denote significant strain*molt program interactions (P<.01).

TABLE 77. EFFECT OF BROWN EGG STRAIN AND SYNCHRONIZED MOLT PROGRAM ON EGG WEIGHT AND EGG SIZE DISTRIBUTION OF HENS IN THE 36th NCLP&MT (119-771 DAYS) IN BATTERY CAGES (HOUSE 7)

Breeder (Strain)	Molt Program	Egg Weight (g egg/hen/d)	Pee Wee (%)	Small (%)	Medium (%)	Large (%)	Extra Large (%)
Bovans Brown	NM	63.0	0.1	0.5	3.2	21.0	74.8
	NA	63.8	0.0	0.0	2.5	17.5	79.6
	NALS	63.5	0.0	0.4	2.8	17.9	78.9
	Average	63.4 ^B	0.0	0.3	2.8	18.8 ^A	77.8
Bovans Goldline	NM	64.2	0.0	0.4	3.8	15.4	80.2
	NA	65.2	0.0	0.2	3.3	12.2	84.1
	NALS	65.2	0.0	0.3	2.7	13.1	83.6
	Average	64.9 ^A	0.0	0.3	3.3	13.6 ^B	82.6
Hy-Line Brown	NM	63.0	0.1	0.5	6.1	20.3	72.9
	NA	64.7	0.0	0.1	1.9	15.2	82.5
	NALS	64.9	0.0	0.2	2.8	14.4	82.5
	Average	64.2 ^{AB}	0.0	0.3	3.6	16.6 ^{AB}	79.3
All Strains	NM	63.4 ^Z	0.1	0.4	4.4	18.9	76.0 ^Z
	NA	64.6 ^Y	0.0	0.1	2.6	15.0	82.1 ^Y
	NALS	64.5 ^Y	0.0	0.3	2.7	15.1	81.7 ^Y

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.

TABLE 78. EFFECT OF BROWN EGG STRAIN AND SYNCHRONIZED MOLT PROGRAM ON EGG QUALITY, INCOME AND FEED COSTS OF HENS IN THE 36th NCLP&MT (119-771 DAYS) IN BATTERY CAGES (HOUSE 7)

Breeder (Strain)	Molt Program	Grade A (%)	Grade B (%)	Cracks (%)	Loss (%)	Egg Income (\$/hen)	Feed Costs (\$/hen)
Bovans Brown	NM	92.5	3.4	3.5	0.6	33.61 ^{ab}	13.86
	NA	95.1	2.0	2.6	0.3	33.51 ^{ab}	14.14
	NALS	94.8	1.7	3.0	0.5	35.04 ^a	14.68
	Average	94.1 ^{AB}	2.4	3.0	0.5	34.05	14.23
Bovans Goldline	NM	92.5	3.0	3.8	0.7	33.16 ^{ab}	13.83
	NA	94.7	2.1	2.6	0.5	34.83 ^a	14.57
	NALS	92.6	3.3	3.7	0.5	32.67 ^b	14.14
	Average	93.3 ^B	2.8	3.4	0.6	33.55	14.18
Hy-Line Brown	NM	93.9	3.1	2.6	0.4	33.80 ^{ab}	13.14
	NA	95.7	1.7	2.5	0.1	33.72 ^{ab}	13.93
	NALS	94.7	1.5	3.4	0.5	32.65 ^a	13.89
	Average	94.8 ^A	2.1	2.8	0.3	33.39	13.65
All Strains	NM	93.0 ^Z	3.2 ^Y	3.3	0.6	33.52	13.61
	NA	95.2 ^Y	1.9 ^Z	2.6	0.3	34.02	14.22
	NALS	94.0 ^Z	2.1 ^Z	3.4	0.5	33.45	14.23

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.

a,b - Different letters denote significant strain*molt program interactions (P<.01).

TABLE 79. EFFECT OF WHITE EGG STRAIN AND POPULATION ON HENS IN THE 36th NCLP&MT (491-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

Breeder	Population ¹	110 Wk Body Wt	2nd Cycle Wt Gain	2nd Cycle Wt Gain	Total Wt Gain	Total Wt Gain
(Strain)		(kg)	(g)	(%)	(g)	(%)
LSL-Lite White	3	1.64	160	12.7	419	34.4
	4	1.71	193	14.3	469	38.2
	Average	1.67 ^C	176	13.5	444 ^{BC}	36.3
Bovans White Exp.	3	1.75	257	18.2	487	38.8
	4	1.73	250	18.3	491	39.8
	Average	1.74 ^B	253	18.3	489 ^{ABC}	39.3
Bovans White	3	1.61	219	17.9	493	44.5
	4	1.66	198	15.0	480	40.8
	Average	1.64 ^{CD}	209	16.4	486 ^{ABC}	42.6
DeKalb White Exp.	3	1.69	205	15.7	458	37.9
	4	1.69	218	15.9	487	40.7
	Average	1.69 ^{BC}	212	15.8	472 ^{BC}	39.3
DeKalb White	3	1.69	232	17.4	473	39.5
	4	1.71	202	14.6	529	45.9
	Average	1.70 ^{BC}	217	16.0	501 ^{AB}	42.7
Hy-Line (W-36)	3	1.64	184	14.4	467	40.8
	4	1.64	196	14.9	453	38.3
	Average	1.64 ^{CD}	190	14.7	460 ^{BC}	39.5
Hy-Line (W-98)	3	1.82	155	10.4	542	42.7
	4	1.84	265	17.7	564	44.5
	Average	1.83 ^A	210	14.0	553 ^A	43.6
CV-20	3	1.58	160	12.4	403	34.6
	4	1.62	207	15.7	437	37.1
	Average	1.60 ^D	184	14.1	420 ^C	35.8
ISA White Exp.	3	1.67	197	14.8	489	41.5
	4	1.67	253	18.8	465	38.6
	Average	1.67 ^C	225	16.8	477 ^{ABC}	40.0
All Strains	3	1.68	196	14.9	470	39.4
	4	1.70	220	16.1	486	40.4

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

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

TABLE 80. EFFECT OF WHITE EGG STRAIN AND SYNCHRONIZED MOLT PROGRAM ON HENS IN THE 36th NCLP&MT (491-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

Breeder	Molt Program	110 Wk Body Wt	2nd Cycle Wt Gain	2nd Cycle Wt Gain	Total Wt Gain	Total Wt Gain
(Strain)		(kg)	(g)	(%)	(g)	(%)
LSL-Lite White	NM	1.67	-82	-4.7	424	34.2
	NA	1.68	306	22.5	457	37.5
	NALS	1.67	304	22.8	452	37.2
Bovans White Exp.	NM	1.69	41	2.8	436	35.0
	NA	1.80	378	27.0	559	45.0
	NALS	1.73	341	25.0	472	37.9
Bovans White	NM	1.63	-13	-0.5	493	43.3
	NA	1.62	281	21.6	453	39.1
	NALS	1.66	358	28.2	514	45.5
DeKalb White Exp.	NM	1.67	1	0.6	456	37.6
	NA	1.70	286	21.0	501	42.5
	NALS	1.70	348	25.8	460	37.7
DeKalb White	NM	1.67	32	2.3	505	45.1
	NA	1.72	250	17.4	500	41.3
	NALS	1.70	369	28.3	499	41.7
Hy-Line (W-36)	NM	1.62	-47	-2.8	412	35.2
	NA	1.67	319	24.7	500	43.1
	NALS	1.65	299	22.2	469	40.4
Hy-Line (W-98)	NM	1.85	48	2.6	570	44.5
	NA	1.82	276	18.5	546	43.0
	NALS	1.81	306	21.0	545	43.4
CV-20	NM	1.59	-4	0.0	415	35.6
	NA	1.63	247	18.0	449	38.5
	NALS	1.59	308	24.2	396	33.4
ISA White Exp.	NM	1.64	41	3.1	443	37.2
	NA	1.68	293	21.7	504	43.0
	NALS	1.70	340	25.8	484	40.0
All Strains	NM	1.67	2 ^Z	0.4 ^Z	461	38.6
	NA	1.70	293 ^Y	21.4 ^Y	497	41.4
	NALS	1.69	330 ^Y	24.8 ^Y	477	39.7

Y,Z - Different letters denote significant differences (P<.01), comparisons made among molt program average values.

TABLE 81. EFFECT OF BROWN EGG STRAIN AND POPULATION ON HENS IN THE 36th NCLP&MT (491-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

Breeder	Population ¹	110 Wk Body Wt	2nd Cycle Wt Gain	2nd Cycle Wt Gain	Total Wt Gain	Total Wt Gain
(Strain)		(kg)	(g)	(%)	(g)	(%)
Bovans	3	1.99	210	12.9	451	29.6
Brown	4	2.03	289	17.0	514	34.4
	Average	2.01	249	14.9	483 ^B	32.0 ^B
Bovans	3	2.01	244	14.4	524	35.4
Goldline	4	2.04	258	15.8	551	37.2
	Average	2.02	251	15.1	537 ^{AB}	36.3 ^{AB}
Hy-Line	3	1.95	206	12.6	554	39.9
Brown	4	2.01	275	16.9	606	43.5
	Average	1.98	240	14.8	580 ^A	41.7 ^A
All	3	1.98	220	13.3	510	35.0
Strains	4	2.02	274	16.6	557	38.4

¹All strains were housed at a constant density of: 413 cm² equals 64 in².

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

TABLE 82. EFFECT OF BROWN EGG STRAIN AND SYNCHRONIZED MOLT PROGRAM ON HENS IN THE 36th NCLP&MT (491-771 DAYS) IN STAIR-STEP CAGES (HOUSE 5)

Breeder	Molt Program	110 Wk Body Wt	2nd Cycle Wt Gain	2nd Cycle Wt Gain	Total Wt Gain	Total Wt Gain
(Strain)		(kg)	(g)	(%)	(g)	(%)
Bovans Brown	NM	1.96	23	1.3	445	29.7
	NA	2.06	364	21.5	545	36.3
	NALS	2.02	361	22.0	458	30.0
Bovans Goldline	NM	2.04	50	2.7	595	41.1
	NA	2.00	365	22.5	497	33.3
	NALS	2.03	339	20.1	520	34.6
Hy-Line Brown	NM	1.94	12	0.6	557	40.5
	NA	2.00	329	20.0	578	41.0
	NALS	2.00	380	23.7	605	43.6
All Strains	NM	1.98	28 ^Z	1.5 ^Z	532	37.1
	NA	2.02	353 ^Y	21.3 ^Y	540	36.9
	NALS	2.01	360 ^Y	21.9 ^Y	528	36.1

Y,Z - Different letters denote significant differences (P<.01), comparisons made among molt program average values.

TABLE 83. EFFECT OF WHITE EGG STRAIN AND SYNCHRONIZED MOLT PROGRAM ON HENS IN THE 36th NCLP&MT (491-771 DAYS) IN BATTERY CAGES (HOUSE 7)

Breeder (Strain)	Molt Program	110 Wk Body Wt (kg)	2nd Cycle Wt Gain (g)	2nd Cycle Wt Gain (%)	Total Wt Gain (g)	Total Wt Gain (%)
LSL-Lite White	NM	1.60	-123	-7.1	427	36.5
	NA	1.76	366	26.6	534	43.8
	NALS	1.82	458	34.0	608	50.3
	Average	1.73 ^C	233	17.8	523 ^C	43.5 ^C
Bovans White Exp.	NM	1.76	-3	0.0	574	48.8
	NA	1.92	503	35.5	661	52.6
	NALS	1.85	504	37.7	634	52.1
	Average	1.84 ^B	334	24.4	623 ^{AB}	51.2 ^{ABC}
Bovans White	NM	1.64	-73	-4.1	530	47.9
	NA	1.87	538	40.7	722	63.3
	NALS	1.76	420	31.7	611	53.3
	Average	1.76 ^C	295	22.8	621 ^{AB}	54.9 ^{AB}
DeKalb White Exp.	NM	1.73	-3	-0.2	521	43.1
	NA	1.78	455	34.9	592	49.9
	NALS	1.87	470	34.4	646	52.8
	Average	1.79 ^{BC}	307	23.0	586 ^{BC}	48.6 ^{ABC}
DeKalb White	NM	1.70	-30	-1.7	467	37.9
	NA	1.79	436	32.6	600	50.9
	NALS	1.82	483	36.6	632	53.5
	Average	1.77 ^{BC}	296	22.5	566 ^{BC}	47.4 ^{BC}
Hy-Line (W-36)	NM	1.66	-40	-2.3	492	42.2
	NA	1.88	580	45.4	739	64.9
	NALS	1.86	514	38.6	714	62.2
	Average	1.80 ^{BC}	351	27.3	648 ^{AB}	56.4 ^A
Hy-Line (W-98)	NM	1.80	7	0.8	556	44.8
	NA	1.96	474	32.0	736	59.8
	NALS	2.01	598	42.6	763	61.3
	Average	1.93 ^A	359	25.1	685 ^A	55.3 ^{AB}
CV-20	NM	1.67	47	3.0	529	46.5
	NA	1.72	463	37.1	610	55.3
	NALS	1.78	484	37.4	633	55.2
	Average	1.72 ^C	331	25.8	591 ^{BC}	52.3 ^{ABC}
ISA White Exp.	NM	1.70	63	4.0	506	42.6
	NA	1.82	455	33.5	629	52.8
	NALS	1.88	546	41.2	666	55.0
	Average	1.80 ^{BC}	355	26.3	600 ^{ABC}	50.1 ^{ABC}
All Strains	NM	1.70 ^Z	-17 ^Z	-0.8 ^Z	511 ^Z	43.3 ^Z
	NA	1.83 ^Y	474 ^Y	35.4 ^Y	647 ^Y	54.8 ^Y
	NALS	1.85 ^Y	497 ^Y	37.1 ^Y	656 ^Y	55.1 ^Y

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

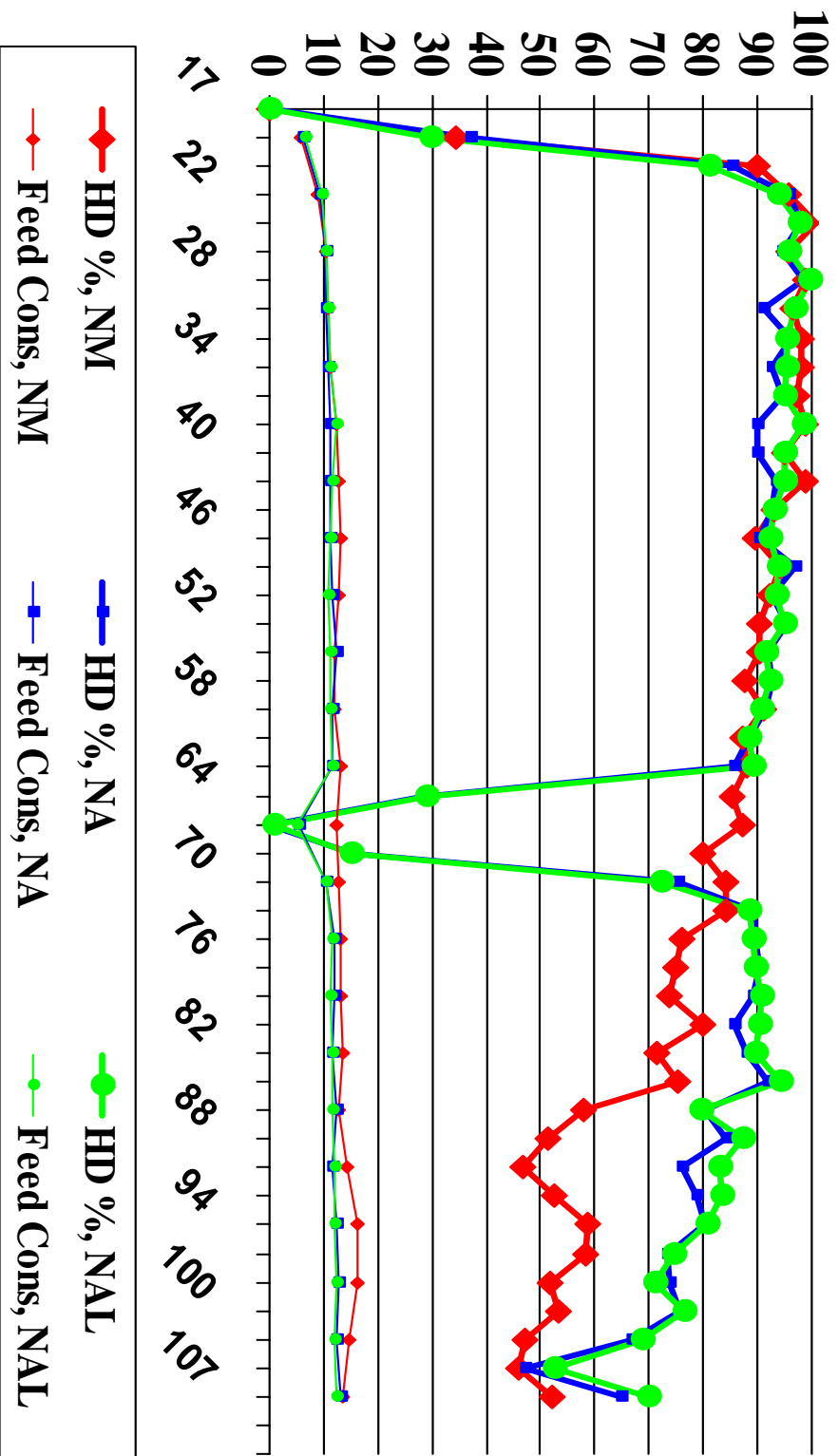
Y,Z - Different letters denote significant differences (P<.01), comparisons made among molt program average values.

TABLE 84. EFFECT OF BROWN EGG STRAIN AND SYNCHRONIZED MOLT PROGRAM ON HENS IN THE 36th NCLP&MT (491-771 DAYS) IN BATTERY CAGES (HOUSE 7)

Breeder (Strain)	Molt Program	110 Wk Body Wt (kg)	2nd Cycle Wt Gain (g)	2nd Cycle Wt Gain (%)	Total Wt Gain (g)	Total Wt Gain (%)
Bovans Brown	NM	1.99	57	2.9	619	45.1
	NA	2.07	474	29.7	558	37.0
	NALS	2.03	468	30.0	596	41.9
	Average	2.03	333	20.9	591	41.4
Bovans Goldline	NM	2.01	117	6.2	589	41.4
	NA	2.06	474	30.2	615	42.5
	NALS	2.06	458	28.7	595	40.5
	Average	2.05	349	21.7	600	41.5
Hy-Line Brown	NM	1.98	117	6.2	579	41.2
	NA	2.08	472	29.7	685	49.0
	NALS	2.14	520	32.4	757	55.1
	Average	2.07	370	22.8	673	48.5
All Strains	NM	2.00	97 ^Z	5.1 ^Z	596	42.6
	NA	2.07	473 ^Y	29.9 ^Y	620	42.8
	NALS	2.08	482 ^Y	30.3 ^Y	649	45.9

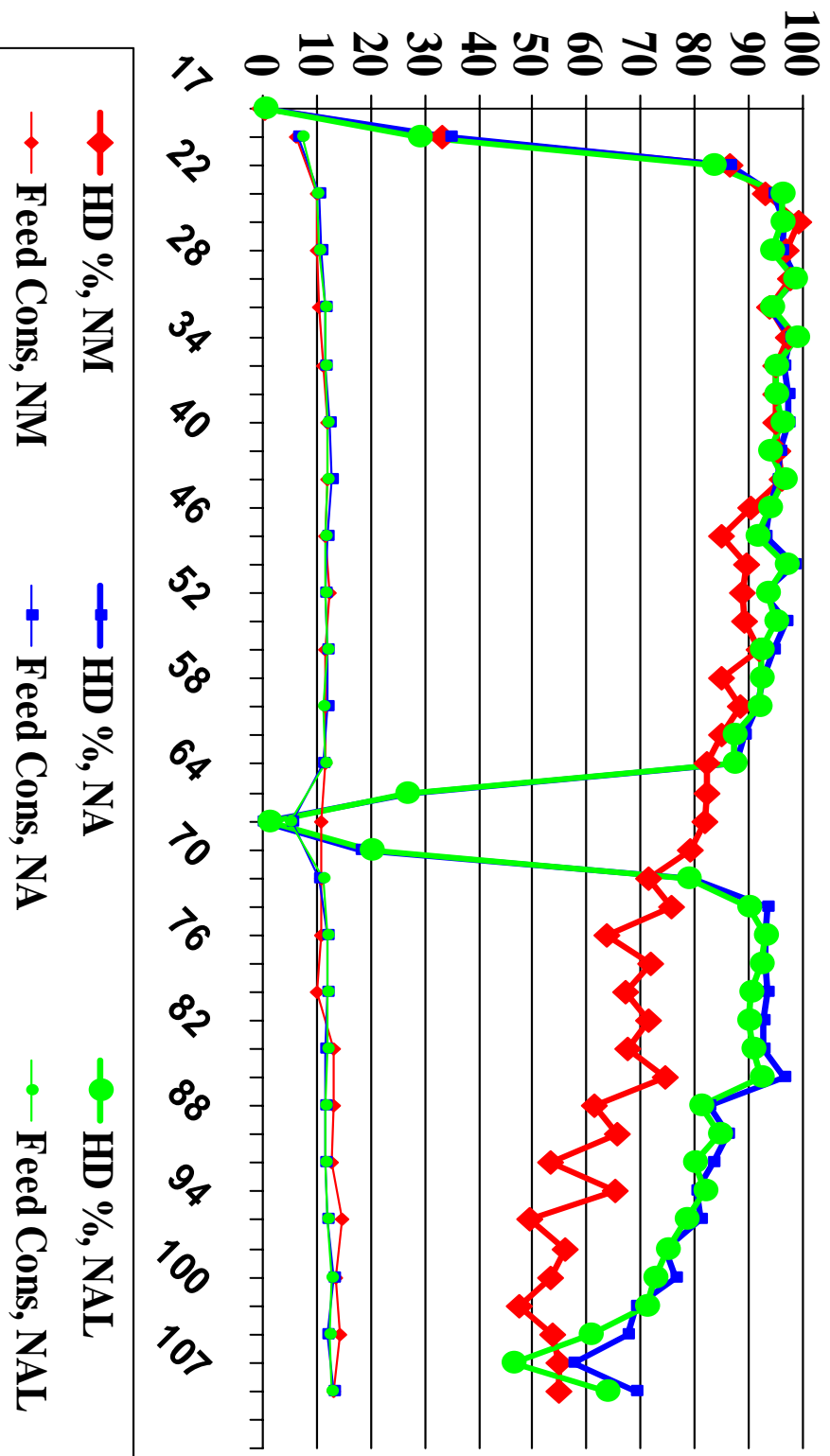
Y,Z - Different letters denote significant differences (P<.01), comparisons made among molt program average values.

Figure 1. Lohmann ‘LSL-Lite’ Strain, Bi-weekly Percent Egg Production at 3 hens/cage by molt program¹ and Period Feed Consumption (kg per 100 Hens) House 5



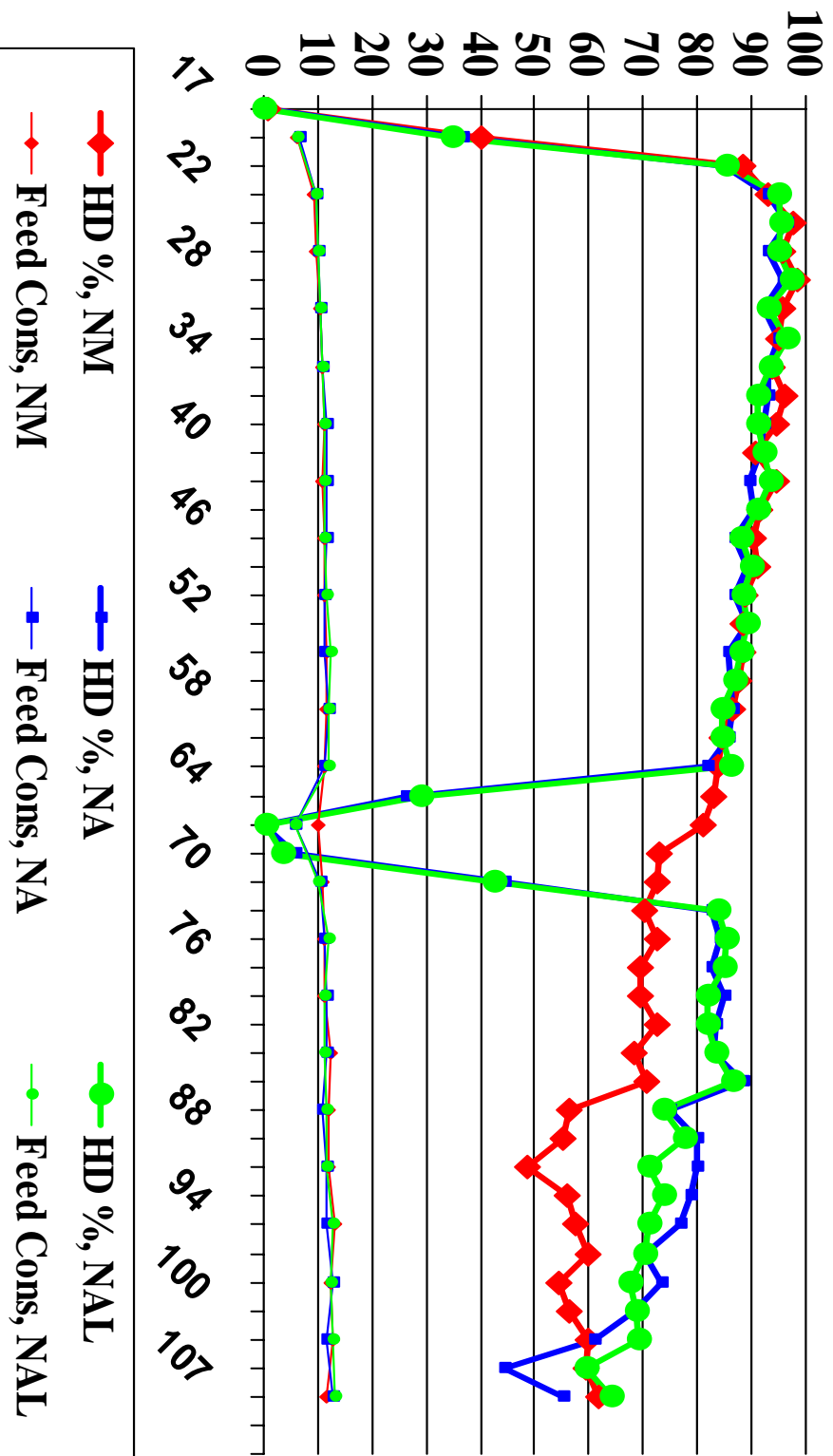
¹ NM = Non-molted; NA=Non-Anorexic Molt; NAL=Non-Anorexic Low Na Molt

Figure 2. Lohmann 'LSL-Lite' Strain, Bi-weekly Percent Egg Production at 4 hens/cage by molt program¹ and Period Feed Consumption (kg per 100 Hens) House 5



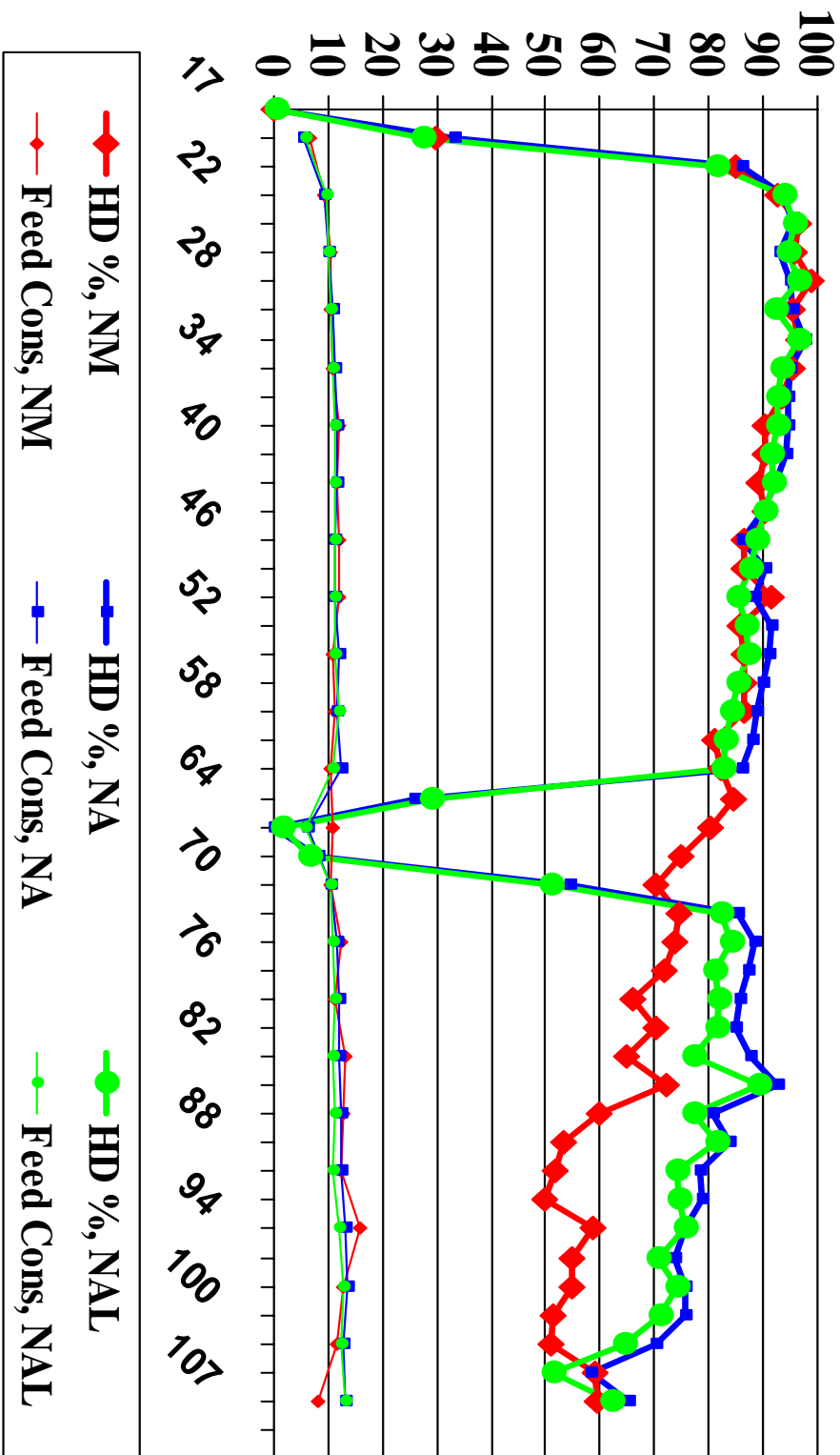
¹ NM = Non-molted; NA=Non-Anorexic Molt; NAL=Non-Anorexic Low Na Molt

Figure 3. Bovans ‘White Exp’ Strain, Bi-weekly Percent Egg Production at 3 hens/cage by molt program¹ and Period Feed Consumption (kg per 100 Hens) House 5



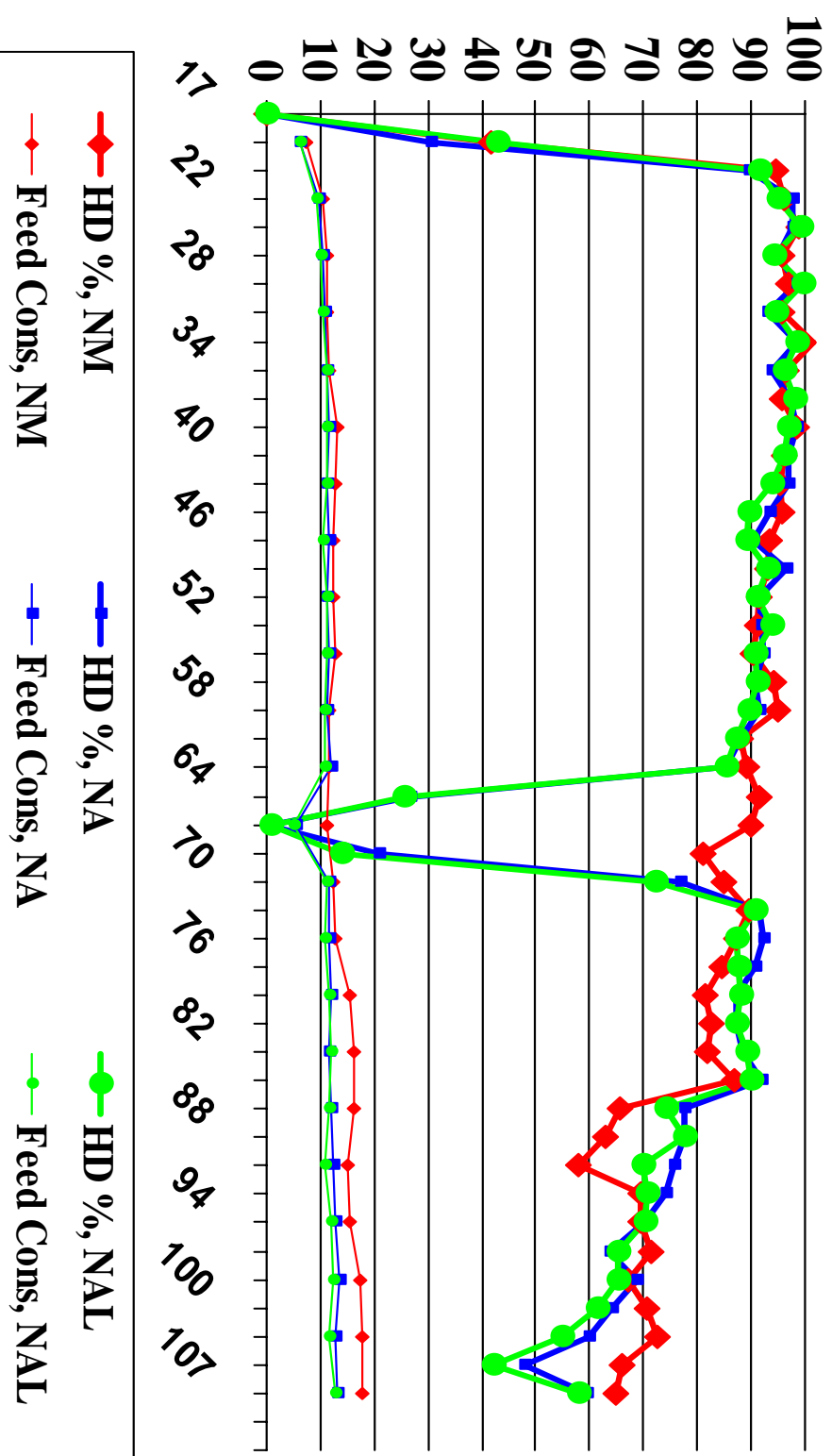
¹ NM = Non-molted; NA=Non-Anorexic Molt; NAL=Non-Anorexic Low Na Molt

Figure 4. Bovans ‘White Exp.’ Strain, Bi-weekly Percent Egg Production at 4 hens/cage by molt program¹ and Period Feed Consumption (kg per 100 Hens) House 5



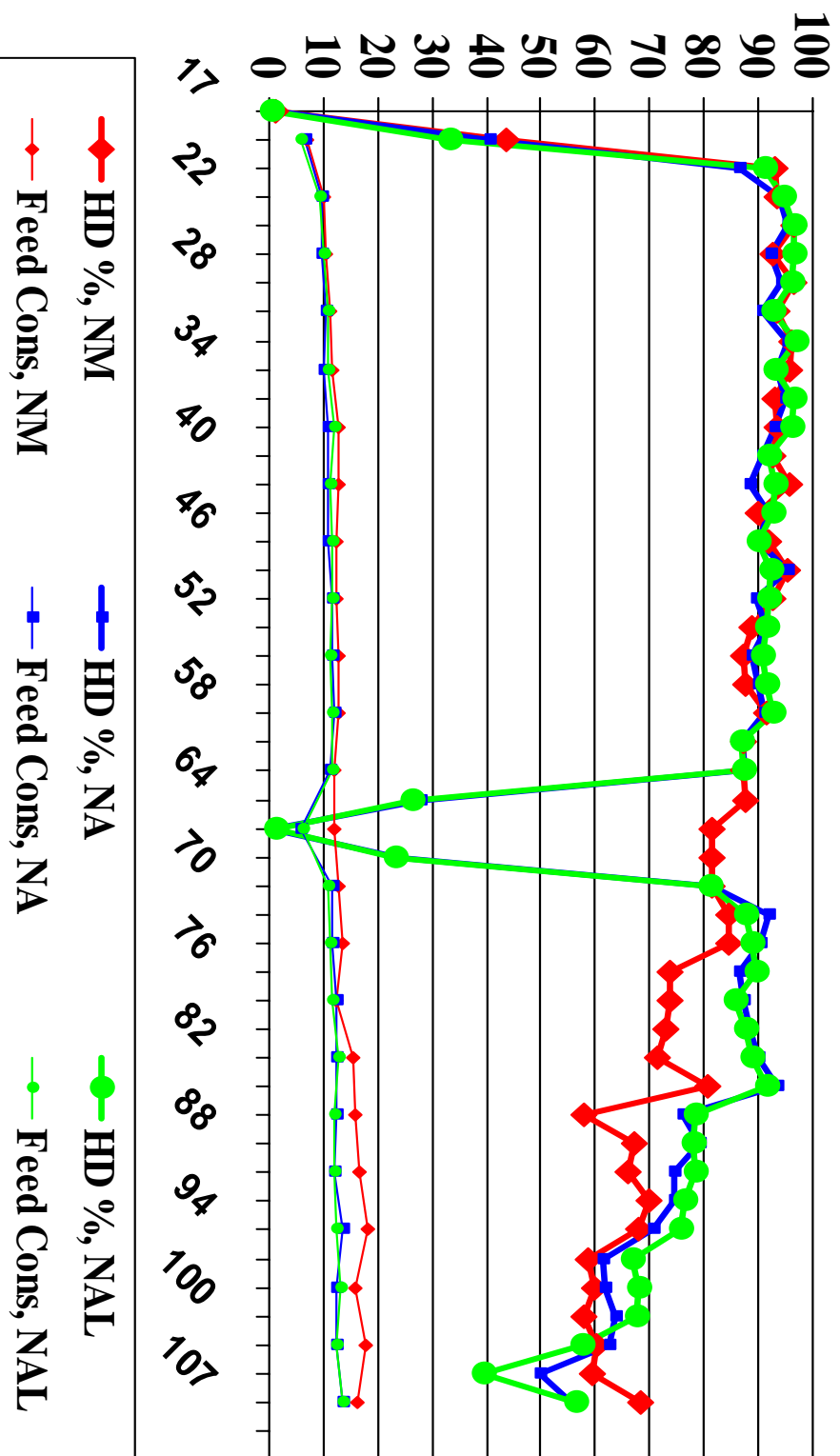
¹ NM = Non-molted; NA=Non-Anorexic Molt; NAL=Non-Anorexic Low Na Molt

Figure 5. Bovans ‘White’ Strain, Bi-weekly Percent Egg Production at 3 hens/cage by molt program¹ and Period Feed Consumption (kg per 100 Hens) House 5



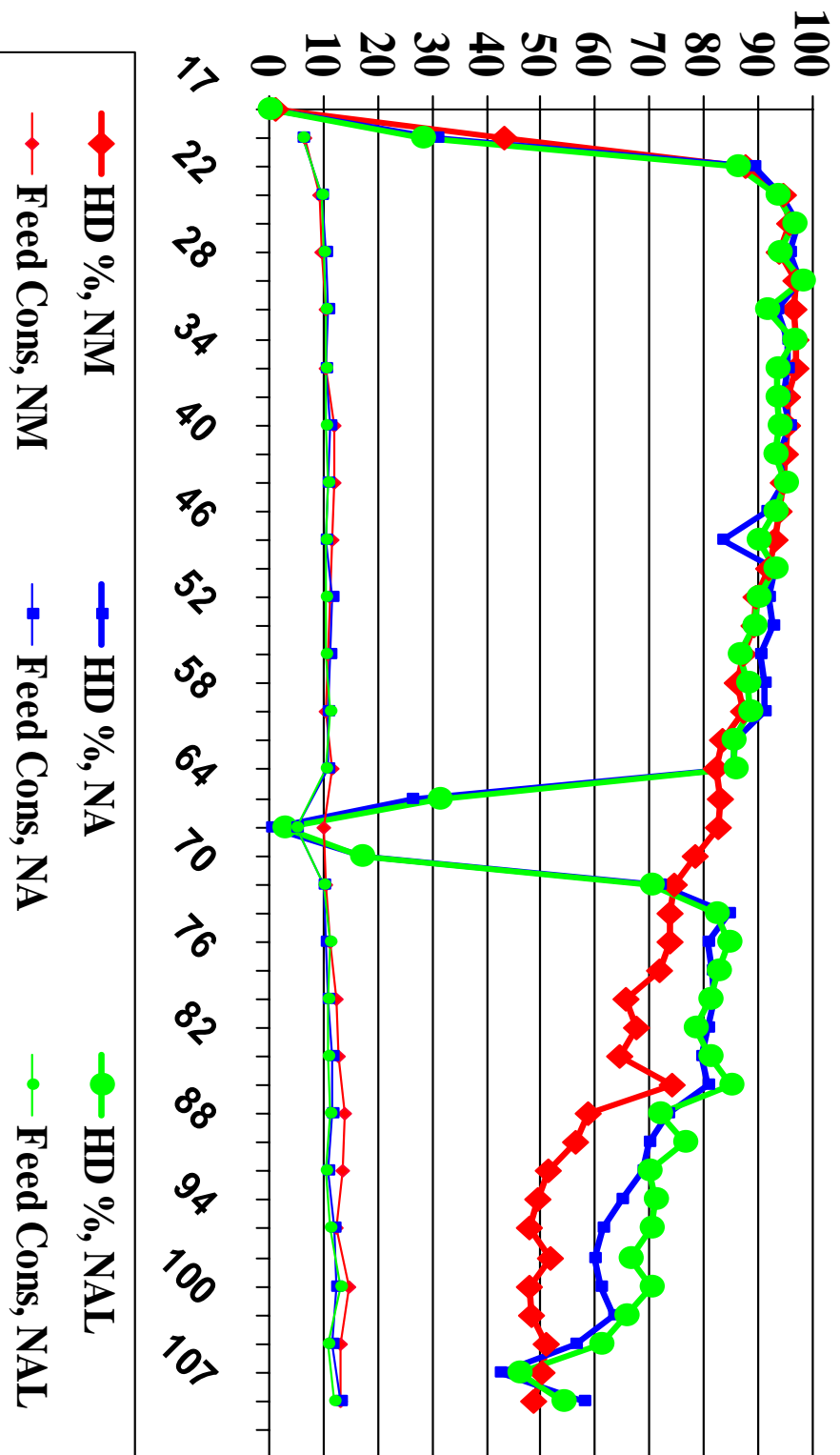
¹ NM = Non-molted; NA=Non-Anorexic Molt; NAL=Non-Anorexic Low Na Molt

Figure 6. Bovans ‘White’ Strain, Bi-weekly Percent Egg Production at 4 hens/cage by molt program¹ and Period Feed Consumption (kg per 100 Hens) House 5



¹ NM = Non-molted; NA=Non-Anorexic Molt; NAL=Non-Anorexic Low Na Molt

Figure 7. Dekalb ‘White Exp.’ Strain , Bi-weekly Percent Egg Production at 3 hens/cage by molt program¹ and Period Feed Consumption (kg per 100 Hens) House 5



¹ NM = Non-molted; NA=Non-Anorexic Molt; NAL=Non-Anorexic Low Na Molt

Figure 8. Dekalb ‘White Exp.’ Strain , Bi-weekly Percent Egg Production at 4 hens/cage by molt program¹ and Period Feed Consumption (kg per 100 Hens) House 5

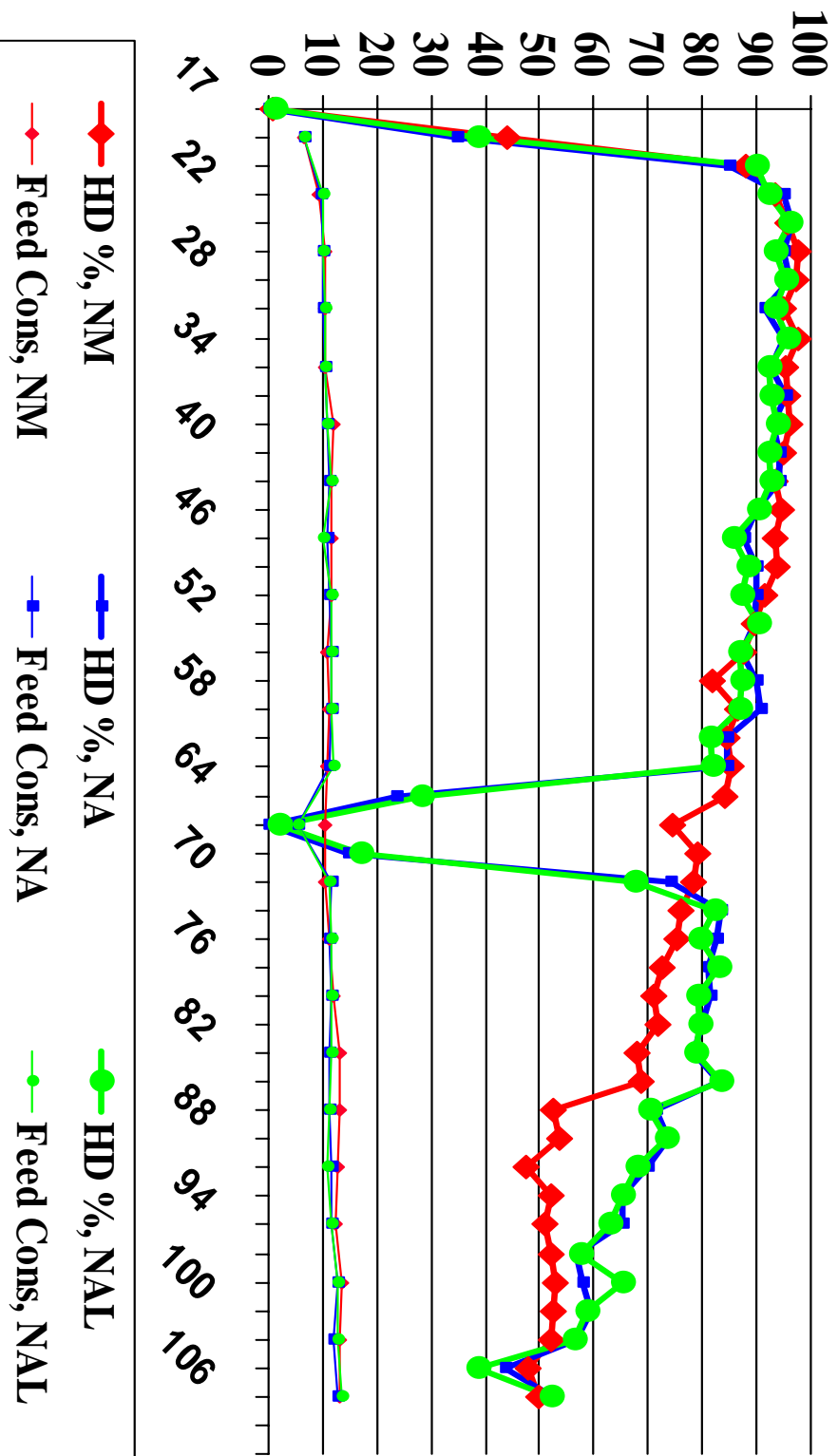
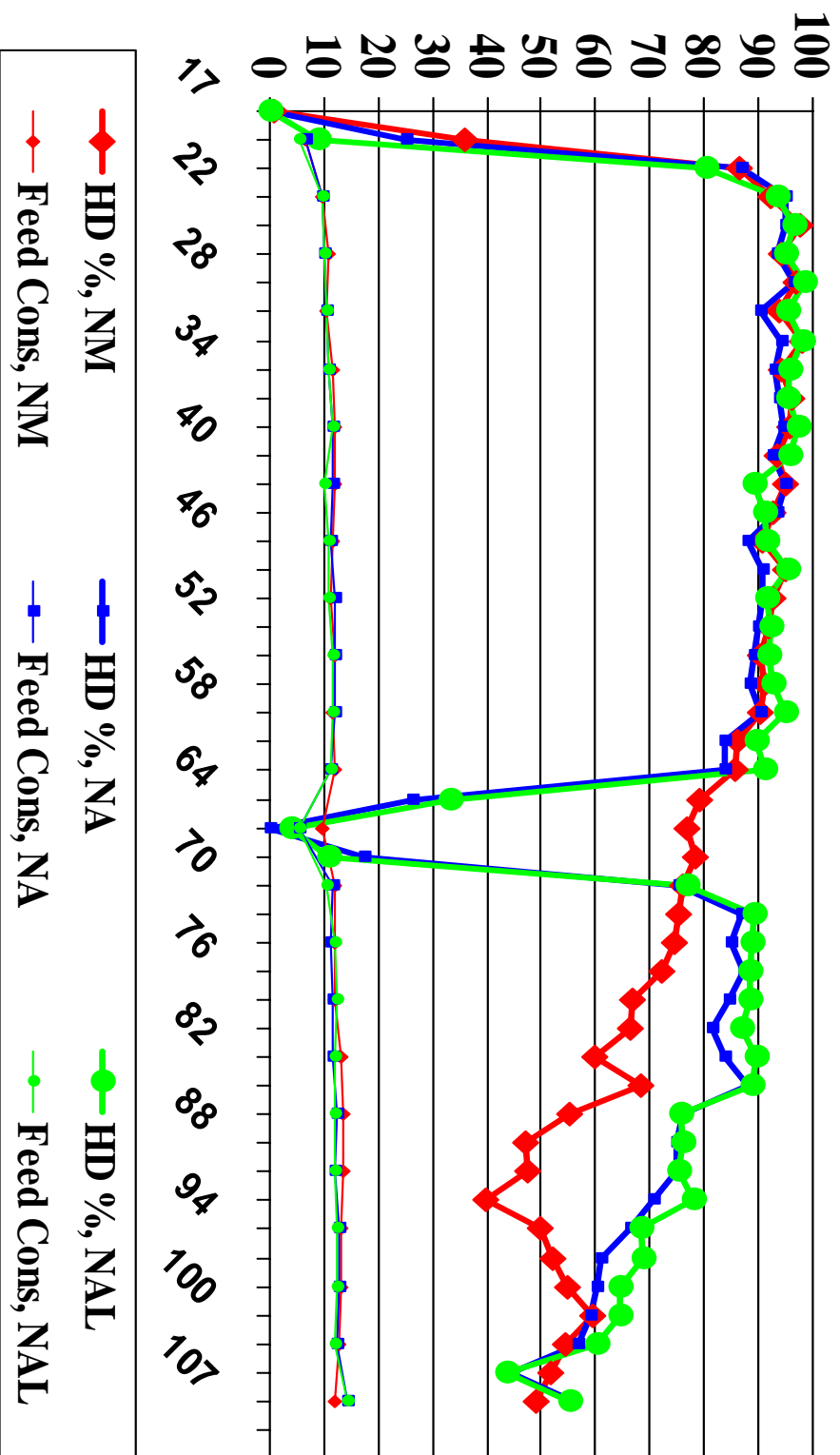
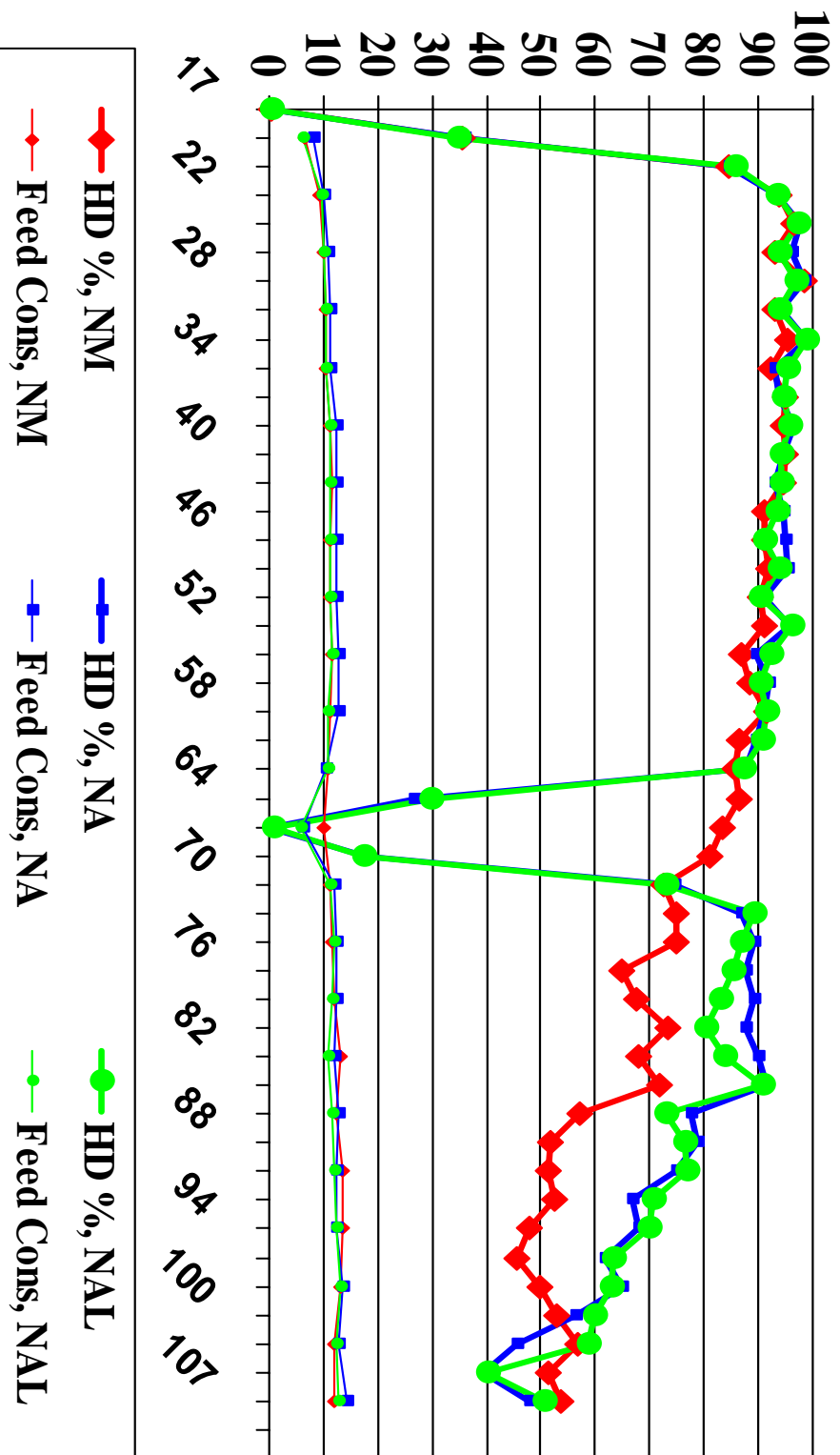


Figure 9. Dekalb ‘White’ Strain, Bi-weekly Percent Egg Production at 3 hens/cage by molt program¹ and Period Feed Consumption (kg per 100 Hens) House 5



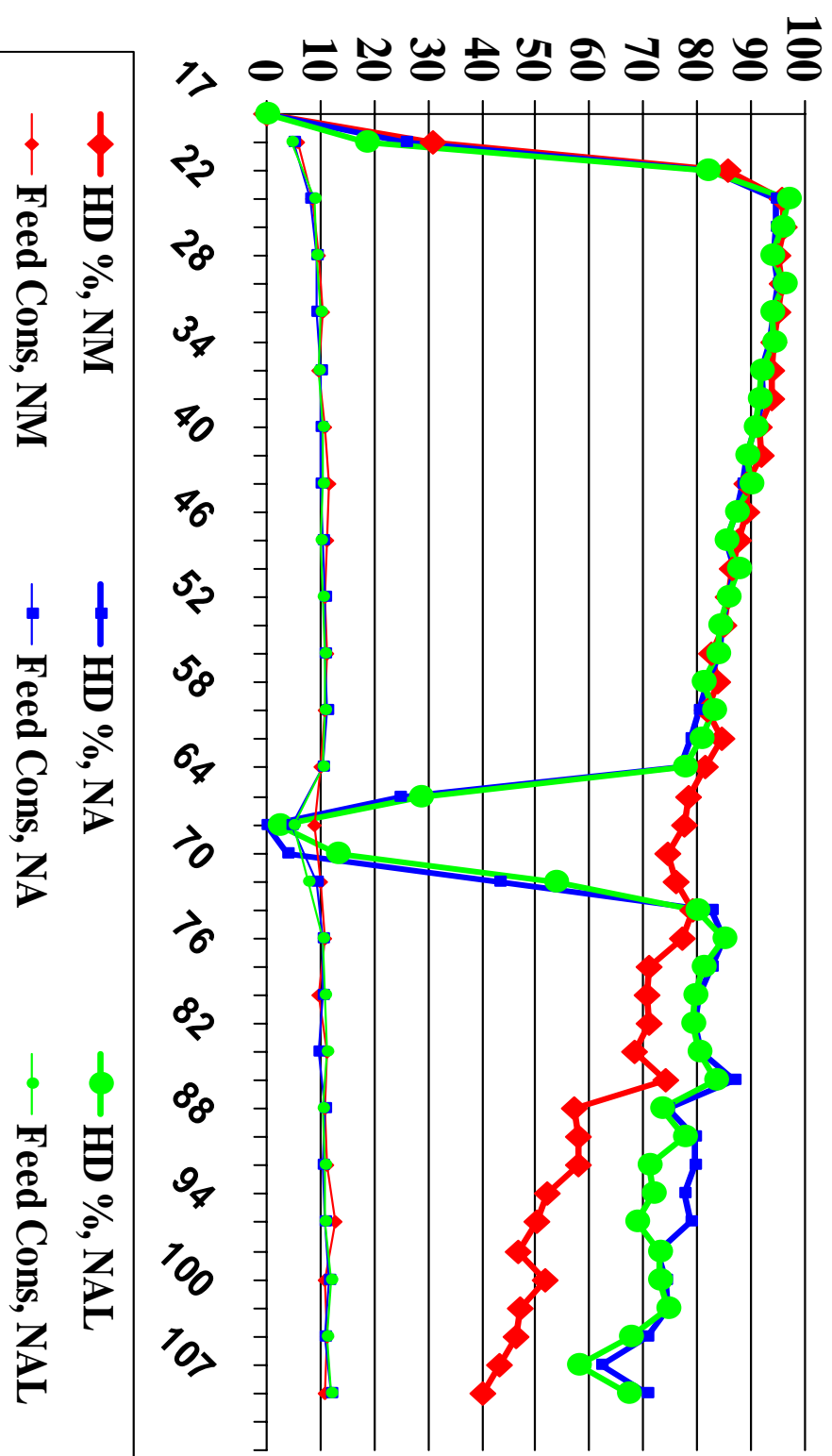
¹ NM = Non-molted; NA=Non-Anorexic Molt; NAL=Non-Anorexic Low Na Molt

Figure 10. Dekalb ‘White’ Strain , Bi-weekly Percent Egg Production at 4 hens/cage by molt program¹ and Period Feed Consumption (kg per 100 Hens) House 5



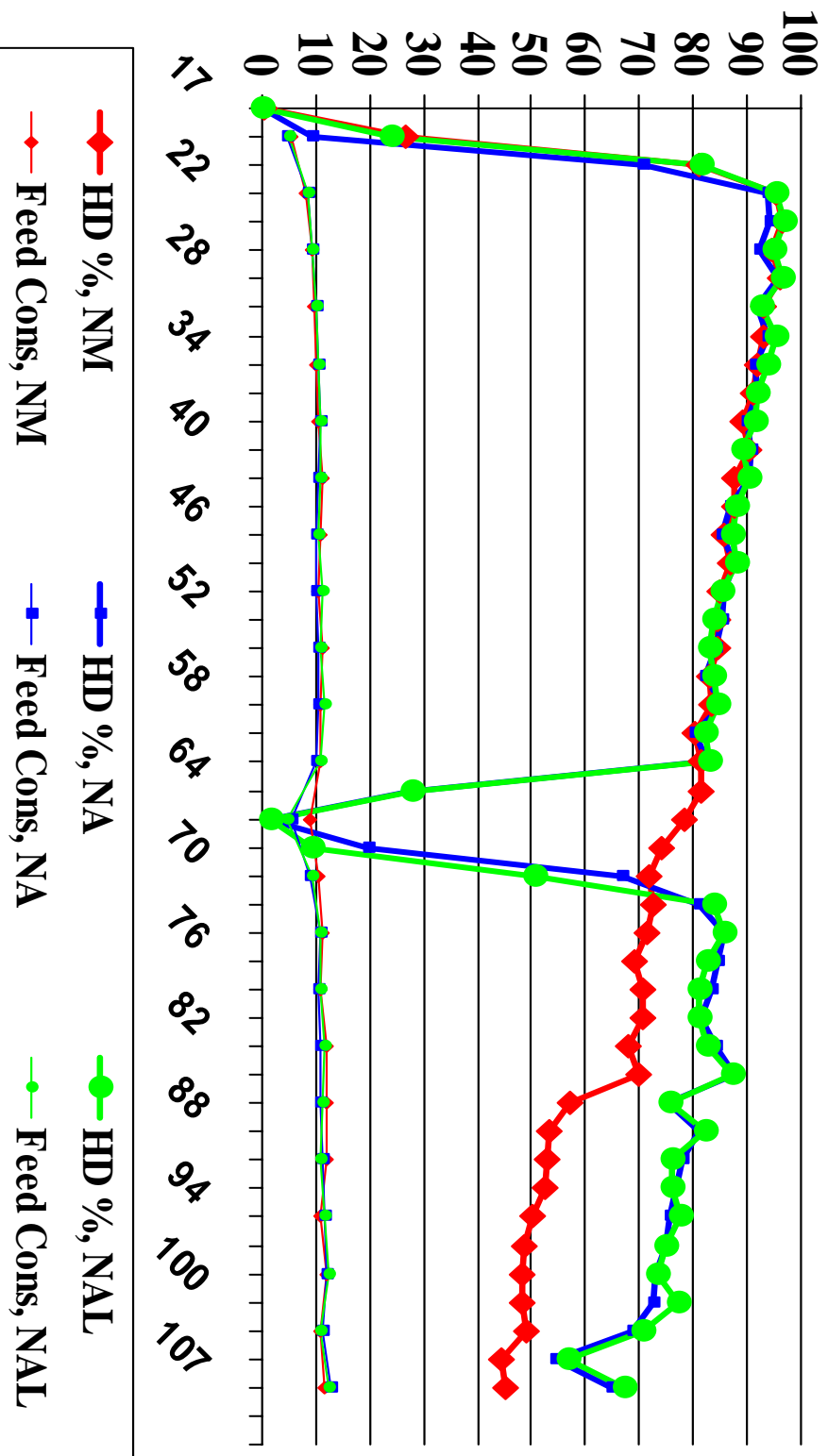
¹ NM = Non-molted; NA=Non-Anorexic Molt; NAL=Non-Anorexic Low Na Molt

Figure 11. Hy-Line “W-36” Strain, Bi-weekly Percent Egg Production at 3 hens/cage by molt program¹ and Period Feed Consumption (kg per 100 Hens) **House 5**



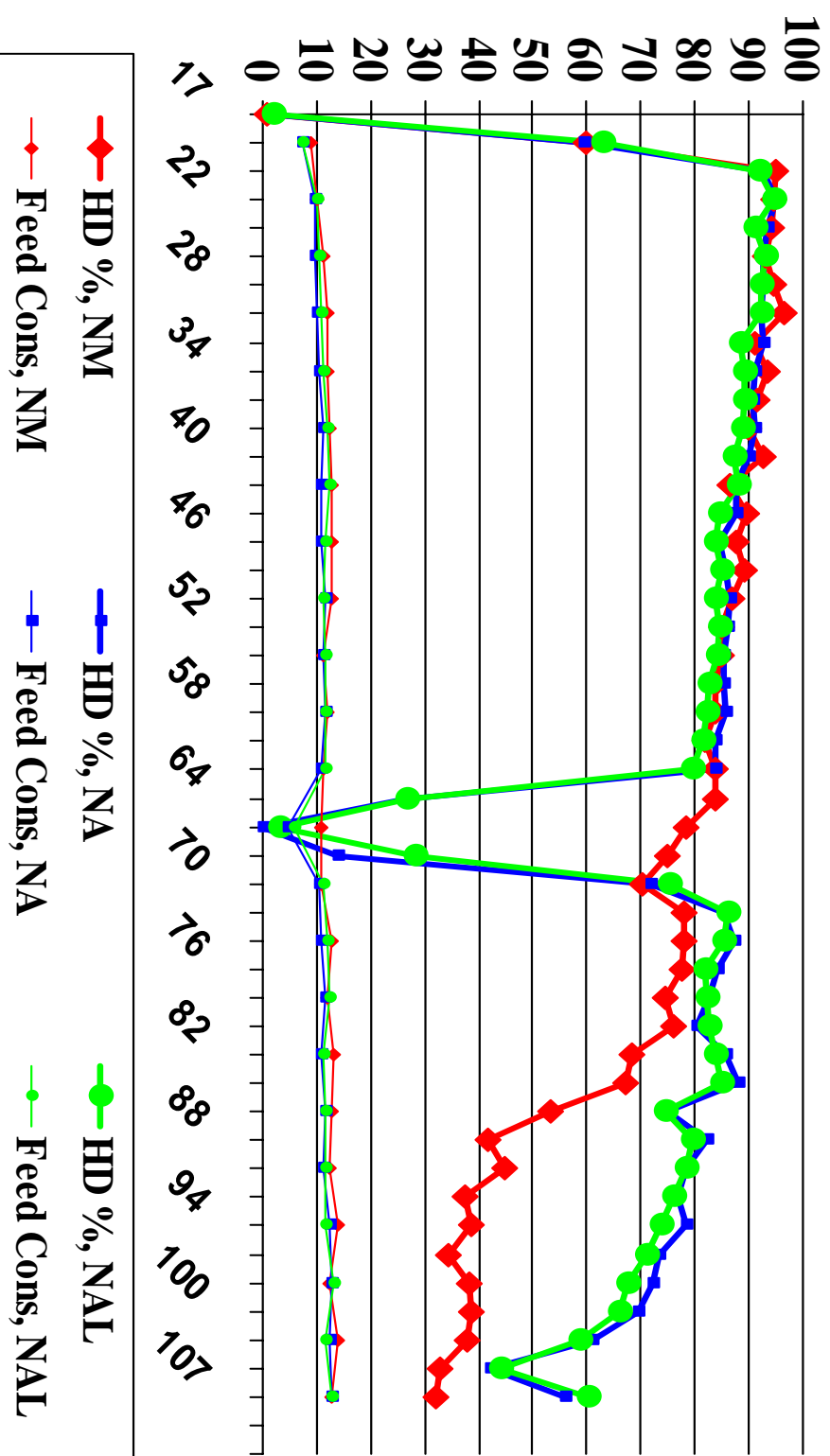
¹ NM = Non-molted; NA=Non-Anorexic Molt; NAL=Non-Anorexic Low Na Molt

Figure 12. Hy-Line ‘W-36’ Strain, Bi-weekly Percent Egg Production at 4 hens/cage by molt program¹ and Period Feed Consumption (kg per 100 Hens) House 5



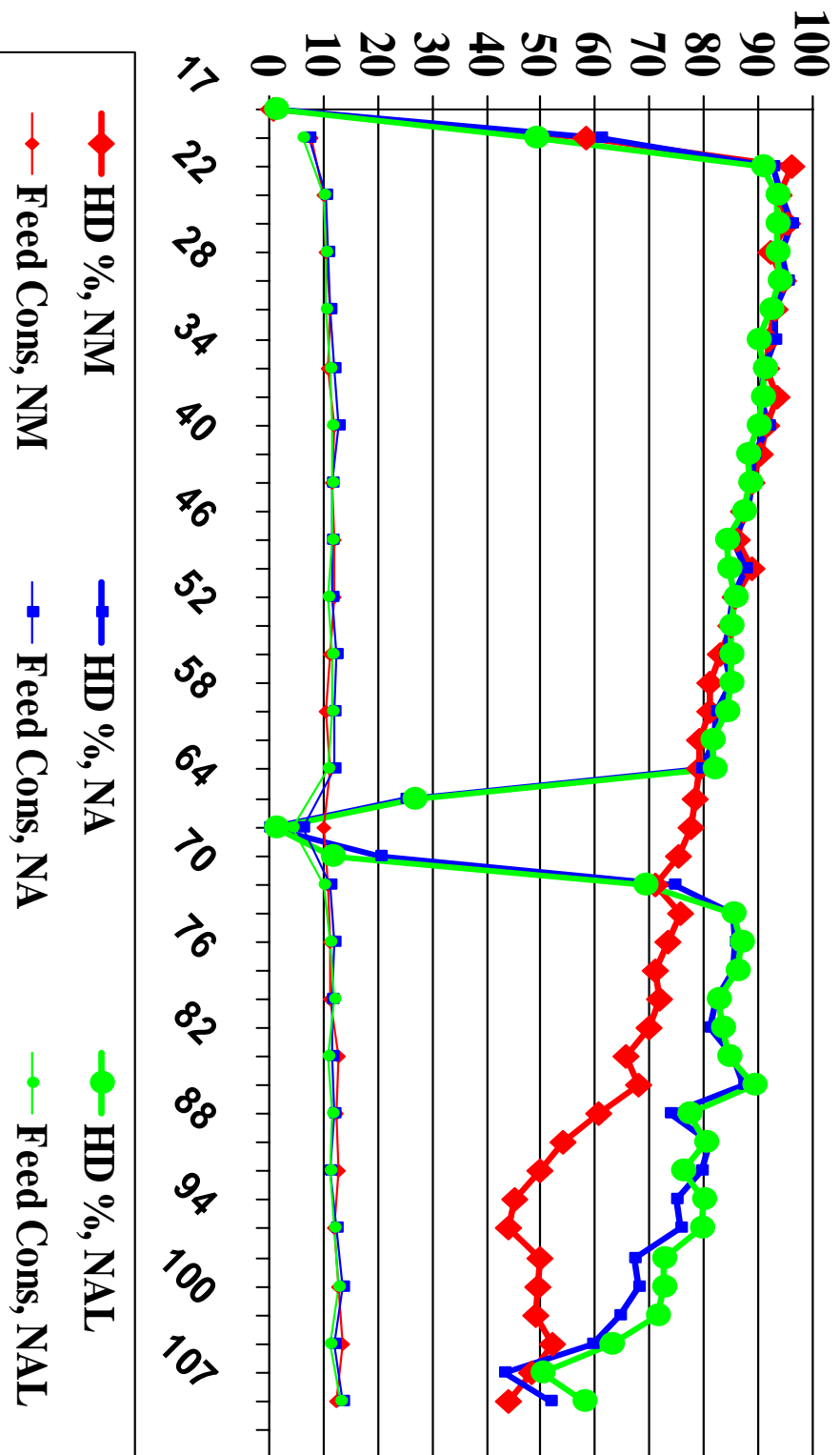
¹ NM = Non-molted; NA=Non-Anorexic Molt; NAL=Non-Anorexic Low Na Molt

Figure 13. Hy-Line “W-98” Strain, Bi-weekly Percent Egg Production at 3 hens/cage by molt program¹ and Period Feed Consumption (kg per 100 Hens) House 5



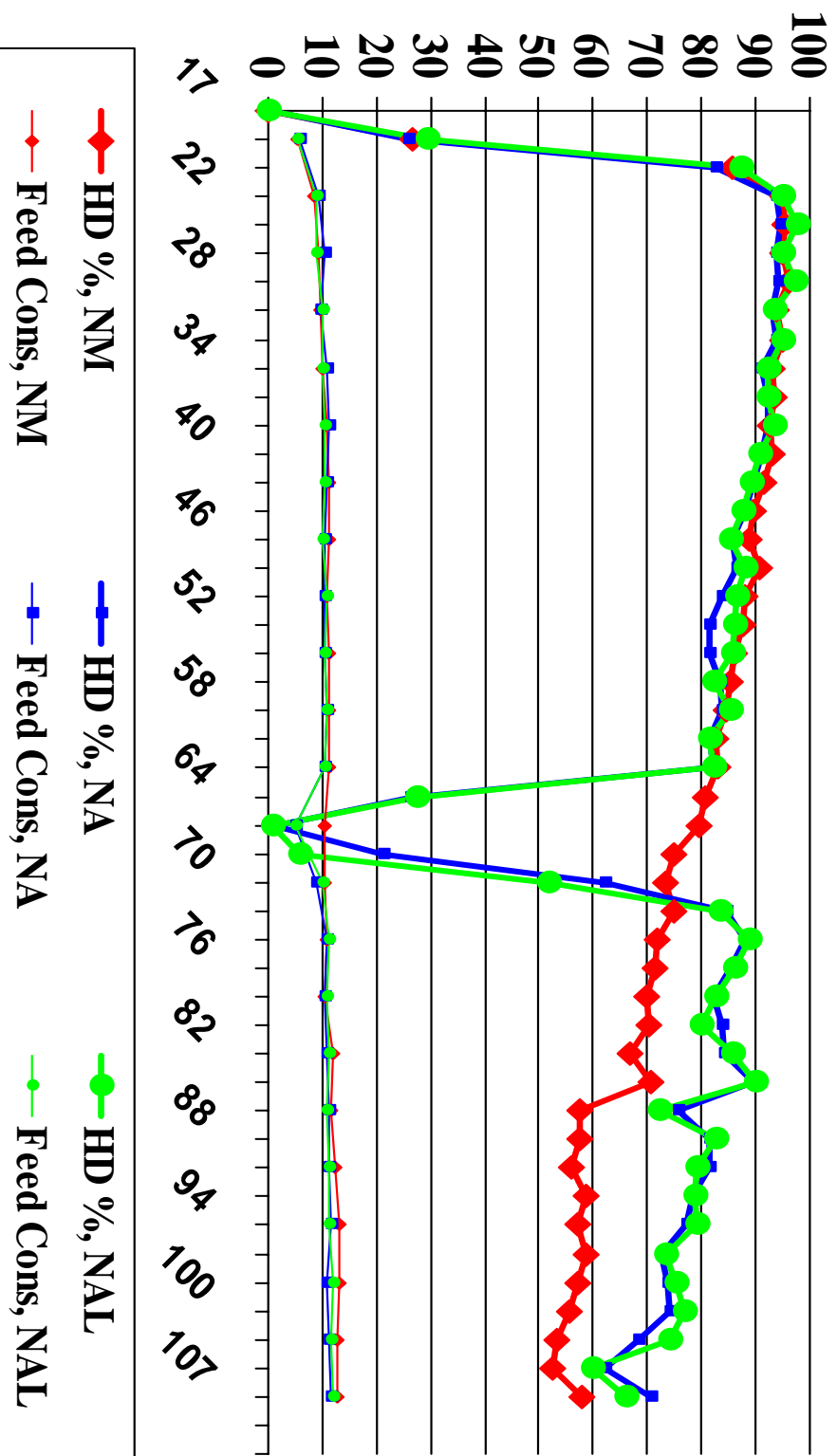
¹ NM = Non-molted; NA=Non-Anorexic Molt; NAL=Non-Anorexic Low Na Molt

Figure 14. Hy-Line ‘W-98’ Strain, Bi-weekly Percent Egg Production at 4 hens/cage by molt program¹ and Period Feed Consumption (kg per 100 Hens) House 5



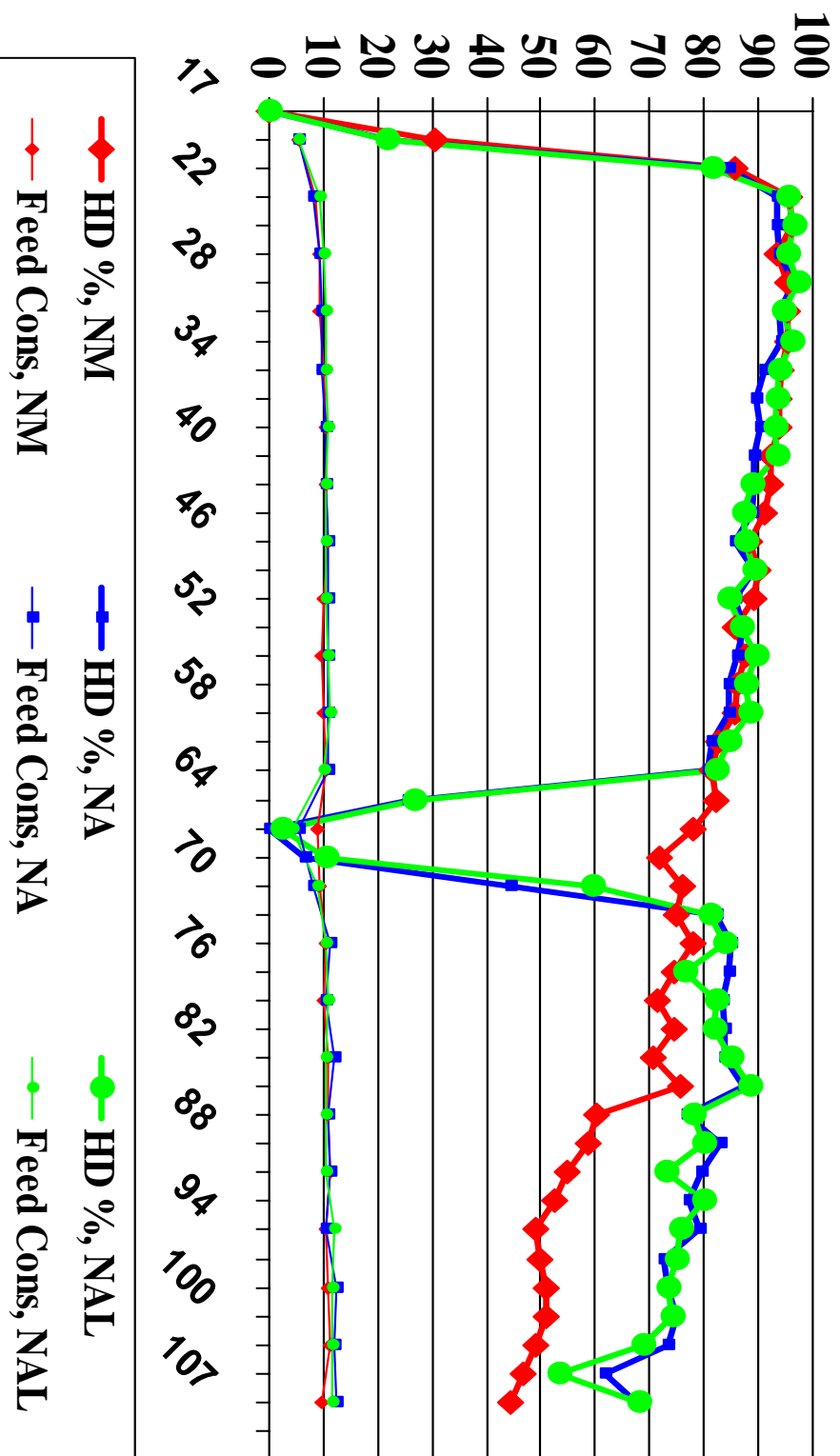
¹ NM = Non-molted; NA=Non-Anorexic Molt; NAL=Non-Anorexic Low Na Molt

Figure 15. Hy-Line “CV-20” Strain, Bi-weekly Percent Egg Production at 3 hens/cage by molt program¹ and Period Feed Consumption (kg per 100 Hens) House 5



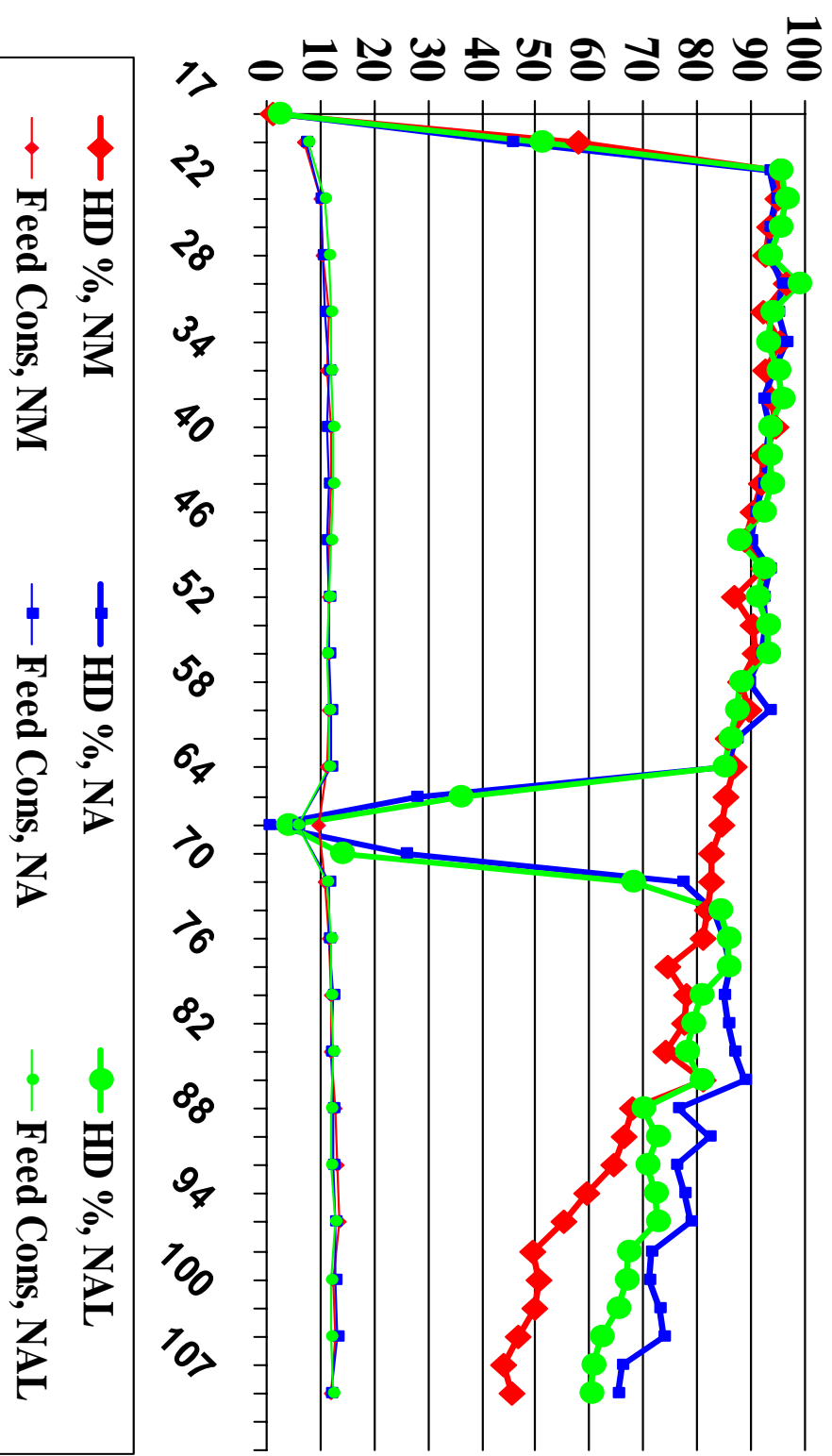
¹ NM = Non-molted; NA=Non-Anorexic Molt; NAL=Non-Anorexic Low Na Molt

Figure 16. Hy-Line “CV-20” Strain, Bi-weekly Percent Egg Production at 4 hens/cage by molt program¹ and Period Feed Consumption (kg per 100 Hens) House 5



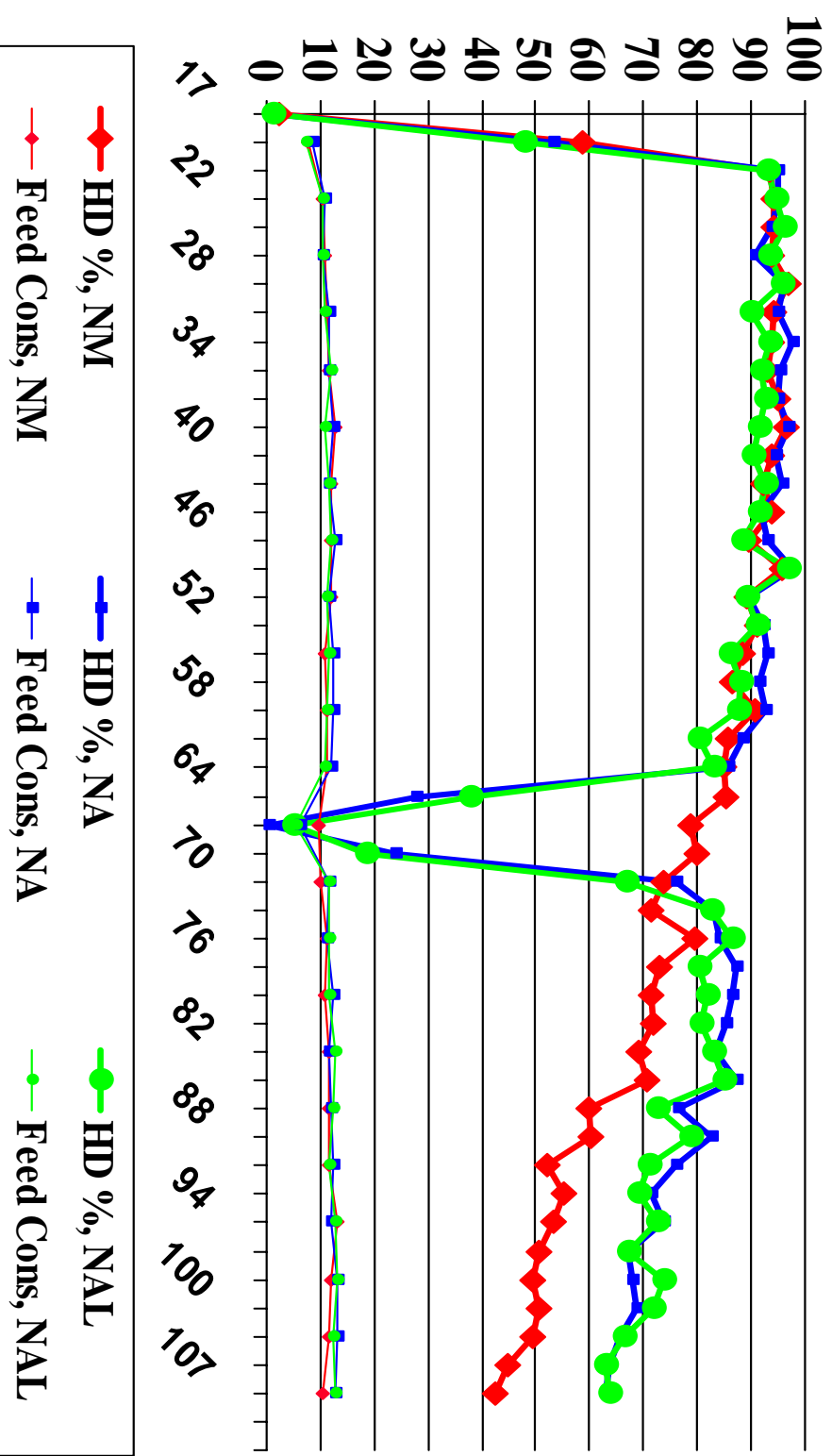
¹ NM = Non-molted; NA=Non-Anorexic Molt; NAL=Non-Anorexic Low Na Molt

Figure 17. Bovans ‘Brown’ Strain, Bi-weekly Percent Egg Production at 3 hens/cage by molt program¹ and Period Feed Consumption (kg per 100 Hens) House 5



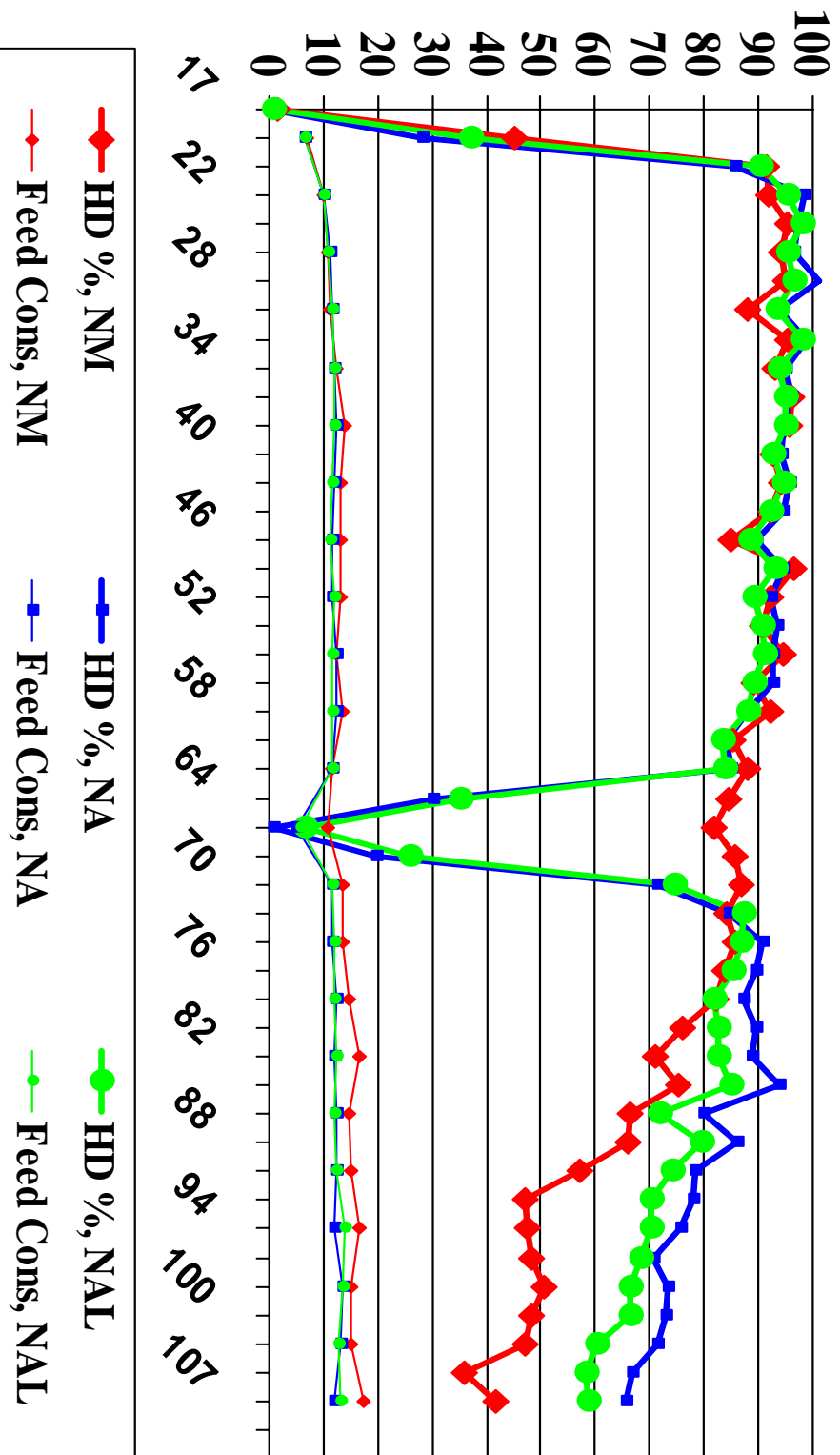
¹ NM = Non-molted; NA=Non-Anorexic Molt; NAL=Non-Anorexic Low Na Molt

Figure 18. Bovans ‘Brown’ Strain, Bi-weekly Percent Egg Production at 4 hens/cage by molt program¹ and Period Feed Consumption (kg per 100 Hens) House 5



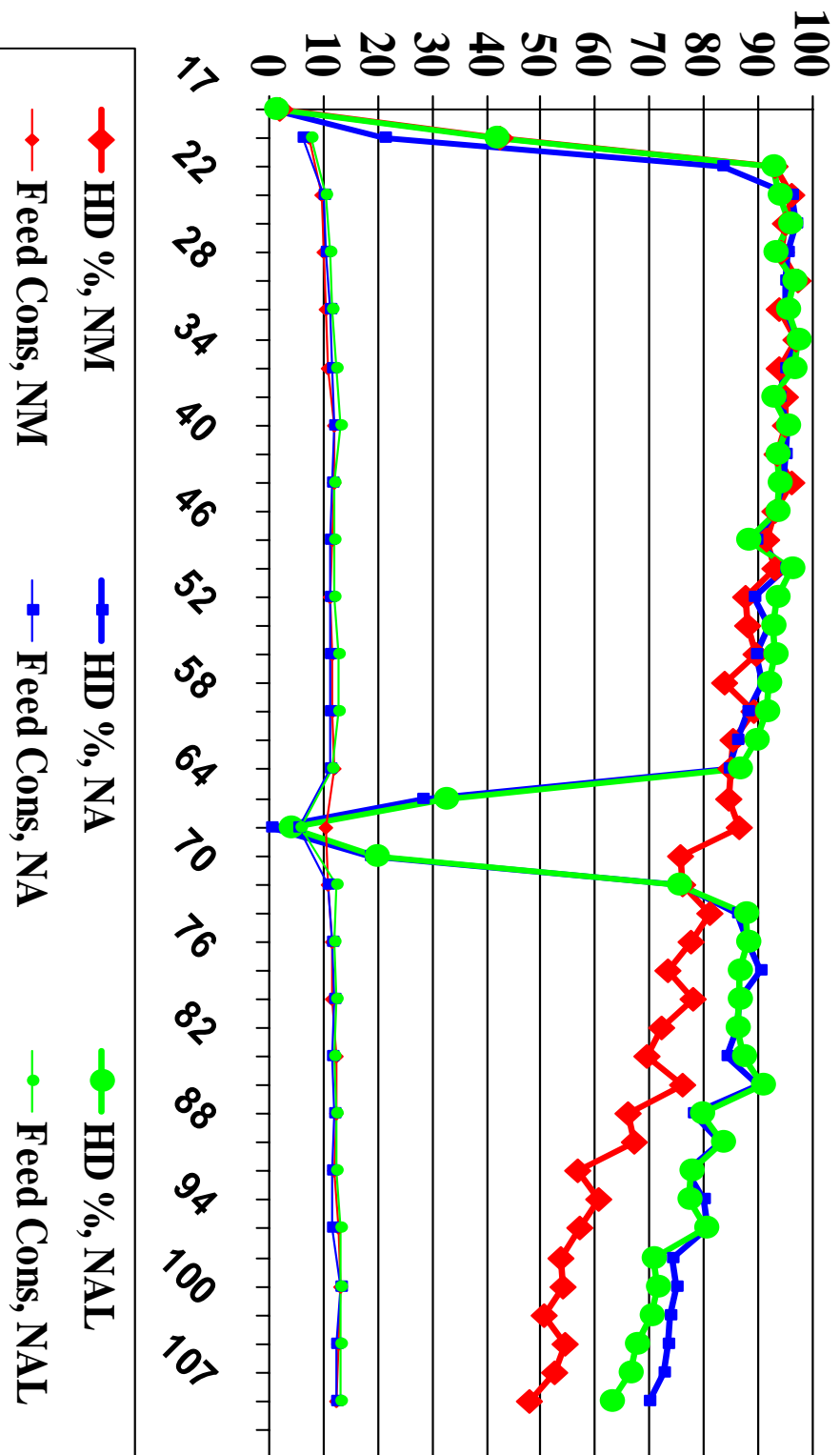
¹ NM = Non-molted; NA=Non-Anorexic Molt; NAL=Non-Anorexic Low Na Molt

Figure 19. Bovans “Goldline” Strain , Bi-weekly Percent Egg Production at 3 hens/cage by molt program¹ and Period Feed Consumption (kg per 100 Hens) House 5



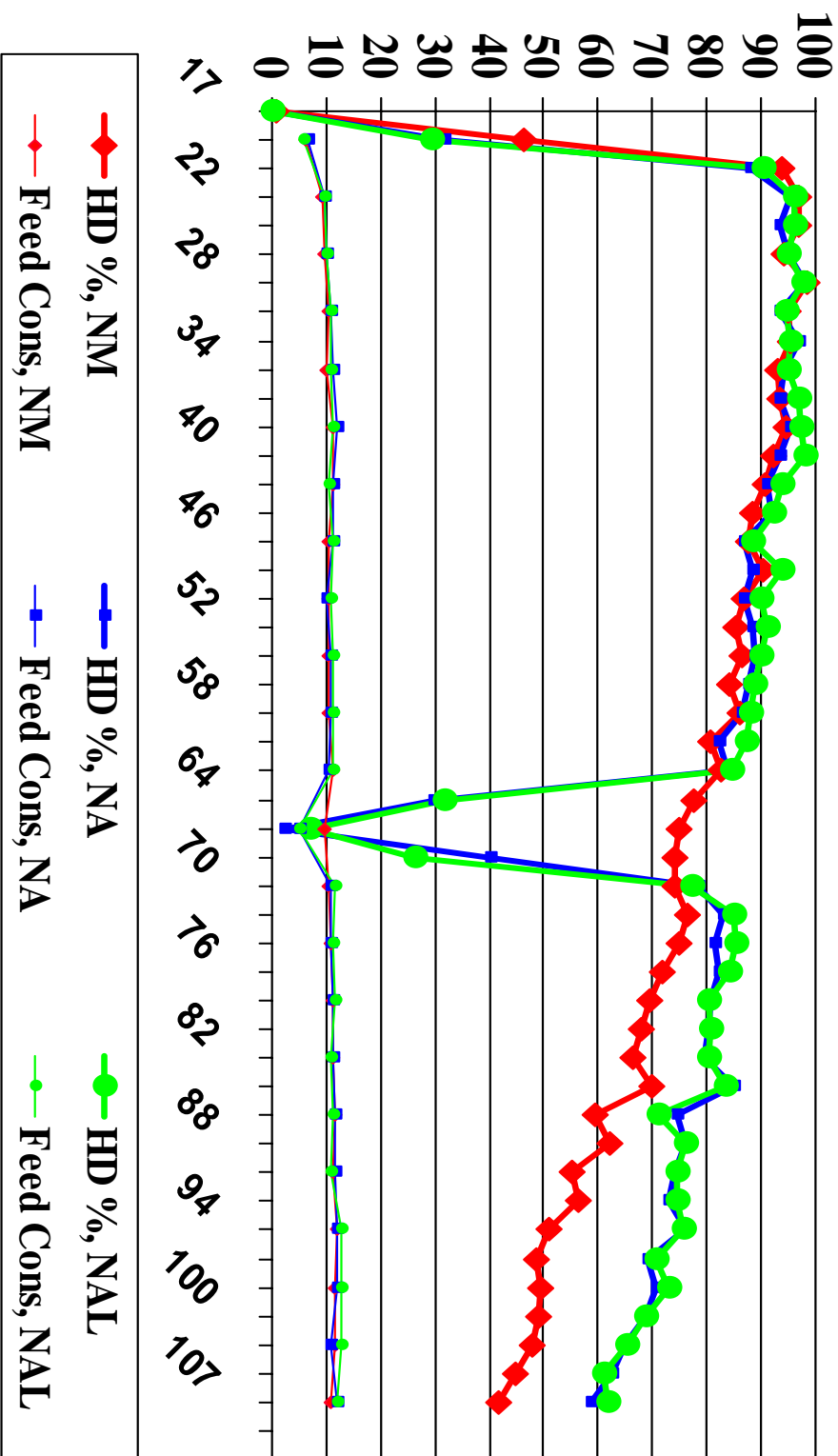
¹ NM = Non-molted; NA=Non-Anorexic Molt; NAL=Non-Anorexic Low Na Molt

Figure 20. Bovans “Goldline” Strain , Bi-weekly Percent Egg Production at 4 hens/cage by molt program¹ and Period Feed Consumption (kg per 100 Hens) House 5



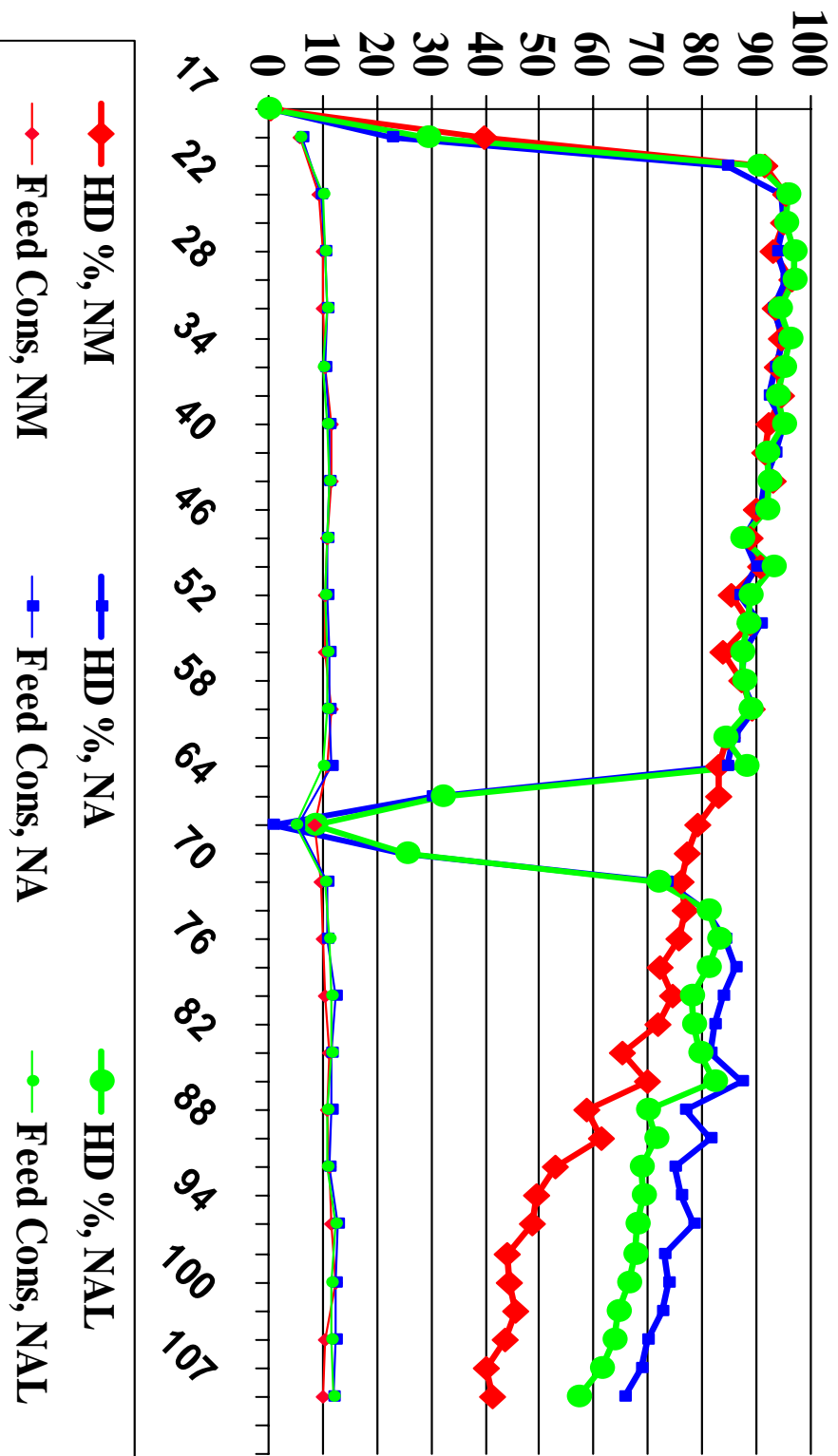
¹ NM = Non-molted; NA=Non-Anorexic Molt; NAL=Non-Anorexic Low Na Molt

Figure 21. Hy-Line ‘Brown’ Strain , Bi-weekly Percent Egg Production at 3 hens/cage by molt program¹ and Period Feed Consumption (kg per 100 Hens) House 5



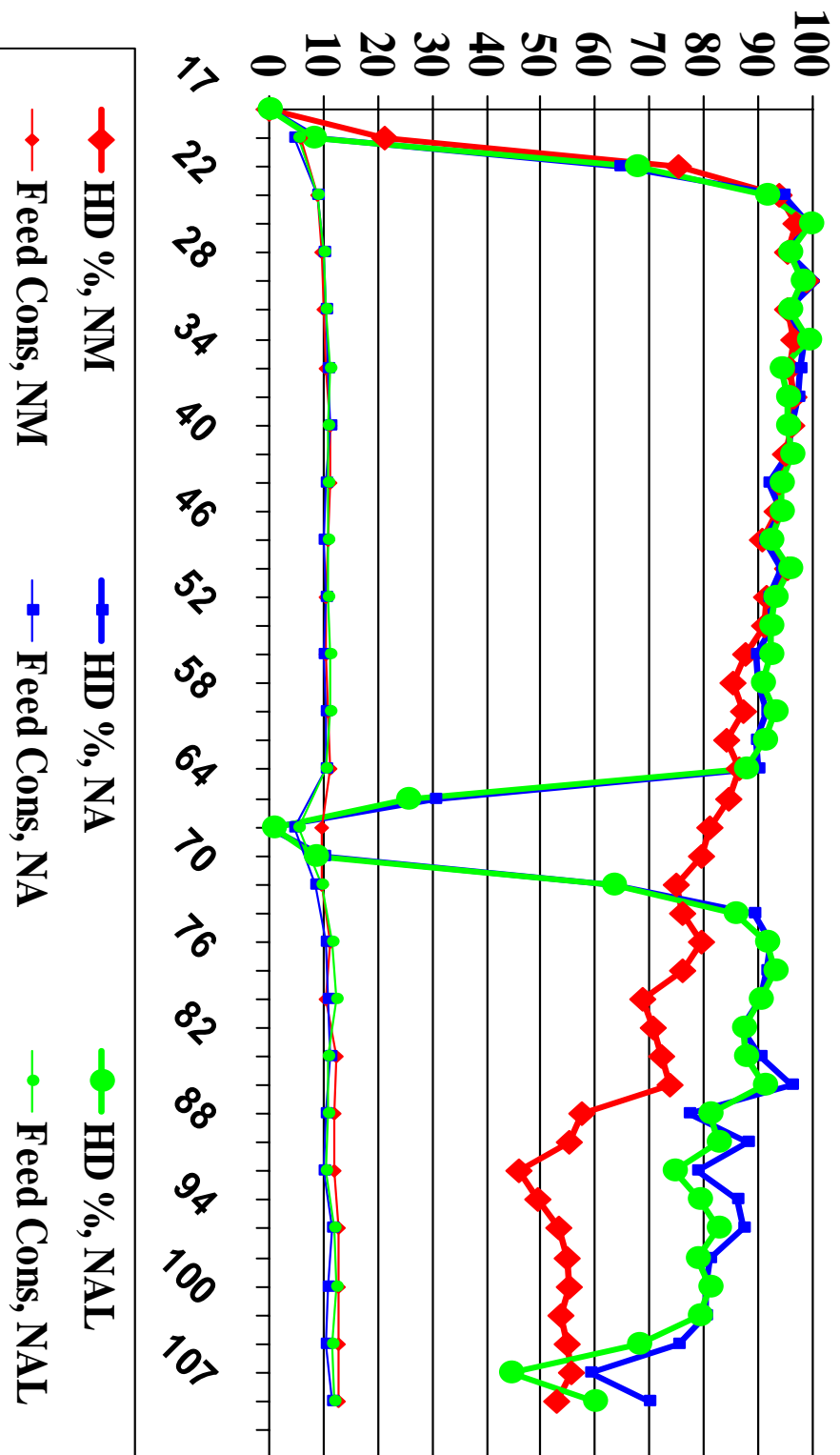
¹ NM = Non-molted; NA=Non-Anorexic Molt; NAL=Non-Anorexic Low Na Molt

Figure 22. Hy-Line ‘Brown’ Strain , Bi-weekly Percent Egg Production at 4 hens/cage by molt program¹ and Period Feed Consumption (kg per 100 Hens) House 5



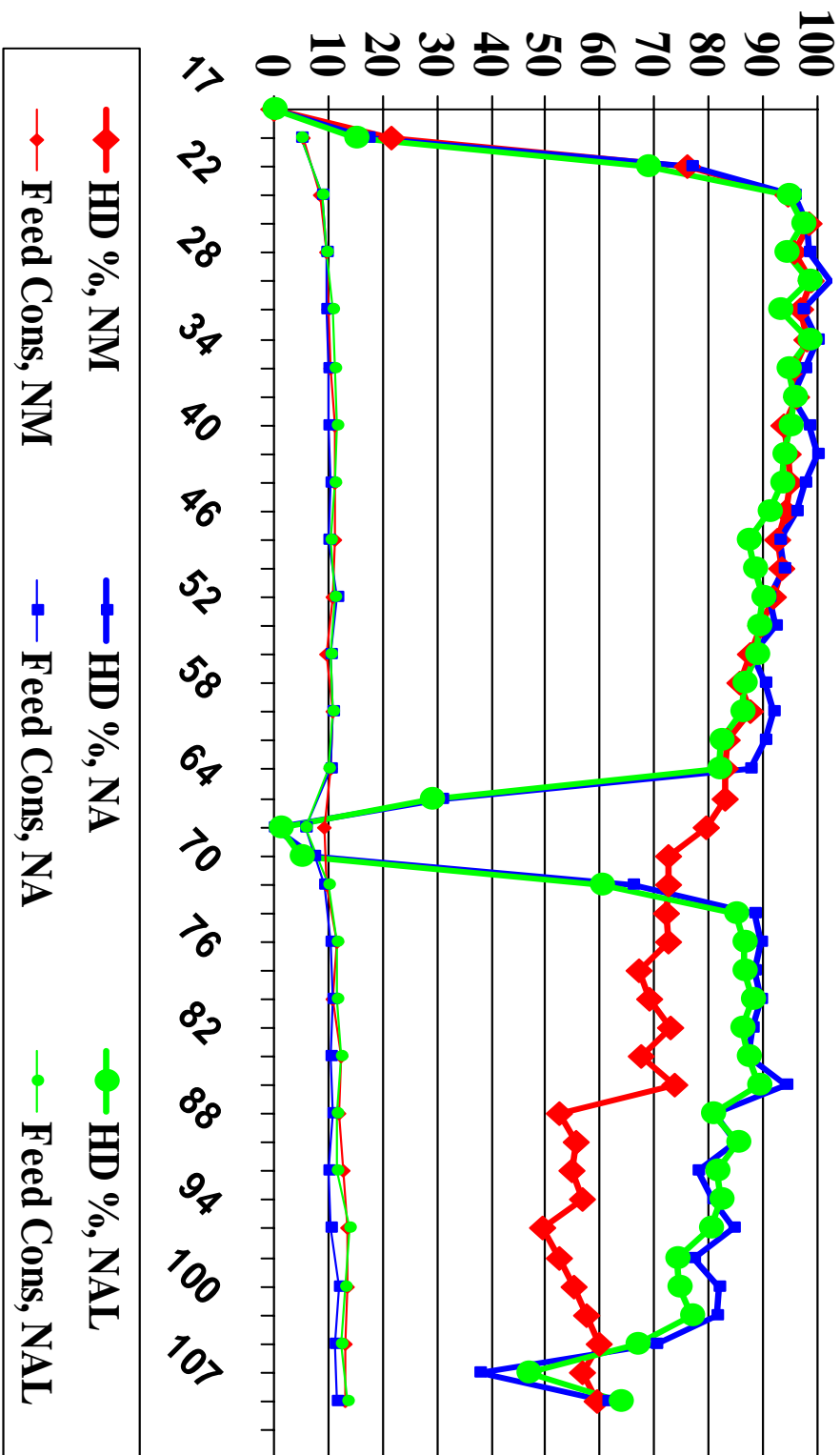
¹ NM = Non-molted; NA=Non-Anorexic Molt; NAL=Non-Anorexic Low Na Molt

Figure 23. ISA ‘White Exp.’ Strain , Bi-weekly Percent Egg Production at 3 hens/cage by molt program¹ and Period Feed Consumption (kg per 100 Hens) House 5



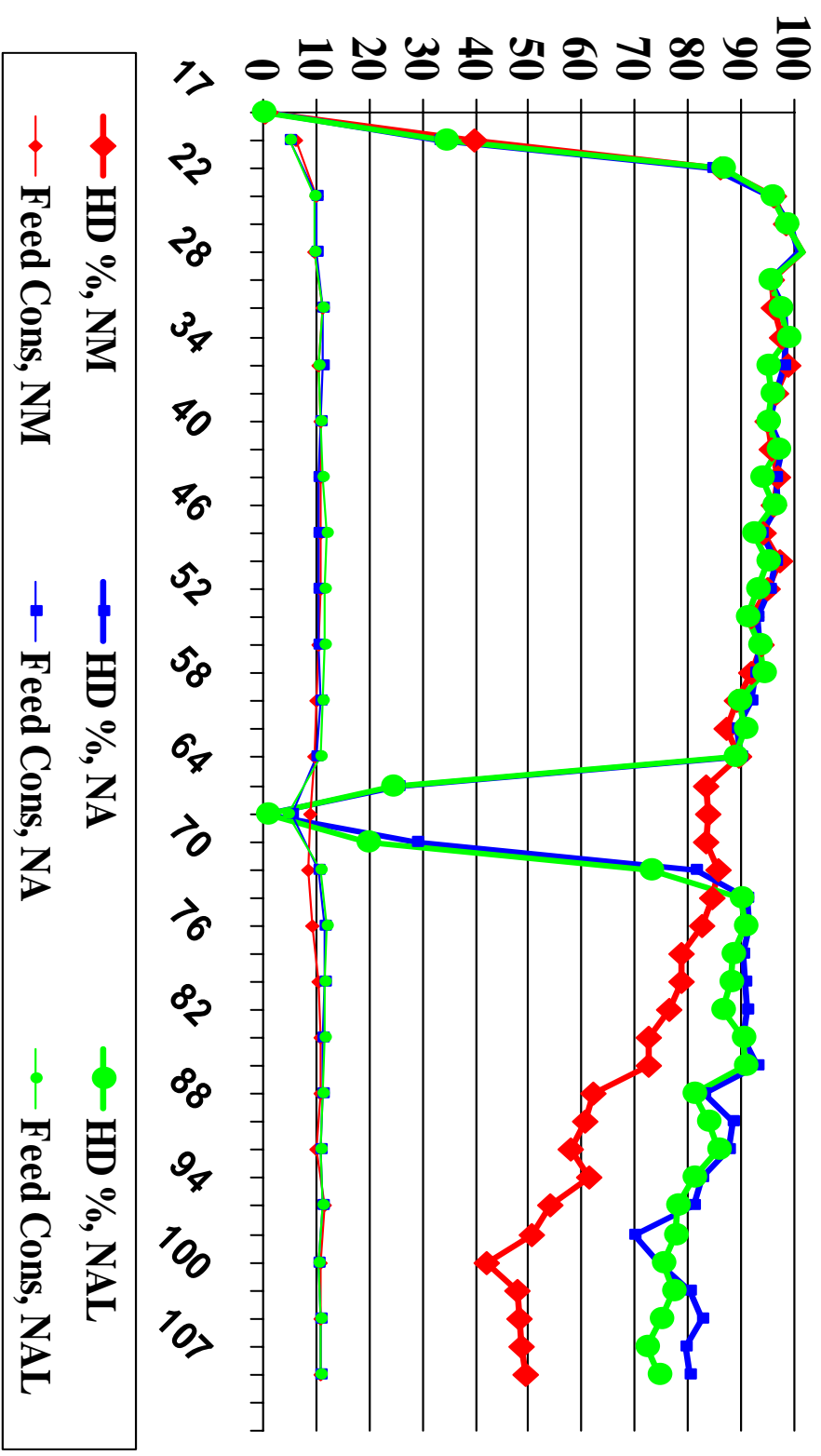
¹ NM = Non-molted; NA=Non-Anorexic Molt; NAL=Non-Anorexic Low Na Molt

Figure 24. ISA ‘White Exp.’ Strain , Bi-weekly Percent Egg Production at 4 hens/cage by molt program¹ and Period Feed Consumption (kg per 100 Hens) House 5



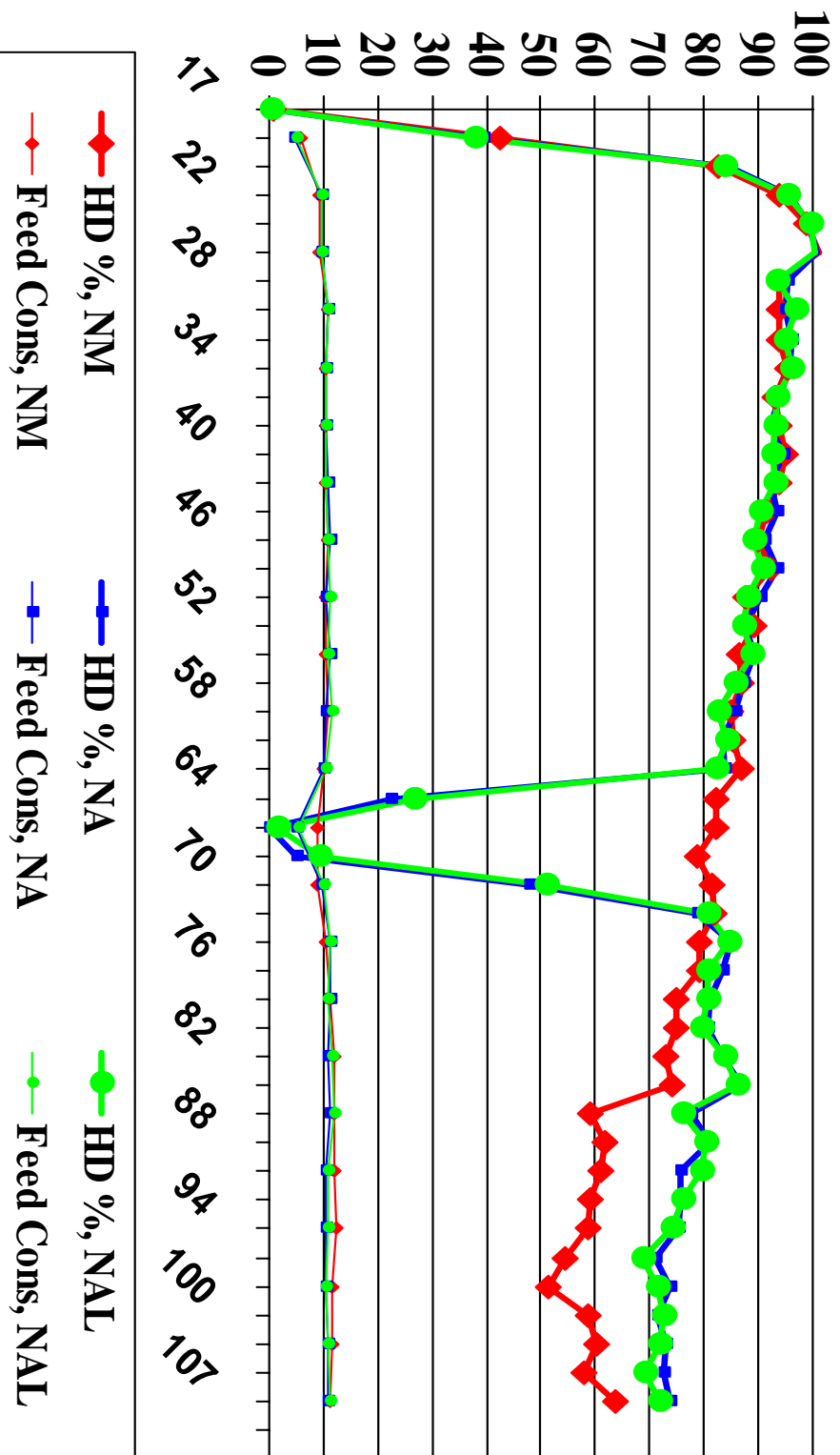
¹ NM = Non-molted; NA=Non-Anorexic Molt; NAL=Non-Anorexic Low Na Molt

Figure 25. Lohmann ‘LSL-Lite’ Strain , Bi-weekly Percent Egg Production at 7 hens/cage by molt program¹ and Period Feed Consumption (kg per 100 Hens) House 7



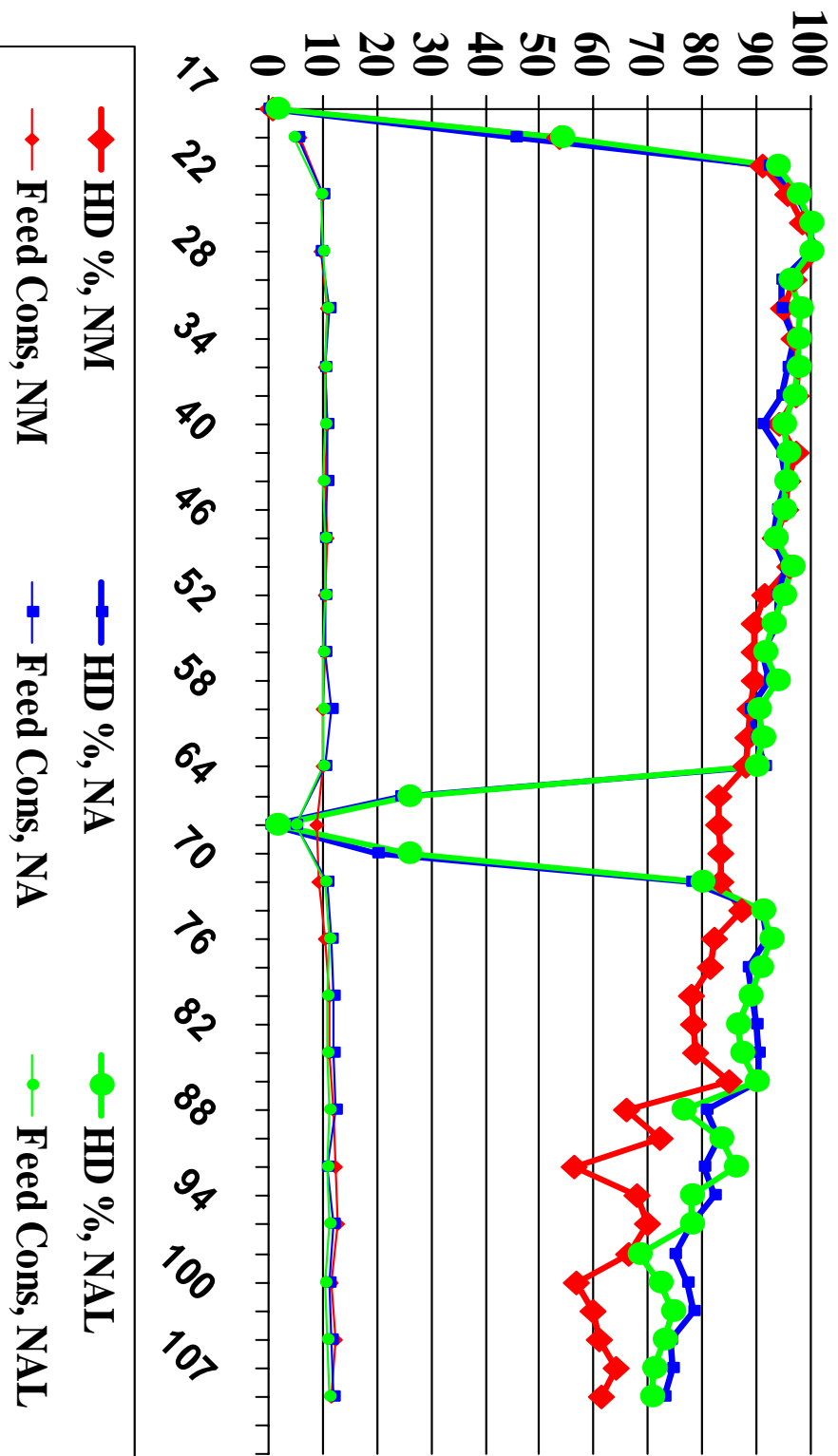
¹ NM = Non-molted; NA=Non-Anorexic Molt; NAL=Non-Anorexic Low Na Molt

Figure 26. Bovans ‘White Exp.’ Strain, Bi-weekly Percent Egg Production at 7 hens/cage by molt program¹ and Period Feed Consumption (kg per 100 Hens) House 7



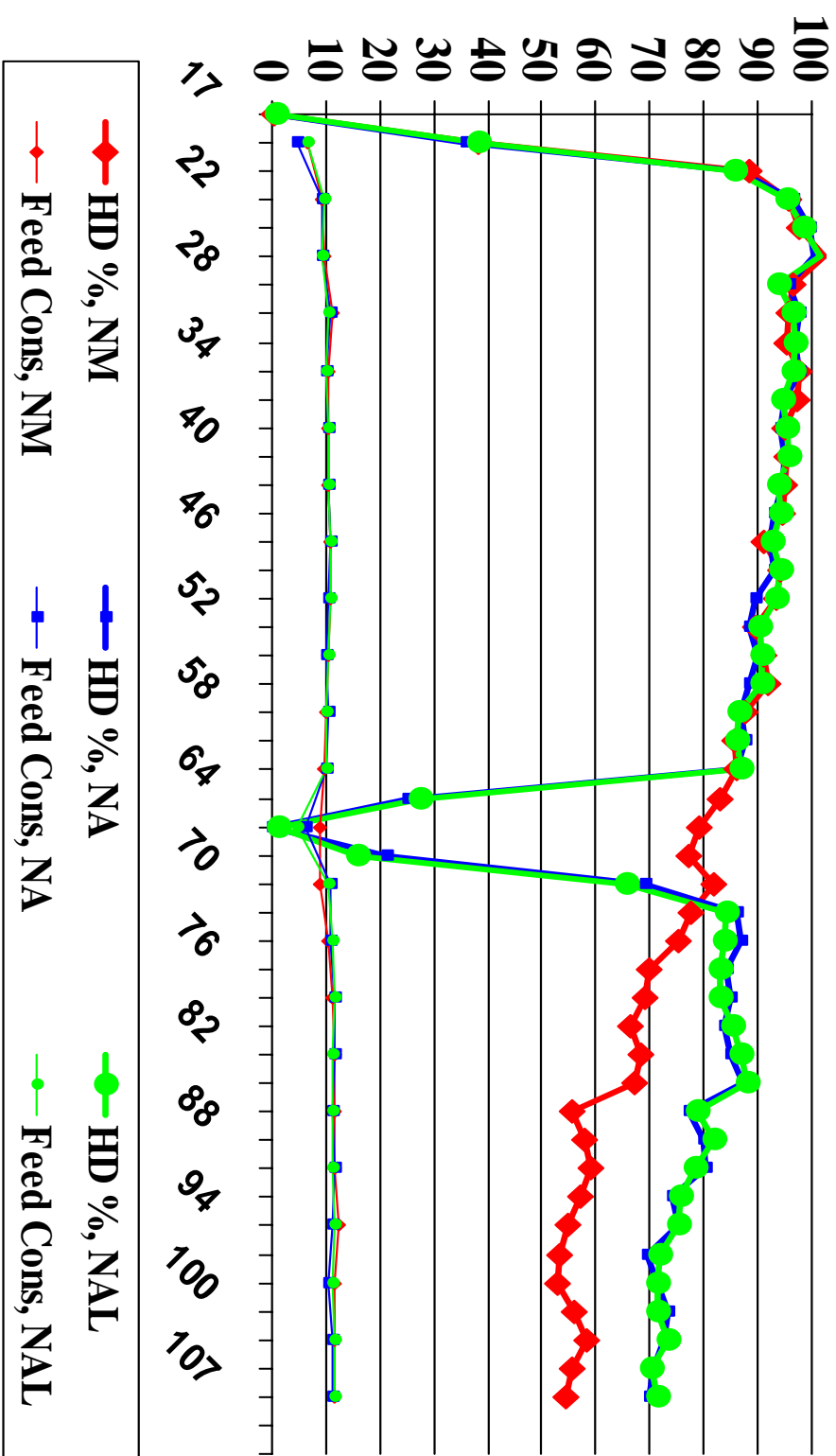
¹ NM = Non-molted; NA=Non-Anorexic Molt; NAL=Non-Anorexic Low Na Molt

Figure 27. Bovans ‘White’ Strain , Bi-weekly Percent Egg Production at 7 hens/cage by molt program¹ and Period Feed Consumption (kg per 100 Hens) House 7



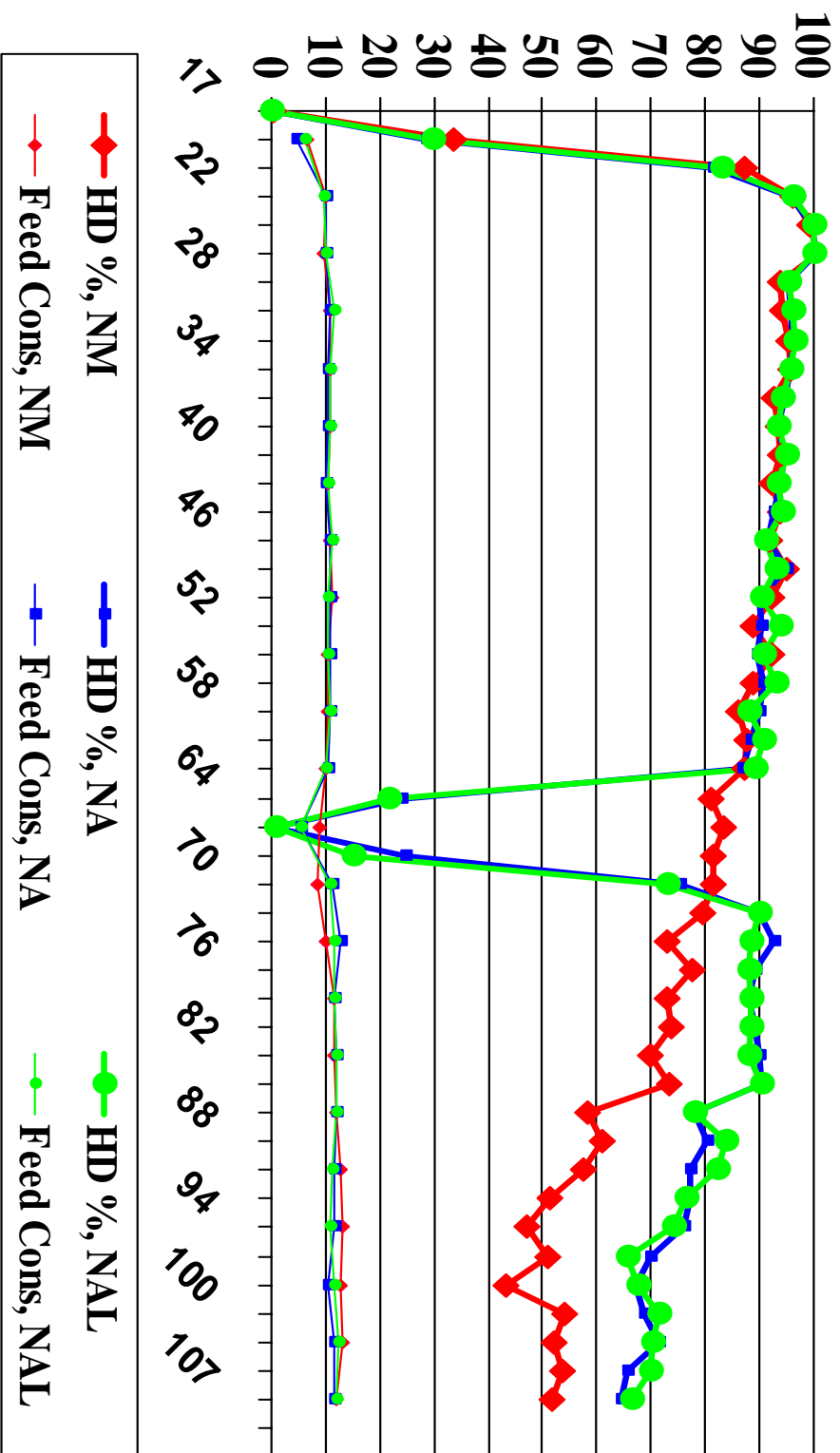
¹ NM = Non-molted; NA=Non-Anorexic Molt; NAL=Non-Anorexic Low Na Molt

Figure 28. Dekalb ‘White Exp.’ Strain, Bi-weekly Percent Egg Production at 7 hens/cage by molt program¹ and Period Feed Consumption (kg per 100 Hens) House 7



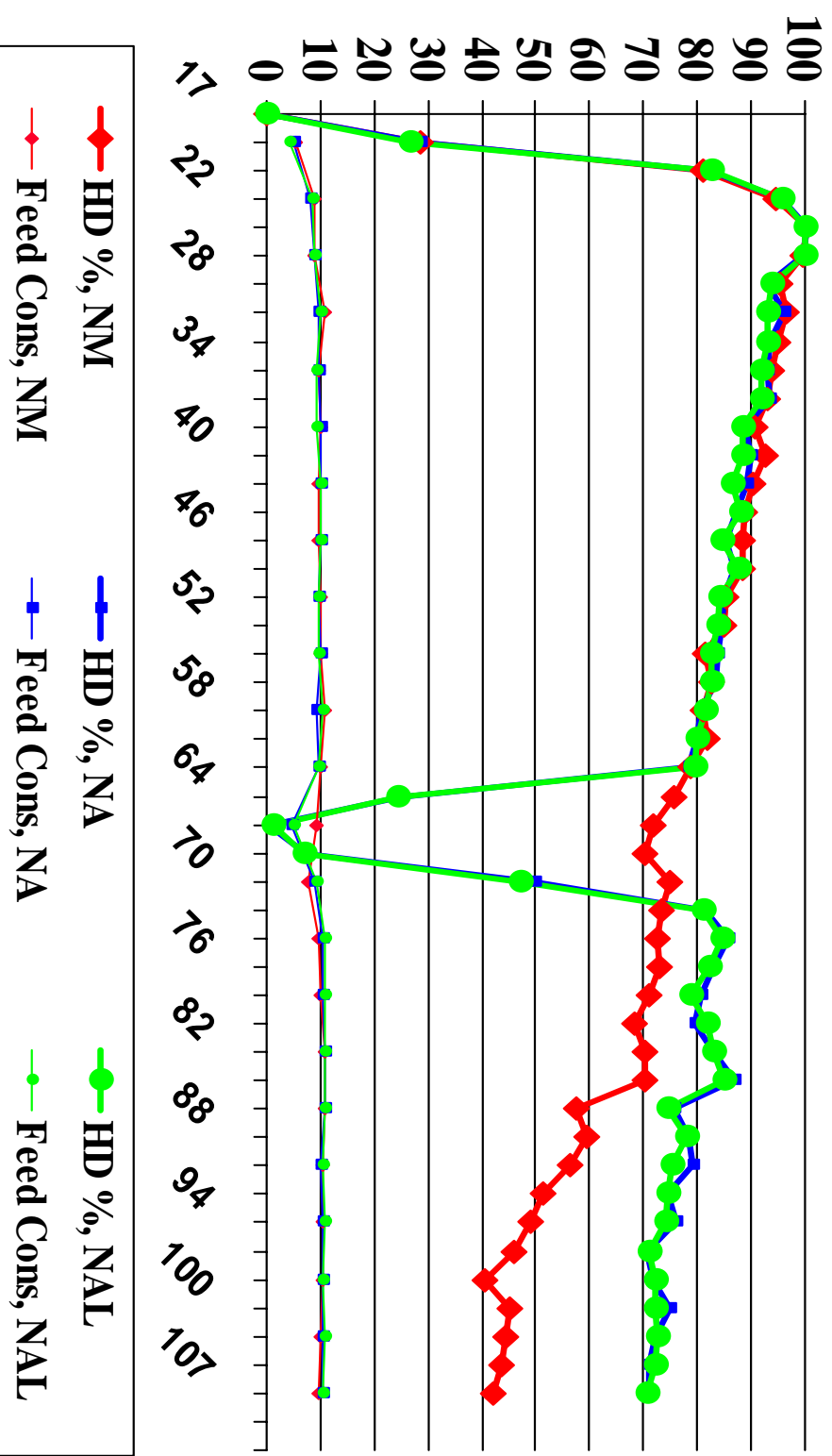
¹ NM = Non-molted; NA=Non-Anorexic Molt; NAL=Non-Anorexic Low Na Molt

Figure 29. Dekalb ‘White’ Strain, Bi-weekly Percent Egg Production at 7 hens/cage by molt program¹ and Period Feed Consumption (kg per 100 Hens) House 7



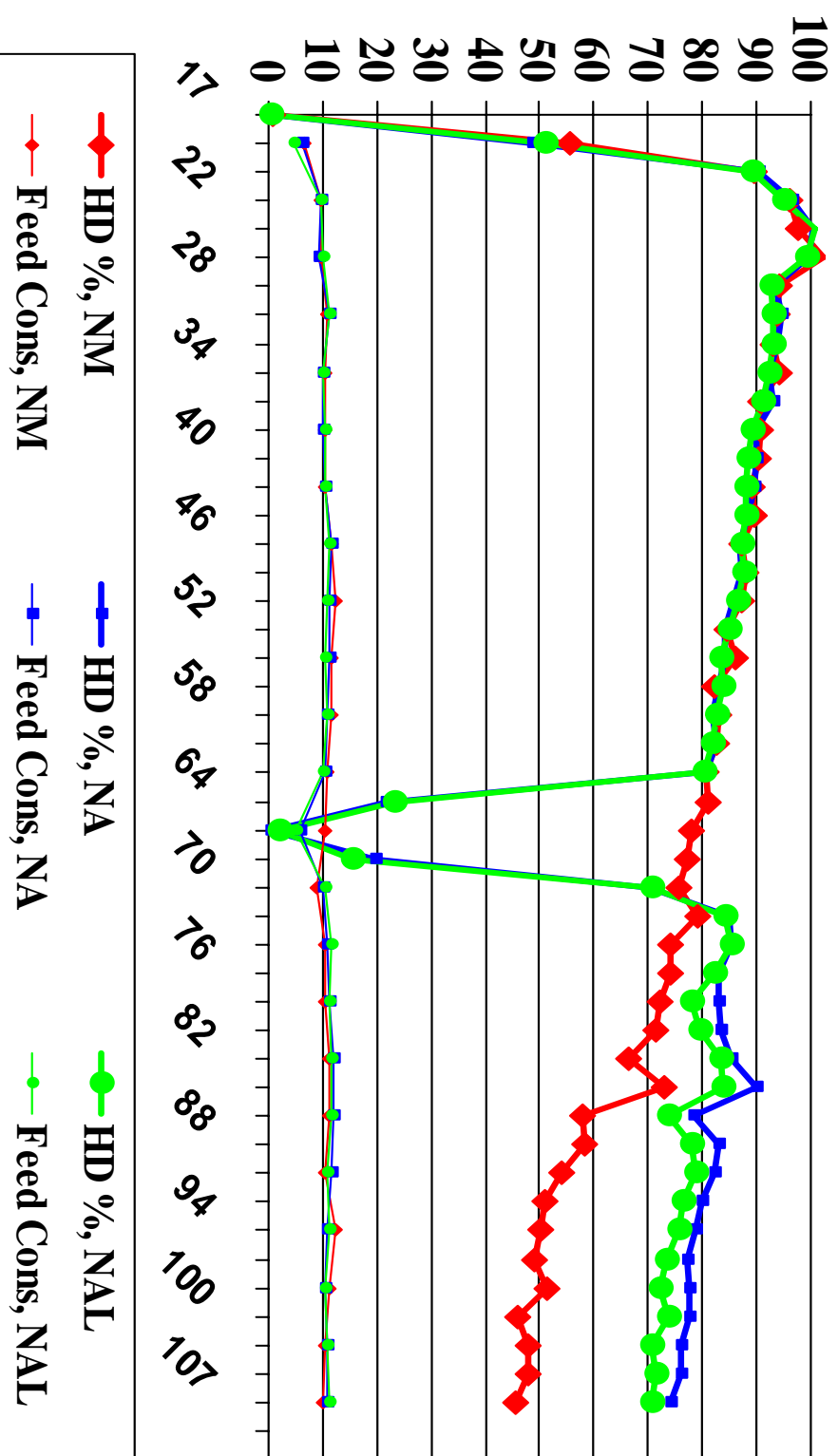
¹ NM = Non-molted; NA=Non-Anorexic Molt; NAL=Non-Anorexic Low Na Molt

Figure 30. Hy-Line ‘W-36’ Strain, Bi-weekly Percent Egg Production at 7 hens/cage by molt program¹ and Period Feed Consumption (kg per 100 Hens) House 7



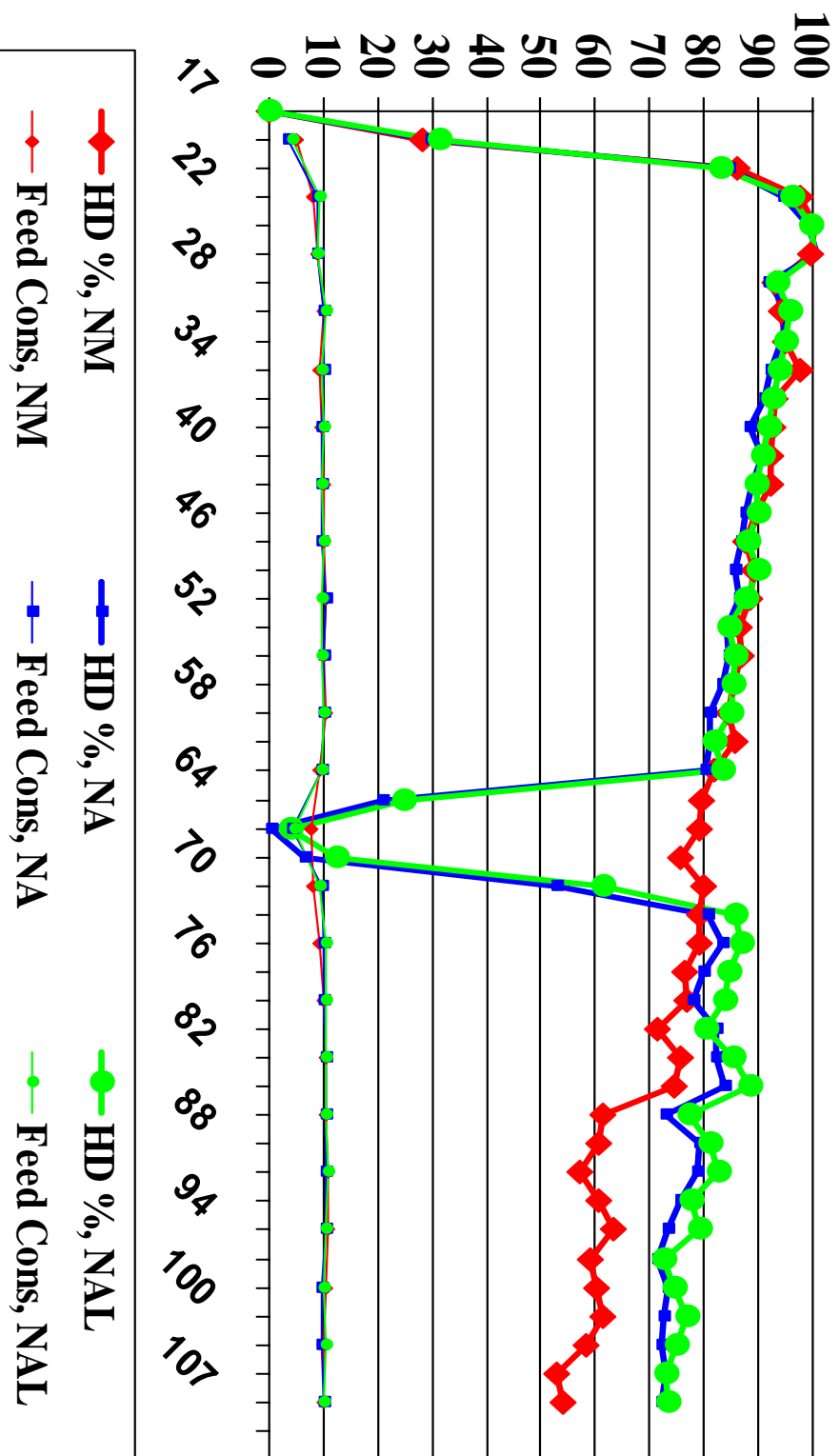
¹ NM = Non-molted; NA=Non-Anorexic Molt; NAL=Non-Anorexic Low Na Molt

Figure 31. Hy-Line ‘W-98’ Strain, Bi-weekly Percent Egg Production at 7 hens/cage by molt program¹ and Period Feed Consumption (kg per 100 Hens) House 7



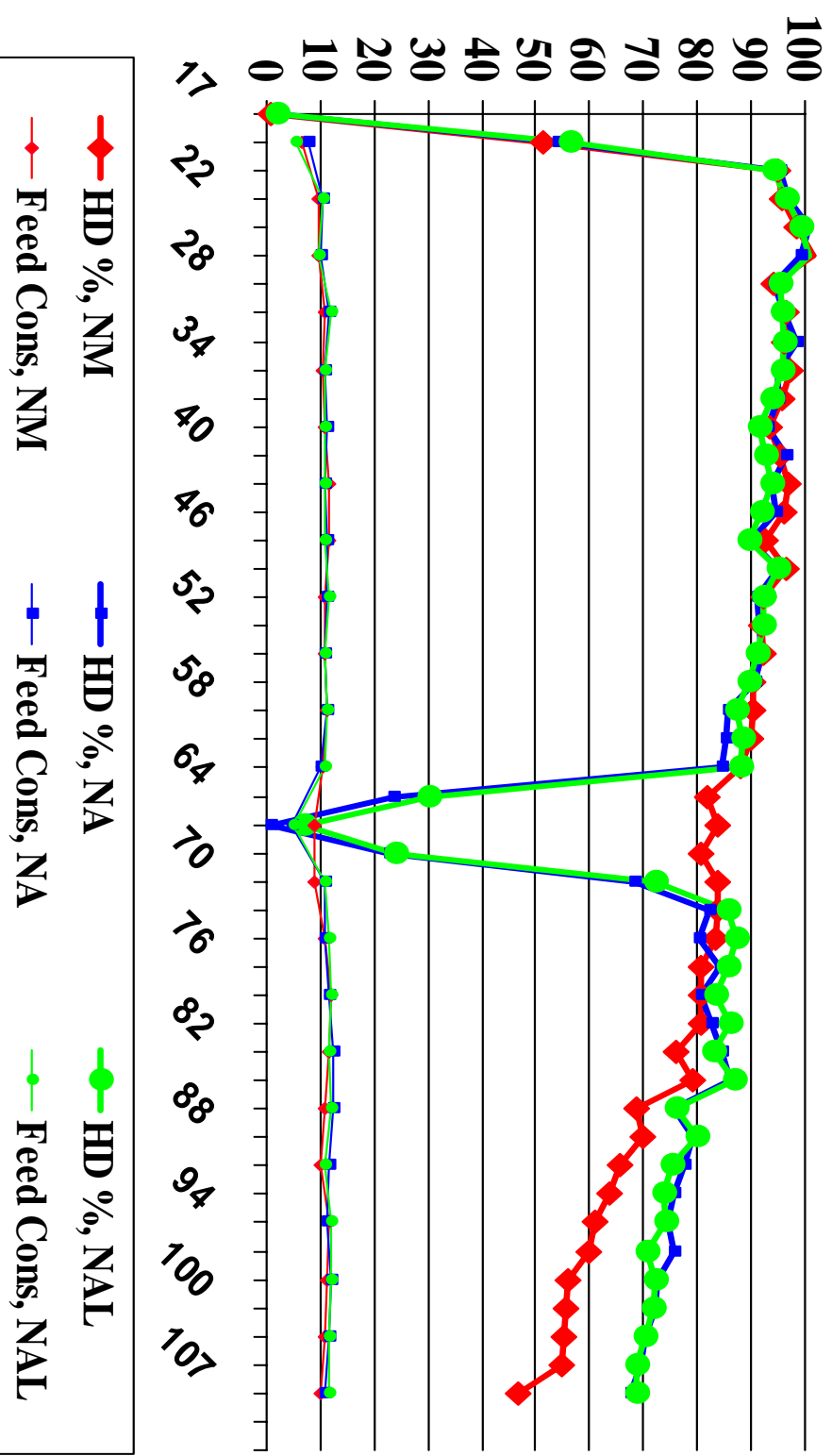
¹ NM = Non-molted; NA=Non-Anorexic Molt; NAL=Non-Anorexic Low Na Molt

Figure 32. Hy-Line “CV-20” Strain, Bi-weekly Percent Egg Production at 7 hens/cage by molt program¹ and Period Feed Consumption (kg per 100 Hens) House 7



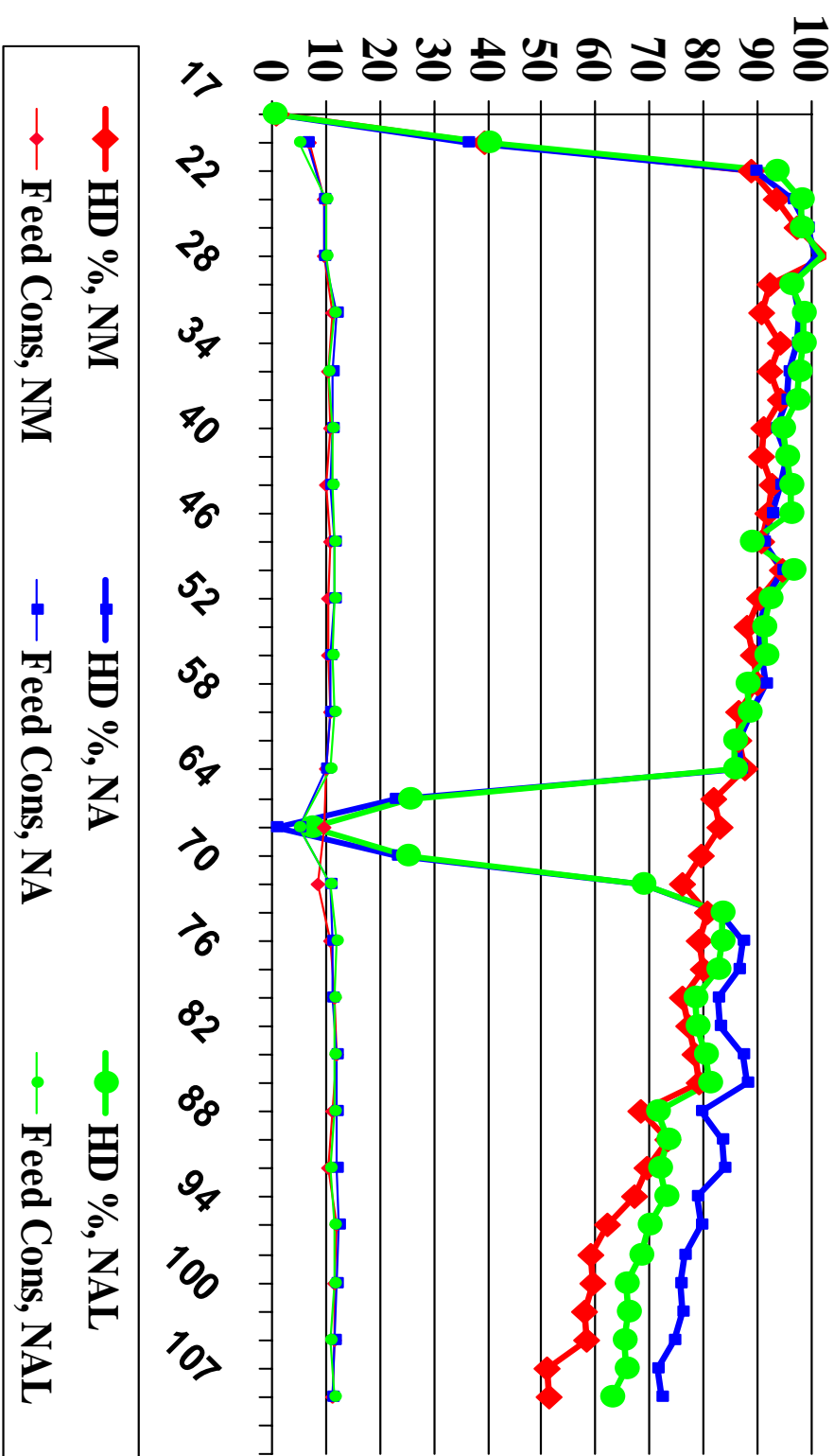
¹ NM = Non-molted; NA=Non-Anorexic Molt; NAL=Non-Anorexic Low Na Molt

Figure 33. Bovans ‘Brown’ Strain, Bi-weekly Percent Egg Production at 7 hens/cage by molt program¹ and Period Feed Consumption (kg per 100 Hens) House 7



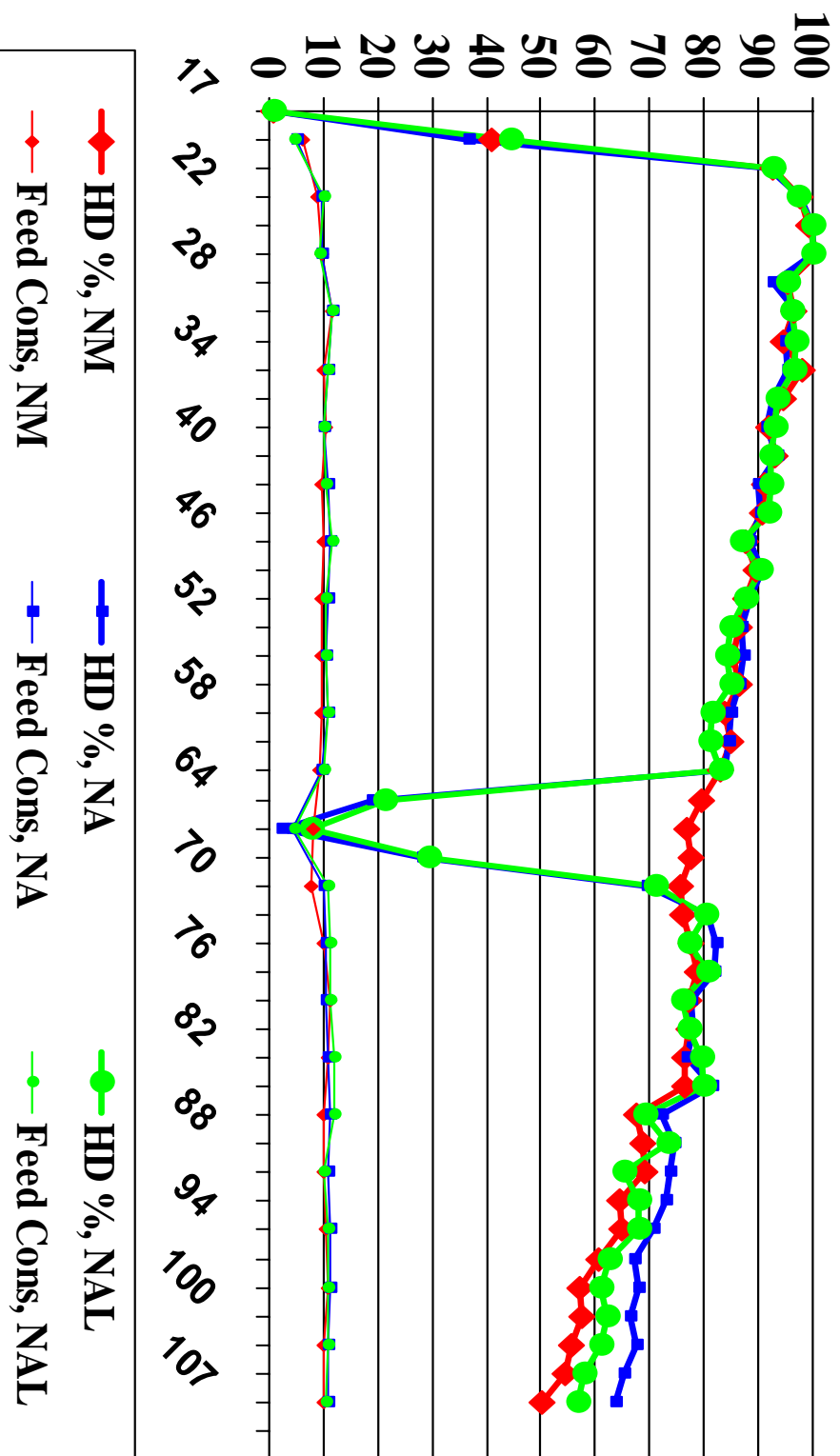
¹ NM = Non-molted; NA=Non-Anorexic Molt; NAL=Non-Anorexic Low Na Molt

Figure 34. Bovans “Goldline” Strain , Bi-weekly Percent Egg Production at 7 hens/cage by molt program¹ and Period Feed Consumption (kg per 100 Hens) House 7



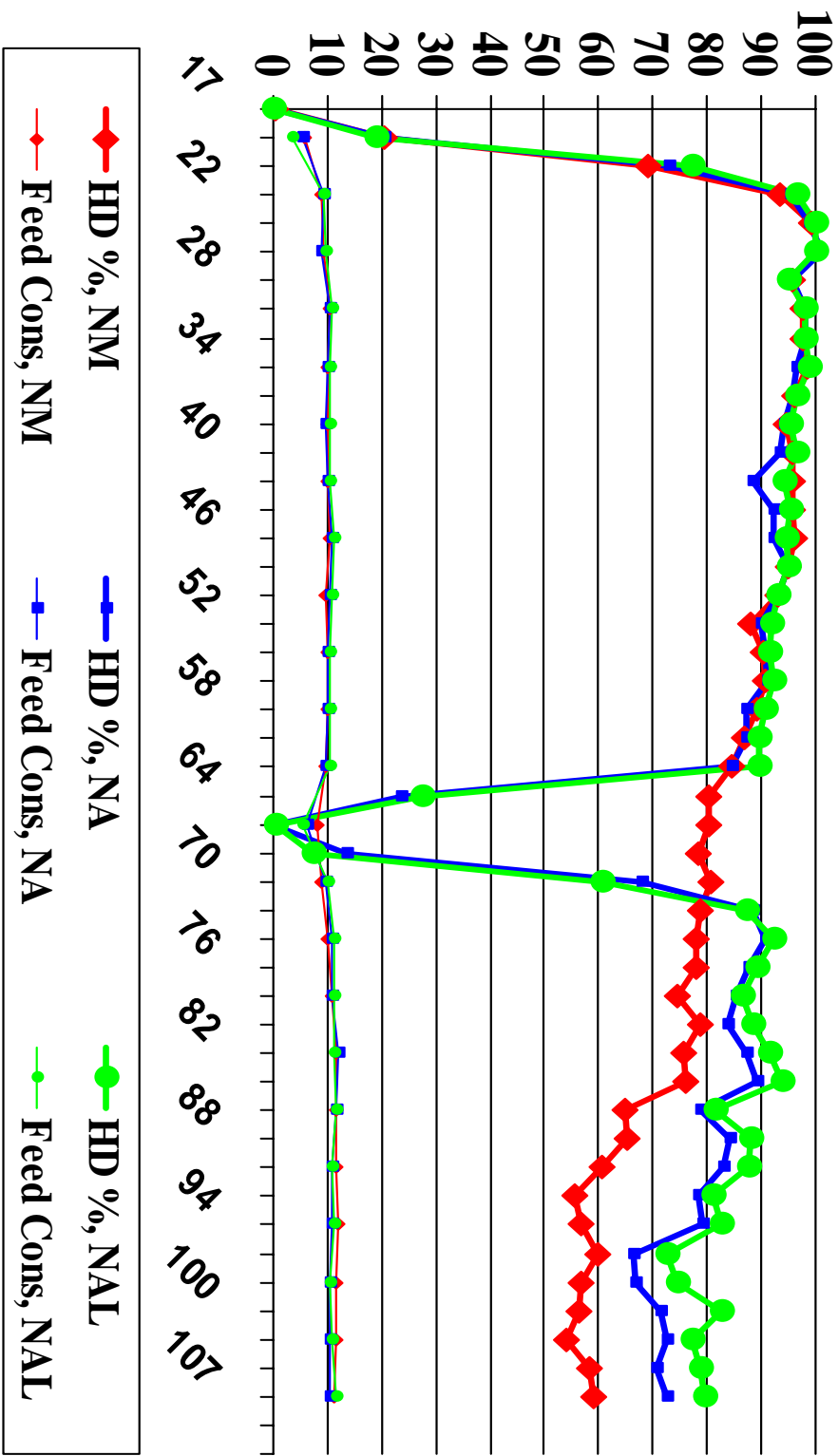
¹ NM = Non-molted; NA=Non-Anorexic Molt; NAL=Non-Anorexic Low Na Molt

Figure 35. Hy-Line ‘Brown’ Strain , Bi-weekly Percent Egg Production at 7 hens/cage by molt program¹ and Period Feed Consumption (kg per 100 Hens) House 7



¹ NM = Non-molted; NA=Non-Anorexic Molt; NAL=Non-Anorexic Low Na Molt

Figure 36. ISA ‘White Exp.’ Strain , Bi-weekly Percent Egg Production at 7 hens/cage by molt program¹ and Period Feed Consumption (kg per 100 Hens) House 7



¹ NM = Non-molted; NA=Non-Anorexic Molt; NAL=Non-Anorexic Low Na Molt

Table 85. Entries in the 36th NCLP&MT by Breeder, 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
	Hy-Line Brown	I-A	(Same)
	W-98	I-A	Hy-Line North America 79 Industrial Rd E-town, PA 17022
	CV-20	I-A	(Same)
Lohmann Tierzucht Inc., N.A. 2433 Bethany Rd Sycamore, IL 60178	Lohmann LSL-Lite	I-A	Hy-Line North America 79 Industrial Rd E-town, PA 17022
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
	Dekalb White Experimental	III-A	(Same)
ISA North America Box 400 Cambridge, Ontario N1R 5V9 Canada	ISA White Experimental	III-A	Cox Brothers Poultry Farm R.R. #1 Maitland, Nova Scotia B0N 1T0 Canada

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