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HATCH AND SEROLOGY REPORT OF THE THIRTY SEVENTH 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-Poultry Unit, Salisbury, North Carolina. Mr. Joe Hampton is Piedmont Research Station Superintendent; Mr. Aaron Sellers is Resident Manager of the flock; Mrs. Pamela Jenkins is coordinator of data compilation and statistical analysis; and Dr. K. E. Anderson is Project Leader. The purpose of this program is to assist poultry management teams in evaluation of commercial layer stocks and management systems.

Copies of current and past reports are maintained for public access at http://www.ces.ncsu.edu/depts/poulsci/tech_manuals/layer_reports/37_hatch_report.pdf .

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Entries:

Sixteen entries were accepted or acquired in accordance with the rules and regulations of the test. Ten white egg strains and six brown egg strains are participating in the current test. Table 1, shows the source of the laying stock (Breeder) and the strain which was entered in the test and Table 5 provides the breeder, source of eggs, and entry status of each strain. The egg deliveries to the Research Station occurred from May 10 to 14 and all eggs arrived in good condition. The eggs for each of the strains were shipped directly to the station via delivery truck, FedEx ground freight, or via US Mail. There were few broken eggs and the number of dirty eggs was minimal among all shipments for the represented strains. The eggs were set 90 eggs/tray and allowed to come to room temperature prior to placement in the incubators. At time of transfer, two egg trays were transferred to each hatching tray, and were then placed into the hatchers. Only obvious leakers or contaminated eggs were removed at transfer to facilitate the hatch and were noted on the hatching tray labels.

Table 1. 37th North Carolina Layer Performance and Management Test Strain Code Assignments

Strain No.	Source of Stock	Strain
1	Hy-Line International	Hy-Line W-36
2	Hy-Line International	Hy-Line W-98
3	Hy-Line International	Hy-Line CV-22
4	ISA North America	Shaver White
5	Centurion Poultry Inc.	Dekalb TX
6	Lohmann Tierzucht Inc., N.A.	Lohmann LSL-Lite
7	Lohmann Tierzucht Inc., N.A.	H&N Nick Chick
8	Centurion Poultry Inc.	Bovans White
9	Centurion Poultry Inc.	Hisex White
10	Centurion Poultry Inc.	Bovans Robust
11	ISA North America	ISA Brown
12	Hy-Line International	Hy-Line Brown
13	Hy-Line International	Hy-Line Silver Brown
14	Centurion Poultry Inc.	Bovans Brown
15	Centurion Poultry Inc.	Hisex Brown
16	Centurion Poultry Inc.	Dekalb Amber Link

Dates of Importance:

The eggs were placed into trays and set on May 15, 2007 and were pulled from the hatchers on June 6, 2007. The chicks from each strain were all sexed according to their genetics (feather, or color), vaccinated for Marek's disease, banded for identification.

Data Collection:

Serology: The serum samples were obtained by collecting a blood sample from 30 male chicks obtained from each strain at the time of hatch. The blood was allowed to agglutinate and the serum to separate for collection. The serum samples were then pooled by combining the individual samples from two chicks per strain into 1 ml samples or aliquots. The pooled samples were collected and packaged and refrigerated until delivery to the NCDA & CS Rollins Diagnostic Laboratory. Table 2 gives the findings for the pooled samples provided from each strain. The serological tests were conducted for Infectious Bursal Disease using the Agar Gel Immuno Diffusion (AGID) method and Mycoplasma gallisepticum using the ELISA test.

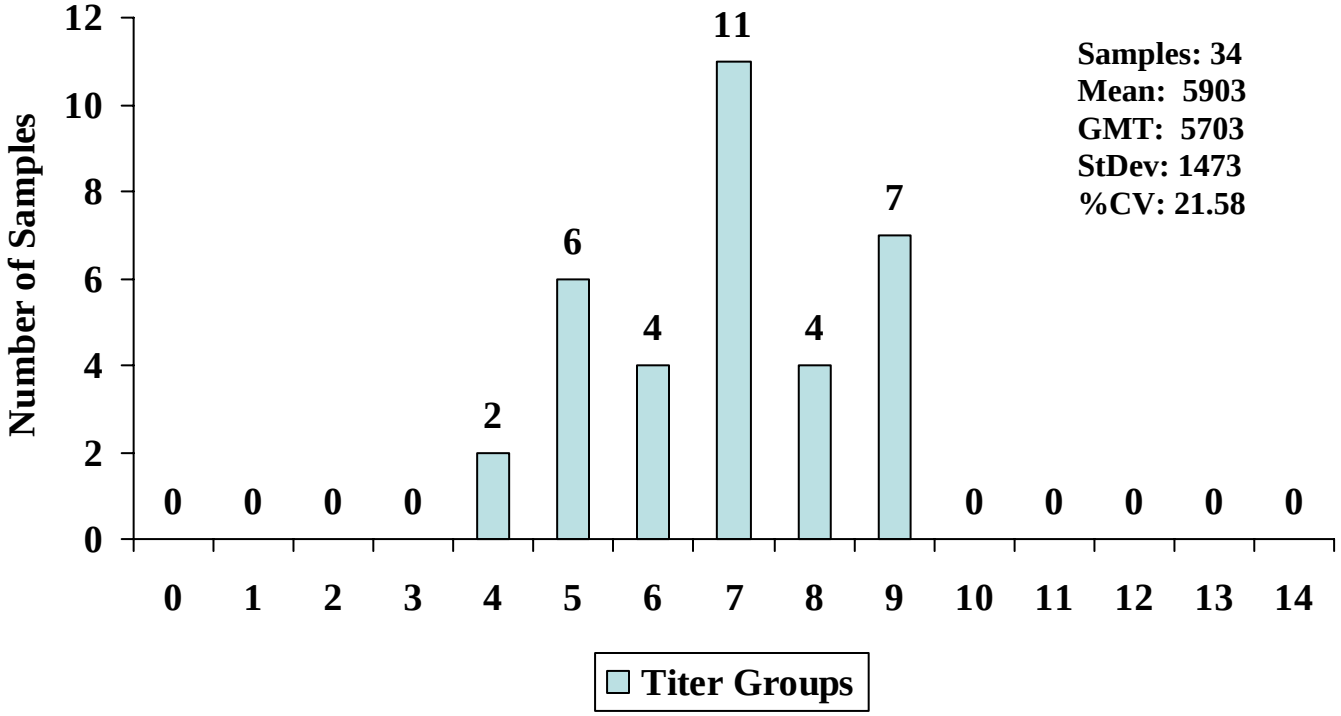
The serum pools were adequate for each of the 16 strains. Serology results for MG and IBD are shown in Table 2. The samples were tested at the NC Department of Agriculture & Consumer Services, Rollins Diagnostic Laboratory for MG and by Synbiotics Corp for IBD. The chicks were MG negative and the IBD antibody levels were positive, indicative of a reasonable breeder vaccination programs in the breeder flocks of all strains. IBD titers were present in all the strains and the titer levels for the individual samples appeared to have a greater variation between strains than seen in previous reports.

Table 2. Status of the IBD parental immunity and determination of MG presence in the participating strains in the 36th NCLP&MT

Strain	MG[1]	IBD[2]	
Hy-Line W-36	Neg	6950	7692
Hy-Line W-98	Neg	5778	6477
Hy-Line CV-22	Neg	7655	8091
Shaver White	Neg	8139	7982
Dekalb TX	Neg	3499	2544
Lohmann LSL-Lite	Neg	4910	5376
H&N Nick Chick	Neg	7116	7260
Bovans White	Neg	3575	3834
Hisex White	Neg	4495	4384
Bovans Robust	Neg	5674	6080
ISA Brown	Neg	5640	5998
Hy-Line Brown	Neg	7812	7800
Hy-Line Silver Brown	Neg	5536	5674
Bovans Brown	Neg	6395	6021
Hisex Brown	Neg	6595	6348
Dekalb Amber Link	Neg	5421	4417

[1]MG status was determined using the ELISA method
[2]IBD status was determined using Agar Gel Immune Diffusion (AGID) by Synbiotics Corp

Figure 1. Distribution of strain serum samples across titer groups



Hatch and Hatch Residues: The analysis of fertility and embryonic mortality was conducted on a random sample of the egg and hatch residues remaining in the hatching trays on the hatch day. Table 3 shows the percent usable chicks, cull chicks, and residue of the total eggs set. Table 4 shows the distribution of the residue by each embryonic category and is based upon the percentages based upon the total residue.

Table 3. Analysis of hatch by evaluating chicks pulled, female, male, and cull chicks as a percentage of the total eggs set

Strain	Chicks Pulled	Female Chicks[1]	Male Chicks	Cull Chicks	Total Egg Residue
	----------%----------				
Hy-Line W-36	83.58	41.65	41.93	1.46	14.96
Hy-Line W-98	57.65	29.06	28.58	2.22	40.13
Hy-Line CV-22	65.04	33.85	31.19	3.33	31.63
Shaver White	81.93	35.29	46.64	0.97	17.09
Dekalb TX	69.22	32.21	37.01	2.08	28.69
Lohmann LSL-Lite	72.09	35.64	36.44	0.97	26.94
H&N Nick Chick	63.79	31.88	31.92	2.08	34.12
Bovans White	90.77	44.80	45.97	0.28	8.95
Hisex White	51.90	25.63	26.27	1.88	46.22
Bovans Robust	78.13	38.42	39.71	0.49	21.38
ISA Brown	60.25	36.01	24.24	0.76	38.99
Hy-Line Brown	78.26	39.83	38.43	0.42	21.31
Hy-Line Silver Brown	61.34	27.35	33.98	1.94	36.72
Bovans Brown	75.55	36.65	38.91	0.35	24.10
Hisex Brown	67.39	33.29	34.10	0.78	31.83
Dekalb Amber Link	47.39	36.55	10.84	0.28	52.33

[1]Calculated as a percentage of total eggs set.

Table 4. Analysis of breakout on eggs set to determine cause of embryo mortality as percent of residue

Strain	Infertile	Early Dead		Dead		Air Cell		Piped		Contam[1]	Abnormal		Upside Down[3]	Crack
		Mem	Blood	Mid	Late	Pre-pip	Post-pip	Live	Dead		Shell[2]	Embryo		
		---------- % ----------												
Hy-Line W-36	19.55	7.82	10.61	7.82	6.15	21.79	9.50	8.94	1.12	1.68	0.00	1.12	1.68	2.23
Hy-Line W-98	17.93	8.32	9.61	15.34	12.57	21.81	2.40	3.70	1.66	3.70	0.18	0.00	1.29	1.48
Hy-Line CV-22	18.03	9.84	7.49	3.28	3.51	27.87	5.39	14.05	3.75	1.17	0.23	0.47	3.51	1.41
Shaver White	36.93	11.62	10.79	2.07	2.49	14.94	4.15	9.54	3.32	0.83	0.00	0.83	1.66	0.83
Dekalb TX	40.55	17.26	3.84	1.37	7.12	4.11	3.29	19.18	2.74	0.00	0.00	0.55	0.00	0.00
Lohmann LSL-Lite	25.29	23.55	12.79	4.07	13.08	7.56	4.36	3.78	0.87	1.16	0.00	0.29	0.29	2.91
H&N Nick Chick	8.46	35.43	16.54	4.33	18.70	3.74	1.18	4.13	1.57	3.54	0.00	0.00	0.00	2.36
Bovans White	25.62	13.22	2.48	9.92	5.79	20.66	4.13	4.96	4.96	4.96	0.00	0.83	0.00	2.48
Hisex White	62.00	8.11	2.23	4.93	1.43	10.02	1.27	3.18	1.59	1.27	0.32	0.16	0.32	3.18
Bovans Robust	47.64	7.77	9.80	5.07	3.04	9.12	3.72	8.45	5.07	0.34	0.00	0.00	0.00	0.00
ISA Brown	19.25	27.55	11.32	8.68	6.79	11.70	5.66	0.75	1.89	1.89	0.00	0.38	0.38	3.77
Hy-Line Brown	17.65	16.54	5.51	5.88	15.07	28.68	5.51	1.10	1.47	0.37	0.00	0.00	1.47	0.74
Hy-Line Silver Brown	30.04	21.79	8.42	4.95	12.45	8.61	2.01	3.11	2.93	2.01	0.55	0.18	0.18	2.75
Bovans Brown	20.90	13.43	5.97	5.67	18.21	16.72	5.67	3.88	6.87	1.49	0.30	0.00	0.90	0.00
Hisex Brown	24.65	14.79	6.57	3.99	8.69	15.02	5.40	9.62	8.92	0.23	0.00	1.64	0.23	0.23
Dekalb Amber Link	41.51	20.75	7.28	2.43	12.67	6.47	2.43	1.62	2.70	0.54	0.00	0.27	0.27	1.08

[1]Contaminated eggs.
[2]Abnormal shell structure.
[3]Eggs set with the small end up.

Housing: The chicks were weighed then randomly assigned to the growing replicates with white egg and brown egg replicates being intermingled throughout the rooms within the house. The white egg strains occupied approximately 66 % of the house and brown egg strains occupied the other 34 % 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. This allows for a total of 3,744 pullets per room. Rooms 1 to 4 were used for the 36^{th} 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. Paper was placed on the cage floor for the first 7 days within each of the replicate series within each row. Each cage within the replicate was filled with 13 white-egg or brown-egg (13 per 24" x 26" cage) pullets on the day of hatch for a rearing allowance of 48 in^2 (310 cm^2). 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.

Table 5. Entries in the 36th NCLP&MT by Breeder, Stock Suppliers, and Categories

Breeder	Stock	Category[1]	Source
Hy-Line International 2583 240th Street Dallas Center, IA 50063	W-36	I-A	Hy-Line International 4432 Highway 213, Box 309 Mansfield, GA 30255
	W-98	I-A	Hy-Line International 17458 G. Avenue Perry, IA 50220
	Hy-Line Brown	I-A	Same
	Hy-Line Silver Brown	I-A	Dallas Center Research Farm 2418 N Ave. Dallas Center, IA 50063
	CV-22	I-A	Same
Lohmann Tierzucht Gmbh Am Seedeich 9-11 . P.O.Box 460 D-27454 Cuxhaven, Germany	Lohmann LSL-Lite	I-A	Hy-Line North America 79 Industrial Rd E-town, PA 17022
H&N International 321 Burnett Ave South, Suite 300 Renton, Washington 98055	H&N "Nick Chick"	I-A	Feather Land Farms 32832 E. Peral Road Coberg, OR 97408
Centurion Poultry, Inc. P.O. Box 591 Lexington, Georgia 30648	Bovans White	I-A	CPI-South Central Hatchery 5087 County Road 35 Bremen, AL 35033
	Bovans Robust	II-A	(Same)
	Bovans Brown	I-A	(Same)
Centurion Poultry, Inc. P.O. Box 591 Lexington, Georgia 30648	Hisex White	I-A	(Same)
	Hisex Brown	I-A	(Same)
Centurion Poultry, Inc. P.O. Box 591 Lexington, Georgia 30648	Dekalb TX	I-A	(Same)
	Dekalb Amber Link	II-A	(Same)
Instiut de Selection Animale (A Hendrix Genetic Company) ISA North America 650 Riverbend Drive, Suite C Kitchener, Ontario N2K 3S2 Canada	Shaver White	II-A	McKinley Hatchery P O Box 1900 772 Queen Street St. Mary's, Ontario N4X 1C2 Canada
	ISA Brown	II-A	(Same)

[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