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Comparative Performance of Several Broiler Strains and Crosses With White or Near-White Plumage Color

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The tests reported in this bulletin were designed to give some indication of the growth and yielding performance of several white and near-white plumaged broiler strains and crosses. *It cannot be too strongly emphasized that the results of this trial apply only to the birds tested and under a given set of environmental conditions. Because of sampling variations and differences in environments, repeated testing is necessary to reliably evalwate the real performance of strains and crosses.* It is suggested that hatcherymen and growers use the results of this trial only as an indication of performance of several strains or crosses which might be tested under their own environmental conditions. Only by repeated trials with several stocks will the producer be able to select the stock that will make the most money for him.

Results of this one trial are not to be interpreted from the viewpoint of competition among the strains or crosses tested.

Over 14 breeders and hatcheries, listed on page 6. helped to make this test. Their interest and cooperation are sincerely appreciated.

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During the past few years there has been an increasing demand for broiler chickens with white or near-white plumage color. Of the reasons given for demanding a white chicken, the one most commonly heard is that white chickens dress out better and faster, thus presenting a better product to the consumer.

Breeders have responded by producing many new strains or crosses of white-plumaged broilers. These strains or crosses are so new that Oklahoma broiler growers have not had an opportunity to evaluate them. This trial was run in order to help Oklahoma growers evaluate some of the most promising of these new stocks.

How the Trial was Run

Thirty dozen hatching eggs were secured from each breeder or hatchery. All eggs were set on the evening of October 8, 1954. The chicks hatched on October 30. Chicks of each strain or cross were vaccinated intranasally for Newcastle Disease, and randomly allotted to pens. They were grown intermingled in lots of 460 chicks per lot, with one square foot of floor space per bird. Gas brooders were used. All birds were fed Oklahoma formula Ex-54, a copy of which may be obtained from the Poultry Department.

Data were collected on hatchability, feathering, individual body weight by sexes at 8 weeks, 5 days of age, mortality, and off-color plumage.

A random sample of 10 males and 10 females were selected at the end of the trial to secure dressing data. All birds were treated uniformly. Feed was withheld 2 to 3 hours before slaughter. All birds were scalded at approximately 130°F. and picked on a mechanical picker.

Less than 3 hours elapsed between picking and evisceration. All birds were cut up by one person.

Key to Strains or Crosses

To simplify the tables, an abbreviation is used to identify each strain or cross. In identifying crosses, the male parent is listed first in all tables.

W.R.	White Rock
D.W.R.X.	Dominant White Rock Cross
S.B.	Silver Oklabar
N.H.	New Hampshire
Lanc.	Lancaster
S.B. X N.H.	Silver Oklabar males crossed on New Hampshire females
#12	Nichols Line 12 females
Wh. Ace	White Ace

Names and Addresses of Breeders and Hatcheries

1. Nedlar Farms, Inc., Peterborough, New Hampshire
2. Cobb's Pedigree Chicks, Inc., Concord, Massachusetts
3. Hubbard Farms, Inc., Walpole, New Hampshire
4. Parkin Hatchery, Shawnee, Oklahoma
5. Indian River Poultry Farm, Inc., Lancaster, Pennsylvania
6. Sunny Acres Poultry Farm, Greenland, New Hampshire
7. F. J. Frizzell Peachblow Farm, Charlestown, New Hampshire
8. Holtzapple White Rock Farm, Elida, Ohio
9. Sturtevant Farms, Inc., Halifax, Massachusetts
10. Coleman Research Farm, New Brunswick, Maine
11. Pilch's Poultry Farm, Hazardville, Connecticut
12. Arbor Acres Poultry Farm, Glastonbury, Connecticut
13. Oklahoma Agric. Experiment Station, Stillwater, Oklahoma
14. Embry Hatchery, Blackwell, Oklahoma
15. Oklahoma Agric. Experiment Station, Stillwater, Oklahoma
16. Cotton Mountain Farms, East Wolfeboro, New Hampshire

Results

Methods of Shipping Hatching Eggs

All breeders shipped one case (360 eggs) of eggs either by air express, railway express or by truck. All eggs were shipped in standard fiber board cases. Three cases of eggs were shipped by air express,

nine cases by railway express, two cases by truck, and two cases were produced on the A. & M. College Farm. Those shipped by air express had 4.6 percent cracked or broken eggs. Similar figures for railway express and truck were 2.6 and 2.4 percent. No definite conclusions can be drawn from these figures because of uncontrolled variables such as shipping distance, type of flats used, etc.

Hatchability

Fertility and hatchability data are shown in Table 1 on page 9. It is well known that hatchability is affected by temperature to which eggs are subjected prior to incubation. The average high temperature in Stillwater for the first four days of October, when most of these eggs were in transit, averaged 90°F. These eggs were subjected to a wide variety of conditions enroute to Stillwater, in addition to high temperatures. Little, if any, significance should be attached to the data on hatchability.

Shipping hatching eggs long distances during hot weather is a problem to Oklahoma hatcherymen. A comparison of the hatchability of eggs shipped from varying distances for this trial illustrates this problem.

Source of Eggs	Percent H.F.	Percent H.T.
New England	71.0	58.2
Ohio and Pennsylvania	74.1	67.5
Oklahoma	89.6	75.4

Thus, if hatching eggs are purchased from distant States, purchase them during cool seasons of the year, or take special shipping precautions to protect the eggs against unfavorable environmental conditions.

Growth Data

Data on feathering, body weight, mortality and off-color plumage are shown in Table 2 on page 10. Rate of feathering at 14 days ranged from 26 to 100 percent. Less than 3 percent of all broilers were "barebacks" at the end of the trial. Only three Dominant White crosses had more than 10 percent of the birds with plumage color that deviated from the expected. In most cases, the undercolor of such birds was very light or white. Mortality was low for most strains and crosses.

Body weights were taken when 8 weeks, 5 days old because Oklahoma buyers prefer broilers averaging between 2¾ pounds and 3 pounds live weight. The range in average body weight for all strains and crosses was only 0.4 pound, but the differences in body weight between strains and crosses were highly significant statistically.

The feed efficiency of all birds in the trial was 2.53 pounds; that is, 2.53 pounds of feed were required for each pound of weight gained. Feed efficiency for each strain or cross could not be measured because the birds were intermingled during the growing period. However, it is well known that there is a very close relationship between growth rate and feed efficiency; therefore, the heaviest strains or crosses had a more efficient feed utilization than did the lighter strains or crosses.

Dressing Data

Table 3 on page 11 lists the percentage of live weight remaining after bleeding, after picking, and after visceration for each strain or cross. In addition, this table shows the percentage of the eviscerated weight for each of the parts—wings, legs, thighs, neck, back, breast, and giblets.

Statistical analysis of the eviscerated weights, after being adjusted for differences in live weight, indicate that some strains and crosses have a higher eviscerated yield than others. However, these differences are small and based on only a 20-bird sample. Thus, they should not be taken as conclusive evidence of superiority or inferiority of the various strains or crosses in eviscerated yields, but only as an indication.

Table 1—Fertility and Hatchability

Breeder	Breed or Cross	No.* Set	No. Chicks	Percent Fertility	Percent H.F.	Percent H.T.	No. Cull** Chicks
1. Larrabee	Wh. Ace	348	210	83.3	68.6	57.2	11
2. Cobb	W.R.	333	182	78.9	66.2	52.2	8
3. Hubbard	D.W.R. X	346	197	80.3	69.1	55.5	5
4. Silvey	S.B. X N.H.	350	263	86.2	85.1	73.4	6
5. Ellis	Lanc. X #12	353	213	90.6	65.6	59.5	3
6. Amee	W.R.	354	211	84.4	68.6	57.9	6
7. Frizzell	Peachblow	338	205	86.9	68.4	59.5	4
8. Holtzapple	W.R.	339	261	91.4	82.9	75.8	4
9. Sturtevant	D.W.R. X	348	206	80.7	71.2	57.5	6
10. Coleman	#512	355	257	88.7	78.7	69.8	9
11. Pilch	W.R.	358	224	81.2	75.2	61.2	5
12. Arbor Acres	W.R.	352	158	71.9	62.4	44.9	0
13. Okla. A&M	S.B. X N.H.	352	269	82.1	90.3	74.1	8
14. Embry	S.B. X N.H.	351	281	86.0	92.4	79.5	2
15. Okla. A&M	S.B.	351	264	82.0	90.6	74.4	3
16. Thurrell	W.R.	349	240	83.0	79.3	65.9	10
Total & Average		5577	3641	83.6	76.1	63.7	5.6

* Difference between number eggs shipped (360 in each case) and number set gives the number of eggs cracked or broken during shipment.
** Obviously crippled, deformed or of poor vigor.

Table 2—Growth Data

Breeder	Breed or Cross	Percent Fast Feathering At 14 Days	Average Body Weight 8 Wks. 5 Days				Percent Mortality	Percent Off-color Plumage	Percent Barebacks
			Male	Female	Av.	C.V.*			
1. Larrabee	Wh. Ace	89.8	3.18	2.59	2.88	15.6	3.6	0.0	1.6
2. Cobb	W.R.	78.9	3.38	2.79	3.08	13.2	1.7	0.0	2.3
3. Hubbard	D.W.R. X	62.1	3.01	2.55	2.78	13.3	2.7	11.2	2.8
4. Silvey	S.B. X N.H.	77.0	3.06	2.49	2.78	14.9	2.3	0.0	1.6
5. Ellis	Lanc. X #12	25.8	3.27	2.67	2.97	14.4	1.9	1.0	3.4
6. Amee	W.R.	56.9	2.99	2.49	2.74	13.6	4.4	0.0	4.1
7. Frizzell	Peachblow	82.2	3.24	2.69	2.96	13.5	2.0	28.5	4.1
8. Holtzapple	W.R.	95.8	3.10	2.59	2.84	12.4	1.2	0.0	1.6
9. Sturtevant	D.W.R. X	41.5	3.05	2.39	2.72	16.8	4.1	41.7	3.7
10. Coleman	#512	54.1	3.46	2.83	3.14	14.4	3.3	2.5	2.9
11. Pilch	W.R.	82.0	3.34	2.71	3.02	13.4	3.9	0.0	6.5
12. Arbor Acres	W.R.	72.9	3.29	2.71	3.00	13.5	6.2	0 0	2.5
13. Okla. A&M	S.B. X N.H.	100.0	3.21	2.55	2.88	14.7	1.9	0.5	0.5
14. Embry	S.B. X N.H.	100.0	3.14	2.56	2.85	13.4	4.4	0.5	1.4
15. Okla. A&M	S.B.	98.9	3.06	2.52	2.79	13.7	3.3	5.7	1.7
16. Thurrell	W.R.	70.7	3.13	2.62	2.88	13.3	3.6	0.0	3.7
Average		74.3	3.18	2.60	2.89	14.7	3.1	5.7	2.7

* As the uniformity of the birds increases, the numerical value of the coefficient of variations (CV) decreases.

Table 3—Dressing Data

	Breeder	Breed or Cross	Percentage of live weight			Percentage of eviscerated weight						
			After Bleeding	After Picking	After Eviscer-ation	Wings	Legs	Thighs	Neck	Back	Breast	Giblets
1.	Larrabee	Wh. Ace	96.0	88.0	67.7	13.3	15.0	16.1	6.4	17.6	25.8	5.8
2.	Cobb	W.R.	95.9	87.9	68.3	12.9	14.9	15.9	6.7	18.0	25.8	5.8
3.	Hubbard	D.W.R. X	95.6	87.4	68.3	13.1	15.0	16.5	6.6	18.1	24.5	6.2
4.	Silvey	S.B. X N.H.	95.8	87.6	68.3	13.6	14.8	16.3	7.0	18.4	23.5	6.4
5.	Ellis	Lanc. X #12	95.6	86.9	68.7	13.5	15.4	16.7	6.5	17.8	24.3	5.8
6.	Amee	W.R.	96.1	88.0	68.4	13.2	14.7	15.6	6.6	18.0	25.4	6.5
7.	Frizzell	Peachblow	96.0	88.8	69.3	13.6	14.5	16.0	6.6	18.2	25.3	5.8
8.	Holtzapple	W.R.	95.6	87.7	67.6	13.3	15.1	15.8	6.6	17.9	25.1	6.2
9.	Sturtevant	D.W.R. X	95.6	87.0	67.4	13.5	14.9	16.4	6.6	18.3	24.1	6.2
10.	Coleman	#512	95.7	87.9	67.7	13.4	14.8	16.6	6.9	18.6	23.9	5.8
11.	Pilch	W.R.	96.0	88.0	68.9	13.1	14.8	16.2	6.5	18.1	25.3	6.0
12.	Arbor Acres	W.R.	95.7	88.3	68.6	12.9	15.0	16.0	6.5	18.0	25.5	6.1
13.	Okla. A&M	S.B. X N.H.	95.5	86.8	67.5	13.6	14.8	16.6	6.7	18.8	23.5	6.0
14.	Embry	S.B. X N.H.	95.5	86.5	68.0	13.4	14.7	16.5	7.0	18.2	24.1	6.1
15.	Okla. A&M	S.B.	97.3	86.9	68.3	13.9	14.5	16.1	6.4	18.5	24.4	6.2
16.	Thurrell	W.R.	95.9	87.7	68.7	13.1	14.8	16.1	6.7	18.4	24.9	6.0
Average			95.9	87.6	68.2	13.3	14.8	16.2	6.6	18.2	24.7	6.0