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The Feeding Value of Different Grades of Yellow Corn for Broilers

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SUMMARY AND CONCLUSIONS

● Four experiments involving 3,400 broilers were conducted to compare the gross feeding value of different grades of yellow corn for broilers. Birds in the first two experiments were kept in floor pens for the entire growing period, whereas birds in the third and fourth experiments were kept in starting batteries for 4 weeks and then transferred to floor pens for the remainder of the growing period.

● The results of these experiments indicate that:

1. Growth rate, feed efficiency and feathering of broilers fed diets containing Sample Grades of yellow corn containing either 30 percent cracked kernels, 15 percent damaged kernels, or 30 percent damaged kernels were equal to those broilers fed a comparable diet containing No. 2 yellow corn.

2. The feeding of diets containing a Sample Grade of yellow corn with 55 percent damaged kernels resulted in increased growth rate of females grown in floor pens, when compared to a similar group receiving No. 1 yellow corn. However, when these lots of corn were studied in batteries, this difference was not found to exist. Body weights of males receiving these diets were found to be equal, whether started in batteries or in floor pens. Feed efficiencies obtained from feeding these two grades of corn were found to be equal in both experiments.

3. The feeding of a diet containing Sample Grade of corn (30 percent damage, most of which was from "blue eye") resulted in producing females which weighed more than those fed the diets containing No. 2 yellow corn. No significant differences could be detected between the average weights of males or in feed efficiencies.

4. The skin of broilers receiving diets containing No. 1 and No. 2 yellow corn were more deeply pigmented than skin of birds receiving Sample Grades of corn (30 percent damage, Experiment 4, or 55 percent damage, Experiment 2).

5. No mortality was attributed to feeding any of the lots of damaged corn used in these experiments.

● Data obtained from these studies indicate that many Sample Grades of yellow corn can be safely fed to broilers and results equal to those from feeding No. 2 yellow corn can be expected. However, the suggestion which Peck (1946) made in a review on the feeding value of moldy corn would still be a safe suggestion to follow. He suggested that a few animals or birds be fed large amounts of moldy feed for 4 or 5 days, and if no ill effects are noted, the feed in question might then be fed to other animals.

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by

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The feeding value and economic worth of the various grades of corn for poultry has long been a question confronting poultrymen. (Classification of grades of corn is shown in the appendix.)

REVIEW OF LITERATURE

Ronk and Carrick (1931) reported a series of experiments involving the feeding of moldy corn to chicks. They found that chicks receiving 20 percent moldy corn and 30 percent No. 2 corn grew as rapidly as those receiving 50 percent No. 2 corn. However, chicks fed 30 or 40 percent of moldy corn in the ration grew less rapidly than those receiving either 20 percent of moldy corn or 50 percent of No. 2 corn. They concluded that no mortalities, except possibly one due to aspergillosis, could be attributed to the moldy corn used in these experiments.

According to Peck (1946), University of Illinois workers found that pigs fed moldy corn gained 1.44 pounds per day as compared to 1.66 pounds per day for the control pigs. They reported no mortality among the lot fed the moldy corn.

Johnson **et al.** (1945) published work concerning the feeding of moldy corn to hogs, cattle, and sheep. They reported that hogs fed moldy corn did not gain as fast as those fed sound corn. They also reported that soft moldy corn was palatable to cattle and sheep. They found that lambs receiving hard corn gained .02 pounds per day more than did the lambs receiving the moldy corn. These workers observed no digestive disturbances when the moldy corn was fed to steers.

Mitchell and Beadles (1940) studied the effect of molds on the nutritive value of corn. **Diplodia Zeae, Fusarium moniforme,** and **Gibberella Zeae** were the three molds studied. The samples of corn fed were artificially inoculated. They found that the gross energy of moldy corn was reduced by 13 percent and that corn containing as much as 53 percent of kernels damaged by **Gibberella Zeae** (Schw.) Pitch. (G. saubenitie [Mont.] Sacc.) was extremely toxic to young albino rats.

Damaged corn usually has a lower market value than does No. 2 corn and often is difficult to market. Also, as the feeding value of damaged corn in broiler diets was unknown, a study to determine the feeding value of damaged corn for broilers was designed. Four experiments were conducted, the results of which are presented.

Data in all experiments were analyzed using analysis of variance according to Snedecor, 1956.

EXPERIMENT 1

Procedure. — Twelve lots, each containing 100 straight-run White Plymouth Rock chicks, were started June 24, 1955. These birds were intra-ocularly vaccinated at 1 day of age for Newcastle disease and bronchitis.

Four experimental diets were formulated using four lots of yellow corn as shown in Table 1. These types of damage were determined by a U. S. official grain inspector. A comparison of these lots of corn by various chemical analysis is shown in Table 2.

One square foot of floor space was allowed for each bird. Wood shavings were used as litter. Infra red bulbs were used for brooding. Water was supplied by the use of one 4-foot automatic watering trough per pen. At no time did the chicks have less than 2.3 inches of feeder space per bird.

At 10 weeks of age all birds were individually weighed, and degree of feathering was measured. A score of "3" was allowed for those birds completely feathered, a score of "2" for those exhibiting medium feathering, and a score of "1" for those birds exhibiting many pin feathers.

RESULTS

The use of yellow corn containing either 30 percent cracked kernels, 15 percent damaged kernels or 30 percent damaged kernels

resulted in broiler growth equal to the growth rate obtained from feeding No. 2 yellow corn (Table 3). Growth rate obtained in all groups was inferior to growth rate obtained in later trials. This was due in part to source of stock and to the extremely hot summer weather.

The degree of feathering or utilization of feed by birds receiving either of the three damaged grades of yellow corn was not significantly different from that for birds receiving the No. 2 yellow corn. No significant difference could be detected in mortality between any of the four experimental groups, which would indicate that each of these samples of corn was satisfactory for feeding broilers. The exact type of damage of these samples of corn was not reported by the grader although the damage observed consisted of mold, discolored grain, cob rot, shriveled grain, etc. Therefore it should not be concluded that all damaged corn might be a satisfactory feed ingredient. Some types of mold found in samples of corn could be toxic to chicks.

EXPERIMENT 2

Procedure. — Twelve lots of straight-run broiler chicks (White Plymouth Rocks) consisting of 101 birds each were started November 4, 1955. Each bird was vaccinated by the intra-ocular method at 1 day of age for infectious bronchitis and Newcastle disease. Heat was furnished during the brooding period by the use of infra red bulbs. Wood shavings were used as litter. One square foot of floor space was allowed for each bird. Feed and water were supplied **ad libitum.** The water was supplied by the use of one 4-foot automatic watering trough per pen. A minimum of 2.3 inches of feeder space per chick was provided.

The feeding value of two grades of corn was studied in this experiment. The amount of each type of damage in each lot of corn is shown in Table 4, with the amount of moisture, protein and free fatty acids contained in each lot of corn shown in Table 5. The composition of two basal diets employed in this study is shown in Table 6. The third basal was formulated by mixing 40 percent of a commercial supplement and 60 percent of corn. Two experimental diets were formulated with each basal using a No. 1, and a Sample Grade of yellow corn resulting in a total of six experimental feeds.

At 10 weeks of age all birds were individually weighed, and a random sample of birds—15 males and 15 females from each treatment group—were slaughtered and a comparison of pigmen-

tation made. Pigmentation scores were obtained by using a ranking of "1" to "7", with "7" being the more deeply pigmented.

RESULTS

The average 10-week weight of broilers is shown in Table 7. No significant difference could be detected between the males receiving these two grades of yellow corn. The females receiving the No. 1 grade of yellow corn had an average weight of 3.01 pounds as compared to 3.07 pounds for those fed the Sample Grade of corn. This difference was found to be significant at the .05 level of probability.

A highly significant interaction was found to exist between the grades of corn and the three basal diets. This interaction was brought about by the damaged corn decreasing growth when used with the high protien diet, and increasing growth when fed with the commercial supplement. Possibly this indicates that the damaged corn contained less energy than did the No. 1 yellow corn, as a higher level of energy would have been required in the high protein diet.

There were no significant differences in feed efficiencies obtained from feeding the two grades of corn. A significant interaction on feed efficiency was obtained between the three basal diets and the two grades of corn. This interaction was due to the improvement in feed efficiency when damaged corn was fed with the commercial supplement and a decrease when fed with the other two basal diets.

A highly significant difference in pigmentation was found to exist between the group of broilers fed the No. 1 corn and those fed the Sample Grade of corn. The birds receiving the No. 1 corn possessed the more deeply pigmented skin. This would indicate that much of the carotinoid pigments had been lost from the Sample Grade of corn. No pigmentation difference was detected between sex.

Mortality of birds fed the Sample Grade of yellow corn was slightly lower than obtained from feeding the No. 1 corn. However, this difference was not found to be statistically significant.

EXPERIMENT 3

Procedure. — White Plymouth Rocks were sexed at 1 day of age and placed in electrically heated starting batteries. They were maintained in these batteries until they were 4 weeks of age, when

they were individually weighed, vaccinated for Newcastle disease and bronchitis by the intra-ocular method and moved to floor pens. Infra red bulbs were used for brooding in the floor pens, and wood shavings were used for litter. Feed and water were fed **ad libitum.**

The two grades of corn used in Experiment 2 (Tables 4 and 5) were again studied. Each lot of corn was used with each basal diet shown in Table 8, resulting in four experimental diets. Two pens of males and two pens of females (25 birds per pen) were fed each of these experimental diets.

RESULTS

The average body weights of broilers receiving the diets containing Sample Grade of corn were equal to those obtained from feeding No. 1 corn (Table 9). Birds receiving Sample Grade corn in the high energy diet were found to be slightly heavier than those receiving the diet containing the No. 1 corn. The opposite was found to exist when comparing the growth rate obtained from feeding the two lots of corn with the low energy diet. However, these differences were not enough to cause a significant interaction of diet with grade of corn.

Mortality was very low in this experiment and none was attributed to feeding damaged corn. Feed efficiency of birds receiving diets containing the Sample Grade of corn was equal to that obtained from feeding the No. 1 corn.

EXPERIMENT 4

Procedure. — In this study, a Sample Grade of corn (Table 10) was compared with No. 2 corn as to feeding value for broilers. White Plymouth Rock chicks were used. They were sexed at 1 day of age and randomly assorted into their respective pens in electrically heated batteries. They were maintained in these batteries until 4 weeks of age when they were moved to floor pens with wood shavings used as litter. Each bird was vaccinated by the intra-ocular method at 4 weeks of age for Newcastle disease and bronchitis.

Two pens of males and two pens of females (25 birds per pen) were fed each of the experimental diets as shown in Table 11. All birds were individually weighed at 4 and 10 weeks of age.

At 10 weeks of age, 15 birds from each pen were selected at random to be slaughtered. These birds were used in making com-

parisons on pigmentation, fleshing, market grade, and dressing losses. Pigmentation scores were ranked "1" to "6". Market grade and fleshing scores were ranked "1" to "3". In each instance the higher score indicated the better quality. The necks and giblets were not included in the eviscerated weight used in calculating evisceration losses.

RESULTS

Females receiving the diets containing the Sample Grade of corn were significantly heavier than those receiving the diets containing the No. 2 corn (Table 12). No significant difference could be detected in the weight of the males. Feed efficiencies obtained from feeding these lots of corn were found to be equal.

Pigmentation scores of birds fed No. 2 corn were found to be significantly better than those fed the damaged corn. The use of damaged corn resulted in a slight depression of fleshing and market grade; however, neither of these were statistically significant. The dressing percentages of birds receiving the damaged corn were significantly greater than those receiving the No. 2 corn.

ACKNOWLEDGEMENTS

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The arsanilic acid and menadione sodium bisulfite were supplied through courtesy of Abbott Laboratories, North Chicago, Ill. Calcium pantothenate, niacin, Vitamin A, Vitamin B_{12}, choline chloride, and procaine penicillin were supplied through the courtesy of Chas. F. Pfizer, & Co., Inc., Terre Haute, Indiana.

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APPENDIX—Grades For Corn[1]

No. 1. Cool and sweet, not less than 55 pounds to the bushel, not over 14 percent moisture; not more than 2 percent foreign material and not more than 2 percent of damaged corn; there shall be no heat damage.

No. 2. Cool and sweet, not less than 53 pounds to the bushel, not over 15.5 percent moisture; not more than 3 percent foreign material and not more than 4 percent damaged corn; not more than 0.1 percent heat damage.

No. 3 Cool and sweet, not less than 51 pounds to the bushel, not over 17.5 percent moisture; not more than 4 percent foreign material and 6 percent damaged corn; not more than 0.3 percent heat damage.

No. 4 Cool and sweet, not less than 49 pounds per bushel, not over 19.5 percent moisture; not more than 5 percent foreign material and 8 percent damaged corn; not more than 0.5 percent heat damage.

No. 5 Cool and sweet, not less than 47 pounds per bushel, not over 21.5 percent moisture; not more than 6 percent foreign material and 10 percent damaged corn; not more than 1 percent heat damage.

No. 6 Cool but may be musty or sour, not less than 44 pounds per bushel, not over 23 percent moisture; not more than 7 percent foreign material and 15 percent damaged corn; not more than 3 percent heat damage.

Sample grade. Sample grade shall be corn which does not come within the requirements of any of the grades "1" to "6", inclusive, or which has any commercially objectionable foreign color, or is heating, hot, infested with live weevils or other insects injurious to stored grain, or is otherwise of distinctly low quality.

[1] Taken from **Feeding Poultry**, 2d Ed. Willey, Gustave F. Heuser (1955)

Table 1. — *Composition of Diets, Experiment 1*

Ingredients	Lb./cwt.
Yellow Corn[1]	57.4
Soybean oil meal (44% Protein)	27.0
Fish meal	5.0
Meat scraps	2.5
Alfalfa leaf meal	2.5
Dried whey	2.5
Ground limestone	1.2
Defluorinated rock phosphate	1.0
Salt	0.5
Vitamin mix[2]	0.4

[1] Diet No. 1 No. 2; Diet No. 2 30% Cracked Kernels; Diet No. 3 15% Damaged Kernels; Diet No. 4 30% Damaged Kernels.

[2] Supplied per lb. of feed: 0.9 mg. riboflavin, 4.8 mg. calcium pantothenate, 19 mg. niacin, 4.6 mcg. vitamin B_{12}, 1,050 I.C.U. vitamin D_3, 1,737 I.U. vitamin A, 2 mg. procaine penicillin, 45 mg. arsanilic acid, 0.08 gm. $MnSO_4$ and 2.5 mg. nitrofurazone.

Table 2.—*Amount of Various Nutrients in Lots of Corn Used in Experiment 1*[1]

Grade of yellow corn	Moisture %	Protein %	Fat %	Carotene units/lb.	Riboflavin mg./lb.	Panothenic acid mg./lb.	Niacin mg./lb.	Fat acidity[2]
No. 2	10.54	9.52	4.02	1,750	0.62	1.57	8.39	17.9
30% cracked kernels	10.73	8.33	3.89	1,390	0.57	2.02	8.00	65.0
15% damaged kernels	10.31	9.09	3.73	1,370	0.77	2.46	8.53	51.8
30% damaged kernels	11.39	10.28	3.64	1,670	0.68	1.23	7.27	227.5

[1] Determinations were obtained through the courtesy of Dr. W. W. Cravens, McMillen Feed Mills, Division of Central Soya Co., Inc., Decatur, Indiana.

[2] Fat acidity determined as mg. of KOH required to neutralize the free fatty acids from 100 gm. of corn on a dry basis method described in Cereal Laboratory Methods, p. 8.

Table 3.—*The Effect of Four Grades of Corn on Body Weight, Feed Efficiency, Feather Score, and Mortality of White Plymouth Rock Broilers.*

Diet No.	Av. weight (pounds) ♂	♀	Av.	Lb. feed/lb. of broiler	Feather score[1]	Mortality Percent
1	2.88	2.30	2.59	3.38	2.90	1.0
2	2.92	2.31	2.61	3.28	2.83	0.7
3	2.87	2.29	2.58	3.43	2.84	0.3
4	2.92	2.29	2.61	3.37	2.86	1.7

[1] Score ranked "1" to "3", with "3" indicating the better feathered birds.

Table 4.—*Amount and Types of Damage in Lots of Corn Used in Experiment 2 and 3*[1]

Grade of Corn	Type of damage	Amount of damage Percent
Sample	Sprout	40
	Mold[2]	10
	Weevil	5
	Total	55.3
No. 1	Cob Rot	2

[1] Grades and type of damage were supplied through the courtesy of Mr. R. L. Bumgardner, Central Soya Company, Chattanooga, Tennessee, in cooperation with the Chattanooga Grain Inspection Department, Chattanooga, Tennessee.

[2] The molds present in the sample of corn were classified to be Penicillum sp., Aspergillus (fumigatus group,) Rhizopus Nigricans, Monila (Neurospera) and Cephalosporum. No effort was made to determine amounts of each mold present. Classification of molds were made by Dr. J. O. Mundt, Associate Bacteriologist, Tennessee, Agricultural Experiment Station.

Table 5.—*Amount of Various Nutrients in Lots of Corn Used in Experiments 2 and 3*[1]

Grade of Yellow Corn	Protein Percent	Fat Percent	Free Fatty Acids
No. 1	8.66	4.06	0.26
Sample	10.06	3.56	1.18

[1] Determinations were supplied through the courtesy of Dr. W. W. Cravens, McMillen Feed Mills, Division of Central Soya Co. Inc., Decatur, Indiana.

Table 6.—*Composition of Diets, Experiment 2*[1]

Ingredients	Pounds per hundredweight Low protein	High protein
Yellow Corn	57.8	56.1
Soybean oil meal (44% Protein)	26.9	2.5
Soybean oil meal (50% Protein)		28.1
Alfalfa leaf meal	2.4	
Meat scraps	2.4	2.5
Fish meal	4.8	5.0
Dried whey	2.4	2.5
Defluorinated rock phosphate	1.0	1.0
Ground limestone	1.2	1.2
Salt	0.5	0.5
Vitamin mix[2]	0.6	0.6
Menadione sodium bisulfite		100.0 mg.
Percent Protein	21.7	24.6

[1] Experimental Plan
Diet No. 1 Low protein basal with No. 1 corn.
Diet No. 2 Low protein basal with Sample Grade corn.
Diet No. 3 Commercial supplement with No. 1 corn.
Diet No. 4 Commercial supplement with Sample Grade corn.
Diet No. 5 High protein basal with No. 1 corn.
Diet No. 6 High protein basal with Sample Grade corn.

[2] Supplied per lb. of feed: 0.9 mg. riboflavin, 3mg. calcium pantothenate, 5 mg. niacin, 3 mcg. vitamin B_{12}, 250 mg. choline chloride, 1737 I.U. vitamin A, 1050 I.C.U vitamin D_3, 0.08 gm. $MnSO_4$, 2mg. procaine penicillin, 45 mg. arsanilic acid and 2.5 mg. nitrofurazone.

Table 7.—*Average Body Weight, Feed Efficiency, Mortality, and Pigmentation Scores of White Plymouth Rock Broilers When Fed Two Grades of Yellow Corn Using Three Basal Diets.*

Basal Diet	Grade of corn	Average weight-lb. ♂	♀	Av.	Lb. feed/lb. of broiler	Mortality percent	Pigmentation score[1] ♂	♀	Av.
Low protein (21.7%)	No. 1	3.71	2.90	3.31	2.68	3.0	4.00	3.53	3.77
	Sample	3.73	3.02	3.38	2.74	2.5	2.80	2.33	2.57
Commercial supplement	No. 1	3.63	2.95	3.29	2.78	5.0	5.53	4.80	5.17
	Sample	3.81	3.13	3.47	2.64	4.0	3.20	3.07	3.14
High protein (24.6%)	No. 1	4.03	3.18	3.61	2.60	3.5	3.00	3.07	3.04
	Sample	3.83	3.09	3.46	2.71	5.5	1.46	1.73	1.60

[1] Scores ranked "1" to "7", with "7" being the more deeply pigmented birds.

Table 8.—*Composition of Diets, Experiment 3*

Ingredients	Pounds per hundredweight Low energy	High energy
Yellow corn	53.2	26.6
Wheat shorts		26.6
Soybean oil meal (44% protein)	29.1	29.1
Dried whey	2.4	2.4
Meat scraps	7.2	7.2
Fish meal	4.8	4.8
Ground limestone	1.2	1.2
Deflurinated rock phosphate	1.0	1.0
Salt	0.5	0.5
Vitamin mix[1]	0.6	0.6

[1] Supplied per lb. of feed: 0.9 mg. riboflavin, 3 mg. calcium pantothenate, 5 mg. niacin, 250 mg. choline chloride, 3 mcg. vitamin B_{12}, 1050 I.C.U. vitamin D_3, 1,737 I.U. vitamin A, 0.08 gm. $MnSO_4$, 1 mg. procaine penicillin, 2.5 mg. terramycin hydrochloride, 1.0 mg. menadione sodium bisulfite, 45 mg. arsanilic acid, and 2.5 mg. nitrofurazone.

Table 9.—*Average Body Weight, Feed Efficiency, and Mortality of White Plymouth Rock Broilers When Fed Two Grades of Yellow Corn using Two Basal Diets*

Basal diet	Grade of corn	4 Weeks		9 Weeks				
		Av. weight (grams)	Feed efficiency	Av. weight—lb. ♂	Av. weight—lb. ♀	Av. weight—lb. Av.	Feed efficiency	Mortality percent
High energy	No .1	351	1.81	2.95	2.60	2.78	2.65	2.0
	Sample	364	1.79	3.09	2.54	2.82	2.61	2.0
Low energy	No. 1	341	1.96	2.96	2.51	2.75	2.91	0.0
	Sample	329	1.88	2.84	2.45	2.64	3.02	0.0

Table 10.—*Amount and Types of Damage in Lots of Corn Used, Experiment 4*[1]

Grade of corn	Type of damage	Amount of damage, percent	Moisture percent	Test weight per bu., pounds
Sample	Heat	2.8	12.0	57.2
	Weevil	3.0		
	Foreign material	1.8		
	Other[2]	22.4		
	Total	30.0		
No. 2	Foreign material	2.0	13.0	52.0
	Damaged	3.0		

[1] Grades and types of damage were supplied through the courtesy of Mr. R. E. Burket, Central Soya Company, Chattanooga, Tennessee, in cooperation with the Chattanooga, Grain Inspection Department, Chattanooga, Tennessee.

[2] Majority of this due to "blue eye."

Table 11.—*Composition of Experimental Diets, Experiment 4.*

	Pounds per hundredweight					
Diet No.	**1**	**2**	**3**	**4**	**5**	**6**
Ingredients						
Yellow Corn (No. 2)	40.7	.....	56.7	.....	49.1	.....
Yellow corn (sample grade)	.....	40.7	.....	56.7	.....	49.1
Soybean oil meal (44% protein)	24.0	24.0	30.0	30.0	31.3	31.3
Stabilized yellow grease	.....	.....	.....	.....	6.3	6.3
Wheat shorts	22.0	22.0	.....	.....	.....	.....
Alfalfa leaf meal	2.5	2.5	2.5	2.5	2.5	2.5
Meat scraps	2.5	2.5	2.5	2.5	2.5	2.5
Fish meal	5.0	5.0	5.0	5.0	5.0	1.0
Defluorinated rock phosphate	1.0	1.0	1.0	1.0	1.0	1.0
Ground limestone	1.2	1.2	1.2	1.2	1.2	1.2
Salt	0.5	0.5	0.5	0.5	0.5	0.5
Vitamin mix[1]	0.6	0.6	0.6	0.6	0.6	0.6

[1] Supplied per lb. of feed: 0.9 mg. riboflavin, 3 mg. calcium pantothenate, 5 mg. niacin, 250 mg. choline chloride, 3 mcg. vitamin B_{12}, 1,050 I.C.U. vitamin D_3, 1,737 I.U., vitamin A, 0.08 gm. $MnSO_4$, 2 mg. procaine penicillin, 45 mg. arsanilic acid and 2.5 mg. nitrofurazone.

Table 12.—*Average Body Weight, Feed Efficiency, Eviscerated Carcass Yield, Pigmentation Score, Fleshing Score, and Market Grade of White Plymouth Rock Broilers When Fed Two Grades of Yellow Corn Using Three Basal Diets.*

Diet No.[3]	Average weight (grams) ♂	♀	Av.	Lb. feed/lb. of broiler	Eviscerated carcass (percent)	Pigmentation[1] score	Fleshing[2]	Market grade[2]
1	1,428	1,137	1,283	2.69	69.0	3.56	2.53	2.38
2	1,469	1,103	1,286	2.70	69.4	1.80	2.30	2.00
3	1,443	1,145	1,294	2.55	69.5	3.31	2.59	2.51
4	1,527	1,179	1,356	2.54	70.5	2.55	2.56	2.98
5	1,563	1,165	1,364	2.33	70.2	4.96	2.77	2.76
6	1,488	1,252	1,370	2.38	70.9	2.50	2.67	2.40

[1] Score ranked "1" to "6" with "6" being the more deeply pigmented.
[2] Score ranked "1" to "3" with "3" indicating the better grade.
[3] See Table 9 for composition of diets.

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