

Route 1  
Mound, Minnesota  
December 12, 1949

Dr. Ralph Manley  
Director of Research  
General Mills, Inc.  
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Minneapolis, Minnesota

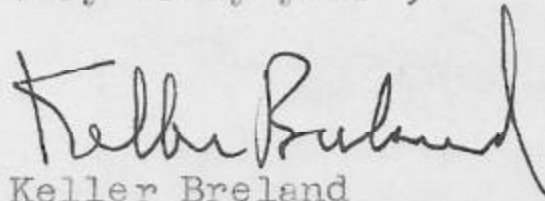
Dear Dr. Manley:

Enclosed is our progress report describing as of December 1 the state of our experiments on psychological factors in feeding chickens. The bulk of this material represents the final reports of experiments described in the November 1 report. Experiments still in progress are so indicated and have been reported in the briefer form used last month.

Thank you for forwarding Dr. Hochbaum's letter. We were much interested in his discussion of the effects of light on ducks and geese and of the eating habits of ducklings. Some of this relates in part to problems we are running into in connection with developing our yellow pellet. I will be very glad to have a chance to talk with Dr. Hochbaum when he comes to Minneapolis.

We admit to being somewhat baffled by the accumulation of results in the accompanying reports, in view of the unequivocal findings in our earlier work with day-old and young chicks. However, we have started off on some new lines now which we hope will lead to more positive results.

Very truly yours,

  
Keller Breland

Experiment 4  
(Final Report)

Preferences of Broiler Birds for Yellow Pellets and Other Feeds

Purpose: To test preferences of broiler birds for Larro broiler mash, broiler mash (3/32" pellets), broiler mash (3/16" pellets), and a high protein yellow pellet specially developed at the Research Laboratory.<sup>1</sup>

Subjects: Groups A and C (13 and 12 birds respectively) were approximately six weeks old at the start of the experiment. They were White Rocks of mixed sex, hatched at Glen Lake Hatchery, purchased at six weeks from a local broiler raiser. Prior to purchase they had been raised in a four-deck battery and fed on a locally prepared broiler mash (Connecticut formula). During the course of the experiment they were housed in the top and third deck of a four-deck broiler battery and were fed ad libitum from a trough divided into three sections. Larro broiler mash, powder form, was fed in one section, Larro broiler pellets (3/32") in another, and the yellow pellets in a third (a few were crushed on the first day). The positions of these three feeds in the trough sections were altered every two weeks, to avoid the formation of position habits.

Groups B and D (10 birds each) were approximately three months old at the start of the experiment. They were White Rocks and Wyandottes<sup>2</sup> of mixed sex, purchased from Glen Lake Hatchery, raised at our own farm at first in a battery brooder and later in floor pens. They had been fed exclusively on Larro broiler mash in its three forms; for about six weeks they had been on an all-pellet ration. For 3 or 4 weeks prior to the experiment about half their ration had consisted of 3/16" pellets. During the experiment they were housed in the second and bottom decks of the four-deck battery and were offered in divided troughs, ad libitum, 3/32" broiler pellets, 3/16" broiler pellets, and yellow pellets, a few of which were crushed on the first day. Positions of the feeds were changed every two weeks.

Grit and water were continuously available to all groups, except that no fresh grit was added to the troughs the day prior to feed weighing, since we wished to obtain weights of the feeds uncomplicated by varying amounts of grit.

Amounts of feed added were recorded at the time of each addition. The birds were weighed at the end of each week, and feed consumed during the week was measured at the same time.

The experiment was carried on for six weeks, until the yellow pellets were used up.

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<sup>1</sup> Made from a 50 percent starch and 50 percent casein preparation which was cooked and extruded. The finished pellet was intermediate in size between the 3/16" broiler pellet and the 3/32" broiler pellet.

<sup>2</sup> Reported as White Rocks only in the preliminary report. As the birds grew, a few rose combs became evident.

Table I  
Mean Weights and Gains in Ounces for Six Experimental Weeks

	Group A		Group C	
	Weight	Gain	Weight	Gain
Initial weight	18.17		18.18	
End of week 1	23.92	5.75	23.91	5.73
End of week 2	29.42	5.50	29.45	5.54
End of week 3	35.25	5.83	35.00	5.55
End of week 4	42.17	6.92	40.55	5.55
End of week 5	48.33	6.16	47.09	6.54
End of week 6*	52.25	3.92	51.54	4.45
	Group B		Group D	
	Weight	Gain	Weight	Gain
Initial weight	33.50		33.60	
End of week 1	38.30	4.80	37.00	3.40
End of week 2	42.80	4.50	41.30	4.30
End of week 3	49.60	6.80	45.50	4.20
End of week 4	55.20	5.60	50.50	5.00
End of week 5	57.40 <sup>x</sup>	2.20	54.30	3.80
End of week 6*	61.10	3.70	56.80	2.50

\* This final week was shorter by one day than the other weeks, since the yellow pellets were exhausted one day before the scheduled weighing day.

<sup>x</sup> When weighed on the usual day, this group was found to be substandard in weight. An investigation showed that there had been an accident to the wire on one side of the cage which rendered the water supply inaccessible for perhaps twelve hours. The difficulty was repaired and the birds were reweighed the following day. This recorded average is for the second weighing. The feed record for this week is also based on the second day's computations.

Table II  
Feed Consumption in Total Grams and Grams per Chicken  
for all Groups during Six Experimental Weeks

Week	3/32" Pellets		Group A Mash		Yellow Pellets		Grand Total
	Total	Per bird*	Total	Per bird	Total	Per bird	
1	2610	200.8	2488	191.4	1826	140.5	
2	3170	243.8	2764	212.6	2316	178.2	
3	3919	301.5	3045	234.2	1642	126.3	
4	4897	376.7	3156	242.8	2143	164.8	
5	4937	379.8	3886	298.9	2484	191.1	
6	4141	318.5	2499	192.2	2312	177.8	
Total	23674		17838		12723		54235
Subtotal		41512					
Percent	43.6		32.9		23.5		100.0
			Group C				
1	3381	281.8	2028	169.0	771	64.2	
2	4677	389.8	2578	214.8	765	63.8	
3	4081	340.1	2981	248.4	932	77.7	
4	4543	378.6	2888	240.7	930	77.5	
5	6104	508.7	3058	254.8	1121	93.4	
6	3882	352.9	2491	226.5	1319	119.9	
Total	26668		16024		5838		48530
Subtotal		42692					
Percent	55.0		33.0		12.0		100.0
			Group B				
Week	3/32" Pellets		3/16" Pellets		Yellow Pellets		Grand Total
	Total	Per bird	Total	Per bird	Total	Per bird	
1	4183	418.3	518	51.8	880	88.0	
2	4556	455.6	1184	118.4	626	62.6	
3	3857	385.7	3344	334.4	373	37.3	
4	4995	499.5	2697	269.7	244	24.4	
5	3857	385.7	2953	295.3	283	28.3	
6	3407	340.7	2808	280.8	424	42.4	
Total	24855		13504		2830		41189
Subtotal		38359					
Percent	60.3		32.8		6.9		100.0
			Group D				
1	3328	332.8	349	34.9	1175	117.5	
2	3759	375.9	1727	172.7	392	39.2	
3	2950	295.0	2950	295.0	447	44.7	
4	2603	260.3	4540	454.0	436	43.6	
5	1650	165.0	5214	521.4	446	44.6	
6	1869	186.9	3865	386.5	679	67.9	
Total	16159		18645		3575		38379
Subtotal		34804					
Percent	42.1		48.6		9.3		100.0

\* All "Per bird" figures are based on the number of chickens present in the group during the week in question: Group A: 13 for all weeks (12 only on weight and gain figures since one bird was isolated at the very end), B: 10, C:12 for first 5 weeks, 11 for last, D: 10.

Results: Average weights and gains, in ounces, are presented in Table I.

Groups A and C were very closely matched as to average weight and gain, particularly during the first three weeks of the experiment, and ended up less than an ounce different in average weight.

Groups B and D were matched within 0.1 ounce at the beginning of the experiment but Group D failed to gain quite as rapidly and finished up 4.3 ounces lighter in average weight than B.

Table II presents feed consumption records for all groups. As is evident from the table, yellow pellets were not preferred by any of the groups over the other two feeds. All groups except D preferred the 3/32" pellets to the other feeds offered. During the last 3 weeks of the experiment, Group D ate more of the 3/16" broiler pellets.

Some data of interest emerge from the feed table. For one thing, there is a positive though imperfect relationship between total feed consumed and amounts and percentages of yellow pellets consumed. Group A consumed more feed and more yellow pellets (both absolutely and on a percentage basis) than the other groups. D ate the least feed and the second smallest amount of yellow pellets. Subtotals of the two types of broiler mash show that the groups ate more nearly similar amounts of broiler mash (there is about an 8000 gram difference between the lowest and highest groups on this basis and a 16000 gram difference between the lowest and highest in total feed consumption). This may mean that the yellow pellets were eaten in addition to the other feed and thus led to greater total feed intake than would have occurred if the yellow pellets had not been offered. This finding, if true, means that the yellow pellets, even though not preferred to the other feeds, were fulfilling one function of the desirable dessert pellet.

Study of the grams per bird figures for the last week of the experiment reveals that in all groups except A there was an increase in the amount of yellow pellets eaten, while the amounts of other feeds eaten did not increase. While Group A did not eat more yellow pellets per bird during this week, their consumption of the other feeds dropped relatively more than was the case with the yellow pellets. This was a week of thawing temperatures after several weeks of freezing weather. It may be that the moisture content of the yellow pellets increased during this week, softened them, and thus made them more palatable to the birds.<sup>3</sup> This finding may relate to some of the data collected in our Experiment 7 on hardness of the various feeds.

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<sup>3</sup> The pellets, along with the bulk of the other feeds, were stored in a loft where the temperature dropped below freezing during the cold weeks.

Experiment 5  
(Final Report)  
Feed Preferences in Grown Chickens

Six New Hampshire hens about 2 1/2 years old were used in this experiment to test preferences for Larro egg mash (pelleted) as compared to the specially made yellow pellets, crushed yellow pellets, and whole corn. The method used was that of comparison to a standard; that is, pellet egg mash was offered every day in one section of a divided pan; in the other, yellow pellets were offered for eight days of the experiment, crushed yellow pellets for four days, and whole corn for four days.

Prior to the start of the experiment, the hens had been for months on a schedule of once-a-day feeding, their usual ration being 80 grams of egg mash and 20 grams of scratch grain. During the experiment, they were fed once a day in a special cage with an opening in the door through which they could reach the feed pan. The divided pan was placed on a platform on the outside of the door at a height convenient to the hen. Three hens were tested at once in cages of this type. Panels divided the cages so that the hens could not watch each other. Position of the standard egg mash was varied each day to prevent the formation of position habits. The hens were fed to satiation each day<sup>1</sup> and returned to the home cage where grit and water were available.

Table I, Part A, gives in grams the amounts of pellet egg mash and whole yellow pellets eaten by each hen on the eight days of this experiment. Part B gives the comparative figures for pellet egg mash and crushed yellow pellets, while Part C presents similar data for pellet egg mash as compared to whole corn.

Table II summarizes the grand totals for all chickens and all days in total grams and percentages for the three comparisons.

Table III is an auxiliary table presenting the data of Table I in a cross-tabulation by days and shows in addition the total grams eaten by each chicken on each day.

The results<sup>a</sup> of this experiment show considerable variability, both among birds and on various days, with regard to the proportions of mash as compared to the test feed. Not one chicken consistently ate more yellow pellets than mash pellets. One bird (No. 26) started to eat large quantities of yellow pellets, ended the eight days eating none at all. Three birds (1, 25, and 27) consistently ate a fair number of yellow pellets each day, but no bird ate more yellow pellets than mash over the eight day period.

Crushed yellow pellets were even less popular with these grown hens. Whole corn, on the other hand, was markedly preferred by four of the birds after the first day. One chicken which had eaten a fair proportion of yellow pellets (No. 25) ate almost no whole corn.

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<sup>1</sup> A minimum of 15 minutes during the first four days; subsequently the birds were left in the cages at least 30 minutes, although the birds which had previously finished eating in 15 minutes continued to do so.

Table I

A: Pellet Mash Compared to Whole Yellow Pellets; Grams Eaten

Day	Bird Number											
	1		23		25		26		27		32	
	M	WY	M	WY	M	WY	M	WY	M	WY	M	WY
1	150	28	125	12	94	16	25	163	73	73	91	9
2	97	59	151	0	46	81	100	117	55	54	153	2
3	8	166	145	0	30	53	57	147	47	104	182	5
4	119	61	140	0	33	126	162	5	50	78	184	12
5	103	60	177	0	62	6	100	0	33	38	196	0
6	70	100	164	0	77	29	198	3	60	24	198	0
7	78	67	123	0	75	29	123	0	55	25	192	0
8	113	93	112	0	80	36	142	0	55	26	169	3
Tot.	738	634	1137	12	497	376	907	435	428	422	1365	31
%	53.8		99.0		57.2		67.6		50.4		97.8	

B: Pellet Mash Compared to Crushed Yellow Pellets; Grams Eaten

Day	Bird Number											
	1		23		25		26		27		32	
	M	CY	M	CY	M	CY	M	CY	M	CY	M	CY
1	138	33	147	0	84	47	152	0	45	3	152	0
2	117	53	97	0	32	63	129	0	65	7	151	0
3	65	74	127	0	59	41	132	0	64	0	142	3
4	61	69	129	0	66	34	148	20	89	0	128	14
Tot.	381	229	500	0	241	185	561	20	263	10	573	17
%	62.5		100.0		56.6		96.6		96.3		97.1	

C: Pellet Mash Compared to Whole Yellow Corn; Grams Eaten

Day	Bird Number											
	1		23		25		26		27		32	
	M	WC	M	WC	M	WC	M	WC	M	WC	M	WC
1	96	37	88	69	82	18	47	170	56	103	83	21
2	40	138	57	167	124	0	22	148	10	117	92	85
3	57	66	12	167	91	3	16	111	21	90	51	132
4	62	100	0	136	83	2	21*	7*	17	119	66	38
5	67	110	2	190	130	0	20	98	25	39	64	69
6	66	125	4	173	127	0	27	147	15	86	53	77
7	60	102	2	173	110	0	20*	50*	25*	3*	49	44
8	60	132	3	213	75	0	49	71	28	53	44	13
Tot.	508	810	168	1288	822	23	222	802	197	610	492	479
%	38.5		11.5		97.3		21.7		24.4		50.7	

\*On these days the chickens laid eggs very shortly after being returned to their home cages. This impending event apparently upset the eating behavior on these days.

Table II  
Grand Totals in Grams and Percentages,  
All Feeds Tested, All Birds

	Grams	Percent
Pellet Mash	5072	72.64
Whole Yellow Pellets	<u>1910</u>	<u>27.36</u>
Total	6982	100.00
Pellet Mash	2519	84.53
Crushed Yellow Pellets	<u>461</u>	<u>15.47</u>
Total	2980	100.00
Pellet Mash	2409	37.52
Whole Corn	<u>4012</u>	<u>62.48</u>
Total	6421	100.00

In conclusion, we did not find in these grown hens any marked preference for yellow pellets. On the first day of the experiment, all the chickens had been observed to eat the yellow pellets eagerly at first, then to turn away from them, in many cases not to return, at least with any consistency. The difficulty may be (1) size: the yellow pellet may be too small to be preferred markedly by a grown hen; (2) texture: the yellow pellets have a certain glassy texture not possessed by corn or egg mash; (3) hardness: see Experiment 7, below.

At any rate, the yellow pellet here used does not apparently have the proper characteristics to make it a desirable "dessert" feed for grown hens.



Table III

A: Grams Eaten of Pellet Mash and Whole Yellow Pellets  
on Eight Experimental Days\*

Bird	Day 1			Day 2		
	M	WY	Total	M	WY	Total
1	150	28	178	97	59	156
23	125	12	137	151	0	151
25	94	16	110	46	81	127
26	25	163	188	100	117	217
27	73	73	146	55	54	109
32	91	9	100	153	2	155
Total	<u>558</u>	<u>301</u>	<u>859</u>	<u>602</u>	<u>313</u>	<u>915</u>

Bird	Day 3			Day 4		
	M	WY	Total	M	WY	Total
1	8	166	174	119	61	180
23	145	0	145	140	0	140
25	30	53	83	33	126	159
26	57	147	204	162	5	167
27	47	104	151	50	78	128
32	182	5	187	184	12	196
Total	<u>489</u>	<u>475</u>	<u>944</u>	<u>688</u>	<u>282</u>	<u>970</u>

Bird	Day 5			Day 6		
	M	WY	Total	M	WY	Total
1	103	60	163	70	100	170
23	177	0	177	164	0	164
25	62	6	68	77	29	106
26	100	0	100	198	3	201
27	33	38	71	60	24	84
32	196	0	196	198	0	198
Total	<u>671</u>	<u>104</u>	<u>775</u>	<u>767</u>	<u>156</u>	<u>923</u>

Bird	Day 7			Day 8		
	M	WY	Total	M	WY	Total
1	78	67	145	113	93	206
23	123	0	123	112	0	112
25	75	29	104	80	36	116
26	123	0	123	142	0	142
27	55	25	80	55	26	81
32	192	0	192	169	3	172
Total	<u>646</u>	<u>121</u>	<u>767</u>	<u>671</u>	<u>158</u>	<u>829</u>

B: Grams Eaten of Pellet Mash and Crushed Yellow Pellets  
on Four Experimental Days

Bird	Day 1			Day 2		
	M	CY	Total	M	CY	Total
1	138	33	171	117	53	170
23	147	0	147	97	0	97
25	84	47	131	32	63	95
26	152	0	152	129	0	129
27	45	3	48	65	7	72
32	152	0	152	151	0	151
Total	<u>718</u>	<u>83</u>	<u>801</u>	<u>591</u>	<u>123</u>	<u>714</u>

\*During the first four days of this experiment, the hens were placed in the experimental situation every other day, on alternate days were fed their usual ration in their home cages. Subsequently they were tested on the experimental feeds every day.

Table III, Part B: Contin.

Bird	Day 3			Day 4		
	M	CY	Total	M	CY	Total
1	65	74	139	61	69	130
23	127	0	127	129	0	129
25	59	41	100	66	34	100
26	132	0	132	148	20	168
27	64	0	64	89	0	89
32	142	3	145	128	14	142
Total	589	118	707	621	137	758

C: Grams Eaten of Pellet Mash and Whole Corn on Eight Experimental Days

Bird	Day 1			Day 2		
	M	WC	Total	M	WC	Total
1	96	37	133	40	138	178
23	88	69	157	57	167	224
25	82	18	100	124	0	124
26	47	170	217	22	148	170
27	56	103	159	10	117	127
32	83	21	104	92	85	177
Total	452	418	870	345	655	1000

Bird	Day 3			Day 4		
	M	WC	Total	M	WC	Total
1	57	66	123	62	100	162
23	12	167	179	0	136	136
25	91	3	94	83	2	85
26	16	111	127	21	7	28
27	21	90	111	17	119	136
32	51	132	183	66	38	104
Total	248	569	817	249	402	651

Bird	Day 5			Day 6		
	M	WC	Total	M	WC	Total
1	67	110	177	66	125	191
23	2	190	192	4	173	177
25	130	0	130	127	0	127
26	20	98	118	27	147	174
27	25	39	64	15	86	101
32	54	69	123	53	77	130
Total	298	506	804	292	608	900

Bird	Day 7			Day 8		
	M	WC	Total	M	WC	Total
1	60	102	162	60	132	192
23	2	173	175	3	213	216
25	110	0	110	75	0	75
26	20	50	70	49	71	120
27	25	3	28	28	53	81
32	49	44	93	44	13	57
Total	266	372	638	259	482	741

Experiment 6  
(Final Report)  
Feed Preferences of Pullets

Three White Rock pullets about three months old at the start of the experiment were used to test preferences for five different types of feed over a 10-day period.

Each chicken was weighed daily and placed for the experimental feeding in a special cage containing a feeding rack, presenting 100 grams each of the five feeds, in varying positions from day to day. At the end of the period (one hour) the chicken was weighed again and returned to her home cage where grit and water were available.

Feeds tested were yellow pellets, crushed yellow pellets, broiler mash (powder form), broiler mash ( $3/32$ " pellets), and egg mash pellets.

Prior to the start of the experiment the chickens had been on a once-a-day feeding schedule, their ration consisting of 80 grams of egg mash pellets and 20 grams of scratch grain.

Results of the experiment are presented in Table I. Here again the findings are somewhat variable. None of the birds preferred the yellow pellets to the other feeds, although No. 61 ate 31.3 percent of her 10-days' ration in whole yellow pellets (second to egg-mash pellets). The preference of the other two birds for the small broiler pellets suggests that the yellow pellets may have been somewhat too large for this age group. Each of these birds ate at first sizable amounts of the crushed yellow pellets, but then stopped completely. Certain textural problems may be involved here, since the yellow pellets when crushed felt rather like ground glass.

At any rate, again the present yellow pellet, whole or crushed, does not emerge as the solution to the dessert pellet problem for this age group of chicken.

Table I  
Comparison of Five Feeds: Grams Eaten

Day	Bird No. 48					Total
	WY*	CY*	EMP*	BM*	BP*	
1	7	23	3	10	0	43
2	9	48	3	13	12	85
3	29	66	4	14	4	117
4	0	0	0	28	0	28
5	0	0	18	28	18	64
6	0	0	0	20	83	103
7	0	0	6	29	45	80
8	0	0	0	19	85	104
9	0	0	0	32	70	102
10	0	0	0	20	68	88
Total	45	137	34	213	385	814
%	5.5	16.8	4.2	26.2	47.3	100.0

Day	Bird No. 61					Total
	WY*	CY*	EMP*	BM*	BP*	
1	11	0	60	0	22	93
2	25	3	68	0	10	106
3	0	0	87	11	0	98
4	9	4	62	14	16	105
5	56	0	24	7	10	97
6	47	12	25	2	5	91
7	68	3	18	11	3	103
8	5	0	19	23	20	67
9	19	14	37	11	9	90
10	58	0	25	19	0	102
Total	298	36	425	98	95	952
%	31.3	3.8	44.6	10.3	10.0	100.0

Day	Bird No. 87					Total
	WY*	CY*	EMP*	BM*	BP*	
1	16	74	0	0	1	91
2	0	0	35	15	36	86
3	0	0	10	8	58	76
4	0	0	14	13	48	75
5	0	0	14	15	53	82
6	0	0	51	13	30	94
7	0	0	0	13	48	61
8	0	0	0	5	75	80
9	0	0	0	10	94	104
10	0	0	0	17	81	98
Total	16	74	124	109	524	847
%	1.9	8.7	14.6	12.9	61.9	100.0

\* WY = whole yellow pellets, CY = crushed yellow pellets, EMP = egg mash pellets, BM = broiler mash (powder), BP = broiler mash (3/32" pellets).

Experiment 4-A  
(In Progress)  
Feed Consumption of Broiler Birds

The four groups of chickens used in Experiment 4 are being continued under identical circumstances for a few more weeks in order to determine what happens to the feed consumption of these birds now that the yellow pellets are gone.

Groups A and C are being fed on  $3/32$ " broiler pellets and broiler mash (powder form). Groups B and D are being fed  $3/32$ " and  $3/16$ " broiler pellets. Positions of the feeds are being varied as in Experiment 4.

Data from this continuation will be reported at the conclusion of the experiment, and comparisons will be made with the 6 weeks' data of Experiment 4.

Experiment 7  
(In Progress)  
Hardness of Feeds

A special instrument constructed for the purpose of measuring compressibility and elasticity of feeds was used to test these variables in whole yellow corn, broiler pellets, and yellow pellets.

As reported in our previous report, the first test results showed that the yellow pellets were considerably harder and more brittle than dry yellow corn, while broiler pellets were far below both corn and yellow pellets in hardness.

However, retests on the feeds done during the last week of Experiment 4, when, it was noted, temperatures rose above freezing after several weeks of freezing weather, and when the birds ate on the average relatively more yellow pellets than before, yielded readings on corn and yellow pellets which reversed the former conclusions; that is, the yellow pellets now appeared to be softer than the corn. We believe the yellow pellets may have absorbed relatively more moisture than did the corn. At any rate, we have discovered that the whole problem is rather difficult without some moisture control. We are now attempting to dry some samples of the feeds and will retest them.

Experiment 8  
(In Progress)  
New Yellow Feeds

The major problem now, as we see it, is to continue with the development of a suitable yellow pellet or feed for dessert feeding. Since the first development did not prove ideal, we have been experimenting with a variety of preparations and methods in an attempt to work out something more satisfactory. We thought it might be easier for us than for the Research Laboratory to do the initial work on a small scale, and test the product on birds as we work, then perhaps again to solicit help from the Laboratory for the production of a large enough quantity for a final test.

Among the variables we are considering are (1) size of particle, (2) surface texture and hardness, (3) extent of color saturation. A few of the various possibilities we have been investigating use preparations of skim milk powder, both pure and in combination with corn starch or flour, colored before drying, colored after drying, cooked and uncooked. We are testing the possibilities of extruding the preparations and breaking them into pellet form, also the possibility of a yellow crumble-sized feed to be mixed with mash or fed separately. We are retesting yellow spaghetti (used in our earlier experiments on young chickens), macaroni, and similar substances.

These feeds are being prepared in small batches and are being tested on small groups of chickens as they are developed. Nothing has yet emerged from the tests which looks promising enough to warrant production on a large scale.

Experiment 9  
(In Progress)  
Detection by Chickens of Protein and  
Carbohydrate Content of Feed

One of the aims of the yellow dessert pellet was to provide chickens with a high protein diet supplement which they would eat in preference to or at least as eagerly as corn with its high carbohydrate content. It is possible that chickens fed on a high protein ration such as broiler mash or egg mash will not eat much of a protein supplement but will eat a feed high in carbohydrate; that they can, in other words, in some fashion detect the proportions of various elements in their diet. If this were true, it might be advisable to raise the carbohydrate content of a yellow pellet to be fed as a supplement to a high protein ration.

To test the hypothesis, two groups of chickens are being used. Group N, 16 White Rock chicks six weeks old at the start of the experiment, are being fed a protein-fortified broiler mash. Group M, 16 White Rocks of the same age, are being fed carbohydrate-fortified feed. At the end of the experimental feeding period, Group N will be tested on its preference for a ration high in carbohydrate, and Group M will be tested on preference for a high protein ration.