INFLUENCE OF EGG LAYING CONTESTS

by

LEON BIRD LOSEY

A THESIS

submitted to the

OREGON STATE COLLEGE

in partial fulfillment of
the requirements for the
degree of

MASTER OF SCIENCE

June 1939

APPROVED:

[redacted]

Professor of Poultry Husbandry

[redacted]

Chairman of School Graduate Committee

[redacted]

Chairman of College Graduate Council

ACKNOWLEDGEMENT

The writer wishes to express his appreciation to Professor F.L.Knowlton and the Staff of the Poultry Department, for the valuable assistance received during this study.

TABLE OF CONTENTS

	Page
Introduction	1
Purpose of Study	1
Methods of Study	1
History of Early Contests	3
Objects of Contests	4
Rules of Contests	7
Location of Contests	14
Methods of Choosing Entrants for Contests	18
Breeds Entered in Contests	19
Comparison of Breeds in Feed Costs and Receipts for Eggs	23
Relation of Feed Costs to Receipts	27
Increase in Egg Production and Size	29
Breeding Program	36
Body Weight in Relation to Production and Egg Size	37
Feeding Formulas	43
Mortality in Contest Flocks	53
Mortality in the Questionnaire	57
Results from Contests	60
National Poultry Improvement Plan	63
Conclusions	67
Bibliography	69
Appendix	I

LIST OF ILLUSTRATIONS

Page

1. Map Showing Location of Contests and Location of Contest Winners of Five Chief Breeds 15
2. World's Champion Pen of Egg Producers 17A

LIST OF TABLES

Table		Page
1	POINT SYSTEM OF EGG SCORING	13
2	UNITED STATES STANDARD LAYING CONTESTS	16
3	BREEDERS OF HIGHEST RECORD PENS OF ALL CONTESTS TO DATE	17
4	BREED ENTRIES AT STORRS 1915 ACCORDING TO POPULARITY, AS SHOWN BY NUMBER OF ENTRIES	20
5	BREED ENTRIES AT ALL STANDARD CONTESTS FROM 1930-1938 ACCORDING TO POPULARITY AS SHOWN BY NUMBER OF ENTRIES	21
6	BREED COMPARISON ON RESULTS OBTAINED AT STORRS IN 5 YEAR AVERAGE 1913-1918	23
7	BREED COMPARISON ON RESULTS OBTAINED AT STORRS, CONNECTICUT 1919	25
8	BREED COMPARISON ON RESULTS OBTAINED AT NEW YORK STATE 1927	26
9	AVERAGE FOR RETURN ABOVE FEED COST AND PRICE RECEIVED PER DOZEN EGGS 1923-1937	27
10	CHANGES IN FEED AND EGG PRICES IN FIVE CONTESTS DURING FIFTEEN YEARS	28
11	AVERAGE EGG PRODUCTION BY BREEDS AND YEARS AT DIFFERENT CONTESTS	29
12	CHART SHOWING AVERAGE EGG PRODUCTION OF BREEDS AT FOUR CONTESTS 1938	30
13	AVERAGE PRODUCTION BY BREEDS FROM ALL STANDARD CONTESTS IN UNITED STATES 1930-1938	32
14	EGG SIZE IN OUNCES PER DOZEN AT ALL STANDARD CONTESTS IN UNITED STATES FROM 1931-1938	33
15	AVERAGE YEARLY EGG PRODUCTION OF ALL BREEDS	35
16	BODY WEIGHTS AND PRODUCTION OF S. C. WHITE LEGHORNS AT VARIOUS CONTESTS 1926-1937	37

Table Page

17 BODY WEIGHT AND PRODUCTION OF RHODE ISLAND REDS AT MARYLAND AND CANADIAN CONTESTS 1925-1931... 38

18 BODY WEIGHT AND PRODUCTION OF BARRED ROCKS AT MARYLAND AND CANADIAN CONTESTS 1925-1931 39

19 BODY WEIGHT AND EGG SIZE OF S. C. WHITE LEGHORNS AT UTAH AND CANADIAN CONTESTS 1925-1929 40

20 BODY WEIGHT AND EGG SIZE OF BARRED ROCKS AND RHODE ISLAND REDS AT CANADIAN CONTESTS 1925-1929 .. 41

21 LAYING MASH AT EARLY CONTESTS 44

22 SCRATCH GRAINS AT EARLY CONTESTS 45

23 LAYING MASHES USED AT 1938 CONTESTS 46

24 SCRATCH GRAINS USED AT 1938 CONTESTS 47

25 ANNUAL MASH AND GRAIN CONSUMPTION PER BIRD AT VARIOUS CONTESTS 50

26 MORTALITY AT NEW YORK CONTEST 1932-1933 53

27 MORTALITY AT VARIOUS CONTESTS 54

28 MORTALITY BY BREEDS 1931-1938 56

INFLUENCE OF EGG LAYING CONTESTS

INTRODUCTION

In all farm production in the United States, dairy products rank first in value with poultry and eggs second. Few people realize the importance of the poultry industry. In the past fifty years the increase in poultry population kept pace with the increase in human population but the per capita production of eggs has increased by almost 250 percent.

The reason for this increase is better management, better breeding and better balanced rations. (11)(52)

PURPOSE OF STUDY

The purpose of this study is to show the influence that Egg Laying Contests have had in helping the development of the poultry industry to its present magnitude.

METHODS OF STUDY

This study was conducted by a search for material in the Oregon State College Library. As only a limited amount of subject matter relating to the topic was found, it seemed necessary to write to the sixteen Contest managers in the United States and Canada, asking for any available material which they had printed since the inception of their

contests. An offer to purchase such material was made and a stamped reply envelope was enclosed. Replies were received from fourteen of the managers, in which they stated they were glad to send all material which they had and no charge was made. One hundred and forty-two pieces of printed matter were received.

A questionnaire was sent to the same individuals, with a stamped envelope, under the same cover. The response to the questionnaire was very gratifying, as fourteen, or 87½ percent were returned completely filled out. The majority of the writers also offered their assistance in any other way, if needed.

From bulletins, contest records and questionnaires, most of the information and data recorded, on the following pages was obtained. A copy of the letter and the questionnaire is included in the appendix.

HISTORY OF EARLY CONTESTS

The first egg laying contest was held in England in 1897. It was started to show winter production and hence was only held for sixteen weeks, from October onwards. Eggs from the pen as a whole were counted at first, but in 1902, trapnests were adopted.

The first twelve months contest in England commenced in 1907. In stead of running a full twelve months, there had to be a break to admit new birds and return the old ones, so the time was limited to forty-eight weeks. (16)

The first contest that ran a full twelve months was held in Australia at the Hawkesbury Agricultural College, in April, 1902. "The Daily Telegraph," Sydney, sponsored this contest and promoted entries.

A Committee was formed, to draw up rules and regulations to govern this Australian contest. This committee did its work so well that these rules serve as the foundation in the formulation of rules for contests in England, South Africa, British Columbia and America.

In the United States, "The North American," a Philadelphia newspaper promoted the first contest, which was held at Storrs, Connecticut, commencing November 1, 1911. The State Agricultural College furnished the ground and buildings and kept the records.

At the same time another competition was started at

the Missouri State Experiment Station in Mountain Grove, where entries were received from many States, as well as from Canada, England, New Zealand and Australia.

The number of laying competitions in the United States increased until 1930, at which time there were some forty-eight. These were scattered all over the continent, from Florida to Maine, and from California, with six contests, north to the State of Washington. Still farther north in Canada, was Vancouver Island, with the twelve other Canadian contests inter-spersed between that and Nova Scotia.

As finances decreased from 1930, there was a corresponding decrease in the number of contests, until at present there are only sixteen Standard and a few Non-Standard Laying contests in operation.

OBJECTS OF CONTESTS

The following are among the more important reasons for starting the contests. Farmers are the main producers of poultry, but most of them care little for the appearance of the birds. If they lay eggs that is enough.

Fanciers, or men who bred fowls for their looks, started poultry shows. The first was held in Boston, in 1849. Poultry exhibitions tended to encourage the development of new breeds and varieties, which attracted the

attention of visitors at the different shows. Many of these people became poultry keepers and thus the interest in poultry increased, until in the period from 1890 to 1925, there were many exhibitions held in cities and at fairs, in the United States. (12)

More attention was paid to feathers than to utility, until a few of the breeders began to make claims for the production of their birds, as well as their beauty. The trapnest was invented, then breeders began to advertise the number of eggs their individual birds laid. Some of these claims were fraudulent. Egg laying contests give the exact number of eggs under impartial conditions. (28) (48)

Authentic and accurate records are needed as to cost of feed and what feeds produced the best results. The much debated question of how long a hen is profitable to keep is studied. The contests call the attention of poultrymen to the fact that hens differ greatly in their production.

The possibility of registering and advanced registering poultry, which will enable breeders to develop families of birds which can have official standing will be obtained. Knowledge is gained which will give better understanding of practical poultry conditions and which applied commercially will make a more profitable poultry

industry. (25)

Contests offer a testing station, where breeders can send their birds and compare their production with that of other strains and varieties, when they are all housed and fed and managed alike.

The relative values of different breeds and varieties according to numbers of eggs, size, feed consumption and other factors are given to the public. (48)

Local conditions for each state are different. Climatic changes are responsible for different types of housing. Some feeds may produce as well as others and may be cheaper. (36) Contests are used as educational exhibits for visitors, as a source of publicity for breeders and a guide to buyers of eggs, chicks and breeding stock. (8) Data can be obtained on egg production and performance records, which, when studied carefully, aids in the development of a more efficient program of selection and breeding. (5)

In New Jersey the plan is to use the station as a foundation plant to supply good stock to the breeders, the birds are kept at the contest as long as they live and stock is hatched and shipped to the owner each year. This is of benefit to those breeders who have birds at the contest. (33) (36)

RULES

In the first Contests the rules were made for conditions as they existed at that ime. The following are the rules as they were laid down in 1917:

1. -- This competition shall be known as the..... Contest, conducted by the,..... Agricultural College. It will begin November 1,..... and terminate October 30, 19- .....

2. -- All records including numbers of eggs laid, weight of eggs, amount of feed, duration of moult, frequency of broody periods, etc., will be made by the Poultry Department of the ..... Agricultural Experiment Station.

3. -- Each entry or each competing pen shall consist of ten pure bred females of some recognized breed or variety, either hens or pullets, but no males will be included.

4. -- Contestants will be privileged to maintain throughout the year, without extra charge, a full complement of ten birds; that is to say, a bird lost by death or accident or otherwise incapacited may be replaced by the owner.

5. -- Pullets that do not lay during the first six months of the contest, or pullets that persist in laying very small eggs or soft shelled eggs will be declared

incompatible with the purposes of the competition and accordingly disqualified.

6. -- Foreign contestants and those west of the Mississippi River or south of the Ohio, may at their discretion send two (2) extra or reserve birds along with their entry. All others may send one (1) reserve bird.

7. -- Extra or reserve birds will be given the same feed and care as the regular competing pens and a trap-nest record made of their eggs. Thus if the reserve happens to be needed in the regular competing pen, the owner will have her record for the entire year.

8. -- All awards will be based on the number of marketable eggs produced. Eggs must weigh not less than one and one-third ounces each, (.08 lbs.) or they will be considered unmarketable.

9. -- A first, second and a third prize ribbon will be awarded to three leading pens each month. The best pen for the year, of each variety, will be awarded a prize provided there are three or more pens of the variety competing. Each hen that lays 200 eggs or more will receive a "Special Merit" ribbon. Each hen that lays 250 eggs or more, will receive a "Super Performance" ribbon. In case of pen ties, for either monthly or annual awards, weight of eggs shall decide.

10. -- All entries must be shipped prepaid and should

be consigned so as to arrive at the College some time during the last week in October. At the close of the competition, fowls will be returned to their respective owners at their expense. Pens that are not laying may be returned any time during the last week of the contest.

11. -- The College reserves the right to refuse any and all entries; the right to reject and return to the owner, fowls suffering from any contagious or infectious disease or otherwise unsuitable for the contest; and the further right to cut or clip feathers from the wing of any fowl that may be troublesome to the yard.

12. -- In the event of any entry being deemed unsuitable and being reconsigned to its owner, the entry fee, or such part of same as has been paid, will also be returned. Not more than two pens can be accepted from any one breeder, and these must represent two varieties.

13. -- After fowls have been received at the College and placed in the competing pen, every reasonable precaution will be taken for their protection and the prevention of loss, but the College will not be held responsible should death or losses occur. No pen may be withdrawn during the progress of the contest.

14. -- All birds will be scored by a licensed poultry judge at the beginning of the contest and the original score cards for each pen will be forwarded to owners as

soon as the data can be transferred and tabulated for purposes of the experiment station.

15. -- Entries will be accepted from any point in this country or any foreign country. The College will accept a competing pen owned jointly by two or more breeders, provided however, that the fowls be all the same breed or variety.

16. -- All applications will be filed in the order of their receipt. Other things being equal, entries, agreeable to the provisions of these rules will be accepted in the same order in which they are received.

17. -- An entry fee of twenty dollars ($20.00), is required for each pen, five dollars to accompany application and balance to be paid on or before October 1st., following. Failure to make a second payment will automatically forfeit the first. (46)

For several years, each contest operated under its own rules. Consequently, there was a general lack of uniformity in the methods used and the records obtained.

In 1921, an effort was launched under the auspices of what was then called, "The American Association of Instructors and Investigators in Poultry Husbandry", (now the Poultry Science Association) to create a disinterested body to collect data on trapnest records and register them. The result was the formation of the

American Record of Performance Council with membership strictly confined to the managing officials of official egg laying contests.

This organization attempted, at different times, to set up standard rules and regulations to govern egg laying contest operations and records. Due to the opposition that always develops to standardization of this type, progress was rather slow.

In 1929, representatives of the Texas, Louisiana, Alabama, Florida, and Georgia contests met at New Orleans and a Standard set of rules was agreed upon. The two most important changes in egg laying contest operation were, to change the starting date from November 1 to October 1, and to adopt the point system of scoring eggs.

Following this meeting of southern contest managers at New Orleans, the American Record of Performance Council met at Auburn, Alabama and these standard rules were adopted with a few minor changes.

Since that time, contests operating under the official rules and regulations of the American Record of Performance Council have been designated as "Standard Contests", and those continuing to operate under their own rules as "Non-Standard Contests". T.C.Ogle, Cornell University, Ithaca, New York, is president of the Council at the present time.

Each standard contest today operates under its own rules and regulations which conform to those set up by the American Record of Performance Council. These rules and regulations vary somewhat, but conform with the following:

1. -- Fifty-one weeks shall constitute the official length of the egg laying contest.

2. -- The contest shall begin October 1.

3. -- An entry shall consist of thirteen birds. The record of all thirteen birds will count as the pen total.

4. -- No replacements will be allowed except during the first two weeks of the contest.

5. -- The following point system of scoring eggs and making awards shall be used.

Table No. 1

POINT SYSTEM OF EGG SCORING.

Egg Weight	Score
18 oz. per doz.....	.70 points per egg
19 " " "	.75 " " "
20 " " "	.80 " " "
21 " " "	.85 " " "
22 " " "	.90 " " "
23 " " "	.95 " " "
24 " " "	1.00 " " "
25 " " "	1.05 " " "
26 " " "	1.10 " " "
Over 26 " " "	1.10 " " "

(35)

It will be noticed in comparing the new Standard Contest rules with the old ones, that there are several changes, as follows:

Length of contest, changed from forty-eight weeks to fifty-one. Time of starting is October 1st. Number of birds in a pen, changed from ten, with one or two substitutes, to thirteen, with no substitutes.

Just recently all of the contests have changed to the thirteen bird pen. Not permitting substitution, helps in breeding standards. The point system for egg scoring which gives value to size of egg, has been another great improvement.

LOCATION OF CONTESTS.

The accompanying map of the United States on page 15, designates the location of the existing Contests, showing that they are all located in the East and South. It also gives the location of the farms of the breeders of the highest pens of the five most popular breeds: White Leghorns, Rhode Island Reds, Barred Plymouth Rocks, White Plymouth Rocks and New Hampshires. The numbers on the map correspond to the numbers in the left hand column in Tables No. 2 and 3.

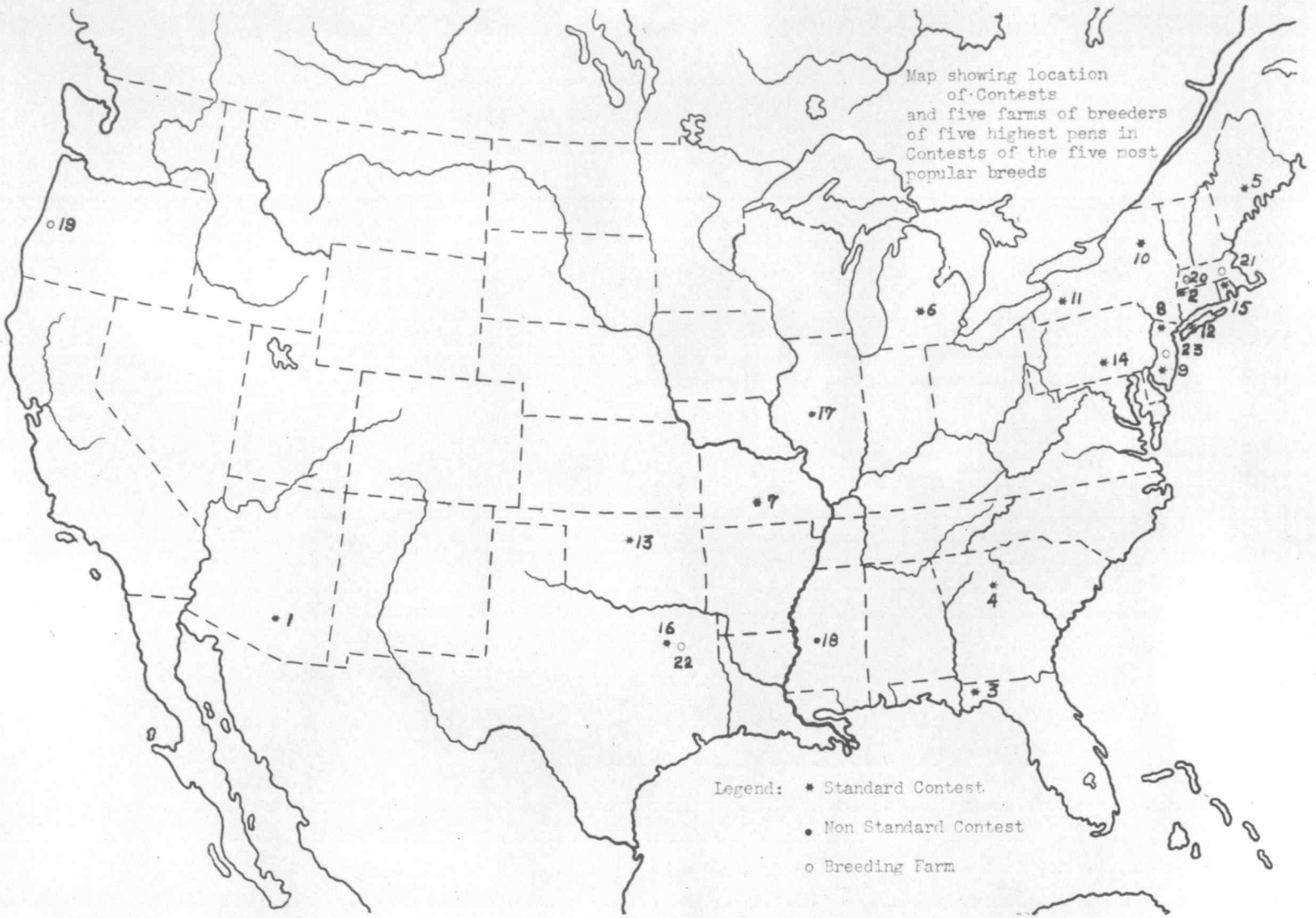

Map showing location of Contests and five farms of breeders of five highest pens in Contests of the five most popular breeds
Legend: * Standard Contest
• Non Standard Contest
o Breeding Farm

Table No. 2

UNITED STATES STANDARD LAYING CONTESTS

1. Arizona ..... Tucson, Arizona
2. Connecticut ..... Storrs, Connecticut
3. Florida ..... Chipley, Florida
4. Georgia ..... Athens, Georgia
5. Maine ..... Monmouth, Maine
6. Michigan ..... East Lansing, Michigan
7. Missouri ..... Mountain Grove, Missouri
8. New Jersey ..... Flemington, New Jersey (Hunterdon)
9. New Jersey ..... Patterson, New Jersey (Passaic)
10. New York ..... Horseheads, New York (Central)
11. New York ..... Stafford, New York (Western)
12. New York State ..... Farmingdale, L.Is.New York
13. Oklahoma ..... Stillwater, Oklahoma
14. Pennsylvania ..... Harrisburg, Pennsylvania
15. Rhode Island ..... Kingston, Rhode Island
16. Texas ..... Stephenville, Texas

NON-STANDARD CONTESTS

17. Illinois ..... Springfield, Illinois
18. Mississippi .....

Table No. 3

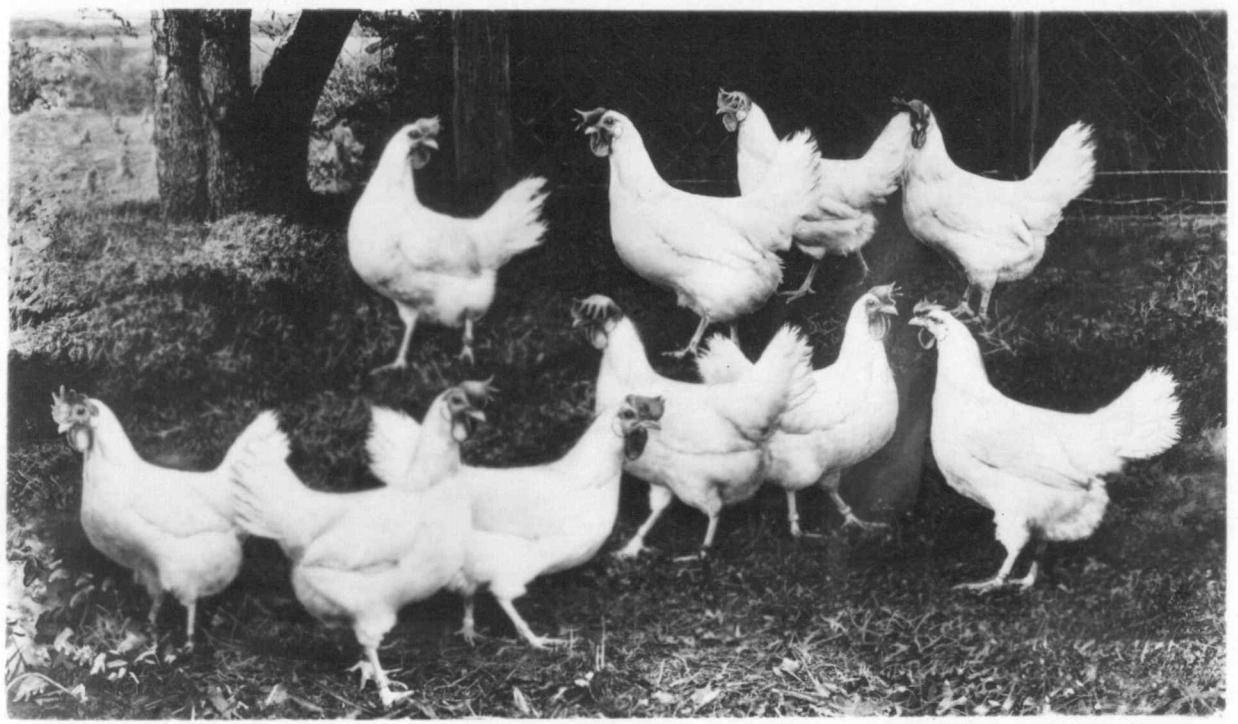
BREEDERS OF HIGHEST RECORD PENS OF ALL

CONTESTS TO DATE

Ten High Hens — Fifty-one Weeks

Owner	Contest	Year	Eggs	Weight	Breed
19 Hanson, Corvallis, Ore.	New York	1937	3082	25.4	Wh.Leg.
20 Parmenter, Franklin, Mass.	Rhode Island	1925	2980	25.5	S.C.Reds
21 Weber, Wrentham, Mass.	Maine	1937	2963	24.3	B. Rocks
22 Murray, Stephenville, Tex.	Texas	1933	2661	24.8	Wh. Rocks
23 Sexton, Whitehouse, N.J.	New York	1937	2643	24.8	New Hamp-shires

(19)



World's Record Contest Pen (All Breeds)

Average Egg Production 335.9 Points

Owned by J.A. Hanson, Corvallis, Oregon

METHODS OF CHOOSING ENTRANTS FOR CONTESTS.

The first contests had to advertise for entries. After the breeders learned the value of the competitions, entries had to be limited. A grand total of 27,823 entries, have been received in all contests to date. Many of these are the same breeders who enter year after year and who enter in different contests. These figures however show the great interest that breeders have in the contests. (36)

Entries at the contests are open to the world, but first choice is given to previous entrants.

The most common commercial varieties of fowl are the ones most desired, as the uncommon ones are not of so much value to the general public. (4)

Those who have the highest record birds, are encouraged to enter contests. (39)

A list of twenty outstanding contest poultry breeders of the four most popular breeds, with their location gives an idea of the different climates where poultry thrives.

White Leghorns: Dryden, California; Lindstrom, Missouri; Hannah, Michigan; Hollywood, Washington; Hanson, Oregon; Kauder, New York; Seidal, Texas.

Rhode Island Reds: Warren, Massachusetts; Homestead Farms, Connecticut; Treadwell, Maine; Booth Farms, Missouri; Anderson, New York.

New Hampshires: Larrabee, Hubbard Farms, Wood, New Hampshire.

Barred Plymouth Rocks: Parks, Pennsylvania; Bishop, New York; Roselawn, Ohio; Wallace, Indiana; Weber, Massachusetts.

(35)

BREEDS ENTERED IN CONTESTS.

When the contests first started there were nearly the same number of breeds entered that are in contests today, but there is quite a difference in the varieties of breeds. This is shown in Tables 4 and 5.

Table No. 4.

BREED ENTRIES AT STORRS 1915 ACCORDING TO POPULARITY, AS SHOWN BY NUMBER OF ENTRIES.

Breed	Number of Birds.
White Leghorns	250
Single Comb Rhode Island Reds	120
White Plymouth Rocks	60
White Wyandottes	50
Buff Wyandottes	40
Barred Plymouth Rocks	40
Rose Comb Rhode Island Reds	20
Buff Plymouth Rocks	20
Columbian Wyandottes	10
Buff Leghorns	10
Blue Andalusians	10
Buff Orpingtons	10
White Orpingtons	10
Silver Campines	10

(13)

According to Table No. 4, in order of popularity, the Leghorns lead, with Reds second, White Rocks third, White Wyandottes fourth, Buff Wyandottes fifth, and Barred Rocks Sixth.

Table No. 5.

BREED ENTRIES AT ALL STANDARD CONTESTS
FROM 1930 - 1938 ACCORDING TO POPULARITY AS
SHOWN BY NUMBERS OF ENTRIES.

Breed	Number of Birds.
White Leghorns	52,595
Single Comb Rhode Island Reds	12,901
Barred Plymouth Rocks	7,151
White Plymouth Rocks	3,564
New Hampshires	2,113
White Wyandottes	921
White Minorcas	697
Australorps	541
Anconas	437
Jersey White Giants	308
Buff Leghorns	162
Black Minorcas	140
Buff Orpingtons	136
Buff Plymouth Rocks	133

(19)

In Table No. 5, White Leghorns still hold first place for popularity. The Reds second, Barred Rocks have changed from sixth to third place, while White Rocks have dropped from second to fourth on the list. White Wyandottes moved from fourth to sixth, while a new breed of recent origin, the New Hampshires, is given fifth place. The White Minorcas not in our first group, are in seventh place. Two other new breeds, Australorps and Jersey White Giants are eighth and tenth, on the list, with Anconas ninth.

Rose Comb Rhode Island Reds, Buff Wyandottes, and all the rest in the fourth Table, are only bred by a few poultrymen for their appearance.

Contests have helped to change the popularity of certain breeds from 1915 to the present time. With economic changes, come the necessity to have breeds that will pay their way. Contest managements by their accurate records, show which breeds do this. Tables 4 and 5 show a change of six breeds, four of them being new ones.

COMPARISON OF BREEDS IN FEED COSTS AND RECEIPTS FOR EGGS

Poultrymen should take advantage of all the knowledge to be obtained. In the following tables are comparative figures, which the average breeder does not produce on his own farm.

Table No. 6

BREED COMPARISON ON RESULTS OBTAINED AT STORRS IN 5-YEAR AVERAGE 1913-1918

Breed	Prod. Eggs	Value Eggs	Feed Cost	Return Above Cost
Wyandottes	163	$5.57	$2.19	$3.37
White Leghorns	161	5.32	2.05	3.26
B. Plymouth Rocks	153	5.12	2.37	2.74
Rhode Island Reds	151	5.06	2.31	2.75

Breed	Value Eggs Per Dozen	Lbs.Feed Per Dozen	Cost Feed Per Dozen	Return Above Cost
Wyandottes	40.9¢	6.6	16.2¢	24.8¢
White Leghorns	39.4	6.1	15.2	24.1
B. Plymouth Rocks	29.7	7.5	18.5	21.2
Rhode Island Reds	40.0	7.5	18.2	21.7

(47)

In Table No. 6 is an interesting comparison of the four most popular breeds in the early days of contests. Production was comparatively low. Feed consumed was normal. The feed cost per hen for Leghorns was only 14¢ less than Wyandottes, while the value of eggs for Wyandottes was the highest at $5.57 and lowest for Reds at $5.06, a difference of 51¢. The return above feed cost was $3.37 per bird for Wyandottes and $3.26 for Leghorns, a balance in favor of Wyandottes of 11¢ per bird in spite of their heavier food consumption.

There was a difference of 63¢ between Wyandottes, the highest, and Barred Rocks, the lowest, in total returns above feed cost.

It took 6.6 pounds of feed for a dozen Wyandotte eggs and only 6.1 pounds for Leghorns, while Rocks and Reds needed 7.5 pounds. Leghorns' cost per dozen eggs was one cent less than Wyandottes' and three cents less than Rocks and Reds. In those days not so much attention was paid to size of eggs, for the Wyandottes were smallest at 23.5 oz. per dozen, with Leghorns 24.1 and Rocks and Reds 25 oz., yet with smaller eggs the returns per dozen above feed cost was most for Wyandottes at 24.8 ¢, Leghorns 24.1 ¢ and Rocks and Reds at 21 ¢. This showed a nice profit even with production low.

Table No. 7

BREED COMPARISON ON RESULTS OBTAINED

AT STORRS, CONNECTICUT 1919

Breed	Prod. Eggs	Feed Cost	Value Eggs	Return Above Cost
White Wyandottes	171	$2.99	$7.64	$4.65
White Leghorns	162	2.82	7.35	4.52
Barred Plymouth Rocks	159	3.21	7.28	4.07
Rhode Island Reds	148	3.10	6.77	3.66

(47)

In 1919 at Storrs, feed prices were much higher than the average for years 1913 - 1918 as in Table No.6, but the returns were proportionately higher. Wyandottes still led with Reds dropping down in production from the previous years.

The question often arises, which breed will make the most money. The contest management answers it by showing data on strains of different breeds that are entered in the contests. Poultrymen then may see the results and choose for themselves.

Table No. 8

BREED COMPARISONS ON RESULTS OBTAINED AT

NEW YORK STATE 1927

Breed	Prod. Eggs	Feed Cost	Value Eggs	Return Above Cost
White Leghorns	178	$2.44	$6.51	$4.71
Rhode Island Reds	165	2.55	5.45	4.55
B. Plymouth Rocks	160	2.63	5.29	4.36
White Rocks	151	2.73	5.06	4.06

(10)

As poultrymen progressed in breeding efficiency and more entries were received at contests, a change in position of the breeds is noted. In 1927, (Table 8) White Wyandottes which led in Table 7 have given place to White Leghorns as leaders. Rhode Island Reds were second, Barred Rocks third, and a different breed, the White Plymouth Rock, replaced the White Wyandotte among the first four breeds.

RELATION OF FEED COSTS TO RECEIPTS

The average poultryman made money during the period from the close of the World War, until 1930. At the contests in Oklahoma, Florida, New York, Connecticut and New Jersey, tabulations show this to be true. An average cross section of the cost and price per dozen is shown in Table 10.

From 1923 to 1930 the receipts, above feed cost, showed a range of 12.8 ¢ to 21 ¢ per dozen. From 1931 to 1936 the amount dropped to a low of 5.4 ¢ and a high of 9.9 ¢.

Many poultrymen went out of business during the period of low prices. In 1937 the price was a little better. Those breeders who had entered their birds in the contests, and those who watched closely to see whose birds produced best there, and who purchased stock from those strains, are making money in the poultry business.

Table No. 9

AVERAGE FOR 15 YEARS 1923 - 1937

	Oklahoma	New York	Florida	Storrs	New Jersey
Return above feed cost per dozen eggs	11.7 ¢				
Price received per dozen eggs	26.0 ¢				
	(15)	(25)	(29)	(32)	(38) (44) (45)

Table No. 10

CHANGES IN FEED AND EGG PRICES IN FIVE CONTESTS

DURING FIFTEEN YEARS

1923 - 1937

Oklahoma New York Florida Storrs New Jersey

Year	Ave. Cost of Feed Per Hen	Ave.Price Eggs Per Dozen	Return Above Feed Cost Per Dozen
1923	$1.90	28 ¢	12.8 ¢
1924	2.21	36	14.3
1925	2.36	38	21.0
1926	2.39	37	17.8
1927	2.61	37	19.8
1928	2.01	34	17.8
1929	1.95	33	16.0
1930	1.77	27	14.9
1931	1.57	16	5.8
1932	1.32	15	5.9
1933	1.55	16	5.9
1934	1.71	20	8.8
1935	1.58	19	5.4
1936	1.98	23	9.9
1937	1.51	22	11.6
		(32) (29) (38)	(15)(25)(44)(45)

INCREASE IN EGG PRODUCTION

Table No. 11

AVERAGE EGG PRODUCTION BY BREEDS AT CONTESTS

Breed	Storrs 1915	N.York 1925	Fla. 1926	Maryland 1926-31	Georgia 1927-31
White Leghorns	152	178	199	201	210
S.C.R.I. Reds	138	147	165	181	178
Barred Ply. Rocks	148	152	178	188	188
Wh. Wyandottes	169	142	175	139	171
White Ply. Rocks	136	103	...	146	148
Blue Andalusians	134	141	...	140	...
Buff Leghorns	157	...	...	121	164
Buff Ply. Rocks	136	...	160	116	140
Buff Wyandottes	134	...	...	...	...
Col. Wyandottes	143	...	142	...	...
R.C.R.I. Reds	125	...	...	...	198
Buff Orpingtons	108	...	...	...	...
Wh. Orpingtons	106	...	...	...	...
Brown Leghorns	...	...	144	148	...
Black Minorcas	...	...	110	...	163
Australorps	...	...	...	180	147
Anconas	...	...	...	162	169
Jersey Blk. Giants	...	...	...	93	157
			(36)	(10) (38)	(55) (37)

Table No. 11 shows the average annual egg production of eighteen of the principle breeds and varieties of chickens, at five different contests, for intervals from 1915 to 1931.

At Storrs in 1915 there were 13 breeds represented. Entries of White Leghorns, Single Comb Reds, Barred Rocks and White Wyandottes were in all five contests. Buff and White Rocks were in four, Buff Leghorns and Blue Andalusians were in three, while the other ten breeds had entries in only one or two contests.

Table No. 12

CHART SHOWING AVERAGE EGG PRODUCTION OF BREEDS

AT FOUR CONTESTS

1938

Breed	New York 1938	Illinois 1938	Florida 1938	Georgia 1938
White Leghorns	226	139	187	202
S.C.R.I.Reds	216	147	171	208
B. Ply. Rocks	222	186	168	182
Wh. Wyandottes	...	157	158	183
Wh. Ply. Rocks	191	169	174	188
New Hampshires	209	215	202	202
Australorps	...	...	187	...
			(29)	(20) (39)

In comparing Tables No. 11 and 12, Leghorns have risen in production from 152 in 1915, to 226 at New York in 1938; Reds from 138 to 216; Barred Rocks from 148 to 222; White Wyandottes from 169 to 183; White Rocks from 136 to 191. Neither New Hampshires nor Australorps are on Table 11, for they are new breeds. New Hampshires were developed from Rhode Island Reds and have a little different type and lighter color. They were bred mainly for egg production and appear to be a coming breed, as contest managers recommend them highly for egg production, egg size, and viability.

Australorps are Australian Black Orpingtons bred for egg production. Whe world's record of 354 eggs and 375 points is held by an Australian Black Orpington hen.

Table No. 13, indicates the relative ranking of the twenty foremost breeds in the United States. These are arranged according to points (see Table No.1) which apply to egg size. These figures are fairly representative of the breeds which have an entry of over 500 birds in all Standard Contests from 1930 to 1938. These breeds follow: White Leghorns, Single Comb Reds, New Hampshires, Australorps, Barred Rocks, White Rocks, White Wyandottes and White Minorcas.

Table No. 13

AVERAGE PRODUCTION BY BREEDS FROM ALL

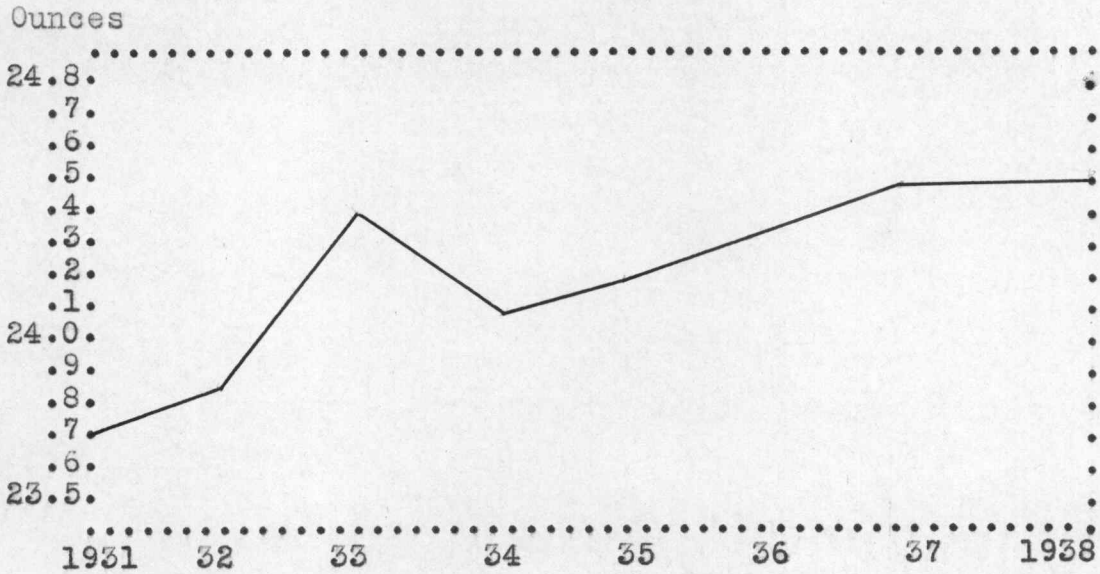
STANDARD CONTESTS IN UNITED STATES 1930-1938

Rank	No. Hens	Breed	Ave. Eggs	Ave. Points	Wt.Per Dozen
1.	52,595	S.C.White Leghorns	206.9	208.7	24.2
2.	12,901	S.C.Rhode Island Reds	201.5	206.4	24.5
3.	2,113	New Hampshires	197.6	205.5	24.8
4.	541	Australorps	196.6	195.8	23.9
5.	7,115	Barred Plymouth Rocks	191.0	189.6	23.9
6.	3,564	White Plymouth Rocks	177.6	179.7	24.2
7.	70	R.C.Rhode Island Reds	181.2	179.6	23.8
8.	93	Silver L. Wyandottes	173.7	173.8	24.0
9.	921	White Wyandottes	158.5	169.7	24.1
10.	110	Jersey Black Giants	159.0	166.4	24.9
11.	437	Anconas	172.1	166.0	24.9
12.	697	White Minorcas	159.8	164.2	24.6
13.	33	Buff Minorcas	157.9	159.9	24.3
14.	140	Black Minorcas	151.9	159.5	25.0
15.	308	Jersey White Giants	143.4	147.1	24.5
16.	50	Light Brahmas	134.7	141.2	25.0
17.	136	Buff Orpingtons	136.1	136.5	24.1
18.	162	Buff Leghorns	135.8	133.7	23.7
19.	123	Brown Leghorns	142.0	132.7	22.7
20.	133	Buff Plymouth Rocks	136.5	130.0	23.0

(17)

Table No. 14

EGG SIZE IN OUNCES PER DOZEN AT ALL STANDARD CONTESTS IN UNITED STATES FROM 1931-1938



(19)

The point system of recording contest eggs encourages breeding for greater egg size. Since 1931 all Standard contests have used this system and breeders have tried to improve their stock along this line.

Table No. 14 depicts the gradual increase in egg size in all Standard contests. In 1931 the average size was 23.7 ounces per dozen or just under the two ounce mark. In 1933 a big jump was made to 24.4 ounces. In 1934 the average dropped to 24.1 ounces. From then on, the trend was up until 1937 and 1938, where it remained at 24.5 ounces per dozen or just over a two ounce egg.

Egg size is very important, as the consumer desires large eggs. Laying contests had not been in operation long before it was recognized that in many cases the best producers were birds that laid small eggs. Genetics show that high production and small egg size are associated.

The egg markets put a premium on large eggs, so contest managers have encouraged the production of large eggs as well as numbers.

Table No. 15 compares egg production of all breeds, from Missouri Contests 1911 to 1922, Georgia, Michigan, Missouri, New York, Oklahoma, Texas and Utah Contests 1922 to 1931, to all of the Standard Contests in the United States, from 1931 to 1937. Breeders sent their best layers to the contests so the graph shows a superior product. It is however, representative of the flocks of poultry in the hands of the best breeders throughout the United States and shows the help given the industry by the Contests.

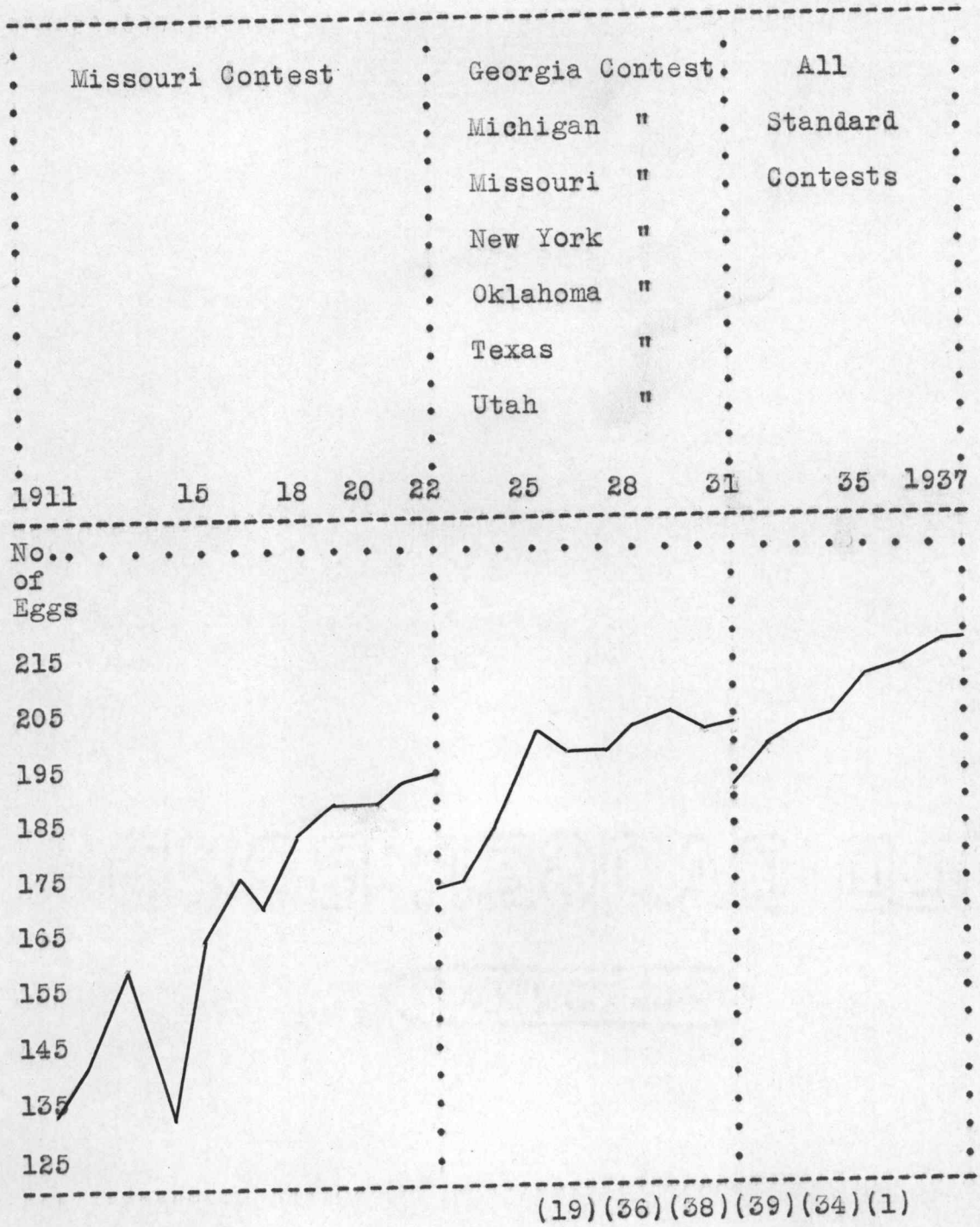
The general trend is upward from 134 eggs per bird in 1911 to 214 eggs per bird in 1937. From 1931 to 1937 the records of the ten highest birds in an entry of thirteen were selected.

During the time of Standard Contests, 82,759 hens have competed. They have laid 16½ million eggs.

(1)(18)(19)(20)(21)(22)(24)(26)(32)(36)

Table No. 15

AVERAGE YEARLY EGG PRODUCTION OF ALL BREEDS



BREEDING PROGRAM

The increase in both numbers and size of eggs that has been attained, is due to various causes. Fourteen present contest supervisors give first credit to the breeders in producing better birds. (51)(28)(20)(15)(27)(7)(50)(39). Eight also give better care at contests, as second; while four, (4)(7)(49)(28) state that better feed at contests is the third reason. Four add better housing, (5)(39)13)(7) and three, better viability. (5)(34)(29)

Several state that the rations have changed very little since 1931. (4)(5)(20) Breeders have learned more about the characters that are involved in the inheritance of egg production and have made use of this information. An example is the case of Reds which have almost caught up with the Leghorns in average egg production.

Breeders whose birds are leaders in egg production have been graduates of State Agricultural Colleges and have a good knowledge of genetics.

The reason that certain breeds have increased in popularity and production is due to the work of individual breeders, who bred according to a genetically correct program and then advertised their breed extensively.

White Wyandottes in 1915, led all breeds with an average of 169 eggs per year (Table 11), but for the period 1930-1938, they were ninth on the list in production, with

the same average of 169. Reds, which were in sixth place in 1915, with an average of 138, are now second with an average of 201, and there are more than sixteen times as many entered in contests.

BODY WEIGHT IN RELATION TO PRODUCTION AND EGG SIZE

Table No. 16

BODY WEIGHTS AND PRODUCTION OF S.C.WHITE LEGHORNS

AT VARIOUS CONTESTS 1926-1937

Utah New York Canada Maryland

Body Wt. Pounds	Production Eggs	No. of Birds
Under 3.0	161	578
3.0 - 3.5	181	3,383
3.5 - 3.7	195	2,917
3.7 - 4.0	198	3,625
4.0 - 4.2	204	1,160
4.2 - 4.5	207	1,002
4.0 - 4.5	218	1,872
4.5 - 5.0	222	3,913
Over 5.0	208	172
		(49)(55)(1)(29)

In Table No. 16 as the weight of birds increases so does production. The maximum production is found in birds weighing from four to five pounds. This is particularly noticeable in one contest, where 65 percent of the birds were in this weight class.

As breeders have gotten better production, they have increased the size of their birds. Better methods of rearing and feeding probably have increased size somewhat and this has also helped in production.

Table No. 17

BODY WEIGHTS AND PRODUCTION OF RHODE ISLAND REDS AT MARYLAND AND CANADIAN CONTESTS 1925 - 1931

Body Wt. Pounds	Egg Production	No. of Birds
Under 4.5	137	74
4.5 - 5.0	158.5	150
5.0 - 5.5	175.	346
5.5 - 6.0	187.8	393
6.0 - 6.5	186	291
6.5 - 7.0	185	147
7.0 - 7.5	165	12
		(49)(55)

At Storrs in 1915 (13), in the third contest, Rhode Island Reds averaged 136 eggs in production with a body weight of 5.5 pounds.

The New York contest (29), 1932 to 1937 (inclusive), had an average body weight of 6.3 pounds and a production of 217.8 eggs.

A correlation between body weight and production is

shown in Table No. 17. Small birds under 4.5 pounds laid 137 eggs per year. The maximum production was reached in the 5.5 - 6.0 pound group, at 187.8 eggs. The three groups from 5.5 to 7.0 pounds showed little difference in production.

Table No. 18

BODY WEIGHT AND PRODUCTION OF BARRED ROCKS

AT MARYLAND AND CANADIAN CONTESTS 1925 - 1931

Body Wt. Pounds	Egg Production	No. of Birds
4.5 - 5.0	175.3	500
5.0 - 5.5	183.0	1,119
5.5 - 6.0	185.0	1,430
6.0 - 6.5	185.1	1,355
6.5 - 7.0	185.2	796
7.0 - 7.5	186.1	485
7.5 and over	174.9	259

(49)(55)

Table 18 covers a total of 5,944 Barred Rocks. A relation between body weight and egg production is indicated. The birds weighing 5.5 to 7.0 pounds produced equally well. The heaviest group, 7.5 pounds showed a decline in production.

Table No. 19

BODY WEIGHT AND EGG SIZE OF S.C.WHITE LEGHORNS

AT UTAH AND CANADIAN CONTESTS 1925 - 1929

Body Wt. Pounds	Ounces Per Dozen	No. of Birds
Under 3.0	22.5	460
3.0 - 3.5	23.2	1,636
3.5 - 3.7	23.4	1,823
3.7 - 4.0	23.8	2,306
4.0 - 4.5	24.2	2,388
4.5 - 5.0	24.5	515
5.0 and over	24.7	178

(49)(1)

The data in Table No. 19 indicates a definite relationship between body weight and egg size in Leghorns, a so-called light breed. As the body weight increases the size of egg increases.

In the questionnaire the contest managers were asked for their opinions on the relationship between body weight and egg size. Their answers may be grouped as follows: 1. Relation general, not absolute (8)(4)(5). 2. We must have good body size for large size eggs (12)(25)(47)(37). 3. We are not sure (7)(32)(18)(9)(26)(49).

Table No. 20

BODY WEIGHT AND EGG SIZE OF BARRED ROCKS AND RHODE ISLAND REDS AT CANADIAN CONTESTS 1925-1929

Breed	Body Wt. Pounds	Ounces Per Dozen	No. of Birds
Barred Ply. Rocks	Under 4.5	22.9	284
Rhode Island Reds	" "	23.3	74
Barred Ply. Rocks	4.5 - 5.0	23.1	467
Rhode Island Reds	" "	23.9	88
Barred Ply. Rocks	5.0 - 5.5	23.4	932
Rhode Island Reds	" "	24.2	154
Barred Ply. Rocks	5.5 - 6.0	23.7	1,252
Rhode Island Reds	" "	24.7	179
Barred Ply. Rocks	6.0 - 6.5	23.9	1,322
Rhode Island Reds	" "	25.1	193
Barred Ply. Rocks	6.5 - 7.0	24.2	765
Rhode Island Reds	" "	25.5	91
Barred Ply. Rocks	7.0 - 7.5	24.4	485
Rhode Island Reds	" "	25.6	69

(49)

A relation exists between body weight and egg weight in both Barred Plymouth Rocks and Rhode Island Reds, (heavy breeds) as shown in Table 20. The lightest group in both breeds laid the smallest eggs and the heaviest group laid the largest eggs. The Barred Rock group weighing over six pounds laid eggs, that were satisfactory in size and the Rhode Island Reds over 4.5 pounds did the same.

In each case the birds well up to standard weight produced the greatest number of eggs as well as the largest eggs. One method of increasing size of egg in the flock, is through using as breeders birds that are up to standard weight.

The foregoing tables, show the vast amount of data worked out at contests for the benefit of breeders. It is indicated that the small egg, small body weight, birds could with profit, be discarded in favor of larger individuals because such birds would lay larger eggs. (18)(19)(20)(21)(22)

FEEDING FORMULAS

Contests are held in connection with State Agricultural Colleges, so the feeding formulas are those that have been worked out scientifically according to basic information along feeding lines.

Corn is the first ingredient on the list of the mash feeds of all early contests as shown in Table 21. This is followed by wheat bran. Shorts are included in only three contest rations.

In some instances locally grown grains have been substituted for the more expensive, as milo for corn, in the Texas ration. Wheat middlings are used by some, while ground oats are standard for all.

Meat scraps (50 - 60% protein) are used as 20% of the mash by most. Storrs used fish meal while Texas substitutes a vegetable protein, linseed meal, for part of it's meat scrap. Two contests use gluten meal, and one, buttermilk and alfalfa meal. Salt, oyster shell, sulfur, bone meal and charcoal are used in varying degrees.

The scratch grains shown in Table 22, are fairly uniform, Storrs using the greatest variety, corn, wheat, oats and barley. Texas adds milo to its corn and wheat.

Table No. 21

LAYING MASH AT EARLY CONTESTS

ON 500 POUNDS BASIS

Ingredient	New York 1923	Texas 1930	Md. 1925	Storrs Conn. 1915	Fla. 1925	Ga. 1929
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
Yellow Corn Meal	100	70	100	75	100	100
Wheat Bran	100	100	100	145	100	100
Shorts	100	100	...	...	...	20
Milo Meal	...	30	...	...	...	...
Wh. Middlings	...	...	100	50	100	100
Ground Oats	100	50	100	75	100	100
Meat Scraps	100	50	100	30	100	100
Dried Fish	...	...	...	30	...	...
Linseed Meal	...	12	...	...	...	...
Gluten Meal	...	10	...	75	...	...
Buttermilk	...	20	...	...	...	...
Alfalfa Meal	...	30	...	...	...	...
Salt	3	3	...	...	3	5
Oyster Shell	...	5	...	...	...	7
Sulfur	3	...	...	...	3	...
Bone Meal	15	5	...	...	...	...
Charcoal	10	5	...	...	...	...
			(7)	(9)	(39)	(24)	(48)	(55)

Table No. 22

SCRATCH GRAINS AT EARLY CONTESTS

ON 500 POUNDS BASIS

Grains	New York 1923	Texas 1930	Md. 1925	Storrs Conn. 1915	Fla. 1925	Ga. 1929
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
Barley	...	...	...	100	...	...
Oats	...	...	...	100	...	...
Wheat	165	100	250	150	250	250
Corn	335	250	250	150	250	250
Milo	...	150	...	...	...	...
				(40)	(39)	(9) (7) (55) (48)

There are two important requirements stressed by the contest managers in feeding. 1. Feed must be fresh. Quantities are purchased for only two weeks at a time. Mash mixing is done frequently. 2. All mash placed in hoppers must be eaten daily. The hoppers should be completely emptied once each day. The caretaker replenishes the supply when needed.

Fresh water, grit and oyster shell are accessible to the birds at all times. At some contests a moist mash is prepared by adding water or milk to the regular dry mash once a day to encourage the birds to eat more. Straw or other litter is on the floor for scratching material to induce exercise.

Table No. 23

LAYING MASHES USED AT 1938 CONTESTS ON 500 POUND BASIS

Ingredient	Penn.	New York	New Jersey	Texas	Fla.	Mo.	Mich.	Maine	Storrs	Ga.	Okla
Yel. Corn Meal	150	150	100	100	100	150	100	160	150	100	75
Wh. Bran	125	50	100	75	100	125	90	80	80	100	145
Shorts	...	...	...	100	...	125	...	...	...	...	75
Wh. Middlings	50	100	100	...	100	...	90	80	80	100	...
Ground Oats	50	75	100	50	100	50	100	80	80	100	...
Barley	...	...	...	50	...	...	...	...	...	...	75
Meat Scrap (55% protein)	50	75	75	50	75	60	45	40	40	40	50
Fish Meal	25	...	...	...	...	...	...	20	20	40	...
Cottonseed Meal	...	...	...	20	...	...	...	...	...	...	30
Dry Milk	25	25	25	30	25	...	25	20	20	...	15
Fish Oil	...	1	...	1	...	...	1	...	11	...	.7
Alfalfa Meal	25	25	...	20	...	25	40	20	20	15	35
Salt	...	3	5	4	3	5	5	4	5	5	5
Oyster Shell	...	...	10	5	7	...	...	10	10	...	5
							(37)	(23)	(15)	(5)	(4)	(8)	(31)	(34)	(7)	(39)	(27)

Table No. 24

SCRATCH GRAINS USED AT 1938 CONTESTS

ON 500 POUND BASIS

Scratch	Penn.	New York	New Jersey	Texas	Fla.	Mo.	Mich.	Maine	Storrs	Ga.	Okla.
Yellow Corn	170	250	250	165	250	250	250	335	335	250	250
Wheat	300	250	250	165	250	250	250	165	165	250	125
Kaffir	...	...	...	170	...	...	...	...	...	...	125
Oats	30	...	...	...	...	...	...	...	...	...	...
				(8)	(31)	(34)	(7)	(39)	(27)	(4)	(5)	(15)	(23)	(37)

The later contests, Table 23, have had the advantage of considerable past feeding experience by which to prove which mashes will do best and as a result the rations are very uniform. They all have the basic ingredients used in the early trials. These are yellow corn meal, wheat bran, wheat middlings, oats, and meat scraps. Two contests use shorts, Texas uses barley and cottonseed meal, Pennsylvania, Maine, Storrs and Georgia have added fish meal.

More knowledge of vitamine requirements (particularly A D and G), and the necessity of supplying the amino acids to insure high egg production, have caused the inclusion of some additional ingredients. Nearly all of the contests use dried milk, alfalfa meal, and fish oil to supply these vitamines and amino acids. Storrs uses a very large amount of fish oil of a U.S.P. potency. Florida and New Jersey are the only ones not using alfalfa meal in the mash.

Sulfur was in the early rations, but it has been left out more recently as its value has been proven negligible. The amount of salt has been increased slightly. Charcoal was once thought essential to purify the blood, but it is not used at the present time. Missouri and Michigan add bone meal to their rations. The scratch grains now used, Table 24, are very similar to the early mixtures; yellow corn and wheat, being the base.

Pennsylvania adds oats, while Texas and Oklahoma add milo.

At most of the contests the scratch grains are fed in litter to give the birds exercise. At the Central and Western New York contests however, the scratch is fed in hoppers. These are opened at the regular grain feeding period late in the afternoon. The action and appetite of the birds is the guide to the length of time the hoppers are kept open. (31)

Green feed is furnished by allowing birds access to yards in which rye or oats were sown and grown to a height of four or five inches before the birds were let in. Sprouted oats are fed when no other green feed is available. (47)

Some contests use green kale, or alfalfa or cut grass as green feed but most contests rely upon dried alfalfa in the mash to take the place of fresh greens.

Table No. 25

ANNUAL MASH AND GRAIN CONSUMPTION PER BIRD

AT VARIOUS CONTESTS

Contests	Mash Pounds	Grain Pounds	Total Feed Pounds
1935			
Missouri			
Light Breeds	39.0	45.1	84.9
Heavy "	37.0	59.6	97.4
1934			
Maryland			
Light Breeds	42.0	44.0	86.5
Heavy "	47.0	45.0	92.5
1936			
Florida			
Light Breeds	40.15	44.0	84.0
Heavy "	36.5	54.0	90.0
1935			
Georgia			
Light Breeds	50.0	36.0	86.0
Heavy "	56.0	37.0	93.0
1931-1937			
Central New York			
Light Breeds	56.0	40.0	96.0
Heavy "	58.0	45.0	103.0
1931-1937			
Western New York			
Light Breeds	58.0	38.0	96.0
Heavy "	63.0	40.0	103.0
Average			
Light Breeds	47.5	41.1	88.6
Heavy "	49.5	46.6	96.1

(55)(29)(44)(36)

Rations are balanced by the proportion of mash ingredients. It is desireable to get the chickens to consume as much mash as possible. In the same contests under the same conditions, the more mash eaten, the greater the egg production. In Table 25 is shown the amount of mash and grain consumed by light and heavy breeds, at different contests. Missouri has the lightest mash consumption with 39 pounds per bird (light breeds), while Western New York has the heaviest, with 58 pounds.

In grains, Georgia has the smallest amount, 36 pounds, for light breeds and Missouri the largest, 45.1 pounds. In heavy breeds, Georgia again has the least amount, 37 pounds, and Missouri the most, with 59.6 pounds.

From data (29) not shown in table 25, New York reports that for a six year average (1932 - 1937), they were able to get both light and heavy breed birds to consume an average of 63.8 pounds of mash and 30.7 pounds of grain, which is a greater difference than any in the table. This was accomplished by the method explained on page 50.

Total feed consumption is fairly uniform, with Florida smallest in light breeds at 84 pounds, New York largest at 96 pounds. Florida is also at the bottom in heavy breeds, 90 pounds, with New York at the top, 103 pounds.

The average feed consumption at all contests for

light breeds, was 47.5 pounds of mash and 41.1 pounds of grain, making a total of 88.6 pounds. For the heavy breeds, the mash consumption was 49.5 pounds, while the grain eaten averaged 46.6 pounds making a total of 96.1 pounds. Light breeds have the advantage of 7.5 pounds less in feed consumption which adds to their profit over heavy breeds.

Statistics such as these have been sent out to contestants in all parts of the United States and have influenced them as well as others in the feeding of their flocks for higher egg yields. Commercial feed companies keep in close touch with the contest results and put any new feeding developements into practice through the feeds they manufacture and sell.

With 82,759 hens, from thousands of flocks in all parts of the country, entered in contests during the past eight years, opportunity has been afforded contest managements to try out different feeding programs in such ways as to demonstrate their relative merits. Such high records as are seen each year in official contests prove that rations have been developed that supply the necessary nutrients to the hens.

MORTALITY IN CONTEST FLOCKS

The disease problem in contest flocks is a very important one. Mortality among birds in a laying contest cannot be expected to be as low as on the well managed and privately owned commercial egg farm. This is natural when it is remembered that birds in a competition come from many sections of the country. Many visitors, who are poultrymen, view the birds and there is a possibility of their bringing disease on their clothing or shoes, as they go through the pens.

At Storrs contest in 1915 mortality was 9.25 percent. The chief causes of death were: diseases of the liver, reproductive organs, tumors, worms and cannibalism. In 1925 a new disease caused great losses in many contests. "Flu", "Canadian Flu", "Infectious Bronchitis", "Laryngo-tracheitis", are some of the names of this plague. Table 26 shows the loss in New York.

Table No. 26

DISTRIBUTION OF MORTALITY AT NEW YORK CONTEST

1926-1927

Disease	Percent Mortality
Infectious Bronchitis	40.0
Roup and Canker	16.0
53 Other Diseases	44.0

(10)

Table No. 27

MORTALITY IN VARIOUS CONTESTS

1923 - 1937

Year	No. of birds	Cent. and West. N.Y. %	Fla. %	Ga. %	Mich. %	Utah %	Ave. %
1923	2,200	24.1	...	...	20.9	...	22.0
1924	2,700	23.0	...	...	20.3	13.0	18.6
1925	2,700	24.0	...	...	17.7	35.0	25.3
1926	2,700	26.0	...	...	17.0	33.0	25.3
1927	3,600	28.0	14.8	14.0	17.0	27.0	20.0
1928	3,920	25.4	14.0	17.7	24.1	18.0	19.6
1929	4,500	24.2	15.0	22.8	17.2	20.0	21.6
1930	4,800	25.1	19.2	33.1	17.5	58.0	30.0
1931	4,467	24.1	18.8	26.6	22.6	....	22.5
1932	4,300	25.3	28.4	23.1	24.4	....	25.0
1933	4,500	23.9	24.11	25.4	27.1	....	25.0
1934	4,300	21.9	23.8	26.10	27.6	....	24.2
1935	3,900	19.9	24.1	26.6	29.9	....	24.8
1936	4,067	20.4	24.4	27.7	29.0	....	25.0
1937	4,122	20.3	25.67	24.5	26.8	....	24.0
			(2)	(56)	(29)	(42)	(23)
			(45)	(31)			

(1)(40)(41)

Table 27 shows the percent of mortality in different contests from 1923 to 1937 and does not look too encouraging. In New York, in 1923, it was 24 percent and has been up and down until 1933, since then gradually it has dropped to 20 percent, which is still too high. Florida's rate has risen from 14 percent in 1927, to 28 percent in 1932, and still shows high at 25 percent. Georgia has held its mortality higher, until 1937, with 24 percent. Michigan started with 10 percent loss, but in 1923 was 20 percent; it dropped for five years to 17 percent, then came up to a high average of about 25 percent. Utah did well, until fowl pox and infectious laryngotracheitis struck and in 1930 had 58 percent loss. The averages are fairly constant. As soon as one disease is partially overcome another takes its place, so advancement, or return to original freedom from disease is very slow.

The acceptance and use of vaccines against fowl pox and laryngotraceitis and the use of the blood test for pullorum disease are apparent in the decline of these diseases.

The increase among contest pullets of cannibalism, parasitis, and reproductive ailments is probably due to conditions in the flocks from which the contestants were chosen.

Table No. 28

MORTALITY BY BREEDS 1931 - 1938

Rank	Breed	No. of Birds	Percent Mortality
1.	Australorps	273	18.2
2.	Rhode Island Reds	7,222	18.8
3.	New Hampshires	1,807	18.8
4.	Barred Plymouth Rocks	3,627	23.7
5.	White Plymouth Rocks	2,314	25.6
6.	White Leghorns	23,257	25.8
7,	Anconas	260	25.8
8.	White Minorcas	390	26.7
9.	White Wyandottes	659	27.0
10.	Jersey White Giants	156	27.6

(19)(29)(9)

In Table 28, is shown the mortality of ten most important breeds entered at contests. Australorps are first with 18.2 percent, but do not have as many entries as Reds. Barred Plymouth Rocks are fourth with 23.7 percent, while the same breed in the White variety is fifth with 25.6 percent.

White Leghorns with an entry of more than all the rest together has 25.8 percent. The rest on the list, the less popular breeds, have from 25.8 to 27.6 percent of deaths. These mortality figures are far too high and are causing breeders great concern.

MORTALITY IN THE QUESTIONNAIRE

The seventh and eighth questions in the questionnaire were: "7. Has there been an increase in diseases since the start of contest?" "8. Which particular disease has been chief cause of loss?" The answers by the different contest managers are as follows:

Hinkle, Pennsylvania: "The chief disease is laryngotraceitis, but vaccines have kept it under control. Leukosis is next."

Kirkpatrick, Storrs: "Mortality increased because of lack of interest of breeders in directing efforts against it. The chief diseases are those of the reproductive organs."

Noland, Missouri: "Increase of mortality comes with lowered resistance caused by artificial housing with electric lights. Ovarian troubles are greatest."

Card, Michigan: "Poultry saturation is the main reason for increase of disease. We are breeding in such large numbers. Fowl pox was a scourge in the early days, now it is paralysis."

Hensarling, Texas: "Paralysis causes our heaviest loss."

Taylor, Canada: "Disease is increasing; we must breed more vigourous families. From 1919 - 1929 intestinal parasites were our chief worries. Now it is infectious Bronchitis."

Platt, New Jersey: "Mortality has doubled. Diseases can be traced to certain farms. It must be controlled by better sanitation by individual poultrymen. No special disease."

Mitchell, Georgia: "There has been an increase. Fowl paralysis causes our greatest loss."

Horton, New York: "A definite increase, new chief diseases, are bronchitis, big liver disease, ruptured yolks, peritonitis."

Stanton, Florida: "Selective breeding will help in keeping disease down. Ovarian trouble, tumors, paralysis and internal hemorrhages are our worst diseases."

Covell, Maine: "Disease is increasing. First we had pox, then laryngotracheitis; vaccines have controlled them. Now we have paralysis and leukemia."

Thompson, Oklahoma: "The last five years disease has increased. There is no one disease predominating."

In the early days of contests the death rate in breeders's flocks was comparatively low. High official records were made and great demand for high quality breeding stock was found by contest winners and others with high record birds.

Mammoth incubators were used to produce more pullets to fill the demand and with the larger number of birds in the hands of commercial poultrymen came a growth in mortality among the birds.

Stock was shipped from every part of the country to the contests. In many instances the pullets came down with disease within three weeks after arriving at the contest. Some died and others survived, became carriers of the disease and when they were returned to their owners after the contest was over, spread the disease in the home flock.

Breeders were fearful of introducing disease onto their farms and so many sold their contest winners rather than take any chances in bringing them home.

The spreading of disease by birds returning from contests has had a very harmful influence on the poultry industry.

RESULTS OF CONTESTS

Contests serve a very useful purpose in stimulating breeders interest in egg production. They are also used as a medium of advertising by those breeders whose high producing birds win at the contests or come near the top. Statistics are available for students who wish to study genetics and other problems relating to poultry husbandry. Their influence is large, but there are limitations.

The entries at contests show a very small number of a breeders best birds, not the average production of his flock. If the breeder retains the birds that win for him and breeds from them, the fact that they have won is no criterion of their producing stock that will perform equally well.

The breeder should have information on the sister's and half-sister's production, under the same conditions. This is not possible as the environment at the contest will be different from that at the home farm.

For these reasons New Jersey has instituted a plan that is working quite well. A breeder's best pullets are entered in the pullet contest, where they remain during their first year of laying. At the close of that year the birds are transferred to the Vineland Hen contest where they are mated with good males. Hatching eggs from this pen are sent to the breeder, who then may pedigree the

chicks.

By continuing to maintain four pens, two of pullets and two of hens, a farm of 1,500 laying birds would have its breeding program very well taken care of without trap-nesting at home, without risk of introducing disease, and with very little extra work.

For the established Record of Performance breeder the New Jersey Egg Laying Contest program provides the means whereby he can place his birds in fair competition with those of other poultrymen. In addition the facilities of Vineland Hen Contest make it possible for him to secure life-time records on some of his birds, thus assisting in building up longevity and sustained production in his flock. The breeding pens at Vineland can be entered in Record of Performance and used for the production of hatching eggs to be taken home and hatched into Record of Performance chicks. (33)

In Canada the Government has correlated the work of the contests and the Record of Performance work. Flocks of members are inspected and the inspector picks the birds to be entered. All records are kept in the National Live Stock Records. The Department of Agriculture of Canada appoints the officers for inspection whose duties are:

1. To inspect all pullets before entering the Canadian National Egg Laying Contest.

2. To inspect and tattoo all females after qualifying in the Canadian Egg Laying Contest.

3. To inspect and tattoo when qualified, all eligible females sired by a registered male, the progeny of two or more generation registered females, which are retained on a breeders plant for breeding purposes and which may qualify on inspection for registration without going through the Canadian National Egg Laying Contest.

4. To inspect all unregistered males to be mated to registered females.

5. To Inspect all registered males to be mated to registered females.

6. To inspect poultry yards, including trapnesting facilities, hatching and private pedigree records, kept in a form approved by the Canadian National Live Stock Records. (51)

It will be seen by the foregoing that the Canadian Contests and breeders are working together along the correct lines for poultry improvement.

NATIONAL POULTRY IMPROVEMENT PLAN

When they realized the benefit derived from entering birds in officially conducted egg laying contests, many breeders asked that some system might be established, whereby records of production made on their own premises might be officially recognized.

Various plans of State poultry improvement work were developed by the breeders in cooperation with State officials. The real objectives were to improve the quality of hatching eggs, baby chicks, breeding stock, and market products, and make poultry production more efficient. Birds in an official contest were under the jurisdiction of a State official. Why not have official recognition of records made on the breeders own premises?

As the number of egg laying contests was limited by finances and could only care for small number of birds, it seemed logical to develop Record of Performance work on a wider scope by including records on the home plants. This has been developed by breeders of skill in mating and pedigree work with the object of supplying stock with pedigrees that have some official standing. (36)

The first states to start Record of Performance work were Washington and Massachusetts, on the extreme sides of the United States. This was in 1923. After seven years of

success by these and other states, in 1930 a call was made by the Michigan Record of Performance Association, inviting all states to meet at Detroit to unify the work in the various states. Sixteen states were represented and the United States Record of Performance Federation was organized. After working for five years, the National Poultry Improvement Plan was formulated and put into operation, July 1, 1935.

This plan has been developed to assist the poultry industry in placing itself upon a more sound and efficient basis. This is being accomplished through: (1) the development of more effective State programs for improving the production and breeding qualities of poultry and reducing mortality from pullorum disease; (2) the authoritative identification of breeding stock, hatching eggs, and chicks with respect to quality, describing them in uniform terms; and (3) the establishment of an effective cooperative program through which the best results from scientific research can be applied immediately to the improvement of poultry and poultry products.

The plan in each of the participating states is administered cooperatively by an official State agency, and the Bureau of Animal Industry of the United States Department of Agriculture. The official State agency recognized by the Bureau of Animal Industry is usually the agency

that was administering the State poultry improvement program prior to the adoption of the national plan. It may be the State department of agriculture, State College of agriculture, State poultry improvement board or association, or similar organization recognized by the State government. Authority for an official State agency to administer the plan within the State is a memorandum of agreement between it and the Federal Bureau of Animal Industry. This State agency directs, supervises, and is responsible for flock selection, testing for pullorum disease, and the other local administrative work involved in the operation of the plan. The Bureau of Animal Industry is responsible for coordinating the program among the States in which the plan is in operation.

Any poultry breeder, hatcheryman, or flock owner in a State having an official State agency for administering the plan may cooperate in the program by signing an agreement with this agency and complying with the provisions of the plan. Following proper certification of the quality of his flocks and hatchery products by the State agency, such flock owner, hatcheryman, or poultry breeder may then use the emblems, designs, and terminology of the National Poultry Improvement Plan in advertising his flock or hatchery products.

The plan is nation-wide in scope. The adoption of the plan on the part of states or individual industry members is entirely voluntary, but participants must meet its minimum requirements. Participation in the plan has grown steadily since its inauguration, and breeders and hatcherymen in 44 states are operating under official supervision, in compliance with provisions of the various breeding and pullorum-control phases of the plan.

Only standard breeds and varieties of chickens are elegible to qualify as breeding stock. All birds intended for breeders are selected annually by qualified flock-selecting agents especially trained by the State college of agriculture or other properly constituted agency and authorized by the official State agency. Inspections of breeding flocks and hatcheries are made by State inspectors employed by the official State agencies. (54)

The greatest and most last influences, that Egg Laying Contests have had on the poultry industry have been the growth and development of the Poultry Improvement Plan in 44 states of our country.

CONCLUSIONS

Egg Laying Contests have had the following advantageous influences:

1. They have shown that high egg production is not a climatic result as high records have been made in all sections of the United States.

2. They have shown that high egg production is a question of strain (breeding), rather than breed or variety.

3. They have provided a means for giving wide publicity to official yearly egg production and feed cost records.

4. They have influenced the public in favor of purchasing stock of winning strains, of five of the more popular breeds.

5. They have constituted a portion of the incentive for breeders, through better breeding practices, to increase the annual egg production of their birds.

6. They have by adopting the point system of scoring, given impetus to the breeding for increased size of eggs.

7. They have given to the poultry industry the foundation for the National Poultry Improvement Plan, which now combines leading poultrymen of 44 states in a useful constructive breeding program.

The outstanding unfavorable influence of Egg Laying Contests has been the spreading of disease by returning to the home farms at the ends of contests, birds which had survived epidemics, but became carriers under the concentrated contest conditions.

BIBLIOGRAPHY

1. Alder, B. 1934: Results of Seven Years of Egg Laying Contests. Utah Agr. Exp. Sta. Bul.248. 28pp.

2. Anderson, C.D. 1929: Report of the New York State Egg Laying Contest. November 1, 1928 to October 23, 1929. Issued by State Inst. of Applied Agr., Farmingdale, L.I.,New York. 27pp.

3. Anderson, C.D. 1930: Report of the New York State Egg Laying Contest. October 15, 1929, to September 22, 1930. Issued by State Inst. of Applied Agr., Farmingdale, L.I.,New York. 19pp.

4. Card, C.G. 1939: Michigan Questionnaire. February, 1939.

5. Covell, H.T. 1939: Maine Questionnaire, February, 1939.

6. Embleton, H. 1939: Arizona Questionnaire. February, 1939.

7. Hensarling, T.A. 1939: Texas Questionnaire, February, 1939.

8. Hinkle, R.S. 1939: Pennsylvania Questionnaire. February, 1939.

9. Horton, D.H. 1924: Report of New York State Egg Laying Contest. November 1, 1923, to October 29,1924. Issued by State Inst. of Applied Agr., Farmingdale, L.I.,New York. 36pp.

10. Horton, D.H. 1927: Report of the New York State Egg Laying Contest. November 1, 1926, to October 23, 1927. Issued by State Inst. of Applied Agr., Farmingdale, L.I., New York. 32pp.

11. Jull, Morley A. 1938: Poultry Husbandry. 2nd Ed. New York and London. McGraw-Hill Book Company, Inc. 548pp.

12. Jull, Morley A. 1932: Poultry Breeding. 1st Ed. New York. John Wiley and Sons, Inc. 376pp.

13. Kirkpatrick, W.F. 1915: Third Annual International Egg Laying Contest. Storrs Agr. Exp. Sta. Bul.82. July, 1915. 99pp.

14. Kirkpatrick, W.F. 1939: Connecticut Questionnaire. February, 1939.

15. Kirkpatrick, W.F. 1938: Twenty-seventh Storrs Laying Contest. Rules and Regulations. October 1, 1937 to September 22,1938. Connecticut State College, Storrs, Conn. 6pp.

16. MacDougal, Ian 1938: Register of Records in Laying Trials, in England. Vol. XII. 307pp.

17. Michigan Egg-laying Contest, 1937: Rules and Regulations of Fifteenth Annual Contest. October 1, 1936, to September 23, 1937. Michigan State College, East Lansing, Mich. 3pp.

18. Missouri National Egg-laying Contests. 1935: Summary of Contests from 1911 to 1935, inclusive. Issued by Missouri Agr. Sta. Mountain Grove, Mo. 2pp.

19. Mitchell, F.E. 1938: Records in Standard United States Egg-laying Tests, from 1930 to 1938. College of Agr., Athens Ga. 7pp.

20. Mitchell, F.E. 1935: Progress Report Ninth Georgia National Egg Laying Contest. Vol.IX.No.12. Issued for September, 1935, by College of Agr., Athens, Ga. 7pp.

21. Mitchell, F.E. 1936: Progress Report, Tenth Georgia National Egg Laying Contest. Vol.X. No.12. Issued for September, 1936, by College of Agr., Athens, Ga. 7pp.

22. Mitchell, F.E. 1937: Progress Report, Eleventh Georgia National Egg Laying Contest. Vol.XI. No.12. Issued for September, 1937, by College of Agr., Athens, Ga. 8pp.

23. Mitchell, F.E. 1938: Progress Report, Twelfth Georgia National Egg Laying Contest. Vol.XII.No.12. Issued for September, 1938, by College of Agr., Athens, Ga. 8pp.

24. Mitchell, F.E. 1939: Georgia Questionnaire, February, 1939.

25. New Jersey Agr. Exp. Sta. 1916: The Development of the Egg Laying and Breeding Contest Idea in New Jersey. Bul.338. Issued by New Jersey Agr. Exp. Sta. 1916. 6pp.

26. New York State Institute of Applied Agr. 1931: Changes in Returns Over Seven Years Period. Ninth New York Test. Issued by the New York Inst. of Applied Agr. September, 1931, at Farmingdale, L.I.,New York. 13pp.

27. Noland, T.W. 1939: Missouri Questionnaire. February, 1939.

28. Ogle, R.C. 1939: New York Questionnaire. February, 1939.

29. Ogle, R.C. 1938: Six Years of Central and Western New York Official Egg Laying Tests. Bul.394. Issued by New York State College of Agr. at Cornell University. Ithaca, New York. October, 1938. 32pp.

30. Ogle, R.C. 1938: September Statement. Central New York State Official Egg Laying Test. Horseheads, New York. Poultry Department, Cornell University. September, 1938. 7pp.

31. Ogle, R.C. 1938: September Statement. Western New York State Official Egg Laying Test. Stafford, New York. Poultry Department, Cornell University, September, 1938. 7pp.

32. Oklahoma Summary of Fifteenth Egg Laying Test. 1938: From October 1, 1937 to September 22,1938. Issued by the Oklahoma Agr. College at Stillwater, Oklahoma, 1938. 12pp.

33. Platt, C.S. 1934: Hints to Poultrymen. The Policy of the New Jersey Egg Laying Contests. Vol.21.No.6 Issued by Department of Poultry Husbandry at New Jersey Agr. Exp. Sta. September, 1934.4pp.

34. Platt, C.S. 1939: New Jersey Questionnaire. February, 1939.

35. Poultry Tribune, 1938: All Time Egg Laying Test Records and 1938 Summaries. Tribune Way Service Leaflet, No. 42. Published by Poultry Tribune, Mount Morris, Ill. 6pp.

36. Robinson, W.E. 1930: American Poultry Record. Official Organ of the American Record of Performance Council. 1930.Sellersville, Pennsylvania.238pp.

37. Soule, A.M. 1932: Five Years of the Georgia National Egg Laying Contest. Vol.XX. No.421. Issued by the Georgia College of Agr. Athens, Ga. February, 1932. 28pp.

38. Stanton, E.F. and Mehrhof, N.R. 1927: First Florida National Egg Laying Contest. November, 1926 to October, 1927. Issued by University of Florida. Chipley, Fla. 12pp.

39. Stanton, E.F. 1939: Florida Questionnaire. February, 1939.

40. Stanton, E.F. and Mehrhof, N.R. 1930: Fourth Florida National Egg Laying Contest. November 1, 1929 to September 22, 1930. Issued by University of Florida. Chipley Fla. 20pp.

41. Stanton, E.F. and Mehrhof, N.R. 1931: Fifth Florida National Egg Laying Contest. October, 1930 to September, 1931. Issued by University of Florida, Chipley, Fla. 19pp.

42. Stanton, E.F. and Mehrhof, N.R. 1932: Sixth Florida National Egg Laying Contest. October, 1931, to September, 1932. Issued by University of Florida, Chipley, Fla. 28pp.

43. Stanton, E.F. and Mehrhof, N.R. 1933: Seventh Florida National Egg Laying Contest. October, 1932, to September, 1933. Issued by University of Florida. Chipley, Fla. 9pp.

44. Stanton, E.F. and Mehrhof, N.R. 1936: Tenth Florida National Egg Laying Contest. October, 1935 to September, 1936. Issued by University of Florida. Chipley, Fla. 20pp.

45. Stanton, E.F. and Mehrhof, N. R. 1937: Eleventh Florida National Egg Laying Contest. October, 1936 to September, 1937. Issued by University of Florida. Chipley, Fla. 20pp.

46. Storrs Agricultural Experiment Station 1917: Bulletin No. 89. Issued by Storrs Agr. College, Storrs, Connecticut. February, 1917. 72pp.

47. Storrs Agricultural Experiment Station, 1919:Bulletin No. 100. Issued by Storrs Agr. College, Storrs, Connecticut. January, 1919. 96pp.

48. Storrs, Official Opening of Twenty-fifth Storrs Egg Laying Contest. Issued by Storrs Agr. College, Storrs, Connecticut. July, 1936. 5pp.

49. Taylor, A.G. 1930: Canadian National Egg Laying Contests. Bulletin No. 139. --New Series. Issued by the Dominion of Canada Department of Agriculture. Ottawa, Canada. 1930. 112pp.

50. Taylor, A.G. 1939: Canadian Questionnaire. February, 1939.

51. Taylor, A.G. 1932: Canadian National Poultry Record Association Blue Book. Issued by Experimental Farm. Ottawa, Ontario, Canada. 64pp.

52. Thompson, R.B. 1939: Oklahoma Questionnaire, February, 1939.

53. United States Department of Agriculture 1937: Statistical Abstract. 85pp.

54. United States Department of Agriculture. 1938: Publication No. 300. January, 1938. 544pp.

55. Waite, R.H. 1934: Feed Consumption Studies Based on the Six Maryland Egg Laying Contests. February, 1934. Bul. No.359. Issued by the University of Maryland Agr. Exp. Sta. at College Park, Maryland. 332pp.

56. Weisner, E.S. 1937: Death Losses Increasing in Pullet Flocks. Reprint from Michigan Agr. Exp. Sta. Quarterly Bul. No.2.Vol.XX. November, 1937.6pp.

I

Corvallis, Oregon

Dec. 22, 1938

To
..... Contest Manager

..... Contest

..... Address

Dear Sir:

I have been following Egg Laying Contests in the Poultry Press for many years and now am working on my Master's Degree in Poultry at the Oregon State Agricultural College.

For my thesis, I am writing on Contests. There is very little available material in our library, so I am writing you asking if your management has any printed material that I might use. I will be glad to pay for any matter that you would feel free to send me.

Thanking you for your interest in the progress of the poultry industry and in whatever you may do for me,

I am yours respectfully,

Enclosed find stamped addressed envelope.

Questionnaire

1. What were the reasons for starting contests?.....

2. Methods of choosing entrants for contests?.....

3. Does your method of choosing entrants give the worth of breeder's flock, or only a few of the best?.....

4. Has the contest been of real value to the whole poultry fraternity, or only to those who enter?.....

5. Has the increase in number of eggs laid been due to better care and change in rations at the contest, or to breeders producing better birds, or both?.....

6. Is there a relationship between egg size and body size?

7. Has there been an increase in disease since the start of the contest? Reasons?.....

8. Which particular disease has been the chief cause of loss?.....

9. Please give your feed formulas of grain and mash at start of contest, in 1930, and in 1938.....

10. Please give any special information that your contest has brought out.....