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# TEXAS AGRICULTURAL EXPERIMENT STATION

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DIVISION OF POULTRY HUSBANDRY

## EGG-PRODUCING VALUES OF SOME TEXAS FEEDING STUFFS



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COLLEGE STATION, BRAZOS COUNTY, TEXAS

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\*As of October 1, 1917.

\*\*In cooperation with A. & M. College of Texas.

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\*\*\*\*In cooperation with United States Department of Agriculture.

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## PREFACE.

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This bulletin presents the results of a poultry feeding experiment carried out in order to determine the relative egg-producing values of certain feeds produced in this State.

## EGG-PRODUCING VALUES OF SOME TEXAS FEEDING STUFFS

BY R. N. HARVEY, POULTRYMAN IN CHARGE.

### INTRODUCTION.

The annual egg production in Texas, figured in proportion to the average number of hens found on the farm and poultry plants of the State, is much lower than it should be if poultry raising is to be engaged in as a money-making enterprise. The average yield per hen has been variously estimated at from fifty to seventy eggs a year. From records kept on several farms during the year 1916, figures from which were available for this bulletin, it is shown that the lowest averaged 47.6 eggs to the hen; the highest giving a yield of 134.12. The average yield to the individual for all the farms was 76.71. Two of these farms, it may be noted, made a specialty of poultry; but eliminating these, we have the others averaging 65 eggs per hen. This may be accepted as typical of the whole state, since the farms here considered are widely scattered, no two of them, in fact, being in the same county.

The reasons for the low egg yield are obvious and are readily pointed out. Indifferent housing, lack of attention, careless breeding, and improper feeding methods are the causes chiefly responsible for the poor showing. But, on the other hand, by keeping well-bred fowls, by providing good houses for them, and by giving their feed even moderate attention, the possibilities of poultry raising as a source of income are surely greatly increased.

### OBJECT.

The object of the experiment with which this bulletin deals was to determine whether or not rations composed entirely of vegetable feed can be fed as profitably as rations consisting in part of meat feeds and also to determine the relative feeding values of skim-milk, cottonseed meal, meat-scrap and peanut meal.

Meat-scrap has long been recognized as an important source of protein, but lack of a good local supply has prevented its use on the average farm. Cottonseed meal is advocated as a poultry feed by manufacturers but has not been regarded as a meat substitute by poultry raisers. The recent development of the peanut industry in this state has led many to hope that the relatively inexpensive peanut meal could take the place of the higher priced meat-scrap.

Sour skim-milk is known as a valuable source of protein, but has never been given the recognition it deserves.

### DATE OF EXPERIMENT.

The experiment was begun on December 20, 1916, and was continued through a period of twenty-four weeks, being brought to a close on July 5, 1917. As at first planned, it was intended to carry the test on for a full year, but erratic fluctuations in prices of feed and the impossibility of securing certain of the ingredients of the rations with which the experiment was begun, rendered it necessary to bring the test to an end.

### HOUSING.

The experiment was conducted in permanent colony houses, designated as houses 1, 2, 3 and 4, respectively, beginning at the house nearest to the egg room. Each house is 14 feet by 14 feet in size, with concrete floors and open front. Solid doors are hinged horizontally along the sides. The houses are equipped with Cornell trap nests.

### YARDS.

Each house has a yard 80 feet by 90 feet, divided longitudinally through the center. For convenience, the yards are numbered consecutively from 1 to 8, inclusive, the odd numbers denoting the yards at the rear of the houses and the even numbers representing the yards at the front of the houses.

The yards were managed as follows: When plowed, harrowed, or planted, all even or all odd numbers were tilled the same day. No charge was made for the pasturage and no credit given for fertility accruing from the droppings of the fowls while in the yards or in the houses at night.

### STOCK.

The stock was standard-bred single-comb White Leghorns of a good strain. This stock, however, was no better than that which could be placed on any farm in this state at a very reasonable expenditure for a few settings of eggs. The chicks were hatched during the preceding spring from Experiment Station stock. They were divided into four lots of forty females each, with two cockerels, of the same breeding and age as the pullets, placed in each lot. All the birds were range-raised and in good condition; and none of them were forced while growing. At the beginning of the experiment, they were evenly divided as regards vigor and maturity.

### RATIONS.

The rations were composed of feeds that can be secured without difficulty, with the possible exception of meat-scrap, which is the only feed not easily available to Texas farmers.

Table 1.—Rations.

Lot 1	Lot 3
Skim-milk	Meat-scrap
400 pounds milo 45 pounds bran 55 pounds shorts 750 pounds skim-milk	400 pounds milo 50 pounds meat scrap 50 pounds bran 60 pounds shorts 40 pounds milo chops
Lot 2	Lot 4
Cottonseed Meal	Peanut Meal
400 pounds milo 60 pounds cottonseed meal 70 pounds bran 50 pounds shorts 20 pounds milo chops	400 pounds milo 53 pounds peanut meal 57 pounds bran 49 pounds shorts 41 pounds milo chops

With meat-scrap as a basis, the rations were calculated to supply as much protein from milk, cottonseed meal and peanut meal as the meat-scrap supplied, using an equal amount of feed. The milo was utilized as a scratch feed. The other feeds were mixed and hopper-fed. The milk was fed in a tin pan.

PRICES.

There had been an increase in the cost of all feeds, some, in fact, nearly doubling in price during the twenty-four weeks of the experiment. The prices charged here represent the average for the year, computed as follows: The amount of each constituent of the ration was determined at the end of each four weeks and charged at the price of the feed at that time. Then, at the end of the twenty-four weeks, the total number of pounds of feed consumed and the cost of the feed were used in compiling costs.

The egg prices were compiled in the same manner, being based on the price of eggs for each week.

CARE AND MANAGEMENT OF THE FLOCK.

The whole milo was placed in a galvanized container in each house and fed morning and night. About one-tenth of the daily portion was fed in the morning and about two-thirds in the evening. The dry mash was fed in hoppers, which were always kept open. The skim-milk was always before the fowls. Green feed was secured only from the yards. One yard of each house being pastured at a time, it was thus possible to keep a crop growing in the other one.

Fresh water was given every morning, and during warm weather a fresh supply was placed in the receptacles for them at noon. The drinking dishes were rinsed out regularly every day.

Records were kept of all feed weighed out to each house and at the end of each seven-day period that which was not consumed was weighed back. The records of feed consumed were totalled and the amount

recorded at the end of each four weeks. The number of eggs from each house was recorded daily and weekly.

Trap nest records were made in December, January, and again in early May. No weights of the hens were recorded.

### LABOR.

The labor charged against each flock is the actual number of hours required to care for a production flock of equal size.

Table 2 presents the average consumption per individual of each feed for each ration fed.

Table 2.—Average Amount in Pounds Per Hen of All Feeds Consumed.

	Lot 1	Lot 2	Lot 3	Lot 4
	Skim Milk.	Cottonseed Meal.	Meat Scrap.	Peanut Meal
Milo.....	19.57	18.82	19.30	19.55
Bran.....	3.5	3.09	2.54	2.39
Shorts.....	4.27	2.21	3.05	1.96
Milo chops.....		.88	2.03	1.84
Sour milk.....	37.52			
Cottonseed meal.....		2.65		
Meat scrap.....			2.54	
Peanut meal.....				2.41
Oyster shell.....	.92	1.07	1.02	.8
Total.....	65.71	28.72	30.49	28.95

It is shown by Table 2 also that the birds in the meat-scrap and skim-milk pens ate more feed per bird than those in the peanut and cottonseed meal pens. It will be noted, however, that the birds in the meat-scrap pen ate but little more ( $1\frac{1}{2}$  to  $1\frac{3}{4}$  pounds) than the peanut meal or the cottonseed meal pens. Milk, being about 90 per cent. water, had to be consumed in large quantities in order to be equivalent to the other protein feeds. At the rate used, one hen will consume about 90 pounds of milk a year, or one-fourth of a pound a day.

The cost of feed, litter, and labor per hen, and the cost of feed, litter, and labor required to produce one dozen eggs, are given in Table 3. Table 3 is a corollary to Table 2, and shows, as would be expected from an inspection of Table 2, that the cost per hen was less for the peanut and cottonseed meal pens, the birds in this pen having consumed a slightly smaller amount of feed than those in pens 1 and 3.

Table 3.—Cost of Feed, Litter, and Labor.

	Lot 1	Lot 2	Lot 3	Lot 4
	Skim Milk.	Cottonseed Meal.	Meat Scrap.	Peanut Meal.
Part 1 per hen.....	\$1.24	\$0.99	\$1.08	\$1.01
Part 2 per 1 dozen eggs.....	\$0.166	\$0.199	\$0.172	\$0.205



Table 3, however, shows that although the cost per hen in the cottonseed and peanut meal pens was less than that in the meat-scrap and skim-milk pens, the cost a dozen for eggs was greater. It is apparent, as will be shown in a later table, that the meat-scrap and skim-milk



Fig. 1.—Cost of producing one dozen eggs.

pens must have produced a greater number of eggs for an equal expenditure of feed, litter, and labor than did the cottonseed and peanut meal pens. This tends to indicate that, so far as producing eggs cheaply is concerned, a ration containing some meat feed is better than one consisting wholly of vegetable feeds.

Table 4.—Number of Pounds of Feed Required to Produce One Dozen Eggs.

Lot 1	Lot 2	Lot 3	Lot 4
Skim Milk.	Cottonseed Meal.	Meat Scrap.	Peanut Meal.
9.41	5.75	4.86	5.8
3.71			

It will be noted (Table 4) that the milk-fed pen required a greater number of pounds of feed to produce one dozen eggs than was needed

to produce an equal number of eggs in any of the other three pens. The large quantity of milk required to supply as much protein as is supplied by the smaller amounts of peanut meal, meat-scrap, or cottonseed meal explains the use of the apparently exorbitant amount of feed. Aside from the milk, only 3.71 pounds of grain were required to produce one dozen eggs in that pen. The meat-scrap pen required about one pound less feed to produce one dozen eggs than did either the peanut meal pen or the cottonseed meal pen.

Table 5.—Average Number of Eggs Per Hen and the Per Cent Production.

Lots.	1	2	3	4
Rations.	Skim Milk.	Cottonseed Meal.	Meat Scrap.	Peanut Meal.
Average number of eggs per hen.....	89.95	59.95	75.31	56.80
Per cent production.....	52.9	35.68	44.7	33.8

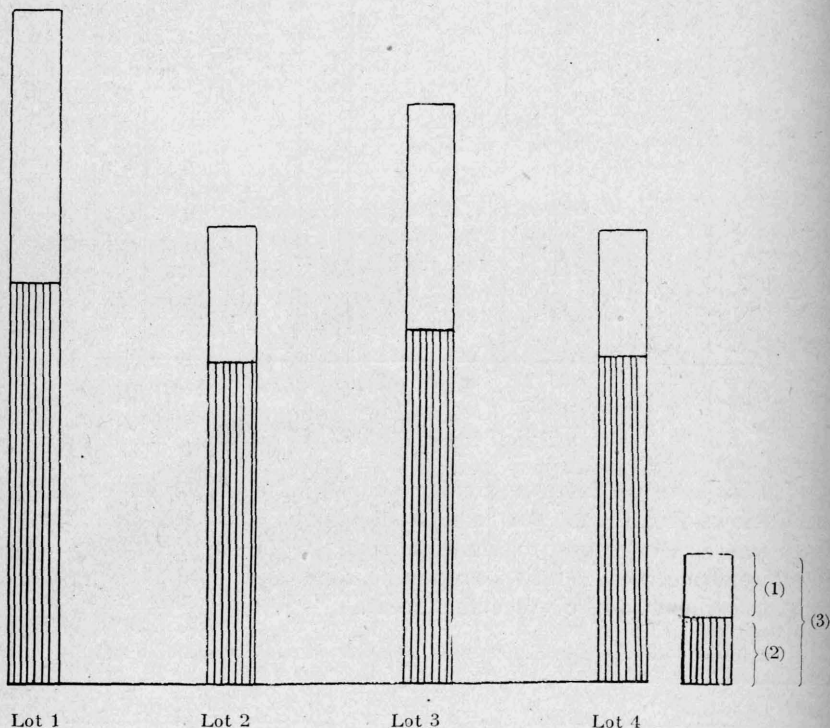


Fig. 2.—(1) Return over cost of feed, litter, and labor; (2) cost of feed, litter, and labor; (3) gross return.

Table 5 shows that the hens composing the skim-milk pen laid the greatest number of eggs each and those making up the peanut meal pen produced the smallest number of eggs per individual. The cottonseed meal pen did slightly better than the peanut meal pen but yielded thirty

eggs less per bird than the milk-fed pen. The two pens (Lots 2 and 4), which received only vegetable feeds, made but mediocre records. The meat-scrap pen made a creditable showing—about half way between the cottonseed meal pen and the milk-fed pen.

Inspection of the part of the table giving the per cent. production will serve to emphasize the observation noted in the foregoing paragraph.

**Table 6.—Average Income Per Hen and the Average Profit Per Hen Over the Cost of Feed, Litter, and Labor Are Here Shown.**

Lots.	1	2	3	4
Rations.	Skim Milk.	Cottonseed Meal.	Meat Scrap.	Peanut Meal.
Average income per hen . . . . .	\$2.09	\$1.41	\$1.79	\$1.40
Average profit per hen over feed, litter and labor . . . . .	.85	.42	.70	.39

The most striking fact to be noted is the cost and profit over feed, litter and labor per hen in Lot 1. The cost is greater for each hen than in any other flock in the test, but also the profit is considerably larger. Conversely, the pen (Lot 4) which cost the least made the smallest profit. The cottonseed meal pen did slightly better than the peanut meal pen. The meat-scrap pen did much better than either the cottonseed meal pen or the peanut meal pen, though not so well as the milk-fed pen.

SUMMARY.

1. The pens which cost the most in feed per hen gave the greatest returns per hen.
2. The hens receiving some animal feed were more profitable than those receiving vegetable feed only.
3. Vegetable feeds with high protein content seemed unable to replace animal feeds in the ration.
4. The fowls preferred the ration containing animal feed and ate it in larger quantities.
5. Sour skim-milk appears to be more profitable than meat-scrap as a source of protein, when it can be obtained at a reasonable cost.
6. The number of pounds of feed required to produce one dozen eggs makes it evident that the fowls receiving some meat feed were able to make a more efficient use of their feed than the hens receiving only vegetable feeds.