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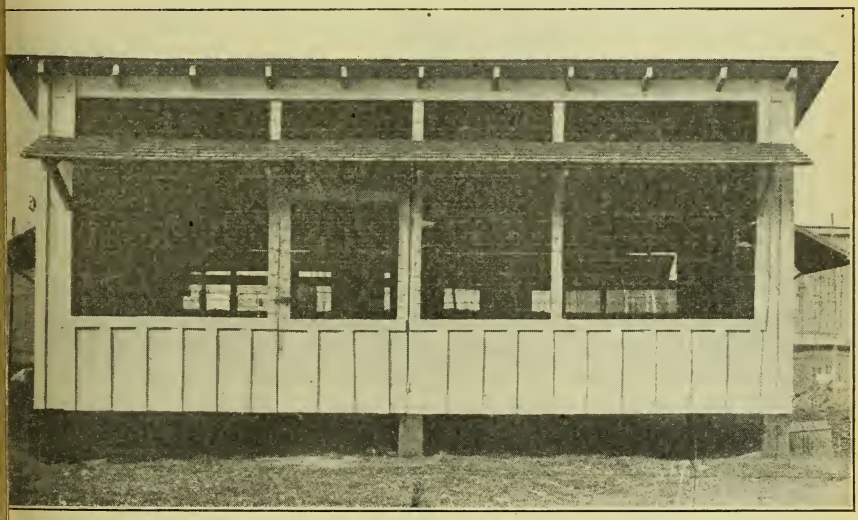
By E. P. CLAYTON



MISSISSIPPI POULTRY HOUSE

This house is arranged with double pens, and provides roosting and laying room for 100 hens. Similar houses can be built on any farm at a moderate cost.

AGRICULTURAL COLLEGE, MISSISSIPPI

TELL FARMER, PRINTER
MERIDIAN

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The hen is a machine to convert raw feed into the delicious finished product—the egg. That she may produce eggs for her owner's profit, she must first have both the quantity and variety of feed essential to her bodily needs. How evident it is, that every owner of hens should plant such a variety of grains and grasses as will at all times insure proper vegetable matter for the poultry. Green feeds—like oats, rye, wheat, rape, collards, some of the clovers—are necessary that hens may be healthy and may produce their maximum number of eggs. Protein in some form is likewise essential. Butter milk, an excellent protein food, should be given in liberal quantities. Where it is available, the farmer should feed some by-product of the packing houses—commercial beef scraps, for example. These by-products, unfortunately, are unobtainable in the small towns of the South. Though rich in protein, they are, moreover, so costly as to cut materially into poultry profits.

Fortunately the Southern farmer needs to provide protein food only during the fall and winter months. During the spring and summer, where hens have range of the farm, they can pick up bugs and worms enough to supply their needs in protein feed. The farmer, furthermore, need provide little succulent matter; in our temperate climate, in almost any month, hens find plenty of grass. If, however, he would have his poultry profitable not only in summer but in winter when grass is less abundant and when worms are hibernating, he must provide a winter pasture and must procure protein in some form for the daily ration.

COTTON SEED MEAL AS A CHICKEN FEED

An excellent protein feed is cotton seed meal. This meal, which is from 33 per cent to 40 per cent protein, has for a number of years been fed with good effects to dairy and to beef cattle, but until recently has not been tried scientifically with poultry. The Mississippi A. and M. College Experiment Station has conducted three feeding experiments with it; two with lay-

ing hens and one with fattening broilers. The first experiment with hens has been described in Bulletin 162 of this station. The second with hens and the experiment with fattening broilers are described in the present bulletin.

COTTON SEED MEAL FOR LAYING HENS

The second experiment with laying hens embraced two tests. Of these the first was with two pens of Rhode Island Reds, nine in each pen. The hens, though old and laying few eggs, were of equal age. The pens were covered, so that nothing should go wrong in the feeding; the hens could fly neither in nor out. The fowls, of both pens, were fed Purina hen feed and a mash of corn meal, wheat bran, oats, and a protein substance. Eleven per cent of the mash given the fowls in pen A was cotton seed meal; the equivalent in protein value of beef scrap was fed the fowls in pen B. The Purina feed was given in straw twice each day—all they could eat at night, a little less in the early morning. The composition of the mash for each pen was as follows:

Pen A.		Pen B.	
Cotton seed meal	11 Parts	Beef scrap	5½ Parts
Corn meal	50 Parts	Corn meal	50 Parts
Oats	29 Parts	Oats	29 Parts
Wheat bran	10 Parts	Wheat bran	10 Parts

The details of the test follow:

	lbs.	lbs.
Mash eaten	125	120
Grain eaten	213	177
Total feed	338	297
Cost of feed	$6.76	$5.94
Eggs laid in October	40	12
Eggs laid in November	25	10
Eggs laid in December	88	28
Eggs laid in January	45	36
Eggs laid in February	86	55
Eggs laid in March	45	33
Total eggs laid	249	174
Cost of feed per hen	$0.75	$0.66
Cost of producing an egg	$0.027	$0.034

The hens in pen A, fed cotton seed meal, ate more mash and more grain than the hens in pen B, fed beef scrap, but they laid many more eggs, at a smaller cost per egg.

In the collateral test White Leghorns instead of Rhode Island Reds were used. In pen K were placed fourteen hens, one of which died during the test, on February 2, of an unknown cause; in D, the check pen, seven hens were put. As in the foregoing test care was exercised to insure accurate results. The hens, though old, were of equal age. Each pen was covered to prevent birds going either in or out. The fowls of each pen were fed Purina hen feed and a mash consisting of corn meal, wheat bran and a protein.

The composition given each pen follows:

Pen K.		Pen D.	
Cotton seed meal	22 Parts	Beef scrap	11 Parts
Corn meal	73 Parts	Corn meal	73 Parts
Wheat bran	5 Parts	Wheat bran	5 Parts

The details of the test follow:

	lbs.		lbs.
Mash eaten	80		65
Grain eaten	214		137
Total feed	294		202
Cost of feed	$5.88		$4.04
Eggs laid in October	45		...
Eggs laid in November	37		3
Eggs laid in December	28		4
Eggs laid in January	47		20
Eggs laid in February	136		98
Eggs laid in March	98		75
Total eggs laid	396		200
Cost of feed per hen	$0.45		$0.58
Cost of producing an egg	$0.015		$0.02

The meal fed hen, it should be noticed, laid a few more eggs than the beef fed hen laid, and at a lower cost per egg.

The experiment with laying hens thus shows that cotton seed meal is an excellent feed for laying hens. In each test the hens fed cotton seed meal laid more eggs per hen than the hens fed beef scrap laid; and in each case they produced them at a lower cost. This was noticeably true during the fall molt.

COTTON SEED MEAL FOR BROILERS

The experiment in fattening broilers with cotton seed meal, like that in feeding layers, embraced two tests. In each of these sixteen choice Rhode Island Reds were used, eight to a pen. Great care was taken to make the test accurate. The pens were

made secure against birds going either in or out. The broilers were the same age and the same size. The rations fed were identical in composition with those fed the laying hens. The broilers were given all the mash they would eat and, late in the afternoon, all the mixed grain they would eat.

In the *First Test* the mash was composed thus:

Pen A.		Pen B.	
Cotton seed meal	11 Parts	Beef scrap	5½ Parts
Corn meal	50 Parts	Corn meal	50 Parts
Oats	29 Parts	Oats	29 Parts
Wheat bran	10 parts	Wheat bran	10 Parts

The details of the test follow:

	lbs.	lbs.
Mash eaten	13.5	20.
Grain eaten	5.12	3.5
Fat gained	3.56	4.5
Cost per lb. of gain, cts.	10.47	11.05

Though the broilers in B, beef fed, gained more in weight than those in A, meal fed, they did so at a greater cost per pound of gain.

In the *Second Test* the proportion of protein to mash was doubled. The composition was this:

Pen K.		Pen D.	
Cotton seed meal	22 Parts	Beef scrap	11 Parts
Corn meal	73 Parts	Corn meal	73 Parts
Wheat bran	5 Parts	Wheat bran	5 Parts

The results are these:

	lbs.	lbs.
Mash eaten	16.5	18.5
Grain eaten	3.5	2.5
Fat gained	4.44	3.5
Cost per lb. of gain, cts.	7.66	10.57

Unlike pen A, the cotton seed meal pen of the first test, pen K gained more weight than its check pen did; the increased amount of cotton seed meal apparently stimulated growth. Pen K, also, gained weight at a smaller cost per pound than D, the beef scrap pen, did.

The experiments indicate that cotton seed meal is a splendid feed for laying hens and for broilers. It is a good laying ration or a good fattening ration when it comprises 25 per cent or less of the mash feed.

GOOD RESULTS WITH WHOLE FLOCK

Experience with the general flock, it may be remarked incidentally, warrants the Station in recommending cotton seed meal in this quantity for these purposes. Pullets at this Station, it is furthermore interesting to note, grow rapidly and mature early and begin to lay early when fed a mash containing at first 15 per cent and, through gradual increase, finally 25 per cent of cotton seed meal. Fed in this way, many of our White Leghorn pullets have begun laying when only five months old and some of our Rhode Island Reds when only six or six and a half months old. Significant is a statement made in regard to the fattening of cattle, in Agricultural Copy Service 8, November 9, 1915, of the College of Agriculture, University of Missouri: "Cotton seed meal stimulates the appetite, thereby inducing rapid gains and a quick finish as well as assisting in maintaining the appetite when the animals are in high condition."

A larger percentage than 25 may or may not be advisable; the poultry department has not completed its experiments with feeds that are more than 25 per cent cotton seed meal. At present the department is conducting some experiments to discover what effects feeds that are 25 per cent to 40 per cent cotton seed meal have on laying hens. It is also discovering the cumulative effects of the meal, feeding it to the progeny of meal-fed hens. And the department is making tests to find out the effects of the meal, when 25 per cent to 40 per cent of the mash, on the fertility of eggs.

For the production of eggs, the Station recommends the following ration:

Cotton seed meal	25 Parts
Corn meal	30 Parts
Wheat bran	30 Parts
Wheat shorts	15 Parts

A little salt may be put into this ration; one pound to the hundred, is advisable.

This mash should be put into clean, dry hoppers in dry sheds. If the mash is dry, the hens will not eat too much of it. They should have access to it at all times.

A grain mixture also should be given the laying hens. This mixture may well be:

Corn	2 Parts
Wheat	2 Parts
Oats	1 Part

Other proportions are sometimes advantageous. In cold weather more corn and less oats may well be given. The following ration is good for winter feeding:

Corn	2 Parts
Wheat	2 Parts
Oats	1 Part

For summer feeding less corn and more wheat should be fed. The following ration is good:

Corn	1 Part
Wheat	2 Parts
Oats	2 Parts

The grain mixture should be fed twice a day. The amount to be given varies with the appetite of the hens; feeders, using good judgment, will give them more when the hens are hungry and less when indifferent. Usually, however, a pint of the mixture should be given to each ten hens in the early morning and a quart in the afternoon.

All grain should be thrown into straw that the hens must exercise, must work for their living.

Fresh water in clean vessels should be provided. Oyster shell, grit, and charcoal should be placed ready for the hens at all times.

For small chicks the mash provided for the hens should be modified. A few other elements should go into it. A good formula is this:

Cotton seed meal	15 Parts
Corn meal	35 Parts
Wheat bran	35 Parts
Wheat shorts	15 Parts
Fine charcoal	3 Parts
Bone meal	5 Parts
Grit	3 Parts

Several parts of rolled oats would improve this mash. But if the oats in bulk cost more than five cents a pound, they should be left out.

The mash should be put into shallow pans or hoppers placed where the chicks can feed at will. As long as it is dry, they will not eat too much. They will grow rapidly. Contrary to the opinion of many poultrymen cotton seed meal does no harm to growing chickens; it develops the little fellows fast by supplying the much needed protein.