

AGRICULTURAL EXPERIMENT STATION of The Alabama Polytechnic Institute, Auburn, Ala.

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GREEN FEED as a SUBSTITUTE for LAYING MASH for HENS

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Many publications stress the importance of green feed as a supplement to the chicken ration. In all cases, however, green feed was considered as a supplement to a laying mash ration and *not as a substitute* for all or a part of the laying mash.

There is a decided shortage in many of the common protein supplements used in poultry rations at the present time. Immature, actively-growing plants are rich in protein, minerals, and vitamins. The protein is of good quality and effectively supplements the proteins of corn and other grains. Plants grown on well fertilized land contains from 16 to 18 per cent protein on a dry basis.

RESULTS of EXPERIMENTS

Preliminary tests. The first test conducted in 1942 was to determine the value of white clover as a source of protein for laying hens.

Twenty-five White Leghorn hens were allowed to graze all the time on an area having a good stand of white clover. They were fed all the corn and wheat they would eat. A similar flock of 25 was fed commercial laying mash as a protein supplement; and corn and wheat. This flock served as a check or control pen. The number of eggs laid by each group by 5-day periods over a 60-day test are as follows:

The egg production of the clover-fed pen was definitely below the control pen at the end of the 60-day period. It was, therefore, decided to give this pen a limited amount of cottonseed meal daily, in order to increase the amount of protein. This was done for a 20-day period. During this time, egg production of this pen was even lower, the 25 hens averaging only 4 eggs per day. The hens refused to eat any appreciable amount of the cottonseed meal.

At this time the clover-fed pen was given a limited amount of laying mash once each day. The 25 hens were fed 1-1/4 pounds per day, which is approximately one-half normal consumption, during a period of 60 days. The number of eggs laid daily increased from 3 to as high as 18, and the flock averaged 16 eggs per day for the last 45 days of this period.

To determine to what extent the laying mash could be reduced when hens are grazed on white clover, the daily amount of laying mash was reduced to 10 ounces for the 25 hens. This is about one-fourth normal consumption. For the next 60 days these hens averaged 11 eggs per day. This was the end of the grazing season and the project was discontinued until the next spring.

Substitution of other grazing crops for laying mash. During 1943 four different grazing crops were studied. White clover

Average Number of Eggs Laid per Day by 5-Day Periods, 60-Day Test

5-day periods	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>
Pen grazed on white clover	11	14	6	9	9	12	13	9	8	8	8	8
Control	16	14	13	12	10	11	11	10	12	12	13	14

* Formerly Mimeograph Series.

was grazed during May, kudzu during June, alfalfa during August, and Ootoan soybeans during September. Four pens of 15 White Leghorn pullets each were used for each crop. Each pen received all of the cracked yellow corn and whole wheat they would eat. In addition Pen 1 had grazing, Pen 2 had grazing and about one-fourth as much laying mash daily as they would normally consume, Pen 3 had grazing and about one-half as much laying mash daily as they

would normally consume, while Pen 4 (check or control) had no grazing but all the laying mash they wanted. A new group of pullets was used for each different green feed.

The results obtained are summarized in Tables 1, 2, 3, and 4. In all cases grain was valued at \$2.15 and laying mash at \$3.20 per hundred pounds. No charge was made for green feed consumed.

Table 1. Results from Using White Clover, Grains, and Limited Laying Mash for Pullets, May 1943

PEN NUMBER	FEED CONSUMED PER HEN PER MONTH		GRAZING CROP	RATE OF EGG PRODUCTION	FEED COST PER DOZEN EGGS
	GRAIN	MASH			
	Pounds	Pounds		Per cent	Dollars
1	4	0	Clover	50	.07
2	2-3/4	3/4	Clover	61	.05
3	2-1/4	1-1/2	Clover	64	.06
4 (ck.)	3-1/3	2-3/4	None	59	.11

Table 2. Results from Using Kudzu, Grains, and Limited Laying Mash for Pullets, June 1943

PEN NUMBER	FEED CONSUMED PER HEN PER MONTH		GRAZING CROP	RATE OF EGG PRODUCTION	FEED COST PER DOZEN EGGS
	GRAIN	MASH			
	Pounds	Pounds		Per cent	Dollars
1	2.9	0	Kudzu	21.5	.11
2	3.6	3/4	Kudzu	37.3	.10
3	3.5	1-1/2	Kudzu	33.3	.13
4 (ck.)	3.0	3-1/4	None	56.0	.11

Table 3. Results from Using Alfalfa, Grains, and Limited Laying Mash for Pullets, August 1943

PEN NUMBER	FEED CONSUMED PER HEN PER MONTH		GRAZING CROP	RATE OF EGG PRODUCTION	FEED COST PER DOZEN EGGS
	GRAIN	MASH			
	Pounds	Pounds		Per cent	Dollars
1	3.5	0	Alfalfa	28.0	.11
2	4.2	3/4	Alfalfa	40.6	.11
3	4.5	1-1/2	Alfalfa	46.2	.12
4 (ck.)	3.0	4	None	52.0	.15

Table 4. Results from Using Ootoan Soybeans, Grains, and Limited Laying Mash for Pullets, September 1943

PEN NUMBER	FEED CONSUMED PER HEN PER MONTH		GRAZING CROP	RATE OF EGG PRODUCTION	FEED COST PER DOZEN EGGS
	GRAIN	MASH			
	Pounds	Pounds		Per cent	Dollars
1	5.0	0	Soybeans	27.5	.15
2	5.0	3/4	Soybeans	48.0	.10
3	5.0	1-1/2	Soybeans	68.0	.09
4 (ck.)	No control available		-----	----	---

In three out of the four tests Pen 2, which received grazing and about one-fourth as much laying mash as they would normally consume, produced eggs with a lower feed cost per dozen than any of the other pens.

White clover seemed superior to the other feeds tested in its ability to replace laying mash. However, time of year, hot weather, and inadequate rainfall considerably reduced growth of the other three green crops.

Substituting white clover for laying mash. Starting on March 10 and continuing for a period of 7 months in 1944, 8 months in 1945, and 6 months in 1946, a pen of 15 White Leghorn pullets that received green feed as a substitute for three-fourths of the laying mash was compared with a similar pen receiving unlimited amounts of laying mash but no green feed.

The crop grazed was largely white clover, although some grasses were also available. The duration of the test each year was limited to the period during which white clover was growing fairly well. The results are summarized in Table 5.

The hens fed green feed and limited amounts of mash laid more eggs each of the 3 years than similar hens receiving no green feed but unlimited amounts of laying mash. They did consume more grain than the control hens, about one-half pound per hen per month.

The feed cost per dozen eggs was decidedly in favor of the limited mash-green feed flock. The difference of 10.4 cents per dozen does not allow for costs of producing the green feed. It is difficult to even estimate how much this would cost. Assuming, however, that it costs not over \$10 per year to maintain an acre of clover and that 115 hens could be grazed on the acre for a 7-month period each year, the cost of green feed per dozen eggs produced would be about one cent per dozen.

CONCLUSIONS

From the results of experiments reported here, it is concluded that

(1) As much as 75 per cent of the usual amount of laying mash fed can be substituted with HOME GROWN green feed.

(2) Hens will produce more eggs when grazed on white clover and fed only limited amounts of laying mash than when fed a full ration of laying mash without green feed.

(3) By substituting green grazing crops for 75 per cent of the mash, feed cost may be cut as much as 35 per cent.

(4) Since both grain and green feed can be grown on the farm, egg production can be more nearly put upon a home-grown feed basis than heretofore.

(5) And, because of the difficulties of grazing large numbers of birds in a unit, this system of feeding is more suitable to small flocks than to large ones.

Table 5. Summary of 3 Years' Results from Feeding Hens Green Feed, Grain, and Limited Amounts of Laying Mash, 1944-46

YEAR	EGGS LAID	PRODUCTION	GRAIN	MASH	O. SHELL	TOTAL	FEED COST PER
	<i>Number</i>	<i>Per cent</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Dollars</i>	<i>DOZEN EGGS</i>
							<i>Cents</i>
GREEN FEED PEN							
1944	1,333	52	378	69.5	24.5	14.82	14.7
1945	1,536	45	501	81.0	17.5	18.65	14.6
1946	1,289	47	367	69.2	17.0	17.03	15.9
Total or av.	4,158	48.0	1,246	219.7	59.0	50.50	15.07
NO GREEN FEED							
1944	1,159	44	294	305	24.0	20.53	24.5
1945	1,298	38	415	358	22.5	25.77	23.8
1946	1,237	45	370	340	22.2	28.99	28.1
Total or av.	3,694	42.3	1,079	1,003	68.7	75.29	25.47

