

Skim Milk and Grain For Laying Hens.

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Many farmers in North Dakota have skim milk as a by-product of their dairy enterprise. This milk as such has little sale value. However, it offers a potential source of feed for poultry and, if properly used, may mean that the farmer will need to purchase very little feed in order to obtain relatively high egg production.

In 1947 a project was started at the North Dakota Agricultural Experiment Station to determine whether it is practical to feed laying hens a ration of skim milk and grain, supplemented with cod liver oil and oyster shells. The oil and shells were added to provide an adequate amount of vitamins A and D and calcium.

PLAN OF THE EXPERIMENT

Two straw-loft houses each divided into two pens by a wire partition, were used for the experiment. One pen in each house, designated as pen C-1 or F-1 depending on the house, received a ration made up of mixed whole grains—50 percent yellow corn, 25 percent wheat and 25 percent oats to which was added 9 pounds of 400D-2000A cod liver oil per ton of grain—and skim milk free choice. These birds received no drinking water in order to force them to drink a sufficient amount of milk.

The birds in the remaining pen of each house, designated C-2 or F-2 depending on the house, received the same grain mixture without the cod liver oil and a laying and breeding mash free choice. In the 1947-1948 laying period a 20 percent protein laying and breeding mash was fed; in 1948-1949, a 26 percent protein mash was given; and in 1949-1950 the mash contained 33 percent protein. The vitamin and mineral content was adjusted according to the protein content of the mash. The mash was the regular North Dakota Agricultural College formula adjusted for the 26 percent and 33 percent protein.

With the exception of the laying year 1949-1950, the birds were kept on test for six 28-day periods during the winter months. In 1949-1950 there were only five periods. At the end of each period the feed was weighed and consumption calculated and the birds were weighed and any changes noted.

The influence of the treatment on production and feed efficiency is shown in Table I.

These data indicate very comparable results from the use of skim milk to replace mash both on a production and on a feed efficiency basis. Most of the trials show slightly higher egg production

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Table I. PRODUCTION AND FEED EFFICIENCY.

Year	Pen Birds		Breed	Treatment	Production ¹	Feed per doz. eggs ²
	No.				pct.	lbs
1948-49	C-1	89	S. C. W. Leghorns	Milk	61.22	5.83
	C-2	90	S. C. W. Leghorns	Mash	66.97	5.51
	F-1	78 ³	S. C. W. Leghorns	Milk	49.94	6.78
	F-2	79 ³	S. C. W. Leghorns	Mash	45.53	7.67
1949-50	C-1	66	New Hampshires	Milk	42.97	8.36
	C-2	64	New Hampshires	Mash	48.65	8.20
	F-1	84	S. C. W. Leghorns	Milk	50.21	6.62
	F-2	83	S. C. W. Leghorns	Mash	54.27	6.42
1949-50	C-1	64	B. P. Rocks	Milk	24.60	14.47
	C-2	62	B. P. Rocks	Mash	24.12	13.68
	F-1	83	New Hampshires	Milk	33.81	11.64
	F-2	71	New Hampshires	Mash	34.89	11.64

¹Calculated on a hen-day basis.²Skim milk is calculated on a dry basis.³Mixed hens and pullets.

and higher feed efficiency from the use of mash and grain. However it must be borne in mind that the mash must be purchased but the skim milk is a by-product on the farm and has little, if any, value unless fed to some form of livestock.

During the experimental period for the year 1949-1950, an outbreak of Newcastle Disease coupled with cholera was experienced. In addition the houses became quite wet due to the severity of the weather during January of 1950. Even under these adverse conditions there were no marked differences in egg production and feed efficiency in comparable pens.

The percentage mortality and the average increase in weight per bird during each trial is shown in Table II.

Table II. MORTALITY AND INCREASE IN BODY WEIGHT.

Year	Pen	Treatment	Mortality	Ave. Wt. Increase Per Bird
			pct.	lbs.
1947-1948	C-1	Milk	10.11	0.34
	C-2	Mash	6.74	0.35
	F-1	Milk	11.51	0.76
	F-2	Mash	17.98	0.56
1948-1949	C-1	Milk	37.88	0.70
	C-2	Mash	35.94	0.50
	F-1	Milk	28.57	0.40
	F-2	Mash	15.66	0.30
1949-1950	C-1	Milk	28.12	0.70
	C-2	Mash	24.19	0.30
	F-1	Milk	14.46	0.20
	F-2	Mash	32.39	0.20

Although mortality was excessively high in all trials, autopsy of the dead birds gave no indication that the rations might have been at fault. As there were no consistent differences in death losses between treatments in the several trials it may be assumed that the use of skim milk was not a contributing factor in the mortality.

The birds fed on milk and grain gained slightly more weight during the test periods than those on grain and mash. Although the table does not show it, perhaps it should be noted that those birds on the skim milk and grain ration gained weight much faster than those on mash and grain. However, the birds fed mash and grain began to catch up in weight by the end of the experimental period.

One additional comparison of the two rations was in the hatchability and fertility of the eggs produced. This comparison is shown in Table III.

Table III. FERTILITY AND HATCHABILITY OF EGGS.

Year	Pen	Treatment	Eggs set	Fertility	Hatch of fertile eggs	
					No.	Pct.
1947-1948	C-1	Milk	372	93.3		80.7
	C-2	Mash	380	94.0		70.9
	F-1	Milk	414	93.2		88.4
	F-2	Mash	219	83.1		73.1
1948-1949	C-1	Milk	206	78.2		71.4
	C-2	Mash	350	82.0		68.6
	F-1	Milk	320	91.3		87.5
	F-2	Mash	262	93.5		83.3
1949-1950	C-1	Milk	443	77.0		50.2
	C-2	Mash	861	74.6		72.3
	F-1	Milk	1505	85.9		70.5
	F-2	Mash	1433	89.3		83.3

When all trials are considered there was no significant difference in fertility between the two treatments. With the exception of the trials in 1949-1950 the percentage hatch of fertile eggs was higher from the pens fed skim milk than from those fed a laying and breeding mash. For all trials, the results are about comparable.

SUMMARY

A ration made up of skim milk and mixed grains to which cod liver oil had been added has proven satisfactory for egg production, fertility and hatchability when fed in comparison with a ration made up of a laying and breeding mash and mixed grains.

Any differences in mortality could not be attributed to the ration fed.