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Michigan State University Extension Service

C.M. Ferguson, Manager, International Egg Laying Contest

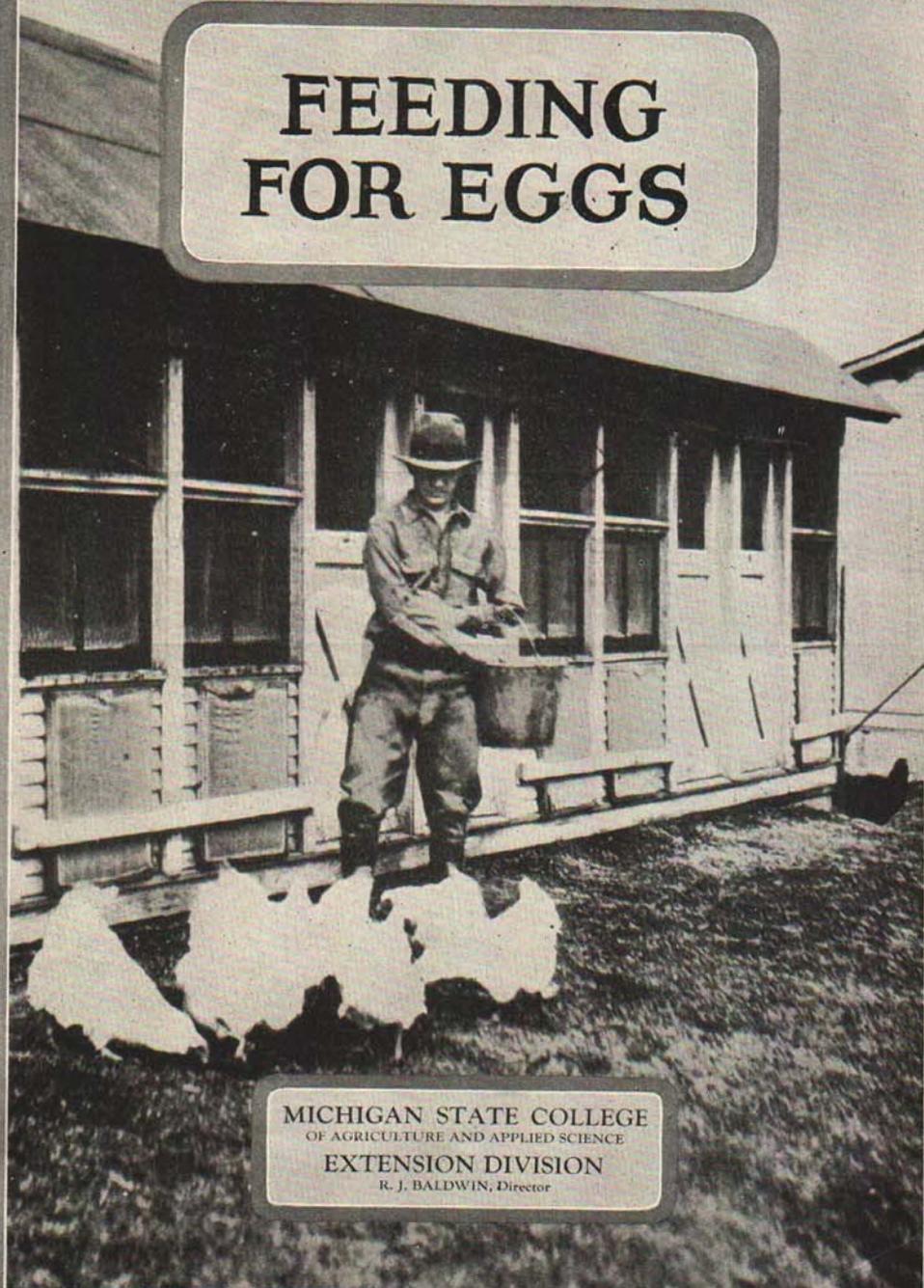
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# FEEDING FOR EGGS



MICHIGAN STATE COLLEGE  
OF AGRICULTURE AND APPLIED SCIENCE  
EXTENSION DIVISION  
R. J. BALDWIN, Director

**A good ration will give good results only when fed to well  
bred birds properly housed.**

## FEEDING FOR EGGS

C. M. FERGUSON, Manager International Egg Laying Contest

It is a generally accepted fact that nutrition plays a major part in securing satisfactory egg production. The selection of feeds must be considered from the standpoint of their nutritive value, but the cost and adaptability are also important factors. While there are various methods of feeding practiced by successful poultrymen, the purpose of this bulletin is to point out feeding practices which will give results under as wide a range of conditions as possible.

It must be borne in mind that while feeding is of great importance, other factors have a direct bearing on production. Birds that do not come from well bred parentage and have not been well raised, under clean, sanitary conditions, cannot be expected to return maximum profits. Extension Bulletin No. 52 deals with problems encountered in growing and maturing pullets.

A satisfactory laying house is the next essential. Extension Bulletin No. 48, "The Shed Type Poultry House," gives working plans for an economical house well suited to Michigan conditions.

As soon as the pullets are mature and about to come into production, they should be placed in winter quarters which have been previously thoroughly cleaned and disinfected. At this time they should be in the best of physical condition carrying a surplus of body fat, healthy and free from lice or intestinal parasites. Bulletins No. 53 and 54 deal with the prevention of diseases and parasites, of growing chicks and adult birds.

The common method of feeding practiced on practically all commercial and farm poultry flocks consists of hopper feeding a dry mash which serves as a carrier of animal protein which is necessary to properly balance our common cereal feeds. The following table will outline the rations used at the Michigan State College Poultry Plant and the Michigan International Egg Laying Contest with such modifications as may be practical under farm conditions.

### Laying Mash

150 lbs. Yellow Corn Meal
100 lbs. Fine Ground Oats
100 lbs. Standard Bran
100 lbs. Flour Middlings
*100 lbs. Meat Scrap
50 lbs. Alfalfa Meal
15 lbs. Bone Meal
5 lbs. Fine Salt

\*The ration can be improved by substituting milk for one-half of the meat scrap. See paragraph on MILK below.

There are several modifications which could be made in this ration without materially changing its composition and which might make it more suitable under certain local conditions.

**Corn Meal**—Fancy yellow corn meal has better keeping qualities than corn feed meal but does not have quite as high feeding value due to the fact that there is a smaller percentage of germ present. If cracked corn which contains a low percentage of the germ is being fed in scratch feed, corn feed meal should replace fancy corn meal in the mash.

**Oats**—Good quality heavy oats finely ground are most suitable. Oat flour or rolled oats are an excellent addition to the mash, but oat feed meal is very low in feeding value and should be avoided.

Soaked or germinated oats are an excellent addition to a ration.

**Bran and Middlings**—Flour middlings are preferred to Standard middlings or where whole wheat is available the bran and middlings may be replaced by 150 pounds of ground wheat and 50 pounds of bran.

**Meat Scrap and Tankage**—A good quality of meat scrap is chosen in preference to tankage, although tankage, if of good quality may be used with good results. There are several precautions that should be observed in the purchase of tankage. Table scrap tankage prepared from garbage is not suitable for poultry feeding. Poorly prepared tankage which has not been properly dried, and waste product tankage as indicated by the presence of a high percentage of hoof, hair, horn, and bone should be avoided. Tankage should be carefully examined for the presence of green mould which makes it unfit for feeding purposes. Meat and bone meal, a product prepared by some of the packing plants, is very satisfactory.

**Fish Meal**—Fish meal while not commonly sold in Michigan is a very suitable protein supplement and can be used to good advantage in adding protein or in giving variety to the proteins in the ration.

**Milk and Milk By-Products**—We have no one single product which can be any more highly recommended for poultry feeding than milk in some form or other. Under farm conditions where skimmed milk or buttermilk is available, the birds should be given all they will consume. Skimmed milk may be fed either sweet or sour. Creamery buttermilk is a very suitable feed, its value depending on the amount of butter washings which it may contain. Where an excess of magnesium hydroxide has been used as a neutralizer, the feeding value of the buttermilk may be seriously affected. Semi-solid buttermilk is a very desirable feed as it has the advantage of being easily kept and is an excellent carrier for cod liver oil. Dried buttermilk and dried

skimmed milk are excellent additions to the mash and may be fed profitably up to 10 per cent of the mash.

The above mash is modified by reducing the amount of meat scrap to 50 pounds when fed with milk in any of the following amounts:

1st. Either all the skimmed milk or buttermilk which the birds will consume;

2nd. Semi solid buttermilk at the rate of four to six pounds per 100 birds per day;

3rd. Fifty pounds of dried skimmed milk or dried buttermilk added to the mash.

**Alfalfa**—While the above ration calls for 50 pounds of alfalfa meal, under ordinary farm conditions where alfalfa hay or alfalfa chaff is available, the meal can be omitted from the mash and the hay or chaff fed to the birds in racks or some other suitable feeding device.

**Barley**—Ground Barley may be used as a substitute for one-half of the corn in the mash.

**Speltz**—Ground speltz or speltz grist may be used to replace one-half of the corn.

**Rye**—Rye is not a suitable poultry feed and should not be used as a mash constituent.

**Buckwheat, Millet, and Minor Cereals**—While Buckwheat and Millet and other minor cereals have some feeding value, they should never be used either singly or in combination to exceed 10% of the entire ration.

### Scratch Feed

#### Mixture No. 1

Cracked Yellow Corn ..... 50 lbs.  
Wheat ..... 50 lbs.

#### Mixture No. 2

Barley ..... 25 lbs.  
Yellow Corn ..... 25 lbs.  
Wheat ..... 50 lbs.

#### Mixture No. 3

Yellow Corn ..... 40 lbs.  
Oats ..... 30 lbs.  
Wheat ..... 30 lbs.

#### Mixture No. 4

Yellow Corn ..... 45 lbs.  
Wheat ..... 45 lbs.  
Buckwheat, Kaffir, Milo,  
Sunflower, etc. .... 10 lbs.

Whole corn apparently gives just as satisfactory results as cracked corn but the cracked corn may be slightly more palatable.

**Green Feed**—Green Feed is fed, first, for the succulence which it contains and, second, for its vitamin content. While satisfactory production can be obtained without green feed, we feel that its addition to the ration is of considerable value.

**Choice No. 1**—Sprouted oats, lettuce, cabbage, or leafy portions of plants. Feed sprouted oats when sprouts are from one-half to one inch in length.

**Choice No. 2**—Mangels, sugar beets, garden beets, turnips, carrots, rutabagas, potatoes, or other succulent root crops.

**Oyster Shell and Marl**—This material should be kept before the birds in hoppers at all times. Grit may also be hopper fed. Dry Marl analyzing 90% or more calcium carbonate may be safely substituted for oyster shell.

**Cod Liver Oil**—Cod liver oil, in the light of recent investigation, is now considered an essential part of a ration for laying hens during the winter months. It supplies Vitamin D the anti-rachitic factor which the birds, under summer conditions, are able to manufacture through the aid of the ultra-violet rays of sunshine. The benefits of feeding cod liver oil may be summed up in brief as follows: First, Stronger and healthier birds; Second, the prevention of leg weakness which is frequently noticed in heavy laying hens during the late winter and spring; Third, a marked improvement in the quality and texture of egg shells; Fourth, increased hatchability and strong chicks; and Fifth, a decrease in the number of blood spots occurring in eggs.

**Methods of Feeding**—Cod liver oil is most easily fed in semi-solid buttermilk or cottage cheese; one pound of cod liver oil to sixteen pounds of semi-solid is fed at the Michigan Laying Contest. If neither of the milk products are being fed, the oil can be most easily mixed with the scratch grain. It should be fed at the rate of one quart of oil to 100 hens per week. A simple method of feeding it is to mix a teacupful with the scratch grain every second day. The feeding of cod liver oil may be discontinued as soon as the birds are out of doors and exposed to direct sunshine.

**Feeding Methods**—Dry mash, oyster shell, grit, and alfalfa should be kept before the birds in open feeders at all times. Scratch feed may be fed either in troughs or hoppers or fed in litter and the birds allowed to scratch for it. Some feeders prefer the feeding of scratch feed twice a day. A small amount, three to four pounds, is fed in the morning and from eight to nine pounds in the late afternoon to each 100 birds.

There is a growing tendency to feed grain only once a day, late in the afternoon, giving the birds all they will clean up, leaving some either in the litter or in the troughs for early morning. Some poultrymen, where semi-solid buttermilk is being fed liberally, are hopper feeding grain with good results. The decided advantage in trough or hopper feeding grain is that there is less danger of the birds con-

suming as large amounts of filth as they do when allowed to scratch for the grain in the litter.

Green feed may also be fed in troughs or thrown on the litter. The old practice of hanging a cabbage on a string and making the birds jump for it has certainly nothing to recommend it other than the fact that there is less danger of it becoming contaminated with filth.

Sour milk or buttermilk should not be fed in galvanized containers since the lactic acid of the milk reacts with the galvanizing material causing metal poisoning. Symptoms of this are more frequent in chicks than in mature stock. Care should be taken that containers be kept scrupulously clean. Semi-solid buttermilk may be fed as it comes from the barrel by plastering it on a suitable vertical feeding board allowing the birds to pick it off. A trowel or wooden paddle is very suitable for this purpose.

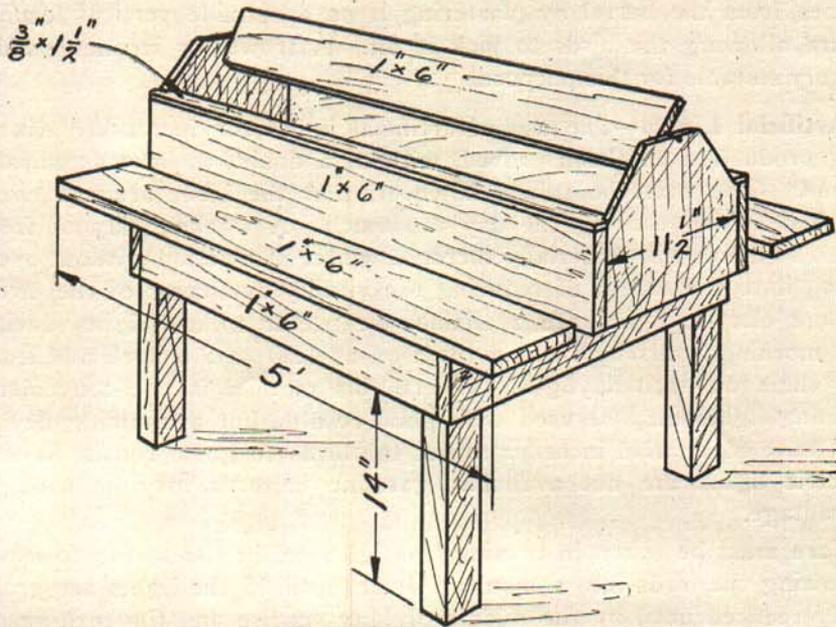
**Artificial Lights**—The use of artificial lights for increasing winter egg production has been proved, without a doubt, to be economically sound. Care must be taken, however, that the birds are not overworked by lengthening the day too much. A working day of from 12 to 14 hours will materially increase winter production without overdoing it to the extent of reducing the vitality and vigor of the birds. Where electric lights are available, we prefer to use lights during the morning hours by turning them on at 4:30 or 5 o'clock and leaving them on until daylight. Where this method is not convenient, evening lights may be used with good results, but a dimming device will have to be used in order to get the birds to go to roost. Where electric lights are not available, gasoline lanterns may be used to advantage.

Care must be taken in turning the lights off in the spring to avoid throwing the birds into a moult. About April 15 the lights are gradually reduced until by the middle of May sunrise and the turning on of the lights are occurring at practically the same time. This precaution is not necessary when the lights are being turned on in the fall. They may be turned on at the desired time as soon as the birds are in winter quarters and on a laying ration.

Where artificial lights are used provision will have to be made for watering the birds during the early morning hours. There are on the market very suitable electrically heated water fountains, also those which can be heated with an oil burning lamp. During winters when there is plenty of snow available, the water pans may be filled in the evening with snow which should be replaced with water or milk by 7:30 or 8 o'clock the next morning. The watering fountains are important pieces of equipment and should be purchased with the idea in mind of keeping them as sanitary as possible at all times.

**Sunshine**—Sunshine is one of the most important factors in maintaining health and securing high production. The sun's rays when taken in through glass lose the ultra violet or actinic ray. The birds should be allowed to run out of doors throughout the winter months. Straw spread in front of the houses will encourage the birds to stay out of doors. If the birds are indoors the windows should be open to admit as much sunshine as possible.

**Caution**—Care should be taken that heavy production is not acquired at the expense of the body weight of the hens. Frequent



Dry Mash should be fed in open Hoppers where it is available to the birds at all times. The feeder illustrated is simply constructed. The revolving board on top prevents contamination of the feed.

handling of the birds will tell the experienced poultryman whether or not the hens are losing weight. It is a good practice however to have a few birds banded with special bands which can be readily picked up and weighed. If the body weight is decreasing as production increases, more grain should be fed. It has been our experience in feeding contest birds that heavy grain feeding accompanied by heavy milk feeding will maintain production with very little danger of loss in weight.

**Winter Feeding Schedule at Michigan Laying Contest**—Dry mash, grit, and oyster shell are kept before the birds in open hoppers at all times.

- 5:00 a. m. Lights are automatically turned on.  
Birds are watered and given a light feed of sprouted oats.
- 5:15 a. m. A light feed of scratch grain is sprinkled in the litter.
- 9:00 a. m. Sprouted Oats are fed.
- 11:00 a. m. Semi-solid buttermilk with cod liver oil added at the rate of one pound of cod liver oil to 16 pounds of semi-solid is fed allowing from five to six pounds of the emulsion to each 100 birds.
- 4:30 p. m. The hens are fed all the scratch feed which they will clean up.

### The Michigan Laying Contest Ration

Mash	Scratch
*150 lbs. *Corn meal	100 lbs. Cracked corn
100 lbs. Ground oats	100 lbs. Wheat
100 lbs. Standard bran	<b>Green Feed</b>
100 lbs. Flour middlings	Winter
50 lbs. Meat scrap	Sprouted Oats
50 lbs. Alfalfa leaf meal	Summer
15 lbs. Bone meal	Sprouted oats
5 lbs. Fine table salt	Alfalfa
	Rape
	Swiss Chard

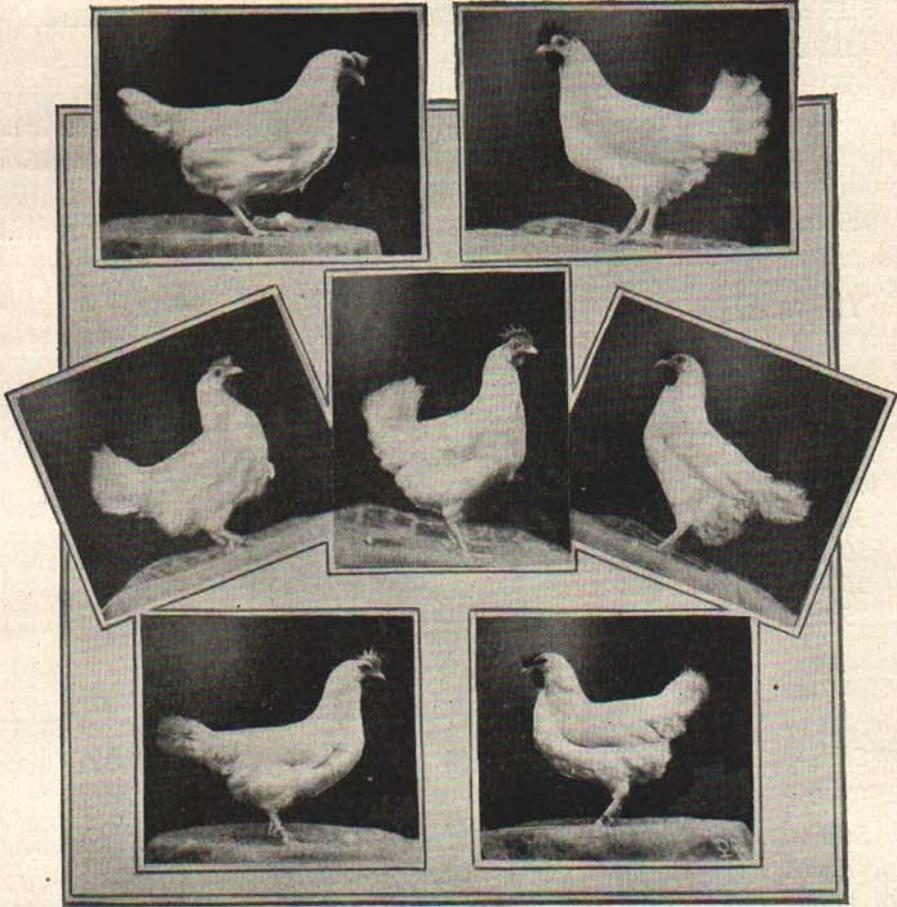
Semi-solid buttermilk at the rate of five or six pounds to 100 hens per day.

**Summer Feeding**—Summer weather brings with it special feeding problems for both the farm flock and commercial plant. The supply of green feed must not be neglected. The natural supply soon disappears with the advance of hot weather and must be supplemented. A rotation of yards around the poultry house will aid materially in solving this problem.

Alfalfa makes one of the best permanent forage crops but an effort should be made to break up alfalfa sod after the birds have used it one season. Rye sown in the fall makes very suitable green feed for early spring. Oats sown in the spring are suitable for a supply of greens for a short time but do not stand pasturing. During the later summer it is best to depend on such crops as swiss chard, kale, rape, lettuce,

\*The corn meal is reduced to 100 pounds for summer feeding.

Three Hundred Egg Records were made by these Hens in the 1925 and 1926 Contest.



Hen No. D 652  
Record 300 eggs

Hen No. D 1057  
Record 307 eggs

Hen No. D 574  
Record 303 eggs

Hen No. D 1153  
Record 314 eggs

Hen No. D 753  
Record 303 eggs

Hen No. D 494  
Record 314 eggs

Hen No. D 561  
Record 300 eggs

and other garden grown greens. Sprouted oats are easily handled in the summer and can be used to good advantage as a part of the summer ration.

During the warm months of summer the birds require a smaller amount of carbonaceous feeds and a higher percentage of protein. To accomplish this the amount of scratch feed is gradually reduced from the customary 12 or 14 pounds mentioned for winter feeding to five or six pounds in late summer and fall. This reduction of scratch induces a greater consumption of mash. To further increase the amount of mash consumed and also the total feed intake, we follow the practice at the Egg Laying Contest of feeding a moist mash starting in gradually about June 10th or 15th using the above mash mixture moistening it with semi-solid buttermilk diluted in water. This method also increases the amount of milk consumed.

**Summer Feeding Schedule at the Michigan Laying Contest**—Dry mash, grit, and oyster shell are kept before the birds in hoppers at all times.

- 5:00 a. m. Birds are given a light feed of sprouted oats.
- 5:30 a. m. A very light feed of scratch grain is sprinkled in the litter.
- 9:00 a. m. Sprouted Oats.
- 11:00 a. m. Semi-solid buttermilk.
- 1:30 p. m. Moist Mash.
- 4:00 p. m. Green feed consisting of such crops as we may have available at that particular season as alfalfa, rape, lettuce, or swiss chard.
- 5:30 p. m. A moderate feed of grain.

Care should be taken that a good supply of fresh water is available at all times. Shade should be supplied in the yards but the practice of allowing the farm flocks to range indiscriminately over the farm yard should be discouraged and the birds should be kept in reasonable confinement by arranging a yarding system so the same land will not have to be used year after year. The practice of permitting the birds to roost in the various farm buildings is one of the most effective ways of aggravating disease conditions and spreading infection.

#### **Give Every Hen A Chance**

- By allowing for each 100 hens
  - 10 feet of hopper space
  - 3 feet of water fountain space
  - 350 to 400 square feet of flour space.



Pens in the Michigan Laying Contest