

# Oats

## RANK FIRST!

### for poultry feed

*Many Experiments Show They Are Well Adapted to Needs of Chicks, Laying Hens and Turkeys*

By H. L. WILCKE

**FOLKS ARE GOING** to feed a lot more oats to their poultry in the next few years if they agree with the conclusions we have reached about their value here at the Iowa Agricultural Experiment Station.

Our experiments over a period of about 5 years show that oats are the best single grain for young growing chicks, turkeys and excellent for laying hens, too. Experimental work elsewhere also indicates that oats are highly valuable as a poultry feed.

Here are a few of the conclusions we have reached about oats as a result of our own experiments and those of others:

1. They are the best single grain for poultry of those commonly available in the Corn Belt (this includes corn, wheat, barley and oats).

2. Up to 40 percent, or perhaps even more, of the ration of the growing chick, the laying hen and the turkey may well be made of oats when the quality is good and the price justifies it.

3. Chicks fed on a ration that is high in oats will grow faster and

feather more rapidly than on any other common grain.

4. When laying flocks are fed only one grain, mortality is least with oats.

5. Whole oats reduce cannibalism and feather picking in growing and laying flocks.

6. Chicks from hens on a high oat ration have more vigor than those from hens with a high corn ration.

7. Hens will not lay as many eggs if oats are the only grain used as they will if corn is the only grain fed.

8. A high oat ration produces chicks with light or no yellow pigment in the beaks and shanks.

9. Even oats as light as 17 pounds to the bushel may be ground and used successfully in the mash of growing chicks, laying hens or mature turkeys when the amount is limited to 28 percent or less.

10. For fattening rations, oats are far less efficient than corn.

### Slipped Tendons

We started testing the value of oats in poultry rations

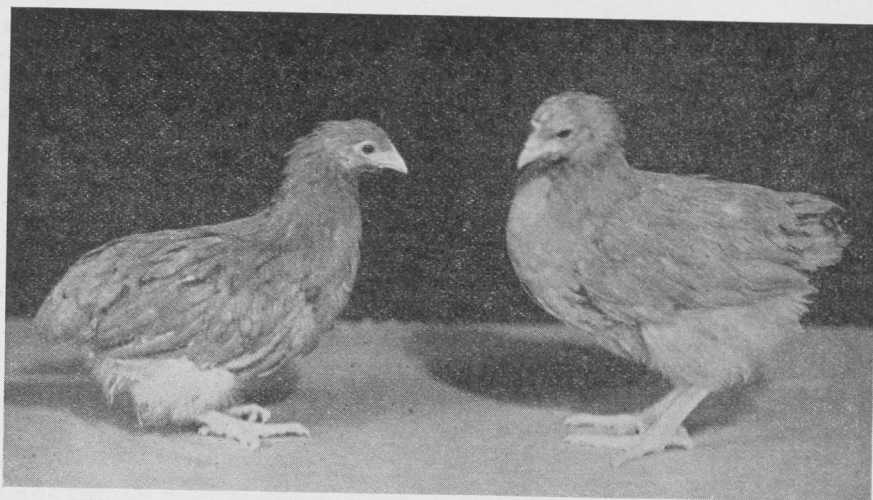
some 5 years ago as the result of a Canadian publication which reported that when chicks were fed high percentages of corn in starting and growing rations their bone development was poor—many of the chicks had abnormal leg bones—and there were many slipped tendons. The Canadians reported further that when they added wheat germ, or oat hulls and wheat germ, or complete oats that the leg malformations were prevented.

Corn is a pretty important crop in Iowa! We wanted to know whether this charge the Canadians made about it as a poultry feed was correct. We had considered corn a valuable poultry feed. Should Iowa poultrymen be feeding less corn and more of some of the other grains? We wanted the answer.

The first series of experiments was designed to test the efficiency of oats, corn and wheat in preventing slipped tendons in chicks. In other words, we were following up the charges of the Canadians. To make such a test, the rations were made up as simply as possible. Only one grain was used with each lot of chicks, the grain being supplemented with what we thought should be the necessary vitamins and minerals. We did not expect that these rations would be practical on the farm, but it was necessary to make them simple in order to find out the exact effect of each grain. The test rations were as follows: The test grain (corn, wheat or oats), 72 parts; dried skim milk, 25 parts; ground oyster shells, 1 part; steamed bone meal, 1 part; salt, 1 part; and cod-liver oil, 1 part.

When we started this test, we expected that the chicks on the oats, with its high percentage of fiber, would grow rather slowly and perhaps show a high mortality. But the opposite was true—the oat-fed chicks were uniformly larger than any others in the experiment, and the corn-fed chicks were smallest. In this experiment there was a heavy mortality in the wheat-fed chicks, most of the deaths occurring between the fourth and fifth weeks. There were no slipped tendons in either the oat or wheat groups, but there were in the corn group.

Corn has less protein in it than wheat or oats, so we decided to even



Same age, same care and feed except the two 8-week old chicks at the left got oats and the two below corn. Those which got oats as the only grain gained more rapidly, feathered more quickly, were healthier and better in about all respects than those that got only corn. The grains were supplemented with dried milk, oyster shell, steamed bone meal, salt and cod-liver oil. Note that the left chick, of the two below, has a slipped tendon. Many of these occurred when corn was the only grain fed. Also, those on corn had rough, shaggy feathering, as shown in this picture.

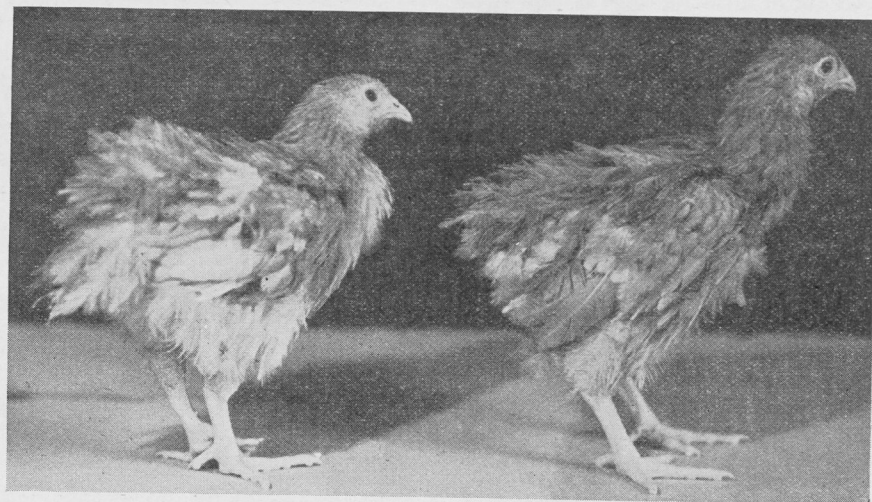
Oats seem to have something about them that prevents cannibalism, one form of which is feather-picking. The factor which speeds growth and feathering apparently is in the hulls.

up the protein content and thus give corn a better chance to show its value. We found that oats even at a lower protein level produced much better growth than corn in this type of diet. When we fed oats as 90 percent of the ration, with only 5 percent dried milk, the growth of chicks was much more rapid than on corn as only 72 percent of the ration and 25 percent dried milk. Besides the more rapid growth of these chicks on practically an "all-oats" diet, they feathered much better than those getting only 72 percent of corn and 25 percent dried milk. Both the oats and wheat lots were much better feathered than the corn lots. The high corn ration produced a characteristic, ragged feathering appearance.

## Test with U.S.D.A.

Our next attack on the grain problem was to find out whether or not some of them tended to produce rickets in chicks, even when sufficient minerals and vitamin D were in the ration. Some evidence had been produced to show that oats had this tendency. This "rickets" experiment was carried on in cooperation with the United States Department of Agriculture at the National Agricultural Research Center, Beltsville, Maryland.

In the experiment at Beltsville, oats, corn and barley were used as single grains in the rations, and, in addition, oat hulls and hulled oats were added to wheat and corn in an effort to find out which part of the oat kernel, if any, had this rickets-producing effect. Other lots



of chicks were fed combinations of whole oats along with corn, barley and wheat.

In these experiments in cooperation with the U. S. D. A., using entirely different strains of chicks from those used at Ames, the lots on oats and those getting a combination of oats and barley produced the best growth, followed in order by the barley, wheat and corn diets. Again, as at Ames, the corn diet gave the poorest growth, oats the best. The addition of 20 percent of ground oat hulls, ground hulled oats or ground whole oats to corn or wheat diets increased the rate of growth and improved the quality of feathering of the corn-fed chicks.

The tests with the U. S. D. A. disclosed that none of the grains had a rickets-producing effect in chicks.

So much for the value of the grains for the growing chicks. Would pullets reared on a ration high in one of the grains be as

healthy and lay as well as those on other feeds? To answer that question, we continued some of the pullets through a complete year of egg production on these high single-grain rations, and other pullets which had been reared on the usual mixed ration were changed to rations made up with corn, wheat or oats as the only grain.

The pullets on the oat diet continued through the year in a quite satisfactory manner, but those on the wheat diet showed a heavy mortality after about 3 months of production. The pullets which had been reared on the corn ration were so poorly matured, poorly feathered and afflicted with slipped tendons and other deficiencies that they could not be continued on this diet.

For egg production, corn seemed to have more value as a single grain than oats or wheat. And this was at least "score one" for corn. On the other hand, mortality was lowest in the group which got the high oats ration.



Fertility of the eggs was not affected significantly by the different rations, but hatchability was best with the eggs from the wheat-fed birds, followed by oats. Corn and the mixed grains were approximately equal. Hens on wheat or oat rations produced chicks with more vigor than those on corn.

## Cannibalism

Experiments conducted at the Western Washington Station at Puyallup, Wash., have shown that oat hulls in the ration will help to prevent cannibalism or feather picking in growing or laying flocks. We have work under way at the Iowa Station to throw additional light on this point. Observations on the college flock have indicated that there is something about oat hulls which helps prevent cannibalism and feather picking.

One of the things we are trying to do now at the Iowa Station is to find out just what it is in the oat kernel but not present in corn that is necessary for the nutrition of chickens and turkeys. Perhaps if we can "put our finger" on the right factor, just a little addition of "something" to the ration will again place corn in the high esteem of the poultryman which it has had in the past.

## Oat Hulls Help

For the past 2 years we have been carrying on experiments in which oat hulls have been added to diets made up with corn and with oat groats (hulled oats) as the only grain. We have found that up to 30 percent of oat hulls added to a corn diet or to an oat-groat diet will stimulate growth, produce more rapid feathering and better quality of feathers in chickens.

Our experiments with oats, in comparison with corn, have included turkeys, too. We got much the same results with turkeys as with chicks.

Poults were reared successfully on a diet containing 77 percent ground whole oats, with milk as the protein supplement. Oat-fed turkeys when fed at the same level of protein grew much more rapidly and feathered much better than similar birds on a corn ration. The corn-fed turkey poults required about 6 weeks longer to reach the marketing stage when judged from the standpoint of weight and freedom from pin feathers.

Most of our experimental work with oats has been done with oats weighing from 28 to 34 pounds per bushel. But we have used successfully in chick rations oats weighing only 17 pounds to the bushel. Oats this light did not work so well in turkey rations.

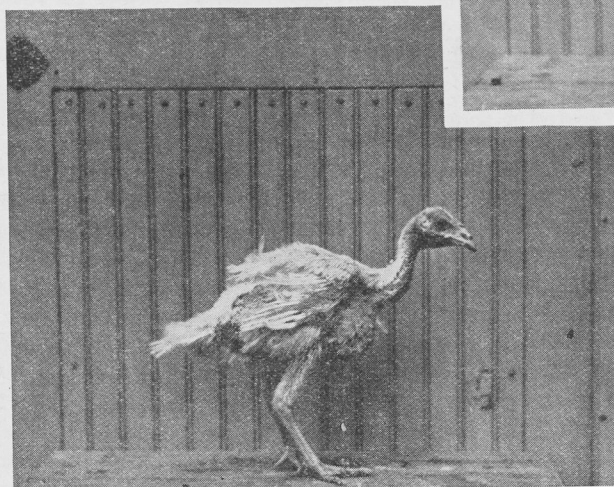
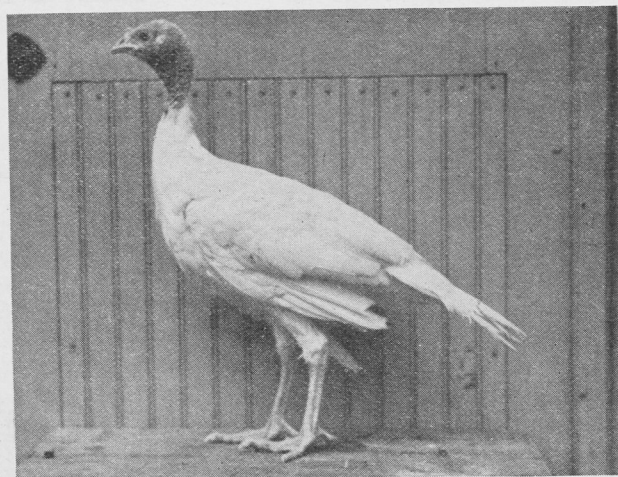
What is the significance of all this work with oats? We are recommending a more liberal use of oats in poultry rations. Rations such as those used in the experiments described here are not practical because when oats make up the major part of the ration, the only source of vitamin A is in the fish oil. There is grave danger, therefore, that if the feed is not mixed frequently with an oil of high potency, there will be a vitamin deficiency.

This high oat ration also produces chicks with light or no yellow pigment in the beak and shanks. This may be undesirable from the standpoint of those who sell breeding stock. It should be pointed out also that all of

the experimental work has been done in complete confinement and that the birds have not had access to green range. It is apparent to us that too much emphasis has been placed on low fiber in poultry rations in the past and that feeds may be utilized more efficiently if the fiber is not kept at a minimum.

The mixed grain type of ration is still recommended in preference to a ration made up with any single grains, because there are certain deficiencies in each grain which may be supplemented by another.

Much work remains to be done with the grains, but the work has progressed far enough to make a definite recommendation that up to 40 percent or perhaps even more of the ration of the chick, the growing hen or the turkey may be made up of oats when a good quality of oats is available and when the price justifies such usage, although it appears that it would be advisable to reduce the amount with extremely light weight grains. While the grains will be ranked in the order of oats, barley, wheat and corn for growth, they would be ranked almost in the opposite order for fattening, that is, corn, barley with oats and wheat equal.



These full sisters (same hatch) were 10 weeks old. The bird above got oats as the only grain and the one at the left got corn as the only grain. These grains were supplemented with dried milk, oyster shell, steamed bone meal, salt and cod-liver oil. Oats as a single grain proved far superior to corn or wheat both for turkeys and chicks. A combination of grains, however, is considered best.

One of the most noticeable things about the "only-corn-fed" turkeys was their poor feathering. It also took the corn-fed poults about 6 weeks longer to reach marketing weight than the oat-fed ones.