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# Turkeying-Off Sorghums and Proso

## A Progress Report



Turkeys, if given a chance, will save labor in harvesting sorghums. Here is a group of turkeys in a field of amber cane at the North Central Substation, Eureka, S. D.

*W. O. Wilson and W. E. Poley*

POULTRY HUSBANDMEN, SOUTH DAKOTA  
AGRICULTURAL EXPERIMENT STATION

**T**URKEYS HAVE LONG been used to range stubble fields of wheat, oats, and barley in South Dakota. In so doing, they salvage much grain that would otherwise be wasted. This is one reason why turkey production fits in well with the grain farming in the state. In these experiments, it was thought advisable to go one step further and not only salvage waste

grains, but to let the birds harvest the grains themselves. Sooner milo, feterita, amber cane, and proso millet were the grains selected for the trials.

The three sorghums were selected as being representative of this crop, which has increased enormously in the number of acres planted. Sorghums are estimated to occupy about 10 percent of the state's entire cultivated area. Their drouth-resistance and other desirable features are well recognized by South Dakota farmers. Proso millet, while not a sorghum,

Agricultural Experiment Station, South Dakota State College, Brookings, S. D.

was included in these experiments because it is an emergency crop. Proso has a short growing period and a low water requirement.

The hogging-off of corn and other grains is an established practice. "Turkeying-off" is the term used to describe a similar practice with turkeys. As this is written, there is a scarcity of farm labor. The "turkeying-off" of grain is a labor-saving practice. Its value has been studied at the South Dakota Agricultural Ex-

periment Station for the past three years. The study is not complete; the results are those obtained to date. Further research may change the picture.

The turkeying-off of grains requires planning. For example, the turkeys allowed in a field of ripe standing grain should be able to harvest it all without undue waste, and also plantings should be planned so as to have a succession of grains available for the birds to harvest.

## How the Experiments Were Conducted

This report covers three years of study on turkeying-off sorghums and proso millet. In addition, data has been collected on the feeding values of sorghums and proso millet when fed in starting and growing mash and as scratch grain.

The turkey starting mash fed at the Agricultural Experiment Station for the first 8 weeks has given exceptionally good results. It is high in protein and vitamins and is fed as an all-mash ration. Its composition is as follows:

	Percent or Pounds
Ground yellow corn, or Sooner milo, or amber cane, or feterita, or proso	18
Pulverized oats	18
Ground wheat	16.5
Soybean oil meal	10
Dehydrated alfalfa leaf meal	5
Fish meal	10
Meat and bone scraps	10
Dried buttermilk	10
Granite grit	1.5
Salt and manganese*	0.5
Fish oil concentrate**	0.5
Total	100.0

\*Nine grams of manganese dioxide were added to 218 grams of common salt for a 100-pound mix. This would be approximately

Limestone or calcite grits should never be used in this ration in place of granite grit, as additional calcium will cause slipped tendons or deformed legs.

The start a turkey gets in life is mighty important in determining his future development. That is why it is necessary to see that one musters every trick of the trade in getting the poult started. A circle around the hover, made from a roll of cardboard or wire with sacks hanging down, will stop the drafts and teach the poult the source of heat. It will also prevent crowding into corners and smothering.

Poults have to be taught to eat. Good lighting is necessary so they can see the smallest bit of feed. The feed should be easily available. Oatmeal flakes will help the poults get started eating. Burlap or cloth bags spread

5 ounces of manganese dioxide per ton of feed.

\*\*The fish oil concentrate contained 400 A.●A.C. chick units of vitamin D per gram of oil.



Fig. 1. This type of shelter, roosts and other equipment were used in the experiments. Plans of the shelter may be obtained by writing to the Poultry Department.

over the litter for the first four days will prevent the poults eating the litter.

When the poults were 9-10 weeks of age, they were divided at random into three lots and moved to the range where they were kept in turkey shelters of simple construction, as shown in Fig. 1. The average number of poults per lot was as follows: 1939—95; 1940—65; 1941—123.

The first year's test was at the Agricultural Experiment Station in Brookings, and the last two years were at the North Central Substation at Eureka. In general, all three tests were the same. In each year's tests, the mash ration was the same in all three lots. The difference was in the grain or the manner in which the grain was fed.

Lot 1 was the control or yardstick by which the results were measured. In addition to the mash, they were fed yellow corn (and oats the last two years) as scratch grain, which was

kept in feeders before the birds at all times. In addition, oyster shells were fed. They were pastured on approximately one-half acre of sudan grass. The pen was divided so the birds could pasture only one-fourth acre at a time. Each weigh period (about 5-6 weeks) they were changed over to the other part of the pen. The sudan grass was cut when it became coarse or started to head, in order to keep the leaves palatable to the birds.

Lot 2 was fed proso and sorghums in feeders at the time the third lot was turkeying-off the same grain. In order of feeding, the grains were: millet, milo, and cane. In addition, feterita was fed the first year. This lot also pastured one-half acre of sudan grass and was fed oyster shells.

Lot 3 was the group that harvested its own grain. Proso millet was the first grain harvested, as it matures early. Proso millet was followed in succession by milo and cane. The

time of turkeying-off, and the size of lot, varied with the year.

Dates of Harvesting and Size of Plots

Year	Millet	Milo	Cane	Feterita
1939	Aug. 2—Sept. 11 (.9 acre)	to Oct. 19 (.22 acre)	to Nov. 2 (.9 acre)	to Dec. 2 (.9 acre)
1940	Aug. 12—Sept. 20 (.7 acre)	to Oct. 28 (1.1 acre)	to Dec. 5 (1.6 acre)	
1941	July 12—Aug. 19 (1.1 acre)	to Sept. 30 (1.1 acre)	to Nov. 10 (2.2 acres)	

Oyster shells were also fed to this lot.

The simple growing mash that was fed two of the three years, and which

gave good results was composed as follows:

Ingredient	Percent or Pounds
Ground yellow corn	41
Ground oats	30
Meat and bone scraps	18
Dried buttermilk	5
Alfalfa leaf meal	5
Salt	1
<b>Total</b>	<b>100</b>

This ration was suitable for birds kept outside and provided with green pasture, grain, and oyster shells.

## What Were the Results?

From the results obtained to date, it would appear as if the sorghums fed in feeders in these experiments were nearly as good as a combination of corn and oats fed in feeders. When the birds harvested their grains, they were able to use their feed about 80 percent as efficiently as the control pen. The birds ate (or wasted) more feed than the other lots and did not weigh as much.

When sorghums are harvested mechanically, a considerable amount of grain is lost. According to Martin et al (U.S.D.A. Technical Bulletin No. 121) the loss in combining milo varied from 4 to 51 percent, with an average of 25.9 percent, and in heading the loss varied from 0.1 to 45 percent, with an average of 13.5 percent. In view of these figures, the 20 percent that the turkeys failed to harvest is not high. The size of the field pastured and the number of turkeys used as well as the yield of grain would vary the results somewhat.

When mortality and market grades were considered, there were but little differences among the lots. How-

ever, the results obtained are not conclusive.

The yields produced by the plots that were harvested by the turkeys were determined by sampling a rod row for each sorghum and a square yard block of proso. The grain was considered as actually being consumed. These figures were used in comparing the feed consumption and the utilization of feed.

The average amounts of feed consumed in pounds per bird during the growing test period were:

Year	Period		Lot 1 Control	Lot 2 Feeders	Lot 3 Turkey- ing-off
1939	9-26 weeks	Mash	37.94	39.40	41.99
		Grain	22.95	23.86	25.79
		<b>Total</b>	<b>60.89</b>	<b>63.26</b>	<b>67.78</b>
1940	10-26 weeks	Mash	39.82	45.11	49.92
		Grain	28.37	29.30	41.46
		<b>Total</b>	<b>68.19</b>	<b>74.41</b>	<b>91.38</b>
1941	9-26 weeks	Mash	29.47	45.46	55.71
		Grain	44.58	37.11	28.56
		<b>Total</b>	<b>74.05</b>	<b>82.57</b>	<b>84.27</b>

These figures may be compared to the feed consumption standard shown in Chart I.

The average weights in pounds of

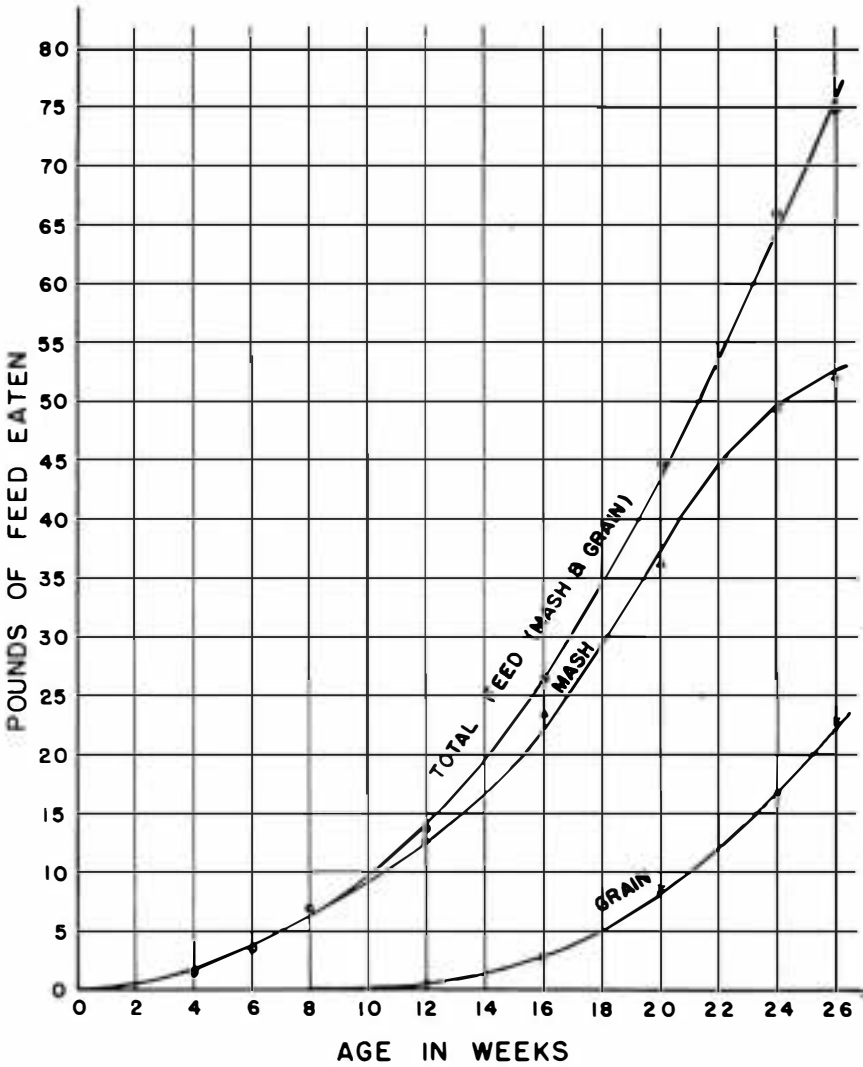


Chart I. Average amounts of feed eaten per turkey on sorghum tests. The amount of feed turkeys will consume may be estimated from this chart.

the toms and hens at the end of the test (26 weeks) for the three years were:

Year		Lot 1 Control	Lot 2 Feeders	Lot 3 Turkey- ing-off
1939	Toms	17.7	16.7	16.8
	Hens	11.8	11.4	11.2
1940	Toms	19.1	18.8	17.7
	Hens	11.9	12.3	11.3
1941	Toms	21.1	21.6	19.6
	Hens	13.8	14.2	13.2

The feeding efficiency or pounds of feed required to produce a pound of gain gives an indication as

to how well the birds made use of the feed available. In order to compare the results with the control pen, the amount has been calculated as the percent of control (which is 100).

Year		Lot 1 Control	Lot 2 Feeders	Lot 3 Turkey- ing-off
1939	Feeding efficiency	4.84	5.27	5.98
	% of control	100	92	81
1940	Feeding efficiency	5.86	6.12	7.51
	% of control	100	96	78
1941	Feeding efficiency	5.21	5.45	6.46
	% of control	100	96	81

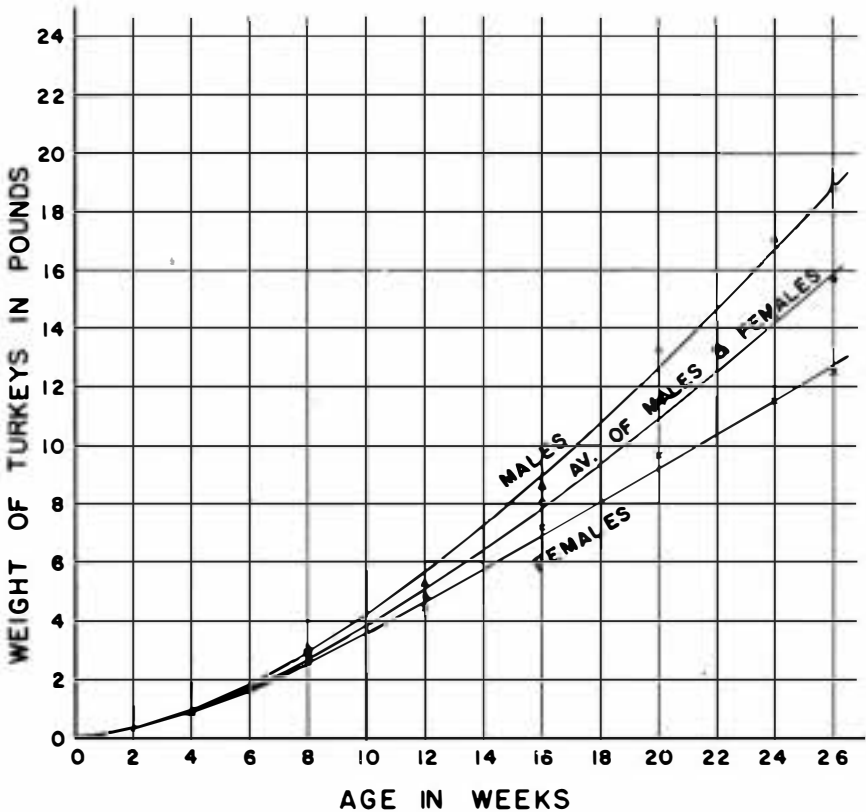


Chart 2. Average growth of turkeys on sorghum tests. The growth of turkeys may be estimated by using this graph.

The average amount of mash, grain, and total feed has been calculated from sorghum feeding tests at the South Dakota Agricultural Experiment Station. About 1,400 birds are represented by these figures, shown in Chart 1. The starting all-mash ration analyzed 26 percent protein, and the growing mash 20 percent protein. Grains were fed after the poults were 8 weeks old. Green pasture helped to keep the amount of feed consumed low.

In order to get a more accurate figure for grain consumption, these lots

turkeying-off their grains were omitted. It is interesting to note how the ratio of mash to grain becomes more equalized as the birds become older and consume more grain.

When buying feed, Chart 1 is of value in estimating the amount of feed needed.

The number of turkeys that died during the course of the tests was around 15 percent. Feed consumption was calculated from the number of poults in a lot for each day. In other words, on a poult-day basis.

## How Fast Do Turkeys Grow?

Chart 2 gives the average body weight of the toms and hens up to 26 weeks, or marketing time. These weights are of great aid in estimating the weight turkeys should be at a given age. The actual points are shown as well as the growth curve.

This standard of growth for the

Experiment Station strain of bronze turkeys was made from the birds on sorghum feeding experiments. The weights are somewhat heavier than native birds because, in 1941, all of the poults were the result of a cross between broad-breasted toms and native hens.

## War Time Turkey Rations

As this is written, it is evident that the rations listed here, in order to be practical, will have to be modified because of war conditions. In the starting ration, the dried milk content will have to be reduced, as milk is too expensive. Dried distillers' grains with solubles have proved a satisfactory substitute for milk in chicken starting rations. When the dried milk is reduced, alfalfa leaf meal, which is rich in vitamins, may be fed up to 10 percent of the mash ration. If purchased in quantities, a carotene analy-

sis should show that the alfalfa leaf meal contains not less than 45 milligrams of carotene per pound.

Cod liver oil and fish oil concentrates may be replaced by synthetic D, sometimes called the dry form of vitamin D (activated cholesterol). Starting rations should contain one-half of one percent of the 400 units per gram product.

Up to one-half of the meat and bone scraps may be replaced by soybean oil meal.

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NOTE.—A more detailed report of these experiments may be obtained by writing the Poultry Department of the South Dakota Agricultural Experiment Station at Brookings.