

MUNG BEANS AS A SOURCE OF PROTEIN FOR TURKEY POULTS

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Among the many effects of the War on Oklahoma agriculture one of the most critical has been the shortage of protein feedstuffs. Proteins of animal origin have been particularly scarce, so poultrymen have had to depend largely on plant proteins. The most abundant vegetable proteins are soybean oil meal and cottonseed meal. Fortunately these two feedstuffs have the highest protein value of all the common proteins of plant origin. Milby, Penquite, and Thompson (1943) have reported experiments on the use of common protein supplements in turkey rations.

Another result of the War has been the discovery that Oklahoma is well suited for the production of mung beans, formerly imported from China. Mung beans are used for the production of "bean sprouts", a major ingredient in certain "Chinese" dishes.

When mung beans are harvested many of the seeds are split, making them useless for sprouting. In 1943 the Oklahoma A. and M. College Poultry Department set up experiments to determine the feeding value of cracked mung beans for chickens and turkeys. The results of the turkey experiments are reported here.

Chemical analysis¹ of cracked green mung beans showed the following percentages: Protein, 24.59; N. F. E., 54.73; fat, 1.2; fiber, 3.62; ash, 3.91. Mung beans are somewhat lower in protein than cottonseed meal, for example, and are quite low in fat. In setting up the experimental rations for starting turkey poults mung beans were used to replace part of the cottonseed meal and soybean meal. To keep the protein level constant in the starter it was necessary to replace part of the corn also. The rations fed are shown in Table I. Ration 1 is the regular A. and M. turkey starter, and Rations 2, 3, 4, and 5 were modified as indicated.

Five lots of approximately 140 Bronze and White Holland poults each were started on the experimental rations when one day old. The duration of the experiment was eight weeks. The poults were kept in colony brooder houses in complete confinement.

The mean weights of the poults at eight weeks are shown in Fig. I. Statistical analysis of the data was made by the method of analysis of variance and the summary of the analysis is given in Table II. Cooked mung beans gave slightly better growth than raw ones, but the difference was not great. Both lots fed on cooked mung beans grew as well as the control lot, No. 1. Comparing the 15- and 25-per-cent levels of mung beans, there is no difference between the cooked-bean lots but in the raw-bean lots the 25-per-cent level was slightly superior, significantly so in the females. If mung beans were definitely inferior to other vegetable proteins one would expect the larger quantity to produce poorer growth.

In the spring of 1944 the experiment was repeated, using the same rations except that the cooked-bean lots were omitted. Note that in 1944 the order of pens is reversed (Table I). The only other difference was that Bronze poults only were used. The mean weights at eight weeks are given in Fig. 2, and the summary of the statistical analysis in Table III. None of the differ-

¹Analyses were made by Dr. V. G. Heller, Dept. of Agric. Chemistry Research, who was a cooperator on this project.

TABLE I

Rations fed

Ingredients	1943 pen No.	1	2	3	4	5
	1944 pen No.	3	2	1	Not fed	Not fed
Ground yellow corn		21	14	10	14	10
Wheat shorts		12	12	12	12	12
Wheat bran		10	10	10	10	10
Pulverized barley		10	10	10	10	10
Alfalfa-leaf meal		6	6	6	6	6
Meat and bone scraps		10	10	10	10	10
Dried buttermilk		5	5	5	5	5
Soybean oil meal		12	8	5	8	5
Cottonseed meal		12	8	5	8	5
Pulverized oyster shell		1	1	1	1	1
Salt		0.75	0.75	0.75	0.75	0.75
Vitamin-A-and-D supplement*		0.25	0.25	0.25	0.25	0.25
Ground raw mung beans		--	15	25	--	--
Ground cooked mung beans ^b		--	--	--	15	25
Total						
		100	100	100	100	100

*A-and-D supplement consisted of D-activated animal sterol and vitamin-A oil plus wheat shorts, vitamin content at least 400 D-3000 A per gram.

^bCooked in steam pressure cooker at 15 pounds for 40 minutes, dried in warm air and then ground.

TABLE II

Statistical analyses, 1943 trial

Comparison made	F values	Significance
All males	2.24	Not significant, but approaching 5 per cent level
Raw vs. cooked mung beans	6.39	Significant, 1 per cent point is 6.67
All females	7.20	Highly significant
Raw vs. cooked mung beans	19.04	Highly significant
Pen 2 vs. Pen 3	9.53	Highly significant
All females except Pen 2	1.69	Not significant

TABLE III

ences are significant; in fact the growth was remarkably uniform in the three lots. The weights attained were practically the same as those in 1943, which may be merely coincidental.

SUMMARY

Green mung beans, used at present primarily for the production of bean sprouts, are a crop well adapted to Oklahoma. Cracked mung beans, useless for sprouting, appear in these trials to contain protein of high quality. They may be used to replace at least two-thirds of the vegetable proteins commonly used in turkey starting rations.

Mung-bean protein differs from the protein of cottonseed meal and soybean oil meal in that it apparently does not need to be cooked to make it available for the birds. Oklahoma farmers have in mung beans a crop that can be grown on their farms, harvested with available machinery, and pro-

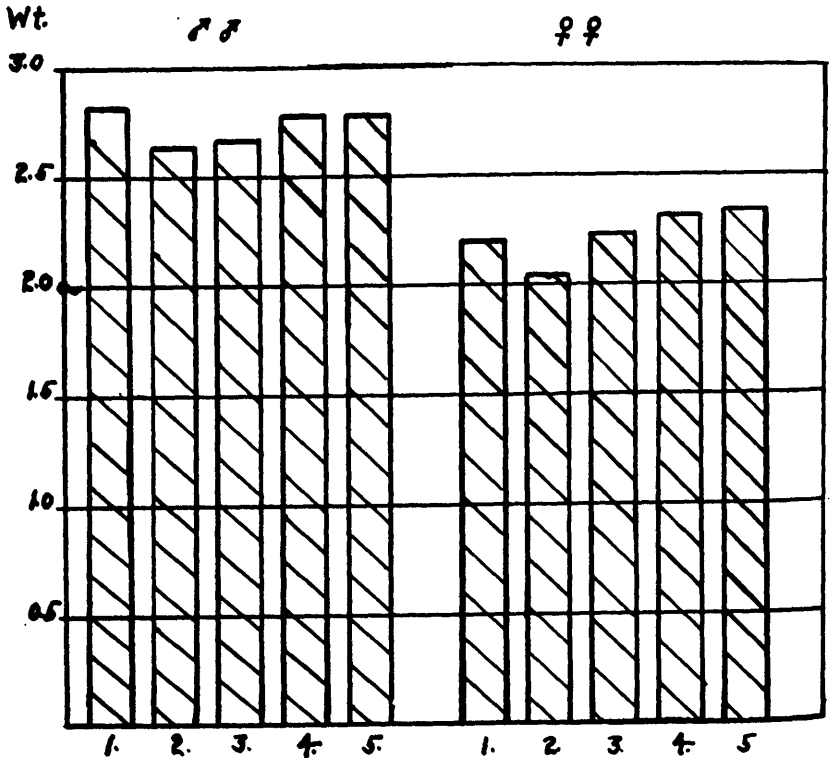


FIGURE 1

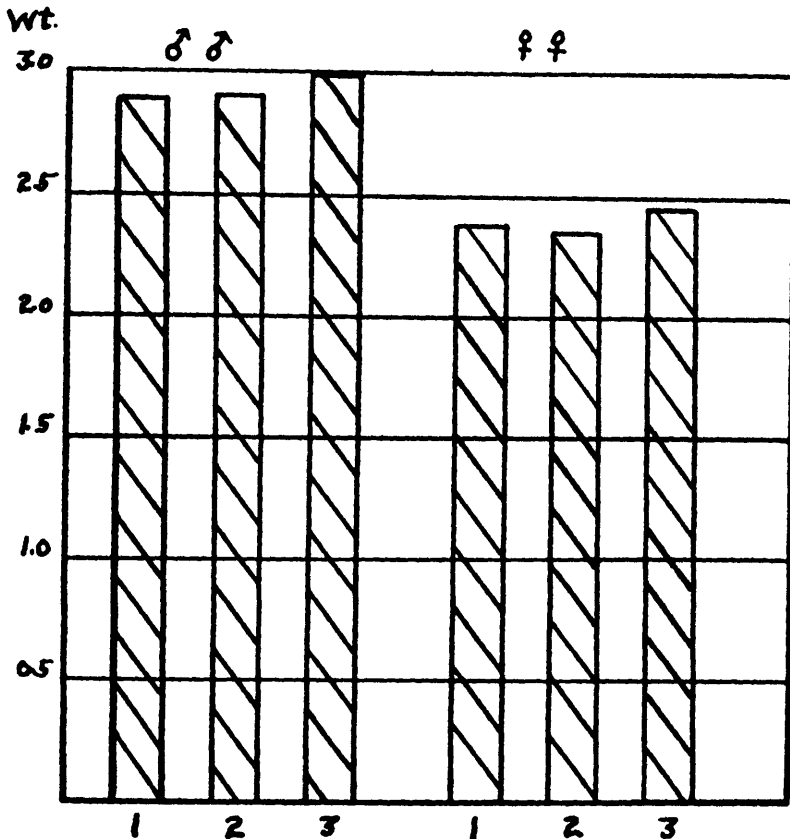


FIGURE 2

cessed at home, and one that is capable of replacing much of the protein usually purchased to feed their turkeys.

LITERATURE CITED

Milby, T. T., R. Penquite, and R. B. Thompson. Fiber and protein in turkey rations: substitutes to meet wartime needs. Circular, Oklahoma Agric. Expt. Sta. C-111: 1-8.