THE USE OF SOYBEANS IN FATTENING RATIONS FOR BROILERS AND FRYERS

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A method of fattening broilers by feeding a synthetic estrogen, 3,4-dianisylhexene-3, in the broiler mash has been reported by Thayer, Jaap, and Penquite (1945). The use of soybean lecithin and crude soybean oil in conjunction with the estrogen seemed to be more effective in producing AA- and A-grade broilers than did the estrogen alone (unpublished data). The proportion or soybean oil and soybean lecithin which was fed in these broiler mashes is the same as that normally present in the whole soybean (Horvath 1938). This suggested that whole cooked soybeans, which contain 20 percent oil and three percent lecithin, might be used as a source of these ingredients. Two feeding tests were completed in which a broiler mash containing soybean meal made from the whole cooked beans was compared to a standard broiler mash.

GENERAL METHODS

Each broiler mash used in these feeding tests consisted of two base-feed mixtures (see Table I) or a combination of one of the base-feed mixtures with varying amounts of crude soybean oil, soybean lecithin, yellow corn meal, and estrogen.

TABLE I

Composition of base-feed mixtures

	Base I	Base II
Yellow corn meal	61 lbs.	51 lbs.
Wheat shorts	5	5
Dehydrated alfalfa meal	3	3
Dried buttermilk	15	15
Soybean meal	5	5
Cottonseed meal	5	
Meat and bone scrap	5	
Salt	0.75	0.75
Vitamin-A-and-D feeding oil	0.25	0.25
Manganese, stock solution	0.20	
Cooked soybean meal		20

Ration 1—100 lbs. base I.

Ration 2—100 lbs. base II.

Ration 3—80 lbs. base I plus 19 lbs. yellow corn meal plus 1 lb. crude soybean oil.

Ration 4—80 lbs. base I plus 19 lbs. yellow corn meal plus 1 lb. crude soybean oil plus 5 gm 3,4-dianisylhexene-3.

Ration 5—80 lbs. base II plus 19 lbs. yellow corn meal plus 1 lb. crude soybean oil.

Ration 6—80 lbs. base II plus 19 lbs. yellow corn meal plus 1 lb. crude soybean oil plus 5 gm 3,4-dianisylhexene-3.

Ration 7—80 lbs. base I plus 15.4 lbs. yellow corn meal plus 4.6 lbs. crude soybean oil plus 5 gm 3,4-dianisylhexene-3.

Ration 8—80 lbs. base I plus 15.4 lbs. yellow corn meal plus 3.7 lbs. crude soybean oil plus 0.9 lb. soybean lecithin.

Ration 9—99 lbs. base II plus 1 lb. crude soybean oil plus 5 gm 3,4-dianisylhexene-3.

All soybeans were cooked for 45 minutes at 15 lbs. pressure in a large pressure cooker before they were ground into meal in a hammermill. The estrogen (3,4-dianisylhexene-3) was dissolved in crude soybean oil at a temperature of 100° C and the oil solution was thoroughly mixed into the broiler mash.

At the end of the premarket fattening period all broilers were dressed at a commercial poultry packing plant and were graded on fatness. The Federal grades were used as a standard.

FEEDING TEST I

In the first feeding test, the standard broiler mash (Ration 1) and the soybean broiler mash (Ration 2) were fed to two groups (Lots 1 and 2) of White Plymouth Rock broilers during the first 9 weeks of a 12-week feeding period. At the beginning of the 9th week each of the two original groups were divided into two groups of equal size. Rations 3 and 4 were fed in place of Ration 1 to Lots 1a and 1b, and Rations 5 and 6 were fed in place of Ration 2 to Lots 2a and 2b, respectively. The results of this test are summarized in Table II.

FEEDING TEST II

In the second feeding test three lots of 12-week-old broilers were fed rations 7, 8, and 9 during an 18-day premarket period. The results of this test are summarized in Table III.

DISCUSSION

The results in Table II, Part A, indicate that whole cooked soybeans ground into meal may be used in place of the commercial soybean meal, cottonseed meal, and part of the yellow corn meal in the standard broiler mash (Ration 1). The rate of gain was about the same for Lots 1a, 1b, 2a, and 2b during the entire 12-week feeding period. During the 3-week premarket fattening period, however, the soybean broiler mash (Ration 6) was not as effective as the standard broiler mash (Ration 4) in producing grade-AA and -A broilers when estrogen was fed as a component of both mashes (Lots 1b and 2b—Table II, Part B). The soybean broiler mash (Ration 5) was slightly superior in this respect to the standard broiler mash (Ration 3) when both were fed without estrogen (Lots 1a and 2a).

The soybean broiler mash (Ration 9) proved to be less effective than the standard broiler mash (Ration 7) or Ration 8, to which soybean oil and soybean lecithin had been added, in producing grade-AA or -A broilers (Table III). Here again, as was the case in the first feeding test, rate of gain was about the same for all three lots during the 18-day premarket fattening period.

CONCLUSIONS

1. Soybean meal prepared from whole cooked soybeans may be used to replace commercial soybean meal and cottonseed meal in broiler mashes which are fed during the growing period just prior to the premarket fattening period.

2. The addition of soybean oil and soybean lecithin to the broiler mash along with estrogen produced no more grade-AA and -A broilers than did the standard broiler mash plus the estrogen during a premarket fattening period.

3. The soybean broiler mash was not as effective as the standard broiler mash in producing AA- and A-grade broilers when estrogen was fed as a component of both mashes during a premarket fattening period.

TABLE II

Summary of first feeding test

A—First nine weeks of growing period

Lot No.	Ration No.	Breed	No. of chicks	Mortality	Lbs. feed consumed per bird	Av. wt. at start	Av. wt. at end	Percent in each grade			
								AA	A	B	C
1	1 (no estrogen)	W. Ply. Rock	150	11	4.94	30.4 gm	1.78 lbs.				
2	2 (no estrogen)		150	11	4.63	30.4 gm	1.77 lbs.				
			B—Three-week premarket fattening period								
1a	3 (no estrogen)	W. Ply. Rock	69	1	3.26		2.65 lbs.	4.5	43.3	50.2	0
1b	4 (estrogen)		70	4	3.25		2.48 lbs.	10.0	53.3	36.7	0
2a	5 (no estrogen)		69	1	3.33		2.69 lbs.	25.8	27.3	46.9	0
2b	6 (estrogen)		70	0	3.30		2.64 lbs.	9.4	43.8	46.8	0

TABLE III

Summary of second feeding test

Lot No.	Ration No.	Breed	No. of chicks	Mortality	Lbs. feed consumed per bird	Av. wt. at start	Av. wt. at end	Percent in each grade			
								AA	A	B	C
3	7 (estrogen)	New Hamps, Oklabar, W. Wyandotte, W. Ply. Rock	22	2	4.65	2.19 lbs.	3.03 lbs.	68.4	21.1	10.5	0
4	8 (estrogen)	Barred Ply. Rock, S. C. Brown Leghorn, and Dom.-white crossbreds	24	0	4.04	2.22 lbs.	3.01 lbs.	62.5	25.0	4.2	9.3
5	9 (estrogen)		24	0	4.04	2.36 lbs.	3.14 lbs.	58.3	20.8	20.8	0

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