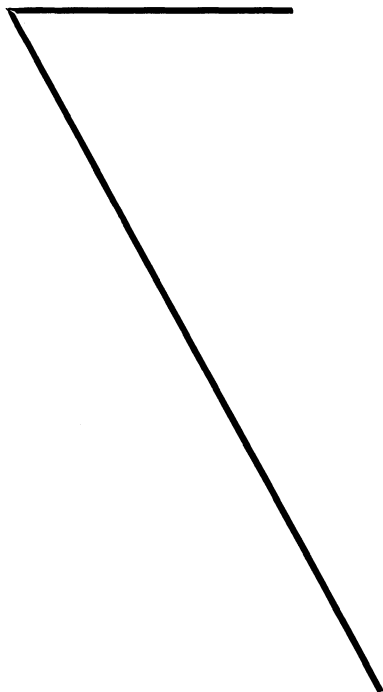


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Grain sorghums are a major source of feed grain in Oklahoma. They have largely replaced corn on Oklahoma farms because they are better adapted to the semi-arid climatic conditions typical of a large part of the state. New improved grain sorghum varieties have been and are being developed at the Oklahoma Agricultural Experiment Station (Davies and Sieglinger, 1952; Chaffin, 1955). The feeding value of these new varieties for poultry and other livestock is a factor which must be considered in selecting those varieties best suited for use in Oklahoma.

Since grain sorghums will be fed primarily as a replacement for yellow corn, it is desirable that new improved varieties be compared to yellow corn in feeding tests in order to determine their relative feeding value.

In the feeding tests reported in this circular, growing chickens were fed new improved varieties of grain sorghums in starter and grower rations as a full replacement for corn. The relative feeding value among the several varieties tested and the relative feeding value of any given variety as compared to corn can be determined from the data obtained in these feeding tests.

Experimental Procedure

Practical starter or grower mashes were used as the basal ration in this series of five experiments. Experimental rations were formulated by replacing all the corn in the basal rations with equal amounts (pound for pound) of one of the grain sorghum varieties listed in Table 1.

Table 1.—Relative feeding value of improved varieties of Oklahoma grain sorghums for growing chickens as compared to yellow corn.

	Grain color	Relative body weight values as compared to yellow corn	Lbs. feed/lb. gain
Experiment 1 (4 weeks)			
Sharon kafir*	White	113	2.15
White schrock	White	109	2.00
Darso*	Brown	107	2.29
White darso	White	104	2.03
Martin's milo*	Red or yellow	103	2.03
YELLOW CORN		100	2.17
Standard kafir	White	99	2.31
Yellow darso	Yellow	97	1.88
Experiment 2 (4 weeks)			
Sharon kafir*	White	120	2.40
Dwarf kafir 44-14*	White	119	2.43
Kaferita #812	Crypto brown**	118	2.66
Yellow darso	Yellow	115	2.40
White darso	White	114	2.57
Darso*	Brown	113	2.57
Redlan*	Red	104	2.76
YELLOW CORN		100	2.82
Experiment 3 (4 weeks)			
Club x day 16	Red or yellow	119	2.18
Feterita 182	Crypto brown**	108	2.33
Schrock	Brown	106	2.35
Dwarf milo	Red or yellow	105	2.31
YELLOW CORN		100	2.36
Martin's milo*	Red or yellow	95	2.45
Kaferita #811	White	91	2.40
Hegari #750*	Crypto brown**	91	2.50
Experiment 4 (6 weeks)			
Dwarf feterita	Crypto brown**	107	3.02
Wheatland*	Red or yellow	105	2.95
Bonita	Crypto brown**	103	3.36
Plainsman milo*	Red or yellow	102	3.16
YELLOW CORN		100	3.33
Atlas*	White	98	3.15
Redlan*	Red or yellow	93	3.34
African millet	Brown	91	3.33

	Grain color	Relative body weight values as compared to yellow corn	Lbs. feed/lb. gain
Experiment 5			
(8 weeks)			
Wheatland*	Red or yellow	108	3.24
African millet*	Brown	108	2.81
Redlan*	Red or yellow	105	3.04
Dwarf feterita	Crypto brown**	101	3.29
YELLOW CORN		100	2.95
Plainsman milo*	Red or yellow	99	3.17
Bonita	Crypto brown**	95	3.27
Atlas*	White	94	3.03
(12 weeks)			
Radlan*	Red or yellow	113	4.62
Wheatland*	Red or yellow	109	5.66
African millet*	Brown	108	4.0 ⁹
Plainsman milo*	Red or yellow	106	4.4 ⁹
Dwarf feterita	Crypto brown**	106	5.17
Atlas*	White	103	4.19
YELLOW CORN		100	4.42
Bonita	Crypto brown**	97	4.53

*Grain sorghum varieties grown extensively in Oklahoma at the present time.

**White with a brown subcoat.

Barred Plymouth Rock and New Hampshire chicks from improved broiler strains were used in all five experiments.

In Experiments 1, 2 and 3, the growing chickens were grown to four weeks of age in battery brooders. In Experiments 4 and 5, the growing chickens were housed in floor pens in a brooder house.

Records were kept on feed consumption, body weight and mortality.

In summarizing the body weight data, the average body weight of the chicks in the lot fed the yellow corn was given a relative value of 100. The relative value of the average body weight of the chicks in each of the lots fed the grain sorghums was calculated as a percentage of the average body weight of the chicks in the lot fed the yellow corn.

Results and Discussion

Relative body weight values and pounds of feed required per pound of gain for the various grains are summarized, by experiments, in Table 1. A color description is given for each grain sorghum variety in the first column of this table.

The percentage composition of a number of the improved varieties of Oklahoma grain sorghums fed is tabulated in Table 2. Most of the grain sorghum varieties tested were equal to corn in promoting chick growth. In some instances a given variety ranked both above and below yellow corn in different feeding tests. Order of rank within a given test or the failure of a given variety to maintain the same rank from test to test may have been due in part to differences in chemical composition (Table 2).

Table 2.—Percentage composition of a mixture of the improved varieties of Oklahoma grain sorghums used in Experiments 1 through 5.

Description	Protein	Moisture	Fat	Fiber	N.F.E.	Ash	Ca.	P.
Kaferita	15.29	10.21	3.17	1.77	67.48	2.08	.04	.344
Hegari #750	12.49	8.14	3.06	1.56	73.00	1.75	.03	.302
White schrock	12.24	10.31	3.12	3.24	69.09	2.00	.041	.301
Redlan	11.84	10.49	3.11	1.68	71.36	1.52	.031	.266
Darso	11.50	10.94	2.86	1.89	70.18	1.63	.03	.284
Martin's milo	11.09	12.08	2.99	1.77	71.13	1.44	.03	.233
Feterita 182	10.84	12.04	2.76	1.56	71.08	1.72	.04	.240
Dwarf kafir 44-14	10.16	10.82	2.65	1.78	72.85	1.74	.04	.236
Bonita	9.69	12.41	2.05	2.18	72.06	1.61	.04	.231
Atlas	9.28	10.63	2.13	1.32	75.11	1.53	.035	.262
Plainsman Milo	8.72	12.41	2.85	1.89	72.30	1.83	.04	.241
Sharon kafir	8.38	11.31	2.23	2.12	74.52	1.44	.035	.239
Yellow corn	8.31	11.16	4.04	1.68	73.72	1.09	.026	.221
Dwarf milo	8.18	12.65	2.05	1.70	73.86	1.56	.04	.231
African millet	8.16	12.44	2.41	1.96	73.54	1.49	.04	.235
Wheatland	8.06	12.68	2.29	2.40	73.15	1.42	.04	.182

Heller and Sieglinger (1944) reported that climatic and soil conditions affected the chemical composition of grain sorghums. The crude protein content was observed to increase as much as 30 percent under drouthy growing conditions. Grain sorghums grown at two localities on different types of soil contained different levels of protein. These differences in protein, unless taken into consideration in formulating poultry rations,

could have a pronounced effect on chick growth. For this reason, a crude protein analysis should be made on all grain sorghums before they are used in a poultry feed. When this is done, needed adjustments in the ration protein level can be made to compensate for differences in the protein content of the grain sorghums.

Seed coat color has been suggested as a criterion in determining the suitability of a given grain sorghum as a substitute for yellow corn in poultry feeds. The observation has been made that darker colored varieties are unpalatable to poultry because of the presence of tannic acid and related compounds in the seed coat. For this reason, the use of white or yellow varieties was recommended. Data obtained in this study, however, indicate that seed coat color is not a reliable measure for selecting the most desirable varieties for use in poultry feeds. The new improved varieties used in these feeding tests ranged in color from white through red with many intermediate colors. There was no apparent relationship between color and growth promoting ability among the varieties tested. Some white and yellow varieties, which by color alone should have been superior to the darker reds, ranked below them in growth promoting ability.

Chicks fed the grain sorghum rations converted feed as efficiently as those fed the yellow corn. In two thirds of the cases, chicks fed grain sorghums required slightly less feed per pound of gain than chicks fed yellow corn. No differences in mortality were observed.

Conclusions

1. The majority of the new improved grain sorghum varieties tested were equal to yellow corn in growth promoting value for growing chickens.
2. Growing chickens fed new improved grain sorghum varieties utilized feed as efficiently as chickens fed yellow corn.
3. A protein analysis should be made on any grain sorghum before it is used in poultry feeds. Variations in protein con-

tent resulting from differences in climatic and soil conditions may affect chick growth adversely unless recognized and compensated for by adjusting the protein level of the ration.

4. Seed coat color among the improved grain sorghum varieties tested was not a reliable measure to use in determining their relative feeding value for growing chickens.

Literature Cited

Chaffin, Wesley, 1955. Sorghums for grain and forage. Oklahoma A. and M. College Extension Circular 478.

Davies, Frank F., and John B. Sieglinger, 1952. Dwarf Kafir 44-14 and Redlan, two new combine-type grain sorghums. Oklahoma Agricultural Experiment Station Bulletin No. B-384.

Heller, V. G., and John B. Sieglinger, 1944. Chemical composition of Oklahoma grain sorghums. Oklahoma Experiment Station Bulletin No. B-274.