

## CONSUMER ACCEPTANCE AND FUNCTIONAL PROPERTIES OF COWPEAS AND LIMA BEANS

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In her extensive survey of consumer preferences for cowpeas in Western Nigeria, Williams (1974) found the following factors to be important:

1. Cooking time of the whole bean, since fuel is costly,
2. Water uptake or swelling in the whole bean, to give a "full pot"
3. Taste, texture and appearance in the traditional dishes prepared from the flour (akara and moin-moin).
4. Ease of removal of the testa (usually by soaking and rubbing) prior to flour making.

These factors are all indicated in our screening program for seed quality. While usually done only on those lines selected for superior protein content and quality (on the basis of total nitrogen and total sulfur assay), they can be done as an early test on any promising field material.

Cooking time is determined pragmatically, but reproducibly, by plotting the increase in weight of seeds submerged in boiling water. For cowpeas and lima beans, the beans are fully cooked 1-3 min. before the plateau of water uptake is reached. The transition from "cooked" to "uncooked" is rapid for these legumes, as found in our taste panel test. The extent of water uptake is a measure of swelling or volume increase and is based on seeds dried at 55-65°C before the test.

For the 12 cowpea lines with highest yield in the 1974 second season IITA trials, the cooking time averaged 52 min., though only 40 min. was required for TVu 1977-0D (Table 1). The average water uptake was about 150%, i.e. 10g. of dry cowpea had a final cooked weight of 25g. The test proved to be remarkably reproducible for different seeds in the same sample (cf. data for TVu 201-0D), but differences between seed lots of the same variety have not been checked. As seen from the table, there is no correlation between good cooking parameters and either seed weight or protein. In previous work, there was no correlation found between cooking time and testa thickness.

For the 12 lima beans showing best yield potential, cooking time was 76 min. on the average, but the shortest time was 60 min. (Table 2). This would be acceptable to the consumer, as would be the highest water regain of 141% (average was 120%). In fact, a number of lines (e.g. TP1 2, 79 and 95e) would be acceptable since they combine satisfactorily these two factors. Lima beans are not uncommonly eaten in Nigeria and the introduction of such new lines should not be difficult. In these lines there seems to be no correlation

Table 1. COOKING CHARACTERISTICS OF SELECTED IITA COWPEAS

Cultivar	Cooking time, min.	Swelling, %	100-seed weight, g	Protein content, %
TVu 201 - 1D	55,55	158,162	14.5	24.3
TVu 317	65	138	12.9	24.5
TVu 1190	50	148	17.9	25.2
TVu 1502	50	134	8.2	25.6
TVu 1630	50	136	12.5	24.1
TVu 1836	45	134	-	-
TVu 1977 - 0D	<u>40</u>	160	7.7	22.8
TVu 4557	55	142	11.2	23.7
TVx 13-2E	45	<u>172</u>	12.8	23.6
TVx 30-3C	60	164	10.5	22.4
TVx 966 - 013	50	138	10.1	23.8
TVx 2551	55	157	11.7	24.4
Average	<u>52</u>	<u>148</u>		

TABLE 2. COOKING CHARACTERISTICS OF SELECTED LIMA BEANS

TP1 No. *	Seed color	Cooking time, min.	Swelling, %	100-seed weight, g	Testa thickness, mm	Protein content, %
1 d	Black/white	70	119	49.2	0.15	27.4
2	Dark brown	70	<u>141</u>	38.2	.15	21.1
9	Grey	75	120	31.3	.12	19.6
10	White	80, 84	113, 107	63.3	.09	23.5
17	Grey	80, 85	120, 124	35.5	.11	20.4
21 c	Brown	71, 70	112, 113	33.0	.12	20.8
36	Grey	78	119	35.5	.11	21.1
60 e	Brown	80, 80	108, 108	41.5	.11	18.0
79	White	70	131	38.1	.11	20.4
80	Grey	72	118	40.0	.10	20.4
95 e	Violet	<u>60</u>	115	46.2	.14	20.8
187	White/brown	86	122	42.6	.12	21.9
		<u>76</u>	<u>120</u>			

\* Grown in second season 1974

between seed size, testa thickness, cooking time or water uptake. Factors such as phytic acid in the testa and the nature of the starch in the seed should be studied.

The results of taste panel tests with 6 promising cowpea lines have been reported in the GLIP Annual Report for 1974. The fried dish akara and steamed dish moin-moin were prepared from flour made from these lines. The panel members were asked to state their preference between two food samples, one made from the test line, the other from a standard highly acceptable line (neither identified to the taste panel). Consumer acceptance of both VITA-1 and VITA-3 was confirmed.

#### REFERENCE

- Williams, C.E. 1974. A Preliminary Study of Consumer Preferences in the Choice of Cowpeas - Western and Kwara States Headquarters and Areas of Nigeria, University of Ibadan, 103 pp.