Economics Program
Progress Report 50

Village Consumers Preference for Sorghum Varieties and Its Relationship to Sorghum Preference Index

P. Parthasarathy Rao and M. von Oppen

ICRISAT

International Crops Research Institute for the Semi-Arid Tropics
ICRISAT Patancheru P.O.
Andhra Pradesh 502 324, India

May 1983

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ABSTRACT

The variation in sorghum prices in the urban wholesale markets reflects variation in quality characteristics of different lots of sorghum sold in the market. Seven quality characteristics have been identified which significantly explain 60 to 70% of the price variation. The multiple-regression coefficients estimated for these quality characteristics are used to predict preferences for sorghum varieties in the form of an index i.e. Sorghum Preference Index (SPI).

In this study twelve sorghum varieties (originating partly from urban wholesale market and partly from breeders' fields) were tested in actual consumer trials to assess village consumers' preferences in Aurepalle village in Mahbubnagar district in Andhra Pradesh. Based on the village consumers' scores these 12 varieties were ranked in order of preference. A SPI was also worked out for these 12 varieties. A rank correlation showed that these ranks were significantly correlated for all household categories put together. A simultaneous test based on regression analysis gave similar results and a set of dummy variables showed that the villagers were not influenced or biased by the design or conduct of the study. Similar results had been obtained earlier in a similar study in Kanzara village in Maharashtra state. In both the studies labor, small and medium households expressed preferences which are well in line with the predicted SPI and statistically there was no difference between the rankings of these groups.

On an average all the household categories in Aurepalle village showed preferences for local varieties of sorghum as compared to HYVs. This preference for locals was expressed particularly strong when consumers were asked to assess flour samples and thus could not see the outer appearance of the grains.

These results strengthen our confidence in the SPI which correctly predicts consumer preferences for sorghum varieties in urban as well as rural areas of SAT India.

Village Consumers Preference for Sorghum Varieties and Its Relationship to Sorghum Preference Index

P. Parthasarathy Rao and M. von Oppen*

On any given market day the price of sorghum grain varies by 20 to 30% around the average price. This variation in price reflects variation in quality characteristics of different lots of sorghum sold in the market. In earlier studies seven quality characteristics have been identified which consistently and significantly explain 60 to 70% of the variation in sorghum prices across time and space. The quantification of this price variation led to the construction of a Sorghum Preference Index (SPI) which tells us the consumer preference for a particular sorghum variety (for details see von Oppen 1981).

The effect of these seven quality characteristics on SPI is shown in Figure 1. On the vertical axis we measure SPI and the quality characteristics on the horizontal axis. The SPI is 100 when all the quality characteristics have average values as shown in the brackets. If we assume a 25% increase in each of these quality characteristics independently of each other from the average, the SPI will be greater or less than 100 depending on the effect of the particular quality characteristic on consumer preference. From the figure we find that slight mould, severe mould, glumes and swelling incapacity influence the SPI negatively and on the other hand dry volume, hundred-seed-weight and protein content have a positive influence on SPI. In terms of % change the cryptic qualities like dry volume, protein content and swelling incapacity have a larger effect on SPI as compared to the other evident qualities.

One of the important issues often raised is that sorghum preferences vary across regions. While this may be true in terms of outer appearance like color, a universal preference seems to exist particularly for the cryptic quality characteristics. This was proven by measuring consumer preferences based on market sample collection, for several important sorghum growing regions in urban India (for details see von Oppen 1981).

Another important point is that the bulk of sorghum consumption in India is in rural areas, and one might hypothesize that urban consumers have preferences which differ from those of rural consumers. The next logical step, therefore, was to find out to what extent the preferences for sorghum expressed by the urban consumer are in line with the

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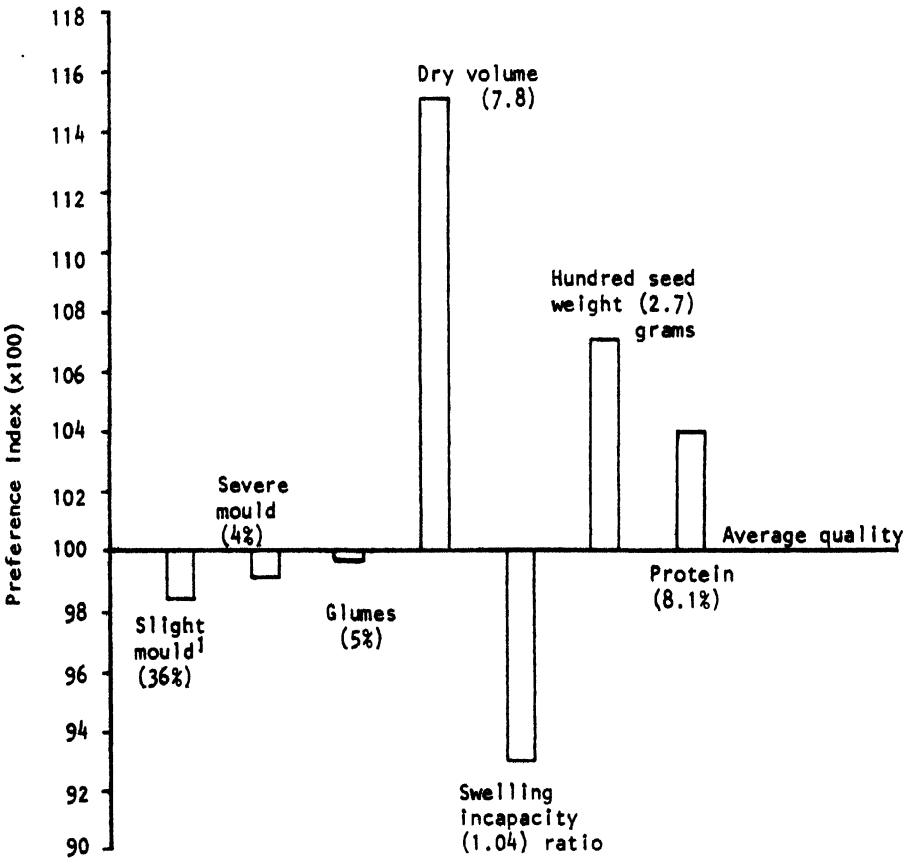
* Research Technician and Principal Economist respectively, Economics Program, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru P.O. 502 324 A.P., India. The authors are grateful to N.S. Jodha, and R.D. Ghodake for their valuable comments on an earlier draft of this paper. They also thank Y. Mohan Rao for his excellent support in carrying out the survey in Aurepalle village and to Md. Nayeemuddin for assisting in tabulation.

Figure 1. Increase or decrease in SPI(x100) due to a 25% increase in sorghum quality characteristics from average.



1. Quality characteristics with average value in brackets.

preferences of the rural consumer.[1] As a first step a large scale consumer panel test was carried out in 1979 in Kanzara village in Maharashtra state. Fifteen sorghum varieties/samples were purchased from Osmangunj market in Hyderabad for the study. These were distributed in the form of flour and grain in a double blind procedure[2] to village households of different size classes for ranking against two reference samples. The results of the study were encouraging. It was found that the villager's ranking of the 15 sorghum varieties was significantly related to the SPI especially for labor, small and medium households. Large farmers' preferences were not in line with SPI (for details see Bapna 1980). Large farmers consume rice and wheat besides sorghum and hence may not be good judges of sorghum quality.

The Kanzara results clearly refuted the hypothesis that rural and urban consumers have different preferences for sorghum quality. In this paper we report another such consumer panel study in Aurepalle village in Andhra Pradesh. This study was carried out to verify the Kanzara results for another region and thus increase our confidence in SPI.

The village Aurepalle (one of the on-going VLS villages of the Economics Program) is situated at a distance of 70 km from Hyderabad in Mahbubnagar district. The important crops grown in the village are: irrigated paddy, rainy season sorghum and pearl millet intercropped with pulses and rainy season castor and castor mixtures. The total irrigated area in the village is only around 12%. Sorghum next to paddy is an important cereal consumed by the entire population. Around 50% of the small farmers' staple food consisted of sorghum whilst it is only 24% for the large farmers. The most commonly consumed variety is 'yellow jowar' grown in the kharif season particularly for labor and small households. While farmers do grow other varieties including negligible quantities of HYV sorghum, consumption of HYV's is even lower, as most of the HYV production is being sold in the market.

Initially it was decided to carry out this study with sorghum samples obtained from the breeding program at ICRISAT. This would have shown the villagers reaction to a new set of sorghum varieties and would have also been a true test for the SPI. However, since only 5 breeders' samples could be obtained in the required quantity of 25 kg, seven market samples from Osmangunj Market in Hyderabad were included in addition to the five breeders' samples. A list of these 12 samples with origin and corresponding SPI, is shown in Table 1.

The experimental design used for the Kanzara study was repeated in toto for the Aurepalle study. To briefly recapitulate, the consumer panel consisted of 40 respondent households in the on-going village level

1. In the urban areas a SPI was derived based on market samples. In rural areas actual feeding trials were carried out in order to arrive at village consumer scores for sorghum varieties.

2. Since the respondents were generally illiterate the samples were identified by means of labels (red or yellow or no label). This labeling was done randomly and independently so that neither the respondent nor the interviewer knew which label represented which variety name.

Table 1. List of sorghum varieties used in the study.

Sorghum variety	Origin	Type	SPI (x 100)
A	Market	Local	100.70
B	Market	Local	108.96
1	Market	HYV	84.09
2	Market	Local	110.03
3	Market	Local	111.77
4	Market	Swarna	91.20
5	Market	Local	88.31
6	Breeder	HYV	100.39
7	Breeder	Local	101.50
8	Breeder	HYV	106.87
9	Breeder	HYV	92.29
10	Breeder	HYV	92.22

studies of the Economics Program, consisting of 30 farmers (small, medium and large categories) and 10 agricultural labor households. Variety A & B were chosen as the reference varieties. For four consecutive days each respondent was provided daily with one packet of 1 kg of the reference variety A or B, and 1 packet of 1 kg of any other variety in the form of either flour on one day or grain the next day. These packets were labelled by red or yellow tapes or left blank. The respondents were asked to prepare chapatis or any other food product and give their preference between the two samples received on a day; also the reasons for an expressed preference were asked. It should be mentioned here that the method of cooking and the vegetable with which they are eaten was not questioned because farmers used the same cooking methods and vegetables for both varieties. All information was collected in a simple questionnaire (Appendix I). At the time of interview neither the respondent nor the investigator knew the variety name or number. Thus a double blind procedure was adopted in carrying out this study. The experimental design is shown in Appendix II for each of the four days of the experiment.

The villagers' preferences for a particular variety were evaluated on the following scale: "very high preference" = 3 points, "high preference" = 2 points, "just preferred" = 1 point, "no difference" = 0 point. All consumers' scores for each variety were added and divided by the number of respondents who consumed that particular variety to arrive at Aurepalle Consumers Scores (ACS) for the 12 sorghum varieties. This was tabulated for all four household categories jointly and separately for each of the household categories (Table 2). On the basis of these scores the varieties are then ranked in an ordinal measurement scale to get Aurepalle Consumers Rank (ACR). The SPI was also calculated for these 12 sorghum varieties (see Table 1) using multiple regression coefficients obtained earlier from samples collected over four years (1977-80) from Osmangunj Market in Hyderabad during peak-marketing season of January to March. The 12 varieties are then ranked based on index value to get SPI ranks (SPIR). In Table 2 the ranks for the 12 varieties are shown based on ACR and SPIR.

In order to test our hypothesis a rank correlation analysis was carried out between the rankings. It is found that ACR and SPIR for all income classes put together have a positive and significant rank correlation of .71. Looking at the income categories individually, we find the ACR for medium farmers has a significant rank correlation of .64 with SPIR. Labor and small farmers have a positive rank correlation although statistically not significant. The large farmers have the lowest rank correlation of .28. This can be explained by the fact that in Aurepalle large farmers' staple food is rice (to the extent of 75%).

These results are in line with the results obtained in the Kanzara village. To make the Kanzara results more comparable, the SPI for the 15 sorghum varieties used in Kanzara village was also recalculated using

Table 2. Ranking of sorghum varieties by different consumer groups in Aurepalle village and Preference Index ranks.

Variety	Preference Index (x 100) (SPI)	Preference Index Rank (SPIR)	Aurepalle Consumers Rank (ACR)	Labor	Small	Medium	Large
A	100.70	6	3	2	2	3	7
B	108.96	3	2	5	1	5	1
1	84.09	11	6	4	9	7.5	3.5
2	110.03	2	1	1	9	1	3.5
3	111.77	1	5	6	3.5	6	9
4	91.20	10	8	7.5	3.5	10	5.5
5	88.31	12	11	11.5	9	7.5	11.5
6	100.39	7	9	3	9	10	11.5
7	101.50	5	4	9.5	9	2	2
8	106.87	4	7	9.5	9	4	5.5
9	92.29	8	10	7.5	5	10	9
10	92.22	9	12	11.5	9	12	9
Rank Correlation			.71**	.39	.35	.64*	.28

** Significant at 1% probability level.
* Significant at 5% probability level.

multiple regression coefficients based on 4 years Osmangunj data.[3] These results are shown in Table 3. The overall rank correlation between Kanzara Consumers Ranking (KCR) and SPI ranking (SPIR) is .57 and is statistically significant. Significant correlations are obtained for small and medium farmers. Large farmers have a very low rank correlation almost equal to zero. Thus the villagers particularly in medium and small households both in Aurepalle and Kanzara did rank the sorghum varieties purchased in Hyderabad market and a few breeders varieties in line with SPI.

A simultaneous approach involving multiple regression analysis was also carried out on the consumer scores in order to see if any biases have occurred owing to color of labels, days of experiment, reference variety and grain vs. flour packets.

The variables included in the analysis are given below, together with information how they were measured.

Dependent variable. Aurepalle consumers score preference over reference variety A or B. This variable attains a positive value if reference variety was preferred and a negative value if the test variety was preferred; the values can be -3, -2, -1, 0, +1, +2 or +3.

Independent variable. Preference index difference with respect to reference variety A or B i.e. Preference index of reference variety minus Preference index of the variety under study. This generates positive and negative values.

Dummy Variables

1) Color label dummy. The packets were labelled with red and yellow tapes and some were left blank. One dummy for red and one for yellow are included to test whether consumers were influenced by these as compared to blank labels.

2) Grain and flour dummy. To test for bias due to grain packets i.e. to what extent the villagers are influenced by the outer appearance of the grain rather than actual quality after cooking.

3) Reference variety A or B dummy. To test for bias due to reference variety.

4) Day dummies. Since the experiment was conducted over four days, a test was required to find out whether a bias related to the days of the experiment existed.

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3. The SPI for the Kanzara samples calculated earlier (see Bapna, von Oppen 1980) were based upon the coefficients available at that time, which had been obtained from 2 years of samples collected at Osmangunj.

Table 3. Ranking of sorghum varieties by different consumer groups in Kanzara village and Preference Index Ranks.

Sorghum variety	Preference Index (x 100) (SPI)	Preference Index Rank (SPIR)	Kanzara Consumers Rank (KCR)	Labor	Small	Medium	Large
A	101.2	9	5	6	3	6	9
B	112.33	2	6	5	4	5	11
C	102.26	8	15	13	10	7.5	14.5
D	114.35	1	10	14	1	9	2
E	104.49	7	7	7	7.5	4	5
F	93.16	11	12	10.5	14	11	7
G	84.46	14	8	10.5	10	13	1
H	87.03	13	14	9	15	13	13
I	88.68	12	9	3	12	7.5	12
J	82.48	15	13	12	13	13	3.5
K	110.51	4	2	4	7.5	3	3.5
L	112.18	3	3	1	5.5	10	7
M	106.55	6	4	8	10	1.5	7
N	106.65	5	1	2	5.5	1.5	10
O	95.6	10	11	-	2	-	14.5
Rank Correlation			.57*	.31	.69**	.58*	.09

** Significant at 1% probability level.
* Significant at 5% probability level.

The regression results for Aurepalle village are shown in Table 4. It is found that the Aurapalle consumer scores are positively related to Preference Index differences, however a significant relationship exists only in the case of medium farmers. Positive relationships for labor, small and large farmers are found but these are not significant. However, for the combined regression for labor + small + medium farmers and all household categories pooled together we get a positive and significant relationship. An F-Test showed that there was no significant difference between the household groups, i.e. labor small, medium and large households, and hence the groups could be combined. None of the dummy variables are statistically significant which means that the villages were not biased by the design and conduct of the study. A close examination of the dummy variables shows that the large farmers seem to be influenced to some extent by ranking the colored labels higher than the blank ones. Thus they based their expressed judgement on some other criterion than own taste of the commodity. Interestingly, the form of either grain or flour did not significantly bias the villagers, even though the grain dummy variable has a negative coefficient, implying that the villagers may have generally ranked flour packets somewhat higher. However, this is not significant. Labor and medium farmers seem to be positively influenced by reference variety A as compared to B, whereas small and large farmers show preferences for reference variety B. However, also these biases are not significant. Generally, the households gave insignificantly higher ranks on the last day of the experiment as compared to the first three days.

For comparison the Kanzara results have been reproduced in Table 5. As mentioned earlier the SPI for the 15 sorghum varieties used in the Kanzara study was recalculated using multiple regression coefficients based on 4 years sample data from Osmangunj. This was done to make the results fully comparable with Aurepalle results, even though the ranks obtained from the 4-year coefficients are very similar to the results obtained earlier using coefficients derived from two year sample data to construct the SPI. This is an indication of the consistency of SPI over years and it strengthens over confidence in the SPI for predicting consumer preferences.

Comparison of the data shows that the results obtained from the Aurepalle study are very much in line with those obtained in Kanzara. While the methodology for the two studies was similar, the Aurepalle study involved not only market samples but also breeders' samples. The inclusion of breeders' samples did not affect the results because the market derived regression coefficients can be used to derive SPI for breeders' samples or any new variety which has not entered the market. The large farmers' preferences in Kanzara village had a negative relationship with SPI though not statistically significant. An F-Test to test for differences between household categories showed that labor, small and medium households form a homogeneous group while large farmers have different preferences.

Table 4. Regression analysis of consumers' scores of sorghum samples in Aurepalle village as a function of predicted preferences and dummy variables.

(t-values in brackets)

Farm size	Preference Index difference	Red label dummy	Yellow label dummy	Grain dummy	Variety A dummy	Day dummies			Intercept	r^2	OBS/DF
						1st day	2nd day	3rd day			
Labor	0.0397 (0.98)	0.67 (0.72)	-0.15 (-0.17)	-0.69 (-1.10)	1.17 (1.5)	-1.35 (-1.4)	-1.36 (-1.4)	-0.74 (-0.8)	0.5261	0.23	39/31
Small	0.020 (0.50)	-0.099 (-0.09)	0.091 (0.09)	0.518 (0.76)	-0.363 (-0.48)	-0.823 (-0.83)	1.11 (1.1)	0.39 (0.40)	0.4183	0.15	39/31
Medium	0.083 (2.08)*	-1.20 (-1.1)	-0.97 (-0.87)	-0.15 (-0.22)	1.43 (2.0)	-0.11 (-0.10)	-0.48 (-0.49)	-0.92 (-1.01)	1.1096	0.27	39/31
Large	0.015 (0.42)	2.24 (1.43)	2.76 (1.8)	-0.41 (-0.65)	-1.08 (-1.5)	-1.07 (-1.2)	-0.21 (-0.23)	-0.73 (-0.80)	-0.9069	0.22	39/31
Labor + Small + Medium	0.054 (2.6)**	0.003 (0.006)	-0.35 (-0.69)	-0.097 (-0.26)	0.893 (2.18)	-0.92 (-1.7)	-0.30 (-0.51)	-0.42 (-0.80)	0.5072	0.11	119/111
All combined	0.049 (2.46)*	0.098 (0.21)	-0.04 (-0.10)	-0.19 (-0.61)	0.42 (1.2)	-0.95 (-2.0)	-0.24 (-0.52)	-0.44 (-0.98)	0.5944	0.067	159/151

** Significant at 1% probability level.
* Significant at 5% probability level.

Note: R^2's are low since most of the explanatory variables are dummies.

Table 5. Regression analysis of consumer scores of sorghum samples in Kanzara village as a function of predicted preference and dummy variables.

(t-values in brackets)

Farm size	Preference Index difference	Red label dummy	Yellow label dummy	Grain dummy	Variety A dummy	Day dummies			Intercept	r^2	OBS/DF
						1st day	2nd day	3rd day			
Labor	0.046 (1.93)	0.115 (0.18)	-0.804 (-0.79)	-0.411 (-0.75)	-0.224 (-0.37)	1.726 (2.10)	0.783 (1.02)	-0.564 (-0.69)	0.1754	0.328	35/27
Small	0.054* (2.68)	-0.278 (-0.56)	-1.207 (-1.64)	0.238 (0.54)	0.746 (1.58)	0.378 (0.62)	0.584 (0.98)	0.442 (0.68)	-0.5513	0.253	44/36
Medium	0.053** (3.20)	0.048 (0.11)	0.078 (0.10)	-0.899 (-2.42)	0.824 (1.79)	0.940 (1.78)	-0.741 (-1.49)	-0.612 (-1.12)	-0.2104	0.442	42/34
Large	-0.013 (-0.69)	-0.298 (-0.66)	0.113 (0.12)	-0.007 (-0.02)	0.573 (1.24)	-1.218 (-2.08)	-0.730 (-1.25)	-0.613 (-1.01)	0.5893	0.190	45/37
Labor + Small + Medium	0.047** (4.08)	-0.030 (-0.11)	-0.859 (-1.81)	-0.343 (-1.31)	0.340 (1.18)	0.882 (2.37)	0.215 (0.61)	-0.250 (-0.65)	-0.0788	0.193	123/115
All combined	0.030** (2.87)	-0.036 (-0.14)	-0.584 (-1.33)	-0.270 (-1.15)	0.419 (1.65)	0.278 (0.85)	-0.054 (-0.17)	-0.33 (-0.95)	0.0799	0.0756	169/161

** Significant at 1% probability level.
* Significant at 5% probability level.

In Table 6 we have presented the combined results for Aurepalle and Kanzara by pooling the two data sets. F-Tests indicated that there was no significant difference between household categories. The group of labor, small and medium households is statistically homogenenous. In the combined set the relationship between consumer scores and SPI comes out more strongly particularly for small and medium farmers. Large farmers continue to have preferences which are significantly different from the other three categories.

Hybrids vs Locals

In the Aurepalle study five locals and five hybrid varieties were used apart from the reference varieties which were local types. These ten varieties originated partly from breeders' field and partly from the grain market in Hyderabad (see Table 7). The Aurepalle consumers' scores for all household categories, scores for each category separately, the market derived SPI (x100) are presented in Table 7. As the Table shows both the quality assessments agree in assigning hybrids a lower average rank or price compared to locals. This is true for each of the household categories also. It is sometimes argued that most of HYVs grown in the kharif season do not compare favorably with the locals grown in the rabi season, because the kharif crops may be damaged owing to excess rain or moisture. The true basis for comparison should be between HYVs and locals both grown in the rabi season. In this study all the HYVs used were grown in the rabi season (sample no. 10 in late rabi or summer season) and hence the basis for comparison is valid. Thus on average the local varieties are prefered over the Hybrid varieties, although there may be hybrids which get a relatively high rank (e.g. No.1) and also locals which rank below most of the hybrids (e.g. No.5). This particular local variety was rain effected and hence the low score is to that extent explained. It is further argued that consumers fail to differentiate between locals and hybrids if the varieties are given in the form of flour. In Table 8 the consumer scores based on flour samples alone is tabulated. We find that the preference for locals and HYVs of sorghum comes out even more strongly in favor of the locals for all the household categories put together and individually.

The preference for the locals is thus not a "solely psychological phenomenon" but a reality, which future efforts in plant breeding should try to overcome by applying the SPI for quality selection. Taste and the cooking quality of the flour were the overriding factors which determined preference for a particular variety. The farmers in Aurepalle however, were prone to another kind of psychological phenomenon for a different reason. As indicated earlier most of the Aurepalle farmers normally are used to consume a yellow local variety of sorghum. Any other sorghum variety hybrid or local is a new variety to most of the farmers. They may have come across these varieties and even consumed them but never on

Table 6. Regression analysis of consumers' scores of sorghum samples in Aurepalle and Kanzara villages as a function of predicted preferences and dummy variables.

(t-values in brackets)

Farm size	Preference index difference	Red label dummy	Yellow label dummy	Grain dummy	Variety A dummy	Day dummies			Intercept	r^2	OBS/DF
						1st day	2nd day	3rd day			
Labor	0.031 (1.45)	0.521 (1.02)	-0.652 (-1.31)	-0.564 (-1.32)	0.311 (0.67)	-0.074 (0.12)	-0.349 (-0.57)	-0.752 (-1.24)	0.6723	0.143	75/67
Small	0.034 (1.82)	0.270 (0.64)	0.029 (0.06)	0.402 (1.03)	0.248 (0.59)	-0.172 (-0.32)	0.884 (1.65)	0.623 (1.12)	-0.4529	0.113	84/76
Medium	0.067** (3.71)	-0.223 (-0.54)	0.148 (0.36)	-0.568 (-1.54)	1.131 (2.73)	0.181 (0.34)	-0.568 (-1.11)	-0.701 (-1.34)	-0.1136	0.236	82/74
Large	-0.009 (-0.49)	0.107 (0.23)	0.886 (1.75)	-0.166 (-0.44)	-0.214 (-0.52)	-1.123 (-2.12)	-0.743 (-1.42)	-0.520 (-0.97)	0.7922	0.109	85/77
Labor + Small + Medium	0.046** (4.09)	0.161 (0.64)	-0.191 (-0.74)	-0.188 (-0.83)	0.603 (2.43)	0.031 (0.09)	0.003 (0.01)	-0.220 (-0.68)	0.00599	0.082	243/235
All combined	0.032** (3.31)	0.146 (0.66)	0.064 (0.28)	-0.196 (-1.0)	0.417 (1.94)	-0.289 (-1.03)	-0.167 (-0.61)	-0.289 (-1.03)	0.1907	0.043	329/321

** Significant at 1% probability level.

Table 7. Preference index and consumer scores for hybrids and local varieties of sorghum.

Sample code No.	Sample origin	Market derived Preference Index	Aurepalle Consumer Score	Labor house-holds	Small far-mers	Medium far-mers	Large far-mers
				Hybrid Varieties			
8	Breeder	106.87	.69	.25	.50	1.25	.75
6	Breeder	100.39	.56	1.25	.50	.25	.25
9	Breeder	92.29	.50	.50	.75	.25	.50
10	Breeder	92.22	.25	0	.50	0	.50
1	Market	84.09	.75	1.00	.50	.50	1.00
Average		95.17	.55	.60	.55	.45	.60
				Local Varieties			
3	Market	111.77	.81	.75	1.0	1.0	.50
2	Market	110.03	1.37	2.25	.50	1.75	1.00
7	Breeder	101.50	.87	.25	.50	1.50	1.25
4	Market	91.20	.62	.50	1.0	.25	.75
5	Market	88.31	.31	0	.50	.50	.25
Average		100.56	.80	.75	.70	1.0	.75

Table 8. Consumer scores for hybrids and local varieties of sorghum based on flour samples only.

Sample Code No.	Sample origin	Aurepalle Consumer Score	Labor households	Small farmers	Medium farmers	Large farmers
			Hybrid Varieties			
8	Breeder	.50	0	.5	.5	1.0
6	Breeder	.63	1.0	1.0	.5	0
9	Breeder	0	0	0	0	0
10	Breeder	.50	0	1.0	0	1.0
1	Market	.25	1.0	0	0	0
Average		.375	.40	.50	.20	.40
			Local Varieties			
3	Market	1.375	1.0	1.5	2.0	1.0
2	Market	1.875	2.5	1.0	2.5	1.5
7	Breeder	.75	.5	0	1.0	1.5
4	Market	.875	.5	2	0	1.0
5	Market	.25	0	1.0	0	0
Average		1.025	.90	1.1	1.1	1.0

a regular basis. In the panel tests some 10 new varieties were consumed by the farmers. Most of the farmers agreed that a majority of the varieties were better than the yellow locals they consume, in taste, preparation of dough and in cooking quality. But a majority of the farmers particularly in the labor and small categories prefered to consume the yellow locals on a regular basis. As their verbal explanations indicated they had some kind of a fear about the new varieties. These varieties they fear may lead to body pains and weaken their system. This could be due to the general impression existing among traditional sorghum eaters that the hybrid varieties are more digestable than the local varieties, Subramaniam et al., in their study showed that this could only be a physiological phenomenon, but a more detailed study is required. They feel they could be convinced to consume new varieties, provided these were of good quality; however, they argued that this would take a trial period of 15 to 20 days.

CONCLUSION

The consumer panel tests carried out in Aurepalle village on the lines of the Kanzara study shows that consumers in Aurepalle village are able to rank the 12 sorghum varieties in line with SPI. These varieties originated partly from the Osmangunj market in Hyderabad and partly from the breeders' field at ICRISAT center. In both villages small and medium farm households, very clearly expressed preferences which were well in line with the predicted SPI. Both these tests strengthen the hypothesis that village consumers' preferences for sorghum varieties are in line with urban market price derived consumers' preferences for sorghum varieties. On average the Aurepalle consumer expressed clearly a preference for local varieties over hybrid varieties. The results confirm our confidence in SPI as a true reflector of consumer preference for sorghum both in urban and rural areas. New sorghum varieties should be screened for consumer acceptance by applying the SPI.

REFERENCES

Bapna, S.L., and von Oppen, M. 1980. Preferences for sorghum qualities among village consumers. ICRISAT Economics Program report, Patancheru, A.P., India.

von Oppen, M., and Parthasarathy Rao, P. 1981. A market divided selection index for consumer preferences of evident and cryptic quality characteristics of sorghum - Paper presented at the International Symposium on sorghum grain quality, 28-31 October, ICRISAT Center, Patancheru, A.P., India.

Subramanian, V., Bapat, D.R., and Jambunathan, R. 1982. Studies on the utilization of hybrid and local sorghums in villages of Maharashtra. Biochemistry-2, ICRISAT, Patancheru, A.P., India.

von Oppen, M., and Parthasarathy Rao, P. 1982. Consumer Preference Index for sorghum in comparison with other rankings - A Research Note. ICRISAT Economics Program, Patancheru, A.P., India.

PPR:NvO:vsssm

Appendix Table 1. A study on village consumers' preference for sorghum quality.

Date:_____

Sample Group:

1. Name of the household:
2. Caste:
3. If farmer, farm size:
4. Highest education:
5. Name of the respondent:
6. Respondent's relation with the head of the family:
7. Response on sorghum quality preference:
   (a) Which quality of sorghum he prefers:
   Red White
   (b) The extent of preference
   (1) very high preference
   (2) high preference
   (3) just preferred
8. Supplementary questions:
   (a) the reason for preference
   i. Taste - extraordinarily good/very good/good
   ii. Cooking quality
   iii. Quality of chapati after 2 to 4 hours of cooking
   iv. Flavour
   (b) Would he prefer to consume regularly the preferred quality of sorghum?
   (c) Name of the sorghum quality normally consumed:
   (d) Comparison of preferred quality with the quality normally consumed:
   Taste:
   Flavour:
   Cooking quality:
   (e) How much additional price per quintal the respondent would offer for the preferred quality:

Appendix Table II. Experimental design for distribution of sorghum varieties to consumers in Aurepalle village.

Respondent group		Day No.	Respondent numbers				
			1	2	3	4	5
Labor	L_1	1	B_g 5_g +	A_f 1_f *	A_g 2_g +	B_f 3_f Δ	A_g 4_g +
		2	A_f 5_f *	B_g 2_g *	B_f 2_f +	A_g 7_g *	A_f 8_f Δ
		3	A_g 9_g *	A_g 3_g *	A_f 3_f Δ	B_g 7_g Δ	B_f 9_f Δ
		4	B_f 8_f +	B_f 4_f Δ	B_g 10_g *	A_f 6_f *	B_g 4_g Δ
	L_2	1	A_f 2_f +	B_g 3_g +	B_f 5_f +	A_f 4_f *	A_g 1_g *
		2	A_g 5_g *	A_f 7_f +	A_g 8_g +	B_g 6_g Δ	B_f 6_f Δ
		3	B_g 9_g *	B_f 7_f +	A_f 9_f *	B_f 1_f *	B_g 1_g Δ
		4	B_f 10_f *	A_g 6_g Δ	B_g 8_g *	A_g 10_g +	A_f 10_f *
Small	S_1	1	A_g 2_g *	B_f 3_f *	A_g 4_g Δ	B_f 5_f Δ	A_f 2_f Δ
		2	B_f 2_f Δ	A_g 5_g *	A_f 5_f +	A_g 7_g *	B_g 6_g +
		3	B_g 7_g *	A_f 9_f Δ	B_f 1_f +	A_f 3_f *	A_g 9_g Δ
		4	A_f 10_f Δ	B_g 4_g +	B_g 8_g +	B_g 10_g Δ	B_f 10_f +
	S_2	1	A_g 1_g +	B_g 5_g Δ	A_f 1_f Δ	B_g 3_g *	A_f 4_f Δ
		2	B_f 6_f *	A_f 7_f Δ	A_g 8_g Δ	A_f 8_f *	B_g 2_g *
		3	B_g 9_g *	A_g 3_g Δ	B_g 1_g Δ	B_f 9_f *	B_f 7_f Δ
		4	B_f 6_f Δ	B_f 4_f *	B_f 8_f *	A_g 10_g *	A_g 6_g *
Medium	M_1	1	A_g 1_g Δ	B_g 3_g +	B_f 3_f +	A_g 2_g +	A_f 1_f *
		2	B_f 2_f *	A_f 8_f Δ	A_g 5_g *	A_f 5_f *	B_g 6_g Δ
		3	A_f 9_f *	A_g 3_g Δ	B_g 9_g Δ	B_f 1_f*	A_g 9_g Δ
		4	B_g 10_g Δ	B_f 8_f Δ	A_f 6_f Δ	B_g 4_g *	B_f 4_f *

Contd.

Appendix Table II. Contd.

Respondent group		Day No.	Respondent numbers 1	2	3	4	5
Medium	M_2	1	A_g 4_g +	B_f 5_f *	A_f 2_f +	B_g 5_g +	A_f 4_f +
		2	B_f 6_f *	A_g 7_g *	B_g 2_g +	A_f 7_f *	A_g 8_g Δ
		3	A_f 3_f Δ	B_g 7_g +	B_f 9_f Δ	B_f 7_f *	B_g 1_g Δ
		4	B_g 8_g *	A_f 10_f +	A_g 10_g Δ	A_g 6_g Δ	B_f 10_f Δ
Large	B_1	1	B_g 3_g +	B_f 3_f *	B_g 5_g Δ	A_f 4_f Δ	A_g 1_g *
		2	A_f 8_f *	A_g 5_g Δ	A_f 7_f Δ	B_g 2_g Δ	B_f 2_f Δ
		3	A_g 9_g *	B_g 7_g *	B_f 7_f Δ	A_g 3_g *	A_f 3_f Δ
		4	B_f 4_f Δ	A_f 10_f Δ	A_g 6_g Δ	B_f 8_f *	B_g 10_g *
	B_2	1	A_g 2_g *	A_f 1_f *	A_g 4_g Δ	B_f 5_f Δ	A_f 2_f *
		2	B_f 6_f *	A_g 8_g Δ	A_f 5_f *	A_g 7_g Δ	B_g 6_g Δ
		3	A_f 9_f +	B_g 9_g *	B_f 1_f *	B_g 1_g Δ	B_f 9_f Δ
		4	B_g 8_g *	B_f 10_f *	B_g 4_g *	A_f 6_f Δ	A_g 10_g Δ

\+ Packets labelled red and yellow

* Packets labelled red and left blank

Δ Packets labelled yellow and left blank