

Proceeding

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# INVESTING IN FOOD QUALITY, SAFETY & NUTRITION

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Southeast Asian Food & Agricultural Science & Technology (SEAFAST) Center  
Bogor Agricultural University

# INVESTING IN FOOD QUALITY, SAFETY AND NUTRITION



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# **Consumption and Preference Survey on Maize Based Food Product in Sub-Urban Area and Production area of Maize: Case Study in Bogor and Bojonegoro**

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## **Abstract**

Maize is the second most important cereal crop after rice in Indonesia. Despite the statistic data indicated that there is a shifting of national utilization of maize as staple food to be used as animal feed and for food industry, there is still an increase of human consumption of maize based products. A survey has been conducted in Bogor, West Java, as sub-urban area and Bojonegoro, East Java, as maize production area, in order to assess the acceptance and preference of consumers on maize based food product. During the survey, questionnaires have been delivered to 100 respondents. The results indicated that maize based food products are still popular in both areas. However, the frequency of maize consumption in maize production area (Bojonegoro) was higher than that in sub-urban area (Bogor). About 62% of respondents in Bojonegoro consumed maize product-at least once a week, while in Bogor was less. The results also showed that the preferences of respondents are varied. Traditional maize snack was more often eaten by respondents in Bojonegoro, while industrialized processed snack was more often consumed by respondents in Bogor. Traditional recipe, cooked maize with grated coconut, however, was still popular in both areas. Experience and accessibility are likely affect the preference of the respondents.

## **Introduction**

Campaign to consume diversified food, including maize based product, has been promoted for decades in Indonesia. After rice, maize is the second most important cereal crop after rice. In general, maize utilization in Indonesia can be grouped into four categories namely: (1) direct human consumption, (2) feed industry, (3) food industry, and (4) other usage (seed, loss, etc.) (Suastika, 2004).



Statistic data indicates that there is a shifting of national utilization of maize. About twenty five years ago, more than 90% of maize was used for human consumption as staple food, while less than 10% was used for animal feed. Recently, the utilization has been shifted, to 40% for animal feed industries whereas less than 40% for human consumption, and about 20% for food industries (Table 1).

**Table 1.** Maize utilization in Indonesia

Year	Consumption		Food Industry		Feed		Total
	(000) ton	(%)	(000) ton	(%)	(000) ton	(%)	(000) ton
1980	3705	93.99	0	0	237	6.01	3942
1990	5703	86.44	499	7.56	396	6.00	6598
2000	4657	43.48	2340	21.85	3713	34.67	10710
2002	4478	40.11	2489	22.29	4197	37.59	11164
2004	4299	37.01	2638	22.71	4680	40.29	11617
Average	4478	40.18	2489	22.29	4197	37.53	11164

Source: Suryana *et al.*, 2005

As indicated in Table 1, recently, most maize in Indonesia that accounting for about 60 percent has been used for food consisted of direct food and manufactured food. The demand for maize as a raw material for the food industry was increasing. Maize is processed into different products ranging from corn on the cob and popcorn to cornstarch. A lot of types of maize based products are available on the market, such as corn chips, snacks, popcorn, corn puff, corn flakes, etc. In order to assess the acceptance and preference of consumers to maize based food product, a survey has been conducted in Bogor, West Java, as sub-urban area and Bojonegoro, East Java, as maize production area. East Java is the most important center in terms of total amounts of maize consumed in proportions that closely approximate their shares in total production.

## Materials and Method

### Data Collection

Questionnaire has been developed and tested for its validity and reliability using One Shot method before field survey. The information collected was the acceptance on maize based product (like, fair, or dislike), place to buy maize products (traditional market, traditional shop (warung), minimarket, or supermarket), frequency of consumption, and type of product consumed by respondents. Two types maize based food and six maize based snacks were assessed. These were traditional cooked maize grain with grated coconut (*'grontol/urap jagung'*), new recipe food - maize cream soup; traditional snacks (fried corn (*'marning'*), corn chips, and corn puff (*berondong jagung*)); and industrialized processed snacks (popcorn, tortilla and cornflakes).

The sample size was determined by  $n = Z^2 (p) (1-p) / E^2$ , where n is the required sample size, Z is the level of confidence expressed in standard errors, p is estimate of population proportion, and E is acceptable amount of sampling error. By using  $p = 0.05$ , the sample size (n) was equal to 72. However, in order to anticipate when not all respondents would return the questionnaires, the sample size should be more than 72. The valid and reliable questionnaires were, therefore, distributed to 100 respondents consisting of 50 respondents in Bogor as urban area and 50 respondents in Bojonegoro as maize production area by purposive sampling.

### Data Analysis

The data were analyzed using SPSS program 12<sup>th</sup> version for windows. Further analyses were carried out by Duncan, Spearman and Chi square test.

## Results and Discussion

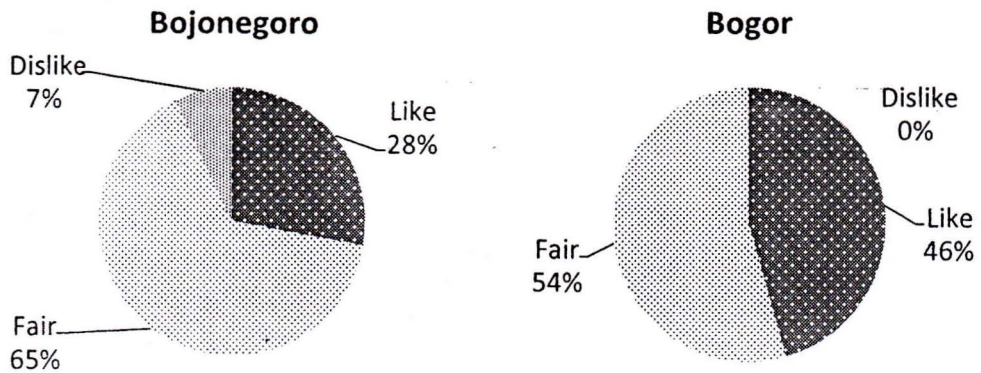
Questionnaires returned and filled by the respondents were forty seven from Bojonegoro and forty five from Bogor. Eighty nine percent of the respondents (42 respondents) from Bojonegoro were between 15 to 25 years old and 11% were between 26 to 40 years old. All respondents from Bogor



were between 15 to 25 years old. During further analysis, the data were based on the respondents between 15 to 25 years old.

### Acceptance

The results showed that almost all respondents liked or fairly liked the maize products in both areas as shown at Figure 1. These results indicated that maize products are still popular in Bojonegoro and Bogor. Only 3 respondents stated that they did not like maize product. Surprisingly, this statement was given by the respondents that were lived in Bojonegoro as maize production area. There is no significance correlation ( $p=0.055$ ) between the place where the respondents live, i.e. sub-urban area or maize production area, with the acceptance of the respondents to maize product.



**Figure 1.** Acceptance of maize based product in sub-urban area (Bogor) and maize production area (Bojonegoro)

The fact that there were more than 50 % of respondents between 15 to 25 years old accepting maize product fairly could be seen as a challenge for food industries to promote more diversified maize product. Hence, these results also indicated a promising market share of maize product for human consumption.

## Frequency of Maize Product Consumption

The frequency of maize product consumption in Bojonegoro as maize production area was higher than that in sub-urban area (Bogor) as shown in Table 2. About 62% of respondents in Bojonegoro consumed maize product at least once a week, while in Bogor was less.

**Table 2.** Average of frequency maize product consumption during the last year

No	Frequency	Respondents in Bojonegoro		Respondents in Bogor	
		N	%	n	%
1.	<1 time/week	13 <sup>a*</sup>	31	35 <sup>a*</sup>	70
2.	1 time/week	16 <sup>a</sup>	38	7 <sup>b</sup>	14
3.	2 times/week	11 <sup>ab</sup>	26	1 <sup>b</sup>	2
4.	3 times/week	2 <sup>b</sup>	5	2 <sup>b</sup>	4

\*Different notification at the same column indicates significance by Duncan test at 95% level.

There is a significant correlation between the place where the respondents live with the frequency of maize consumption ( $p=0.00$ ). The respondents in production area consumed maize product more frequent than the respondents in sub-urban area. However, no significant correlation was found between the acceptance of the respondents with the frequency of maize consumption ( $p=0.09$ ). Other factors possibly affected the frequency of consumption of maize based products.

Previous study also indicated that maize based products were popular among the students as respondents in Bogor (Juniawati, 2003). When they were asked for the last time of consuming maize based product, 51% of the respondents ( $n=100$ ) answered consuming the maize based product during the last week, 12% during two weeks ago, 4% during 3 and 4 weeks ago, and 23% during more than 4 weeks ago. The maize based food, however, were not usually consumed as staple food but more as snack food.

## Preferences

Traditional food, i.e. cooked maize grain with grated coconut was still popular among the respondents in both areas (Table 3). This old recipe has

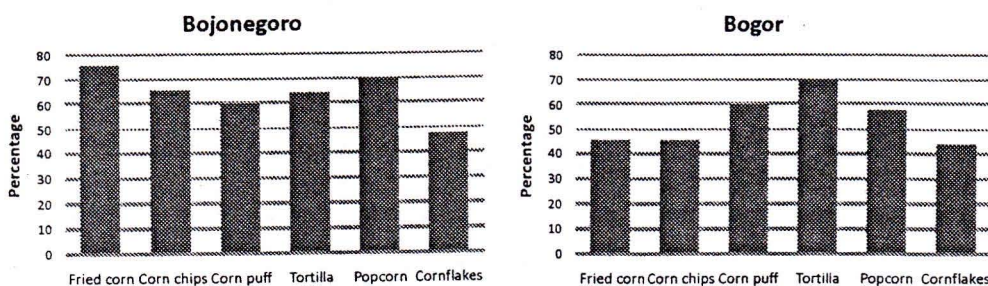


been consumed by 71% of respondents in Bojonegoro and 84% in Bogor, while new recipe i.e. maize cream soup has only been consumed by less than 50% of respondents in both areas. Experiences and memories possibly affected the decision of the consumers whether to eat or not to eat a particular product.

**Table 3.** Characteristic of consumption of maize based food

Product	Respondents	Consumption statement (%)	
		Ever	Never
Traditional food (Cooked maize grain with grated coconut)	Bojonegoro	71	29
	Bogor	84	16
New food recipe (Maize cream soup)	Bojonegoro	42	58
	Bogor	40	60

Furthermore, the results also showed that the traditional fried corn ('marning') was the most frequent consumed by respondents in Bojonegoro, whereas industrialized processed tortilla was the most popular among respondents in Bogor. However, as indicated in Figure 2, other snacks such as popcorn and tortilla were also consumed by more than 50% of the respondents in Bojonegoro.



**Figure 2.** Preference of respondents to maize snacks

Generally, despite the traditional maize based snack were still popular among the respondents, particularly in Bojonegoro, there was an indication of promising acceptance of industrialized processed maize snacks. Changes in

tastes and preferences contribute to the shifts in the demand for maize based products, although their effects are often difficult to identify because they appear to be associated with changes in income, lifestyle or other variables.

**Place to Get the Maize Products**

The results indicated that the maize based products were readily accessible in both areas. In Bojonegoro and Bogor, maize based products were available at traditional market, traditional shop, mini market as well as supermarket. These products were not predominately found in traditional market. Instead, they were found in supermarket, which was accessed by 32% respondents in Bojonegoro, and in minimarket, which was accessed by 37% respondents in Bogor. Possibly due to the more availability of varied industrialized processed products, the maize based products have been got better attention by the vendors/retailers as well as the consumers.

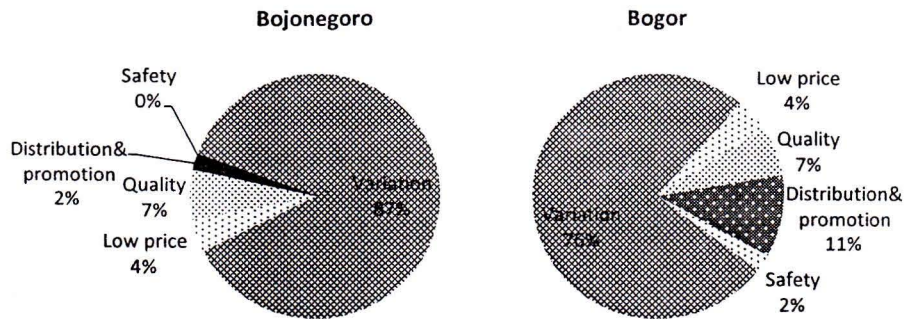


**Figure 3.** Accessibility to get maize based products

**Effort to Promote Maize Products**

In order to enhance the acceptability of maize products, the respondents in both areas suggested enlarging the variation of the product (Figure 4). When they were asked about the most important things they considered when choosing maize based products, 87% and 76% of respondents in Bojonegoro and Bogor respectively, said it was the product’s variation. Seven percent of the respondents said quality, and only 2% mentioned safety as influencing their choice. The respondents in Bogor found that a better distribution system and promotion strategy would also influence the quantities of maize products consumption.





**Figure 4.** Respondents' perception on improvement of maize product consumption

## Conclusion

The consumers have still high expectation on maize based food products. These products are therefore still potential to be developed and produced. Variation of the products will enhance the acceptance and preference of the consumers to consume maize products. Experience and accessibility are likely affect the preference of the respondents.

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