Consumer awareness and attitudes toward GM foods in Kenya

Simon Chege Kimenju[1], Hugo De Groote[2], Joseph Karugia[1], Stephen Mbogoh[1]

and David Poland [2]

[1]University of Nairobi, Department of Agricultural Economics

[2] International Maize and Wheat Improvement Centre (CIMMYT

[*]Corresponding author: h.degroote@cgiar.org, tel. 254 524600, fax 254 524601, CIMMYT, P.O. Box 25171 Nairobi, Kenya

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Names and affiliations of the authors

Simon Chege Kimenju

University of Nairobi, Department of Agricultural Economics

P.O. Box 29053-00625, Nairobi, Kenya

phone:+(254)-20-631815, fax:+(254)-20-631815, email: kimenjucs@yahoo.com

Hugo De Groote

International Maize and Wheat Improvement Centre (CIMMYT)

P.O. Box 25171, Nairobi, Kenya

phone: +(254)-20-524600, fax : +(254)-20- 524601, email : h.degroote@cgiar.org

Joseph Karugia

University of Nairobi, Department of Agricultural Economics

P.O. Box 29053-00625, Nairobi, Kenya

phone:+(254)-20-631815, fax:+(254)-20-631815, email : joseph.karugia@aercafrica.org

Stephen Mbogoh

University of Nairobi, Department of Agricultural Economics

P.O. Box 29053-00625-00625, Nairobi, Kenya

phone:+(254)-20-631815, fax:+(254)-20-631815,

David Poland

International Maize and Wheat Improvement Centre (CIMMYT)

Apdo. Postal 6-641, 06600 Mexico, D.F., Mexico

Tel: +52(55) 5804-2004, Fax: +52(55) 5804-7558, email: d.poland@cgiar.org

Consumer awareness and attitudes toward GM foods in Kenya

Abstract

The debate about genetically modified (GM) crops in developing countries has been conducted with little involvement of key groups of stakeholders, in particular the consumers. Therefore, a consumer survey to determine awareness and attitudes toward GM crops was conducted in Nairobi, Kenya, in November 2003, at three points of sale: supermarkets, kiosks, and maize mills. Analysis shows that supermarkets attract more up-scale groups, while mills cater to low-income groups. Almost half of the respondents (38%) were aware of GM crops, and more so in the high-income groups. Main sources of that information were the media, in particular newspapers, followed by schools. Newspapers are more important to high-income and more educated consumers, radio to the low-income and less-educated. Consumers appreciate the technology's potential positive impacts, with more than 80% agreeing that it increases productivity. Most respondents (68%) would buy GM maize meal at the same price as their favorite brands, although many are concerned with environmental and health risks, and with ethical and equity issues. Consumers fear that GM crops technology can lead to a loss of traditional maize varieties (50% of respondents), and affect untargeted insects (51%). Some fear that consumption of GM foods can damage one's health (37%) or cause allergic reactions (40%). The high consumer acceptance of GM food indicates that the technology has a role to play in addressing food insecurity in Kenya. Still, educational campaigns should be carried out through established sources of information to further inform consumers about the technology. Finally, public opinion should be tracked regularly, and the target population broadened to include the different categories of consumers, in particular rural consumers.

 Key words: consumer, awareness, attitudes, GM crops, Kenya.

1. Introduction

Although GM crops have been accepted in many developed countries, they have generally not been well received in Europe and Japan. Farmers in the United States (USA) have embraced GM crops but at the same time are frustrated with the uncertainty of marketing them (CHERN et al., 2003). Uncertainties about consumer acceptance have increased in many parts of the world, partly due differing attitudes. Consumer organizations,, environmentalists and other non-governmental organizations have expressed concerns related to food safety; ethical, religious and environmental concerns; and the lack of consumer choice due to inadequate labeling. Studies have verified that many consumers in the European Union have difficulty accepting GM products. VERDURME and VIAENE (2002) observed that consumers (especially in the EU and Japan) oppose the use of GM technology in food production. US consumers, on the other hand, are generally willing to accept GM food if sufficient price discounts are made on them (KANEKO and CHERN, 2003). For China, LI et al. (2003) observed that although the majority of Chinese consumers reported that they had little or no knowledge of biotechnology, their attitudes toward GM foods was generally positive, translating to willingness to pay for GM rice and soybean, and hence their acceptance of these foods. Thus, Chinese consumers appear to favor the use of biotechnology to grow pest-resistant crops that require less chemical pesticides. Another key factor that influences consumer acceptance of GM food is awareness and information. Consumers who are better informed about GMOs are more likely to perceive the risks of genetic modification, but they are also more likely to perceive the benefits (LOADER and SPENSER, 1998).

The success of any biotechnology program will depend on whether consumers accept its products. SPRINGER et al. (2002) observed that consumers would be the final judges of emerging technologies in agricultural production. In Africa, where per capita food production struggles to keep pace with population growth and serious food shortages are a regular occurrence, we may not have the luxury of rejecting food with GM content (DE GROOTE et

al., 2004). African policymakers face a dilemma of whether to embrace the technology to feed their hungry people or whether to protect them from potential, yet unproven, dangers. Because many developing nations have not formulated official positions on genetic modification, they may end up adopting those of developed countries as their own. To give African farmers and consumers a voice in the debate, their concerns need to be known. PINSTRUP-ANDERSEN and SCHIOLER (2000) argue that the agenda should be set by those people who have to live with the consequences of the action, in this case African farmers and consumers. DE GROOTE et al. (2003) observe that in order to help make decisions in this heated debate, it is important that scientists contribute their objective analysis to the debate.

Farmers in developing countries face a variety of problems and constraints. In Kenya, insect pests are one of the major constraints to maize production. Of special significance are the maize stem borers. These are estimated to cause crop losses of 12.9% per year nationwide, amounting to 0.39 million tons with an estimated value of US$ 76 million (DE GROOTE, 2002). The significance of crop pests has engendered research to develop insect resistant crop varieties. One such effort is the Insect Resistant Maize for Africa (IRMA) project, which is a joint venture between the International Maize and Wheat Improvement Center (CIMMYT) and the Kenya Agricultural Research Institute (KARI), with funding from the Syngenta Foundation for Sustainable Agriculture. The project is developing stem borer resistant maize using both conventional breeding methods and GM technology, in particular Bt maize. The first Bt maize seed was brought into the country in May 2004 for testing in a biosafety greenhouse, equipped with special containment devices to keep maize pollen and transgenic plant materials from escaping into the outside environment.

It is estimated that the new Bt maize varieties would produce annual benefits of $49 million, of which two-thirds would go to consumers (DE GROOTE et al., 2003). The estimate is based on the following assumptions: (i) the IRMA project is successful in developing Bt

maize adapted to Kenyan conditions; (ii) the Bt maize is effective against all the major stem borers in the country; and (iii) at least two-thirds of the farmers who use modern varieties will adopt the new Bt varieties. Discounted benefits over 25 years reach $208 million, compared to discounted costs of $6.8 million. This produces a benefit/cost ration of 31:1, and an internal rate of return of 83%. However, these benefits will only be realized if consumers accept the Bt maize. Currently, there is no information about the degree of acceptability of GM crops to consumers in sub-Saharan Africa, thus we cannot know whether these potential benefits will be realized. It is therefore important to elicit the concerns of African consumers and farmers before GM crops are developed for African markets. In light of the proposed introduction of Bt maize in Kenya, a consumer survey was conducted in Nairobi to elicit their awareness, attitudes, and willingness to pay (WTP) for GM crops.

2. Methodology

This study uses data collected from 604 personal interviews in Nairobi, Kenya, in November and December 2003.The survey was conducted at three different types of points of sale: supermarkets, kiosks (small roadside shops) and posho mills (mechanical mills for maize), in order to ensure proper representation of different categories of consumers. A total of 17 supermarkets were selected using systematic sampling from a list of supermarkets obtained from Kenya's Central Bureau of Statistics (CBS), which included 12 large ones (with more than 3 branches within the city), and 5 small ones. A total of 183 respondents were interviewed in the supermarkets. A list of city estates (administrative subdivisions) was also obtained from CBS, and 7 estates were selected randomly. Within each of these, 3 kiosks were selected, leading to a total of 21 kiosks. From each of the selected kiosks, 10 consumers were systematically selected and interviewed bringing the number of respondents in kiosks to 210. Finally, the city was toured in order to establish the number of posho mills in each estate, identifying 16 estates with different number of posho mills. Posho mills were then selected depending on their number within the estates, and 211 respondents were interviewed.

A questionnaire was developed to obtain information from maize consumers on their awareness and knowledge of biotechnology and GM crops, their attitudes towards GM food, and their willingness to pay for it. Additional questions dealt with the source(s) of information on GM food, and their maize consumption habits. The survey instrument was pretested at the three points of sale and the enumerators thoroughly trained on its administration. The enumerators approached every third consumer that came along for a possible interview. In the questionnaire structure, the first question sought to establish whether the respondents were aware of GM crops. If the consumer was aware, the entire questionnaire would then be administered, including questions on knowledge of GM foods. Respondents were asked if, according to their opinion, different statements on risk and benefits of GM crops were true or false, and to indicate how sure they were about the given answer on a five-point scale (ranging from 1 = "not sure at all," to 5 = "absolutely sure").

Consumers who were not aware of GM crops were first given a short presentation on GM crops. The text gave a definition of GM crops, the reasons why they are grown, Kenya's position on this research, current and potential benefits of GM crops, potential risks and perceived concerns, biosafety measures, examples of countries growing GM crops, and the leading GM crops being grown. In order to control for possible order effect, some of the respondents received information on benefits first and others on risks first. This group was not asked to answer questions on knowledge about GM crops.

Consumer attitudes on five types of perceptions on genetic modification were obtained: benefits, health risks, environmental risks, ethics, and equity concerns. For each type, several statements were read, and consumers were asked their opinion, on a 5-point scale from 1 = 'totally disagree' to 5 = 'totally agree', with 3 as a neutral mid-point.

Descriptive statistics were used to summarize the variables of interest and determine relationships between them. This entailed computation of measures of central tendency, frequencies, and cross-tabulation using the SPSS software. MS Excel was used in formatting tables and figures.

3. Results

3.1 Consumer characteristics by points of sale

The basis for targeting three points of sale was the need to incorporate views of all categories of consumers, based on the assumption that there are distinct differences in socioeconomic characteristics that may influence awareness and attitudes toward GM crops. The survey results clearly confirm these differences (Table 1). The posho mills have the highest number of women among their maize buyers (59%), whereas more than half of the maize buyers in the supermarkets are male. Supermarkets have the highest percentages of formally employed clients, the highest percentage of those with university education, and also the highest percentage of those with high-income levels (above US$ 200 per month). This indicates that people in the higher socioeconomic categories buy their maize more frequently at supermarkets than at posho mills. Kiosks' clients represent a more amorphous group because kiosks are found everywhere, in both well-to-do and low-income estates. Posho mills are characterized by consumers with the highest percentage of unemployed, those with the lowest education levels, and low-income levels. Posho mills also have the highest percentage of non-students with no income (26%) and lowest percentage of people earning above US$ 200 per month (only 16%). This can be explained by the location of the posho mills; most of them are found in low income residential areas including slum dwellings.

Table 1. Consumer's socioeconomic characteristics, expressed as the percentage of respondents in different categories (sample size in brackets)

Variable	Category	By point of sale			Total
		Supermarket ($N_1=183$)	Kiosk ($N_2=210$)	Posho mill ($N_3=211$)	($N=604$)
Gender	Female	40	35	59	45
	Male	60	65	41	55
Employment status	Formally employed	54	37	35	41
	Self employed	23	35	28	29
	Unemployed	14	17	25	19
	Student	9	11	12	11
Highest level of education	None	1	1	1	1
	Some primary	14	16	30	20
	Some secondary	34	46	40	40
	Some tertiary college	27	29	25	27
	Some university	25	9	4	12
Income level per month (US$)	0(student)	8	11	12	10
	0(non-student)	10	16	26	18
	0 to 200	51	46	47	48
	201 to 667	27	26	15	22
	Over 667	5	1	1	2

3.2 Consumer awareness of genetically modified crops

The results show that 38% of all the respondents have heard or read something about GM crops. Awareness about biotechnology is also high, at 46%. Of the respondents aware of GM crops, 95% are also aware of the term "gene"; 65% know about the virus-resistant sweet potato, 54% about Bt maize, and 21% about Bt cotton.

Awareness about GM crops and biotechnology clearly differs by points of sale, and is highest among supermarket clients and lowest at the posho mills (Figure 1).

Figure 1. Consumers' awareness of biotechnology and GM crops by point of sale (as percentage of respondent in that category)
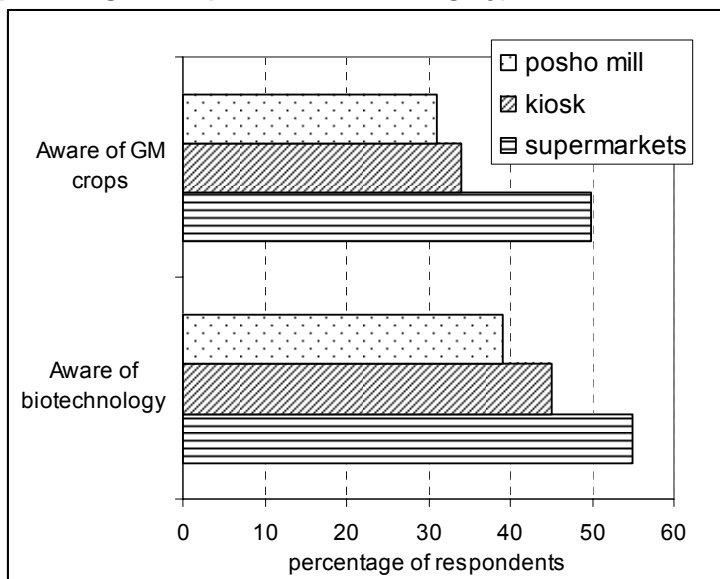
Half of the supermarket respondents are aware of GM crops, 34% and 31%, respectively, for kiosks and posho mills. This implies that that people in the higher socioeconomic groups are more aware of GM crops and biotechnology, which is probably linked to higher education and more exposure to information. Awareness about particular GM crops, which was only asked of those aware of GM crops in general, did not differ by points of sale or by socioeconomic characteristics, indicating that people aware of GM crops have similar socioeconomic characteristics.

Analysis of the awareness of GM crops shows clear differences by socioeconomic characteristics (Table 2). Men are more aware than women (45% vs. 29%), and awareness increases by employment category, from the unemployed (28%), over the self-employed (35%) to the formally employed (43%). Similarly, awareness of GM crops clearly rises with education and with income. Excluding students with zero income, awareness increases with

income from 28% for those with zero income (non-students) to 93% for those with university

education.

Table 2. Consumers' awareness of biotechnology and GM crops by socioeconomic characteristics

Variable	Category	% Of respondents aware of:	
		Biotechnology	GM crops
Gender	Male	53	45
	Female	38	29
Employment	Student	62	42
	Formally employed	52	43
	Self employed	39	35
	Unemployed	35	28
Highest education level	None	17	17
	Some primary	19	10
	Some secondary	32	26
	Some tertiary college	68	53
	Some university	93	90
Income/month (US$)	0 (student)	60	42
	0 (non-student)	35	28
	0 to 200	37	28
	201 to 667	64	59
	Over 667	100	92

3.3 Sources of information

Consumers who had heard or read something about GM crops were also asked about the

source of that information (Table 3). The most important sources of information on GM crops

are the different media, especially newspapers, television, and radio. Second most important

source is schools, followed by resource people such as friends, farmers, and others..
Information sources clearly differ by the type of GM crop (sweet potatoes and maize are
already being tested, while cotton is not) and socioeconomic categories (especially
schooling and income).

Table 3. Sources of information about GM crops, in general and by crop, expressed as a percentage of those respondents aware of GM crops.

Source of information	Consumers aware GM crops in general (229 respondents)	Consumers aware of particular GM crops		
		Virus resistant sweet potato (148 respondents)	Bt maize (124 respondents)	Bt cotton (47 respondents)
Newspapers	34	24	29	17
School/college	21	16	13	30
Media	15	11	16	4
Television	11	8	3	7
Friends/other people	10	8	9	9
Radio	7	4	6	7
Press	5	4	6	4
Seminars/ Conferences	4	4	1	2
Books	3	3	1	4
Journals/articles	3	4	3	
Place of work	2	1	3	2
Agricultural institutes	1	4	2	2
Farmers	1	6	6	9
Internet	1	1	2	2
Agricultural show	0	1	2	0
Agrochemical shops	0	1	1	0
Scheme/project	0	2	1	0

Newspapers are by far the most important source of information on GM crops in general
(34% of respondents aware of GM crops) (Table 3). They are also the most important source
of information on GM sweet potatoes and Bt maize, but not on Bt cotton, which has not yet

been introduced. The importance of newspapers does, however, differ between socioeconomic groups (Table 4). In particular, it increases strongly from people without income (17%), to those in the highest income bracket (82%). Similarly, the importance of newspapers increases from none of those without education to almost half of the university educated. Finally, newspapers are mentioned more by men (36%) than by women (29%).

Schools are generally the second source of information (21% of respondents, Table 3), although they are the first source for Bt cotton (30%). Since this crop has not yet been introduced in Kenya, newspapers have likely given it less attention than the other crops. More importantly, the importance of schools increases with increasing income levels: while it is very important for the group without income (38%), it becomes relatively unimportant for the highest income group (9%) (Table 4). This indicates that low-income groups have less access to other sources of information after school. Also interesting is that women mention schools more often (29%) then men (17%).

Media in general are mentioned by 15% of the respondents, and television in particular by 11%. Television is clearly more important for the high-income group (27%) than for those without income (7%), and more for the educated (16% for university educated vs. 0% for primary education). A bit surprising is that only 3% of respondents aware of Bt maize got their information from the television. Radio is less important as a source of information on GM crops (only 7% of respondents). However, it is particularly important for people with only some primary education (25%), the self-employed (15%), and people in the lowest income category (11%). It is clear that lower income and less educated groups have less access to television, but more to radio.

Table 4. Major sources of information about GM crops by socioeconomic characteristics, expressed as a percentage of that category

Source	Income level per month					Highest level of education					Employment status				Gender	
	0 (Student)	0 (Others)	0 -200	201-667	Over 667	None	Some Primary	Some Secondary	Some Tertiary	Some University	Formal	Self	Unemployed	Student	Male	Female
Newspapers	28	17	26	42	82	0	25	22	36	45	38	33	22	32	36	29
School/college	40	38	21	12	9	0	17	25	24	14	17	13	38	36	17	29
Media	16	10	20	14	9	0	0	10	20	19	16	17	13	14	16	14
Television	20	7	5	16	27	0	0	8	13	16	14	8	3	18	12	10
Friends/other people	8	6	11	10	9	0	25	14	8	6	9	15	9	7	10	9
Radio	4	7	11	6	0	100	25	13	3	3	6	15	3	4	9	4
Press	0	3	8	5	0	0	0	2	8	5	6	7	3	0	5	5
Books	4	7	1	1	0	0	0	0	1	9	2	0	6	11	3	4
Journals/articles	0	0	2	4	9	0	0	0	3	3	5	2	0	0	3	1
Place of work	0	0	0	5	0	0	0	0	3	2	4	0	0	0	2	1
Number	25	29	80	77	11	1	12	63	87	64	107	60	32	28	149	78

Informal contacts through resource people, in particular friends, are the fifth source on information (10% of respondents). This source is particularly important for people with only primary education (25%) and the self-employed (15%). Specialized agricultural institutions such as agricultural research institutes, extension, shows, and projects were rarely mentioned, but this is not surprising since only urban consumers were interviewed. However, urban consumers did get some information directly from farmers, in particular on GM sweet potatoes (6% of those who were aware of this crop), Bt maize (6%), and Bt cotton (9%).

3.4 Consumer attitudes on GM technology

Consumer attitudes on GM technology were determined using 5 variables representing perception of benefits, environmental risk, health risk, ethics, and equity concerns. However, to facilitate the analysis, "strongly agree" and "agree" were collapsed into a single category, as were "strongly disagree" and "disagree." Table 5 shows the percentage of consumers that completed the statements with "agree", "disagree", and "neutral."

Most people believe in the technology's potential positive impacts, with more than 80% agreeing that it can offer a solution to the world food problem, 79% that it can reduce pesticides in food, and 73% that it has potential of reducing pesticide residues in the environment. However, a large number of consumers expressed concerns about potential negative effects. About half of the respondents think that insect resistant GM crops may kill non-target insects and that the technology could lead to a loss of local varieties. More than one-third of the consumers expressed fears about the health effects of GM foods, think that people could suffer allergic reactions after consuming GM foods (40%), and think that consumption could lead to an increase in resistance to antibiotics (35%). Half of the people think that GM food is artificial and that GM represents tampering with nature. Only 23% think that producers of GM foods are "playing God." On equity issues, the Kenyan consumer clearly disagrees that GM crops are biased to large-scale farmers and multinationals. A majority (71%) disagrees with the statement that GM products do not benefit

Table 5. Consumers' attitudes on GM technology (expressed as percentage of respondents)

Type of perception	Statement	Agree	Disagree	Neutral (don't know)
Benefit	GM technology increases productivity and offers solution to world food problem	81	12	7
	GM can reduce pesticides on food	79	11	10
	GM can create foods with enhanced nutritional value	78	13	9
	GM has potential of reducing pesticide residues in the environment	73	14	13
Environment risk	Insect resistant GM crops may cause death of untargeted insects	51	36	14
	GM can lead to a loss of original plant varieties	50	41	8
	GM threatens the environment	34	53	13
Health risk	People could suffer allergic reaction after consuming GM foods	40	39	20
	Consuming GM foods can damage ones health	37	48	15
	Consuming GM foods might lead to an increase in antibiotic-resistant diseases	35	43	22
Ethical concerns	GM food is artificial	50	41	10
	GM is tampering with nature	48	46	7
	GM technology makers are playing god	23	72	5
Equity concerns	GM products are being forced on developing countries by developed countries	36	54	10
	GM products only benefit multinationals making them	30	65	5
	GM products don't benefit small-scale farmers	22	71	7

small-scale farmers. Less than one-third (30%) think that GM products only benefit multinationals while 65% disagree. Only one-third (36%) think that GM products are being forced on developing countries, with a majority (54%) disagreeing.

Table 6 shows differences in benefit perception by awareness about GM crops. Those people initially unaware of GM crops have slightly higher benefit perception (80-89%) than those initially aware (62-74%). This implies that the information text given to the non-aware respondents may have skewed their benefit perception upwards. Other perceptions do not differ between the initially aware and the unaware categories.

Table 6. Consumers' benefit perception of GM technology by awareness about GM crops (as percentage of respondents in their category)

	Aware		Non-aware	
	Agree	Disagree	Agree	Disagree
GM technology increases productivity and offers solution to world food problem	73	14	89	10
GM can create foods with enhanced nutritional value	65	16	87	12
GM can reduce pesticides on food	74	11	83	11
GM has potential of reducing pesticide residues in the environment	62	15	80	14

Attitudes differed by points of sale (Table 7). In general, people in the supermarkets had the lowest benefit perception and highest environmental risk perception compared to those at other points of sale, who did not show much difference. Supermarket consumers have the highest equity and ethical concerns, followed by those in kiosks, and then posho mills. There were small differences according to income with students and those having over US$ 667 per month having higher environment risk perception than the other groups.

Table 7. Consumers' attitudes by point of sale (as percentage of respondents in that category)

Statement	Supermarket		Kiosk		Posh mill	
	Agree	Disagree	Agree	Disagree	Agree	Disagree
GM can reduce pesticides on food	74	12	81	11	81	10
GM technology increases productivity and offers solution to world food problem	73	21	86	8	84	8
GM can create foods with enhanced nutritional value	70	21	80	10	83	10
GM has potential of reducing pesticide residues in the environment	60	19	81	12	76	13
GM can lead to a loss of original plant varieties	62	26	46	45	45	51
Insect resistant GM crops may cause death of untargeted insects	54	28	49	37	49	40
GM threatens the environment	39	48	35	54	30	56
People could suffer allergic reaction after consuming GM foods	41	40	39	38	41	41
Consuming GM foods can damage ones health	40	47	38	46	35	51
Consuming GM foods might lead to an increase in antibiotic-resistant diseases	34	47	40	38	31	44
GM food is artificial	57	30	49	43	43	48
GM is tampering with nature	51	46	51	41	41	50
GM technology makers are playing god	35	60	19	78	17	76
GM products are being forced on developing countries by developed countries	45	42	34	58	30	61
GM products only benefit multinationals making them	44	53	23	71	26	70
GM products don't benefit small-scale farmers	32	60	20	72	15	79

To capture consumers' Willingness to Pay (WTP) for GM maize meal, people were first asked whether they would buy it at the same price as their favorite brand, and then asked if they would purchase it if offered at a premium or a discount, depending on their response to the initial question. More than two-thirds (68%) were willing to buy GM maize meal at the same price as their favorite maize meal brand. This indicates acceptance of the technology despite there being concerns. This result does not, however, reflect the consumers WTP, because it does not account for negative responses to the first offer and responses to the second question. Potential demand will only be revealed if we know how much money consumers are willing to pay for GM maize meal. To achieve this, further analysis of the data is underway using econometric models. This analysis will also reveal which consumer characteristics and cognitive factors influence WTP for GM maize meal.

4. Conclusions and Recommendations

The success of any biotechnology program will depend on the acceptability of its products by consumers, so it is important to track the opinions of the public on such technologies. The results of this consumer survey show that almost half of them are aware of GM crops, so it is generally possible to engage them in the debate. There are, however, differences in awareness, sources of information, and attitudes between clients of different points of sale and between different socioeconomic groups. These characteristics are related, since supermarket clients have a relatively higher socioeconomic status, followed by kiosk clients and posho mill clients, in that order. To have a representative picture while tracking consumer opinions, it should be ensured that all categories of consumers are included because different categories may present different views.

The core of the controversy over GM crops is the extent to which consumers perceive benefits from the technology relative to its risks, as this will determine acceptability. Generally, people are appreciative of the positive benefits of the technology, although many are worried about potential negative effects. The government, the IRMA project, and a range

of stakeholders face an important challenge in communicating the advantages and disadvantages of the technology to the general public. In particular, they should aim to inform the public that GM foods, based on extensive scientific testing, are now generally accepted as safe for human and animal consumption by national and international research and other institutes (FAO, 2004). Concerning equity issues, which are becoming increasingly important in the debate, consumers should be informed that multinational corporations do not hold patents over the Bt technology that is being developed with a Kenyan research institute, to be deployed by Kenyan seed companies. The study has identified the important sources of information for the urban Kenyan consumer, which can serve as a starting point for effectively targeted communication on GM goods in the future. Mass media has come out strongly as the foremost source of information, followed by schools and colleges. In such communication efforts, newspapers and television should be specifically used to target people of high socioeconomic status, while radio can specifically target those of lower socioeconomic status.

Consumers generally have a positive attitude towards GM foods, and 68% are even willing to buy GM maize meal at the same price as their favorite brand, suggesting that the technology can play a major role in food security in Kenya. The national agricultural research system can take some comfort in the survey results should it decide to invest more heavily in biotechnology, however, emphasis must also be given to educating people about the technology. The perception that African farmers and consumers will automatically reject the technology is misplaced. Although many people have various concerns about the technology, a large majority of consumers do not reject it.

Finally, studies tracking public opinion should be conducted regularly in order to determine awareness levels, capture the impact of awareness activities, and note trends in public perceptions. Studies should be extended to smaller towns and rural areas, in order to include these segments of the population in the national discourse.

The present study provided some important insights to improve the methodology. First, the different points of sale represent different types of consumers. However, we do not know how many people fall into each category. Only a household survey could solve this problem, and it is therefore highly recommended. Further, this survey determined the major sources of information, so future surveys can move from open-ended to close-ended questions.

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