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Extensão e Comunicação Rural

Consumer characteristics determining the consumption of yellow maize in Maputo province, Mozambique

Características do consumidor que determinam o consumo do milho amarelo na província de Maputo, Moçambique

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ABSTRACT

Studies conducted in several African countries, including Mozambique, show poor preference of yellow maize when compared to white maize, and there are few studies in Mozambique that examine the factors determining the consumption of yellow maize. The present study examined the social, personal and psychological factors that influence the consumption of yellow maize. The research was carried out in the province of Maputo, in southern Mozambique, using a sample size of 213 households, selected randomly. For data analysis, binary logistic regression was used in STATA 15. The results show that education and producing yellow maize have a positive relationship with its consumption, while the variable age and hired employment have a negative statistically significant relationship. The study show the potential for the acceptance of yellow maize by the younger, low-income people, people with some formal education and by families who adhere to yellow maize production.

Keywords: Consumption; Provitamin A yellow maize; Mozambique

RESUMO

Estudos conduzidos em vários países africanos, incluindo Moçambique, mostram baixa preferência do milho amarelo quando comparado ao milho branco, e há poucos estudos em Moçambique que examinam os fatores que determinam o consumo de milho amarelo. No presente estudo, foram examinados os fatores sociais, pessoais e psicológicos que influenciam o consumo de milho amarelo. A pesquisa foi realizada na província de Maputo, no sul de Moçambique, usando uma amostra de 213 agregados familiares, selecionados aleatoriamente. Para análise dos dados, foi utilizada a regressão logística binária através do pacote STATA 15. Os resultados mostram que a educação e a produção de milho amarelo têm uma relação positiva com o seu consumo, enquanto a variável idade e emprego têm uma relação estatisticamente significativa negativa. O estudo mostra um potencial de aceitação do milho amarelo por pessoas mais jovens e de baixa renda, pessoas com alguma educação formal e por famílias que aderem à produção de milho amarelo.

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Palavras-chave: Consumo ; Milho amarelo provitamina A; Moçambique

1 INTRODUCTION

Despite the efforts that have been undertaken by governments in many countries around the world, to reduce the number of people facing nutritional deficiencies, in 2021 there were around 800 million undernourished people in the world, of which 278 million from the African continent (FAO, IFAD, UNICEF, WFP and WHO, 2022). One of the major nutritional deficiencies contributing to the current state of malnutrition in the world is the deficiency in proteins and micronutrients, such as vitamin A, iron, zinc, selenium and iodine (Global Knowledge Centre on Crop Technology, 2007).

Vitamin A deficiency affects more than 190 million preschool-age children worldwide and the majority of these children are from Africa and Southeast Asia (World Health Organization, 2023). In Mozambique, vitamin A deficiency affects approximately two-thirds of children under five years (Picolo et al., 2019). The deficiency in Vitamin A weakens the immunity of affected people, making them more vulnerable to infections.

The consumption of yellow maize has been seen as vital and sustainable to combat Vitamin A deficiency, in the countries where maize is a staple food, because it contains significantly higher beta-carotene, which converts to Vitamin A, compared to the predominantly consumed white maize (Wilfred *et al.*, 2018; Muzhingi *et al.,* 2007).

The consumption of yellow maize in Mozambique is still a challenge. Studies conducted in Maputo city, indicate some preference for white maize compared to yellow maize (Tschirley and Santos, 1995; Stevens and Winter-Nelson, 2008). The yellow maize comes from biofortification breeding strategy. According to Pillay et al. (2011), in the biofortification of maize, changes occur in the colour of the grain charotenoids, from white to yellow or orange, as well as, changes in the aroma and flavour of the maize. These changes may influence the preference of the yellow maize in places where white maize is traditionally consumed.

Stevens and Winter-Nelson (2008), evaluating the acceptance of orange-coloured provitamin A (PVA) biofortified maize in Maputo, revealed that there are personal and social characteristics that may influence the consumption of biofortified orange maize. Those factors include the family size, the presence of small children, dietary diversity and perceived taste.

Literature suggests that, in general, thereare several factors, including cultural, social, personal and psychological factors, influencing the preference for a particular product (Babu and Banana, 2023, Kotler and Armstrong 2018, Rani, 2014; Nunes, 2017). Market research use these factors to understand the customers and develop strategies and/or messages for product promotion.

The cultural factors influence the perception, values, habits and customs, as well as, the expectations of a given group of people in relation to a product. The social factors include, for example, family and social status. The personal factors are, for example, age, occupation, economic status. The psychological factors refer to learning, beliefs, attitudes, etc. (Babu and Banana, 2023; Kotler and Armstrong 2018; Rani, 2014).

In Mozambique, few studies examine the factors that determine the consumption of yellow maize, and the few studies that analyse the consumption of yellow maize focus in limited variables. The current research aims to identify the social, cultural, personal and psychological factors that influence the consumption of yellow maize. The current research aims to fill the knowledge gap on the factors that influence the consumption of yellow maize, and its results may help in defining strategies that may contribute to the acceptance of PVA biofortified yellow maize.

2. LITERATURE REVIEW

2.1 Consumption of yellow maize in Mozambique

The introduction and subsequent consumption of yellow maize in Mozambique occurred in the 1980s, when large amount of this maize arrived in the country, through food aid programs, to respond to the food emergency. Part of the yellow maize received

was channelled to industrial mills in Maputo and Beira for processing into flour. The large milled quantities of yellow maize flour entered to the commercial circuit, mainly for informal markets in Maputo city, Matola and Beira (Tschirley and Santos, 1995, citing Sahn and Desai, 1993).

Studies carried out in some sub-Saharan African countries, including Mozambique, addressing acceptability of yellow maize for human consumption show that there is a little preference for this maize when compared to white maize (Muzhingi *et al.*, 2008; De Groote and Kimenju, 2012; Rubey, 1993; Tschirley and Santos, 1995). The weak preference for yellow maize varieties is related to its association with animal feed (De Groote *et al.,* 2010), food aid (Rubey, 1993; De Groote *et al*., 2010) and the connotation that this maize has inferior organoleptic properties (De Groote *et al.*, 2010; De Groote and Kimenju, 2012, Muzhingi, *et al.,* 2008).

The consumer preferences of yellow maize, are also influenced by the consumer's income (Pillay *et al.*, 2011, De Groote and Kimenju, 2012), the price of the product (De Groote and Kimenju, 2012; Pillay *et al.*, 2011; Tschirley and Santos, 1995; Rubey, 1993), the eating habits (Pillay *et al.*, 2011), as well as, the information provided (De Groote *et al.*, 2010). Based in price, consumers from Mozambique (Tschirley and Santos, 1995), as well as, from Zimbabwe (Rubey, 1993) and Kenya (De Groote and Kimenju, 2012) are willing to pay yellow maize products if it is sold at lower prices than white maize. The above factors influence the selection, purchase, use and disposal of products, and are objects of study in consumer behaviour, in marketing (Babu and Banana, 2023; Sostar and Ristanovic, 2023; Kotler and Keller, 2012; Kotler and Armstrong 2018).

2.2 Factors influencing consumption behaviour

Consumer behaviour is a study of how individuals, groups or organizations select, procure, use and dispose a certain good, service, idea to satisfy their needs (Babu and Banana, 2023) and wants (Kotler and Keller, 2012). Consumer behaviour refers to

the buying behaviour of the end customers who buy the products or services for their personal consumptions.

Numerous marketing researches around the world adopted the consumer behaviour approach to analyse and identify the factors that influence the consumer decision, because, it explain the decision-making process, needs and motivation (Babu and Banana, 2023; Sostar and Ristanovic, 2023; Kotler and Armstrong 2018; Latuszynska, Wawrzyniak and Furaiji, 2012). Therefore, consumer behaviour is the key element to consider when planning selling a product (Kavitha, Saran, Ram, 2023). The analysis of consumer behaviour is also applicable for the situation where we are introducing new agricultural product, like yellow maize, in the region where the people are traditionally white maize consumers, to understand the factors that may influence their adoption.

To facilitate the consumer behaviour analyses, the Professor Geffrey Jones and their colleagues from Cambridge University, developed the black box model of consumer (Kavitha, Saran, Ram, 2023). This model is used to understand the complexity of the consumer decision-making through analysing the relationship between the stimuli (external influences, like marketing stimulus, social and environmental factors) and consumer responses (internal influences, like personal's beliefs and attitudes) (Kavitha, Saran, Ram, 2023, Kotler and Armstrong 2018; Latuszynska, Wawrzyniak and Furaiji, 2012).

The marketing research's in the black box model are focusing on understanding the consumer characteristics that influence him/her to perceive and react to the certain stimuli and the consumer decision process that affect her/his to need recognition, search, decision to purchase. The buyer/consumer characteristics include cultural, social, personal and psychological (Kotler and Armstrong 2018). As the current research is interested in understanding the yellow maize target population, in order to define strategies that may influence the acceptance of yellow maize, the authors decided to consider the consumer characteristics because seems to be the appropriate approach for this case.

3. METHODOLOGY

The research was carried out in three districts of Maputo province, Boane, Moamba and Manhiça, located in southern Mozambique, where maize is a staple food and one of the most produced agricultural crops. The three districts are the largest maize producers in Maputo province, according to data from the 2020 Integrated Agricultural Survey (Mader, 2020).

The research population consists of all households residing in the three districts. According to data from the 2017 Population and Housing Census, the three districts has 124,420 households, where 53,695 are from Boane, 23,933 from Moamba and 46,792 from Manhiça. Based in the formula 1, of sample size calculation, recommended for cases in which the most important study variable is nominal or ordinal and the study population is finite, the study sample size was 213 households. A 95% confidence level and a 7% margin of error were considered to calculate the sample size.

$$n = \frac{z^2 p.q.N}{d^2(N-1) + z^2.p.q} \quad (1)$$

Source: Só Matemática1
Where: N = population size;
n = sample size;
p = probability of success;
q = complement of p (q = 1- p);
z = abscissa of the standard normal distribution (1.96 for the 5% significance level);
d = margin of error (0.07).

The data collection took place in December 2023 and the research used a structured questionnaire, addressed to households selected through probability sampling and stratified by district and communities within the districts. The households surveyed within the communities were selected randomly. The questionnaire was divided into four sections. The first section included the general characteristics of the household and of the respondent. The second section collected information related to agricultural production, including maize and yellow maize production. The third section,

1 http://www.somatematica.com.br/estat/basica/indice.php.

the questions were related to maize consumption and the consumption of yellow maize. The last section assessed the knowledge, attitudes and beliefs of respondents regarding the consumption of yellow maize.

Since the focus of the research is to identify the factors likely to influence the consumption of yellow maize, and the explained variable is binary, binary logistic regression approach were considered as the appropriate statistical model to use. According to the references, binary logistic regression is used to predict and model the probability of occurrence of a given binary event (Gonçalves, 2017 and Gonzalez, 2018), assisting, for example, to determine the factors that influence the occurrence of these event (Gonçalves, 2017).

The variable used to formulate the binary regression model were extracted from black box model of consumer, the model used to conceptualize the research. Therefore, the following consumer factors and correspondent variable were selected: (i) personal factors (age, sex, education, monthly income, household size, size of the agricultural production area and occupation); (ii) social/cultural factor (production of yellow maize) and; (iii) psychological factors (beliefs regarding to the consumption of yellow maize, i.e., whether it is considered food for poor families, food for emergency period, food for animal feed, rich in vitamin A and more nutritional compared to white).

The formula 2 below is the binary logistic regression model formulated to the current research, based in Carvalho and Góes (2018) model and using the above selected variables. For the detail description of the study variables see table 1.

$$Prob[yi = 1] = pi = \frac{e^{\beta 0+\beta 1X1i+\beta 2X2i+\beta 3X3i+\beta 4X4i+\beta 5X5i+\beta 6X6i+\beta 7X7i+\beta 8X8i+\beta 9X9i+\beta 10X10i+\beta 11X11i+\beta 12X12i+\beta 13X13i+\beta 14X14i}}{1+e^{\beta 0+\beta 1X1i+\beta 2X2i+\beta 3X3i+\beta 4X4i+\beta 5X5i+\beta 6X6i+\beta 7X7i+\beta 8X8i+\beta 9X9i+\beta 10X10i+\beta 11X11i+\beta 12X12i+\beta 13X13i+\beta 14X14i}} \quad (2)$$

Y represents the explained or dependent variable (consumption of yellow maize in the last three years) and the letter X represents the explanatory variables or independent variables, where: X1 - education; X2 - household size; X3 - household income; X4 – size of agricultural production area; X5 - sex; X6 - age; X7 - paid employed; X8 - self-employed; X9 - produced yellow maize; X10 - yellow maize is rich in vitamin A; X11 - yellow maize is more nutritious than white maize; X12 - yellow maize is for the poor; X13 - yellow maize is for animal feed; X14 - yellow maize is for food emergency. The letter β represents the coefficients. The numbers on X and β represent the variables involved in the model and the numbers of the respective coefficients (from 1 to 14), the fourteen explanatory variables of the study) and β0 is the intercept.

Table 1– Description of the study variables that are likely to influence the consumption of yellow maize

Variable	Description
Have you consumed yellow maize in the last 3 years?	Dummy; 1 if the person consumed yellow maize in the last 3 years; 0 – otherwise
Education	Ordinal qualitative
Household size	Quantitative
Household income	Quantitative, measured in Meticais (MZM), Mozambique currency
Size of production area	Quantitative, measured in hectare
Sex	Dummy; 1 if male; 0 – if female
Age	Quantitative, measured in years
Paid employment	Dummy; 1 if the person has paid employment, 0 – otherwise
Self-employment	Dummy; 1 if the person is self-employed, 0 – otherwise
Produced yellow maize	Dummy; 1 if the household produced yellow maize; 0 – otherwise
Yellow maize is rich in vitamin A	Dummy; 1 if the person believes that yellow maize is rich in Vitamin A; 0 – otherwise
Yellow maize is more nutritious than white maize	Dummy; 1 if the person believes that yellow maize is more nutritious than white maize, 0 – otherwise
Yellow maize is for poor's families	Dummy; 1 if the person believes that yellow maize is for the poor; 0 – otherwise
Yellow maize is for animals feed	Dummy; 1 if the person believes that yellow maize is for animal feed; 0 – otherwise
Yellow maize is for food emergency	Dummy; 1 if the person believes that yellow maize is food for emergency; 0 – otherwise

Source: Authors

The statistical program STATA, version 15, was used for data analysis. The data analysis was descriptive statistics and binary logistic regression analysis to identify the consumer's factors likely to influence the consumption of yellow maize.

4. RESULTS AND DISCUSSION

4.1 Household characteristics

Table 2 presents the sociodemographic characteristics of the households involved in the survey, highlighting the variables used to determine the factors that influenced the consumption of yellow maize, consumer characteristics that influence him/her to perceive and react to the certain stimuli.

Table 2 – Sociodemographic characteristics of the households surveyed

Continuous variable	Mean	Standard Deviation	Minimum	Maximum
Age (years)	52.15	14.44	20	87
Household size	5.76	2.84	1	18
Size of the production area (Ha)	1.91	2.33	0	23
Monthly income (MZN)	3311.97	4839.26	0	47000
Categorical variable		Frequency	Percent	
Sex	Male	140	65.73	
	Female	73	34.27	
Education	Illiterate	58	27.23	
	Primary	122	57.23	
	Secondary	26	12.21	
	High	7	3.29	
Paid employed	Yes	89	41.78	
	No	124	58.22	
Self-employed	Yes	112	52.58	
	No	101	47.42	

Source: Authors
1 MZN=0.0156 USD

The results in the table show that the households has 5.76 members in average. The heads of the households are on average 57 years old. Most of household head of the 213 households surveyed are mostly men (65.7%) and with

a low level of education, between primary education (57.2%) and illiterate (27.2%). The average monthly income of the households is 3,300.00 Meticais (MZM).

4.2 Maize consumption in the districts surveyed

Concerning to maize consumption in the three districts involved in the study, the data in Table 3 reveal that maize is one of the most consumed food by households surveyed, were more than 90% of respondents consumed maize or the maize products frequently, namely 58% daily and 36% at least once a week.

Table 3 – Frequency of consumption of maize and maize products by households

Frequency of consumption	Frequency	Percent	Cumulative
Daily	124	58.22	58.22
Weekly	77	36.15	94.37
Monthly	2	0.94	95.31
Occasionally	10	4.69	100.00
Total	213	100.00	

Source: Authors

Maize is consumed in a different form, ranking from *xima* (hard porridge) (96%), fresh maize on the cob (boiled or grilled) (93%), porridge (56%) and bread made from fresh maize (51%). Other locally known alternatives, such as fermented drinks (alcoholic or non-alcoholic), are less common.

For the consumption of yellow maize, which is the subject of the current research, the data show that 193 (90.6%) people, out of the 213 respondents, assumed that they had consumed yellow maize or yellow maize products at least once, but only 35% of the respondents had consumed in the last three (03) years. The data in Table 4 indicate that consumption of yellow maize began 43 years ago, in the 1980s, but the household involved in the study knows yellow maize since the 1970s.

Although around 35% of respondents have consumed yellow maize in the last three years, the survey data indicate that there are still negative beliefs (psychological factors) about yellow maize consumption. For example, some people believe that yellow maize is food for poor families (17.8%); others believe that it is consumed in food

shortage (20.1%); others consider that it is for animal feed (6.6%). There are also people who believe that yellow maize is less nutritious than white maize (49.7%) or that this maize is not rich in Vitamin A (51.6%). These results, regarding to beliefs related to yellow maize, are in line with previous studies such as De Groote et al. (2010), Rubey (1993).

Table 4 – Period of time the respondents know and consume yellow maize

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
How long have you known yellow maize (years)?	210	20.13	13.40	1	53
How long have you known yellow corn (years)?	193	13. 14	12.48	1	43

Source: Authors

4.3 Personal, social, cultural and psychological factors influencing yellow maize consumption in Maputo province

Table 5 shows the results of the binary logistic regression that estimated the probability, of a person or household, to consume yellow maize. Analysing the indicators used to assess the acceptance of the used binary logistic regression model, we can state that, in general, the model is accepted. The reason of acceptance is the following: the chi-square test for estimation of model is 62.98 and the probability (Prob > chi2 is 0.0000), which means that it is significant at 1%, i.e, there is at least one independent variable explaining the explained variable (consumption of yellow maize in the last three years). In terms of the model's total accuracy, the statistical test shows that the model correctly classifies approximately 76% of the consumption of yellow maize in the last three years. The Pseudo R2 indicates that approximately 25% of the variations found in the consumption of yellow maize are explained or influenced by the independent variables of the model.

The results in Table 5 show that four out of fourteen variables tested are significant, meaning that four variables explain the consumption of yellow maize. The

significant variables are, namely: education, age squared, paid employed and produced yellow maize. The variables education and produced yellow maize have a positive relationship with the consumption of yellow maize. The variables age squared and paid employed have a negative relationship with the consumption of yellow maize.

The education was significant at 5%. The logistic regression analysis shows that the probability of consuming yellow maize increases with education, meaning that, the higher the person's level of education, the greater the probability of consuming yellow maize. Based on the analysis of the odds ratio, we found that in the surveyed locations, if a person get one more year in school, the probability of consuming yellow maize increases by approximately 97%. The reason for this tendency may be related to knowledge of the nutritional benefits of the yellow maize. For example, Moon *et al.* (1998) found that consumers with a higher level of education had greater knowledge of nutritional matters.

The variable squared age has a negative relationship with the variable consumption of yellow maize and statistically significant at a 1%. This means that the probability of consuming yellow maize decreases with the increasing age. The odd ration analysis indicates that, in each additional year of the individual age, the probability of consuming yellow maize decreases by 99%. This result diverge with Beswa *et al.* (2020) in a study conducted in the Republic of South Africa.

The results of the current study, indicating a lower probability of yellow maize consumption by older people, may not be related to consumer characteristics (age), but rather to the historical factor, regarding to the bad beliefs raised about yellow maize, in the 1980s, when it was introduced in Mozambique to minimize the food shortage. According to some studies conducted in sub-Saharan African countries, between 1990 and 2012, yellow maize was associated with animal feed (De Groote *et al.*, 2010), food aid (Rubey, 1993, De Groote *et al.,* 2010) and low organoleptic properties (De Groote *et al.,* 2010; De Groote and Kimenju, 2012; Muzhingi *et al.,* 2008). These beliefs and attitude, raised at the above-mentioned period, may still be alive in the people that

experienced this situation. However, younger consumer, who were born much later to 1980s, may not be influenced by these negative beliefs associated to yellow maize.

Table 5 – Effect of personal, social, cultural and psychological factors on the probability of yellow maize consumption

Consumed yellow maize in the last 3 years	Coefficient	Odds Ratio	Standard Error	dy/dx	P>z
Education	0.68	1.97	0.29	0.14	0.02*
Family size	0.16	1.17	0.09	0.03	0.06
Monthly income	0.00	1.00	0.00	0.00	0.06
Size of the production area	-0.20	0.81	0.12	-0.04	0.10
Sex	-0.51	0.60	0.43	-0.10	0.23
Age squared	-0.00	1.00	0.00	-0.00	0.01**
Paid employed	-1.23	0.29	0.48	-0.23	0.00**
Self employed	-0.28	0.76	0.40	-0.06	0.49
If produced yellow maize	1.09	2.98	0.40	0.23	0.00**
Yellow maize is rich in Vitamin A	0.53	1.70	0.42	0.11	0.20
Yellow maize is nutritious	0.40	1.50	0.41	0.08	0.31
Yellow maize is for poor's	-0.43	0.65	1.04	-0.08	0.68
Yellow maize is for animal feed	-0.89	0.41	1.40	-0.15	0.53
Yellow maize is for emergency	-0.31	0.73	0.94	-0.06	0.74
_cons	-2.05	0.13	1.05		0.05
*significant at 5%; **significant at 1%					
Number of observations	192				
LR chi2(14)	62.98				
Prob > chi2	0.0000				
Pseudo R2	0.2523				
Log likelihood	-93.307949				
Correctly classified	75.52				
Sensitivity	57.35				
Specificity	85.48				
Y= Pr (Consumed yellow maize in the last 3 years) (predict)	0.27948807				

Source: Authors

The variable paid employed has a negative relationship with the consumption of yellow maize and is statistically significant at 1%. Therefore, the fact that an individual is a salaried worker reduces the probability of consuming yellow maize by about 71%. According to Raimundo *et al.* (2023), in Mozambique, paid employment when compared to self-employment are the most privileged, involving more men than women, as well as, more educated people and people with greater economic power. Assuming the facts indicated by Raimundo *et al.* (2023), we can affirm that the paid employed consumer have a higher income than those with other employment. Therefore, for the current research, the results indicate that the higher the household income, the lower the probability of consuming yellow maize.

Assuming the above findings that indicating that paid employed workers has higher income compared to others, such as self-employed, we can affirm that Tschirley and Santos, (1995), in the study conducted in Mozambique, and by Muzhing *et al.* (2008), in the research carried out in Zimbabwe, supports the results of the current research. Tschirley and Santos (1995) found that low-income consumers are more willing to consume yellow maize, as it is more affordable, and Muzhing *et al.* (2008) found that when household income increases, the probability of choosing white maize also increases.

The variable regarding whether the household has produced yellow maize has a positive relationship with yellow maize consumption and is statistically significant at 1%. If the household produced yellow maize increases the probability of consuming yellow maize by approximately 198%. Data from the 2022 Household Budget Survey, which indicates that 46% of rural Mozambican families' consumption comes from their own production (Instituto Nacional de Estatística, 2023) support the results of the current study.

5. CONCLUSIONS

The study revealed that the probability of consuming yellow maize is positively affected by education of the consumer and by the production of yellow maize in the household, and negatively affected by the squared age of the consumer and the fact

that he or she is a paid employed. Therefore, we concluded that the level of education of the consumer, that provide knowledge and appreciation of nutritional issues related to yellow maize, and the production of yellow maize, considering that the majority of the rural population of Mozambique consumes own production, increases the probability of consuming yellow maize. We also concluded that if the households has someone with paid employment, which gives them some significant income, and being relatively older, meaning that has experienced the period of the food emergency, where yellow maize was seen as food for poor, food aid and animal feed, reduce the probability of consuming yellow maize.

The results of the current study indicate a potential for acceptance of yellow maize by consumer who did not experience the period of the food emergency, when yellow maize was consumed due to the lack of white maize. There is also potential for acceptance of yellow maize, with nutritional education, that promotes knowledge of the nutritional importance of the yellow maize. There is also a potential for acceptance of the yellow maize by low-income people and by families that adhere to the production of yellow maize.

In order to reduce Vitamin A deficiency in the population of Maputo province, we propose to consider promotional strategies that take into account: personal factors (characteristics of individuals, including their knowledge in relation to yellow maize), social factors (the role of the household and the society) and psychological factors (considering the beliefs and attitude raised around yellow maize).

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