



**ASSESSMENT OF CONSUMERS' PREFERENCES FOR BANANA (*MUSA SPP.*)
RIPENING METHODS AND PERCEIVED HEALTH IMPLICATIONS IN IMO STATE,
NIGERIA**

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ABSTRACT

The study assessed consumer preferences for banana (*Musa spp.*) ripening methods and their perceived health implications in Imo State, Nigeria. The study investigated the determinants of consumer choices using a cross-sectional survey. Data were collected from 450 respondents selected through a multi-stage sampling technique across three major banana markets. Descriptive statistics and binomial logistic regression were employed to analyse the data. Results indicated that, 78% of respondents preferred naturally ripened bananas, while 22% opted for artificially ripened ones. Only 41% were aware of the potential health risks of artificial ripening, and 89% lacked access to reliable information on ripening methods. Regression results showed that education level ($\beta = -0.312$, $p = 0.002$), health risk awareness ($\beta = -0.672$, $p < 0.001$), and access to information ($\beta = -0.598$, $p = 0.004$) significantly reduced the likelihood of preferring artificial ripening. In contrast, gender ($\beta = 0.534$, $p = 0.015$) and income ($\beta = 0.188$, $p = 0.003$) increased this likelihood. The study highlights the need for targeted food safety education and stricter regulatory enforcement to protect consumers and promote healthier fruit consumption practices.

Keywords: Artificial, Banana, Health, Method and Ripening

INTRODUCTION

Bananas (*Musa spp.*) are among the most widely consumed fruits globally and are an integral part of both rural and urban diets, particularly in tropical and subtropical regions. They are valued not only for their palatability and nutritional content rich in potassium, dietary fibre, vitamins B6 and C but also for their affordability and accessibility across various socio-economic groups (Food and Agriculture Organization (FAO), 2021). In Nigeria, bananas serve as a staple fruit that contributes significantly to food and nutritional security, income generation, and rural livelihoods (Olumba and Onunka, 2020). As demand continues to rise, particularly in urban centres, the practices surrounding banana production, ripening, and marketing have become increasingly commercialized and complex.

The ripening process is a critical stage in the banana value chain, influencing not only the fruit's taste and appearance but also its market value and consumer acceptability (Sogo-Temi *et al.*, 2014). Ripening can occur through natural means, where harvested bananas are left to mature at ambient temperature, or through artificial methods, which involve the use of chemical agents to accelerate the process. Among the commonly used artificial ripening agents in Nigeria are ethylene gas, ethrel, and more controversially, calcium carbide, a substance banned in many countries due to its associated health hazards (Bhandare and Malode, 2023; Nasir *et al.*, 2024).



Despite its effectiveness in hastening fruit ripening to meet market demand, calcium carbide poses significant public health risks. Studies have shown that the chemical residues from improperly ripened fruits can lead to serious health complications such as headaches, dizziness, respiratory problems, and in extreme cases, neurological disorders and carcinogenic effects (Anaduaka *et al.*, 2023; Vidhya *et al.*, 2025). Moreover, the use of such chemicals is largely unregulated in many parts of Nigeria, including Imo State, where weak enforcement of food safety laws allows the proliferation of unsafe practices (Apeh *et al.*, 2024; Ubuoh *et al.*, 2022).

Consumers play a pivotal role in influencing market practices through their preferences and buying decisions. However, in many instances, their awareness of the health implications of chemically ripened fruits remains limited. Retailers, on the other hand, are often compelled to adopt artificial ripening techniques due to pressure to meet demand, reduce post-harvest losses, and increase profit margins (Alonso-Salinas *et al.*, 2024; Rizzo *et al.*, 2023). The decision to use a particular ripening method is often influenced by factors such as cost, speed, perceived consumer demand, shelf-life, and accessibility of ripening agents (Maduwanthi and Marapana, 2019). There is an urgent need to understand consumer preferences and perceptions regarding banana ripening methods, particularly in relation to their health concerns. Previous studies have predominantly focused on the perspectives of producers and retailers, with limited attention given to the role of consumers in shaping demand for safely ripened fruits (Islam *et al.*, 2016; Okeke *et al.*, 2022). In a context like Imo State where agricultural practices are rapidly evolving amidst urbanization and increased health consciousness, examining consumer awareness and behaviour is vital for designing effective food safety interventions.

The study therefore aims to assess consumers' preferences for different banana ripening methods in Imo State, Nigeria, and to evaluate their perceptions of the potential health risks associated with these methods. Specifically, it seeks to identify the factors influencing consumer choices, gauge their level of knowledge about artificial ripening agents, and explore their willingness to pay for safely ripened bananas. Findings from this research will inform policy recommendations for improving food safety standards, strengthening regulatory oversight, and promoting consumer education on healthy fruit consumption practices. By addressing these gaps, the study contributes to broader discourses on public health, food security, and sustainable agricultural value chains in Nigeria and other developing economies.

MATERIALS AND METHODS

The Study Area

The research was conducted in Imo State, located in the South-East geopolitical zone of Nigeria. Imo State occupies a landmass of approximately 5,067.20 square kilometres and lies between latitudes 5°45'N and 6°35'N and longitudes 6°35'E and 7°28'E (Anyiam *et al.*, 2020). As of the 2016 population estimate by the National Bureau of Statistics, Imo had a population of 5,408,756, with projections for 2024 indicating a growth to about 5.5 million people, based on an annual growth rate of 3.25% (NBS, 2016). The state's demography, with a high population density and urbanizing trends, presents a vibrant market for agricultural commodities, including fresh fruits like bananas.

Ecologically, Imo State is characterized by tropical rainforest and derived savannah vegetation zones. It experiences a humid tropical climate with two distinct seasons: the rainy season from April to October and the dry season from November to March (Apeh *et al.*, 2023). These agro-climatic conditions, including abundant rainfall and fertile alluvial soils, support a

wide range of agricultural activities. Major crops grown include cassava, yam, maize, rice, vegetables, oil palm, cocoa, and rubber, while livestock farming (poultry, piggery, and goat rearing) is also widespread among rural and peri-urban households.

Banana (*Musa spp.*) production plays a pivotal role in the agricultural economy of Imo State. The state's warm and humid climate is particularly conducive to the cultivation of bananas and plantains, which are grown by smallholder farmers predominantly in mixed cropping systems alongside cassava, maize, and other staple crops. Popular varieties include plantains, Cavendish bananas, and indigenous *Musa* species. Farmers often rely on traditional propagation using suckers, although a few have adopted improved practices such as the use of tissue culture for better disease resistance and yield enhancement (IITA, 2021).

Despite its potential, banana farming in Imo faces challenges including pest and disease outbreaks such as the banana bunchy top virus (BBTV) and black sigatoka as well as substantial post-harvest losses linked to inadequate storage, poor handling practices, and suboptimal transportation infrastructure (Nkwain *et al.*, 2022). These constraints affect both the quality and availability of bananas in the consumer market.

Banana marketing in the state involves a multi-layered value chain comprising producers, wholesalers, retailers, and final consumers. Local open markets are the primary sales outlets, although supermarkets, hotels, and food vendors in urban centres are emerging as alternative points of demand. Retailers play a significant role in determining how bananas are ripened and presented to the public. With bananas being a climacteric fruit, continuing to ripen after harvest, the method of ripening becomes critical in maintaining fruit quality, shelf life, and consumer appeal (Sogo-Temi *et al.*, 2014).

Natural ripening, typically achieved by storing bananas in warm, ventilated environments, is common among traditional vendors. However, the growing pressure to meet market demand for ripe bananas especially in urban and semi-urban centres has led to the increased use of artificial ripening agents such as calcium carbide. Although cost-effective and fast-acting, calcium carbide is widely reported to pose serious health risks, including respiratory complications and carcinogenic effects (Anaduaka *et al.*, 2023; Vidhya *et al.*, 2025).

In Nigeria, particularly in states like Imo, there is growing concern among consumers regarding the safety of chemically ripened fruits, resulting in shifting preferences toward naturally ripened alternatives (Okeke *et al.*, 2022). The prevalence of these artificial ripening practices, coupled with low regulatory enforcement and limited consumer awareness, creates a pressing need to understand how consumers perceive and respond to the different ripening methods employed by banana vendors. Imo State, with its active banana trade and diverse consumer base, thus provides a relevant and strategic setting for assessing consumer preferences for banana ripening methods and their perceived health implications.

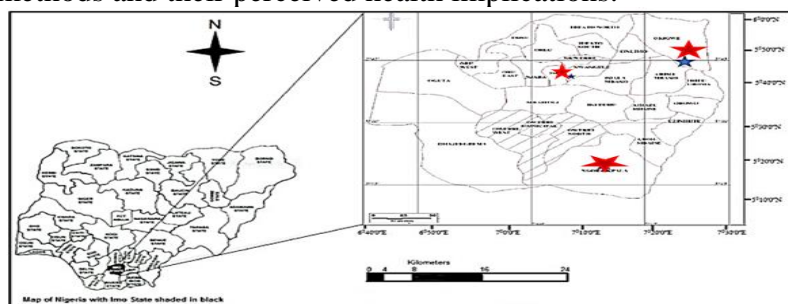


Figure 1: Map of Imo State

Sampling Technique and Sample Size

A multi-stage sampling technique was adopted to ensure a robust and representative sample of banana consumers across the selected LGAs. In the first stage, one prominent banana market was purposively selected from each LGA based on the volume of banana sales and the diversity of consumers. In the second stage, within each selected market, banana buyers and consumers were stratified by gender, age group, and educational background to ensure diversity. Finally, respondents were randomly selected from each stratum using proportionate sampling. A total of 450 respondents (150 from each LGA) were selected for the study. The sample size was considered adequate for statistical reliability and meaningful inference, in line with recommendations by Bartlett *et al.* (2001) for behavioural and consumer preference studies.

Data Collection Process

Data were collected through a cross-sectional survey using structured questionnaires. The instrument was designed to capture comprehensive information on respondents' demographic and socioeconomic characteristics, awareness of banana ripening techniques, consumer preferences, perceived health implications of different ripening methods, and frequency of banana consumption. Data collection was carried out with the assistance of trained enumerators familiar with the local languages and context, ensuring accurate responses and minimizing non-response bias. Respondents were briefed on the purpose of the research and assured of anonymity and confidentiality. Participation was voluntary, and informed consent was obtained from all participants.

Analytical Technique

The study employed both descriptive and inferential statistical tools to analyse the data. Descriptive statistics such as frequencies, percentages, and means were used to summarize respondents' characteristics, preferred banana ripening methods, and perceived health concerns.

To examine the factors influencing consumer preference for banana ripening methods using a binomial logistic regression model, we assume the dependent variable is binary, representing the consumer's preference for Natural ripening methods = 0 and Artificial ripening methods = 1. The model identifies how a set of independent variables influences the probability that a consumer prefers artificial ripening methods. The model is specified as follows;

Let, $Y_i = 1$ if consumer i prefers artificial ripening methods and $Y_i = 0$ if consumer i prefers natural ripening methods.

Let the vector of independent variables be:

X_1 = Gender (1 = Male, 0 = Female)

X_2 = Age (in years)

X_3 = Educational level (measured in years of formal schooling)

X_4 = Monthly income (in Naira)

X_5 = Awareness of health risks associated with artificial ripening (1 = Aware, 0 = Unaware)

X_6 = Access to information on ripening methods (1 = Yes, 0 = No)

The binomial logistic regression model is expressed as:

$$\text{logit}(P_i) = \ln\left(\frac{P_i}{1-P_i}\right) = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \dots + \beta_6 X_{6i} + \varepsilon_i \quad \dots(1)$$

Where:

P_i is the probability that consumer i prefers artificial ripening methods

β_0 is the intercept

$\beta_1, \beta_2, \dots, \beta_6$ are the coefficients to be estimated

ε_i is the error term

RESULTS AND DISCUSSION

Consumers' Socioeconomic Characteristics

The survey captured vital demographic and socioeconomic variables of banana consumers across Imo State, Nigeria, as shown in Table 1. These attributes are critical in understanding preferences and perceptions surrounding banana ripening methods and associated health concerns. The gender distribution showed that the majority of respondents were female (58%), while males accounted for 42% of the sampled population. This gender distribution is significant, as prior studies Ashagidigbi *et al.* (2022) and Pastori *et al.* (2024) have suggested that women in many Nigerian households are predominantly responsible for food selection and household consumption decisions, including fruit purchases.

Age distribution revealed that 45% of respondents were between 30 and 49 years, 29% between 18 and 29, 15% below 18, and 11% aged 50 and above. The dominance of the economically active age group (30–49 years) implies that most respondents likely possess both the economic capacity and health awareness necessary to influence their choices of banana ripening methods (Ampomah *et al.*, 2024). The result of the education level indicated that a substantial number (41%) had 7–12 years of education, while 19% had attained tertiary-level education (13 years and above). Education plays a critical role in shaping consumer knowledge and attitudes toward food safety and health risks (Apeh *et al.*, 2024). Respondents with higher education levels are more likely to be aware of the potential chemical hazards involved in artificial banana ripening processes.

The marital status and household size revealed that married individuals represented the majority (48%), followed by single (35%) and widowed respondents (17%). Household size also skewed towards smaller households, with 53% having fewer than five members. According to Abe *et al.* (2023) household size and marital status can significantly affect food purchasing habits, dietary patterns, and exposure to health-related information.

Table 1: Socioeconomic Characteristics of Respondents

	Description	Proportion (%)
Gender	Male	42
	Female	58
Age (years)	Below 18	15
	18 – 29	29
	30 – 49	45
	50 and above	11
Education level (years)	0 years	15
	1 - 6 years	25
	7 - 12 years	41
	13 years and above	19
Marital Status	Not married	35
	Married	48
	Widow	17
HH Size	Below 5	53
	5 – 9	35
	10 and above	12
Average monthly income (Naira)	Below – 70,000	39
	70,000 – 150,000	42
	Above 150,000	19
Access to information on ripening methods	Yes	11
	No	89

Source: Field Survey, 2025

Given that a large portion of consumers may still be unaware or economically compelled to consume chemically ripened bananas, regulatory oversight becomes imperative. Furthermore, the income distribution implies that affordability may constrain consumer preferences, potentially exposing lower-income groups to greater health risks. Policymakers and food safety authorities should therefore consider interventions such as subsidizing natural ripening technologies or promoting affordable alternatives like ethylene-based ripening, which is less harmful than carbide. In addition, consumer education initiatives must emphasize the risks of chemically ripened fruits while promoting the nutritional and safety advantages of natural ripening processes. This is supported by findings from Apeh *et al.* (2024), who argue that consumer education significantly influences preference for safer food options, especially in developing economies.

Consumer Preferences for Banana Ripening Methods

The study assessed consumer preferences for banana (*Musa spp.*) ripening methods in Imo State, Nigeria. As presented in Table 2, a significant majority (78%) of respondents expressed a preference for bananas ripened through natural methods, while only 22% preferred artificially ripened bananas. This result aligns with findings by Okeke *et al.* (2022), who reported increasing public awareness of the health hazards associated with artificial ripening agents such as calcium carbide. The high preference for natural ripening methods may be attributed to growing consumer concern over food safety and potential health risks, including chemical toxicity, which has been widely reported in the literature (Vidhya *et al.* 2025).

Natural ripening methods often involve the use of ethylene gas released naturally from fruits, burying bananas in sawdust or using heat from sun exposure. These methods are perceived as safer and more environmentally friendly, and they preserve the fruit's nutritional value (Maduwanthi & Marapana, 2019). On the other hand, artificial ripening, especially when involving unauthorized substances such as calcium carbide, is associated with adverse health effects. These include respiratory distress, neurological disorders, and even carcinogenic outcomes due to the production of acetylene gas during the ripening process (Anaduaka *et al.*, 2023; Vidhya *et al.*, 2025).

The relatively lower preference (22%) for artificially ripened bananas may also reflect public distrust of fruit vendors suspected of using unsafe practices. It has been observed that in some urban and semi-urban centres in Nigeria, artificial ripening is adopted to hasten ripening processes for commercial purposes, especially when market demand is high (Orok *et al.*, 2024). However, with increasing media reports and public health advocacy, many consumers now actively seek out organically ripened fruits even at slightly higher prices (Apeh *et al.*, 2023).

The finding also has important implications for market trends and consumer education. While the preference for naturally ripened bananas is encouraging from a health perspective, the continued use of artificial ripening methods by a segment of traders and the 22% of consumers who accept such fruits calls for sustained regulation and public health surveillance. The National Agency for Food and Drug Administration and Control (NAFDAC) and other regulatory bodies in Nigeria must enhance enforcement of existing regulations prohibiting the use of harmful chemicals in food production and post-harvest handling.

Moreover, interventions should include sensitization campaigns targeting both consumers and fruit vendors. Training traders on safe and approved ripening techniques, such as the use of ethylene generators or banana ripening chambers, could reduce the harmful practices still observed

in some parts of the state (Maduwanthi and Marapana, 2019). This could be complemented with labelling and certification systems that allow consumers to identify safely ripened produce.

Table 2: Consumers Preferences for Ripening Methods

Ripening Methods Used	Proportion (%)
Natural Methods	78
Artificial Methods	22

Source: Field Survey, 2025

Access to Information on Banana Ripening Methods

The study examined consumer access to information regarding banana ripening methods presented in Table 3 as part of a broader investigation into preferences and perceived health risks associated with these methods in Imo State, Nigeria. The survey revealed that only 11% of respondents reported having access to reliable information on the various methods used to ripen bananas, while a significant 89% lacked such access. These findings suggest a substantial information gap within the consumer population, which may contribute to uninformed or potentially unsafe purchasing decisions. The limited access to information could explain, in part, the observed consumer behaviours and the general lack of awareness about the health implications of consuming artificially ripened fruits.

Lack of consumer access to ripening method information has several critical implications. First, it limits the public's capacity to make health-conscious decisions regarding the fruits they consume. According to Alonso-Salinas *et al.* (2024), inadequate consumer education and awareness regarding post-harvest practices, particularly the use of hazardous substances such as calcium carbide, significantly increase the risk of exposure to chemical residues. Furthermore, the information deficit may hinder the adoption of safer, naturally ripened fruits even among health-conscious individuals. As noted by (Nasir *et al.*, 2024), consumers' ability to discern between artificially and naturally ripened fruits often depends on the availability and accessibility of clear, reliable information. In a setting where 89% of consumers report lacking such information, regulatory oversight and awareness campaigns become critical.

From a public health standpoint, the implications are far-reaching. Artificial ripening agents, particularly calcium carbide have been linked to adverse health outcomes such as gastrointestinal distress, neurological disorders, and potential carcinogenic effects (Anaduaka *et al.*, 2023; Vidhya *et al.*, 2025). Without adequate consumer awareness, the demand for quick-ripened fruits may inadvertently support practices that compromise food safety. Moreover, the findings align with studies emphasizing the role of information asymmetry in agricultural markets (Abdulsalam *et al.*, 2024). In such markets, vendors or retailers may possess more knowledge about the ripening processes and may exploit this knowledge asymmetry for economic gain, while consumers bear the health risks unknowingly.

Table 3: Access to Information on Banana Ripening Methods

Access to information	Proportion (%)
Yes	11
No	89

Source: Field Survey, 2025



Consumers' Awareness of the Potential Health Impacts of Artificial Banana Ripening Methods

The results in Table 4 reveal a relatively low level of consumer awareness regarding the health implications of artificial ripening methods in Imo State. Only 41% of the respondents reported being aware of the health risks associated with artificial banana ripening, while a significant 59% indicated unawareness. This suggests a substantial knowledge gap in public understanding of food safety, especially concerning postharvest fruit handling.

Among those who were aware of the risks, 26% specifically identified respiratory problems as a health concern, 10% cited potential carcinogenic effects, and 5% reported skin irritation. Interestingly, 59% of respondents perceived no health risks from artificial ripening methods, reflecting either misinformation or a complete lack of exposure to relevant food safety education. This finding is in line with earlier observations by Igwe and Ezekwesili, (2023) and Oladipupo *et al.* (2022), who documented widespread use of hazardous ripening agents such as calcium carbide in Nigerian fruit markets, often without adequate public health warnings. Calcium carbide, in particular, releases acetylene gas during ripening, a chemical compound known to be toxic and capable of inducing respiratory complications, skin burns, and, with chronic exposure, carcinogenesis (Ouma *et al.*, 2022).

The observed low awareness level suggests that a considerable proportion of the population may be inadvertently consuming fruits that pose long-term health risks. This corroborates (Apeh, (2018), who emphasized that health literacy remains low among many consumers in rural and semi-urban Nigeria, contributing to poor dietary safety decisions. The dominant view that artificial ripening has "no known effects" (59%) is particularly concerning. It highlights a potential disconnect between scientific knowledge and community-level understanding. Islam *et al.*, (2016) noted that without effective food safety campaigns, consumers are likely to continue patronizing fruits ripened through unsafe methods, especially when these are cheaper or more readily available.

Table 4: Consumers' Awareness of Potential Health Impacts of Artificial Ripening Methods

Variable	Description	Proportion (%)
Health risks associated with artificial ripening method		
	Aware	41
	Unaware	59
Perceived health risks of artificial ripening method		
	Respiratory issues	26
	Skin irritation	05
	Potential carcinogenic effects	10
	No known effects	59

Source: Field survey, 2025

Determinants of Consumers Choice of Banana Ripening Method

The study employed a binomial logistic regression model to assess the factors influencing consumers' choice between natural and artificial banana ripening methods in Imo State, Nigeria. The dependent variable was binary: 1 = preference for artificial ripening methods, and 0 = preference for natural methods. Table 5 presents the regression coefficients (β), standard errors, odds ratios, and p-values for the predictors included in the model. The model showed an overall good fit with a Nagelkerke R^2 value of 0.297, indicating that approximately 29.7% of the variation in consumer ripening method choice is explained by the independent variables. The Hosmer-

Lemeshow test ($p = 0.435$) suggests a good model fit, and the model accurately classified 79.3% of the cases.

Gender was positively significant at 5% ($\beta = 0.534$, $p = 0.015$). This shows that male consumers were significantly more likely to prefer artificial ripening methods than females. The odds ratio ($\text{Exp}(\beta) = 1.706$) implies that males are about 1.71 times more likely to choose artificial methods. This may reflect gender-based differences in market interactions and perceived utility, as noted by Adepoju *et al.* (2016), who observed male-dominated decision-making in informal food markets in Nigeria.

Age ($\beta = -0.023$, $p = 0.025$), negatively and significantly influenced the preference for artificial ripening. Each additional year in age decreases the odds of preferring artificial methods by a factor of 0.977, suggesting that older consumers are more cautious and likely to opt for natural alternatives. This finding aligns with studies by Szakos *et al.* (2022), which found that older adults were more health-conscious in their food consumption behaviour.

Education Level was negatively significant at 1% level ($\beta = -0.312$, $p = 0.002$). This shows that a higher level of education significantly reduced the likelihood of preferring artificial ripening methods. The odds ratio of 0.732 indicates that educated consumers are 27% less likely to choose artificial methods. This supports previous research by (Apeh *et al.*, 2024), which emphasized the role of education in fostering food safety awareness and critical evaluation of food handling practices.

Monthly Income ($\beta = 0.188$, $p = 0.003$) had a positive and significant effect on the choice of artificial ripening methods. For every ₦10,000 increase in monthly income, the odds of preferring artificial ripening increase by about 20.7%. This may reflect increased consumer demand for ripened fruits due to convenience and availability, regardless of health implications. The health risk awareness ($\beta = -0.672$, $p = 0.000$) had a negative and significant effect on the choice of artificial ripening methods. This implies that the awareness of the potential health risks associated with artificial ripening significantly reduced the likelihood of preferring such methods. The odds ratio of 0.511 implies that those aware of health risks were 49% less likely to choose artificially ripened bananas. This result is consistent with the findings of Mujuka *et al.* (2021), who reported that awareness campaigns significantly influenced consumer rejection of chemically ripened fruits.

Access to ripening method information was significant and negatively influences the consumers choice of artificial ripening methods ($\beta = -0.598$, $p = 0.004$). This means that the consumers with access to information on ripening methods were significantly less likely to choose artificial ripening (odds ratio = 0.550). This reinforces the critical role of consumer education in promoting safe food consumption practices. These findings underscore the multidimensional nature of consumer decision-making regarding fruit ripening methods. Education, age, awareness, and access to information significantly deter preference for artificial methods, suggesting that knowledge-based interventions could drive safer food choices. Conversely, increased income and male gender were associated with higher likelihoods of preferring artificial methods, possibly due to greater exposure to market dynamics or prioritization of convenience.

Public health authorities and agricultural extension agents should focus on targeted awareness programs, especially for younger and lower-education demographics, and ensure that consumers have access to reliable information on the risks of artificial ripening agents such as calcium carbide and kerosene smoke. In line with the Federal Ministry of Health (FMH), (2014)



guidelines, there is also a pressing need for policy enforcement on food safety standards in fruit handling and ripening processes in Nigeria.

Table 5: Factors Influencing Consumers choice of Banana Ripening Method

Independent Variable	β Coefficient	Standard Error	Odds Ratio (Exp(β))	p-value
Intercept	-1.756	0.438	—	0.000
Gender	0.534	0.221	1.706	0.015
Age	-0.023	0.010	0.977	0.025
Education level	-0.312	0.102	0.732	0.002
Monthly income	0.188	0.062	1.207	0.003
Awareness of health risks	-0.672	0.183	0.511	0.000
Access to ripening method information	-0.598	0.205	0.550	0.004

Source: Field survey, 2025

CONCLUSION AND RECOMMENDATIONS

The study provides critical insights into consumer preferences for banana ripening methods and their perceptions of associated health risks in Imo State, Nigeria. The findings reveal a strong consumer inclination toward naturally ripened bananas, driven by growing awareness of the adverse health effects linked to artificial ripening agents, particularly calcium carbide. Despite this preference, a significant portion of the population lacks adequate access to information on ripening methods, and nearly 60% are unaware of the potential health risks posed by chemically ripened fruits. The binomial logistic regression analysis identified several key determinants influencing consumers' choices. Educational attainment, health risk awareness, and access to ripening method information significantly reduced the likelihood of preferring artificial ripening. Conversely, higher income levels and male gender were associated with greater acceptance of artificial methods, likely reflecting a complex interplay between economic incentives and market-driven behaviours.

The findings underscore the urgent need for targeted public health interventions and regulatory reforms. Improving consumer education through mass awareness campaigns, enforcing strict controls on the use of hazardous ripening agents, and promoting access to safe, approved technologies are essential steps toward enhancing food safety. Moreover, empowering consumers with reliable information can reshape demand in favour of healthier alternatives, thereby influencing vendor practices and strengthening the banana value chain. Overall, this research contributes to the broader discourse on food safety, public health, and consumer behaviour in Nigeria's agricultural sector. It calls for coordinated efforts from stakeholders including government agencies, extension services, researchers, and civil society organizations to foster a food system that prioritizes both consumer well-being and sustainable agricultural practices.

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