

<https://doi.org/10.33003/jaat.2026.1202.01>

CONSUMERS' PREFERENCES AND DETERMINANTS OF RETAIL TOMATO PURCHASE DECISION IN KANO METROPOLIS, NIGERIA

¹Khalil Umar Yusuf, ¹Muhammad Auwal Abdullahi, ¹Musa Bako Muhammad, ¹Salihu Musa ¹Talib Abdullahi and ²Buhari Nazifi

¹Department of Agricultural Economics and Agribusiness, Federal University Dutse, Jigawa State, Nigeria.

²Department of Agricultural Economics, Federal University Dutsin-Ma, Katsina State, Nigeria

Corresponding Author: muhammad.auwal@fud.edu.ng

ABSTRACT

This study examines consumers' preferences and the key determinants of retail tomato purchase decisions in Kano Metropolis, Nigeria. Primary data were collected from 144 tomato consumers using a structured questionnaire administered through face-to-face interviews and electronically recorded using Kobo Toolbox. Descriptive statistics and exploratory factor analysis were employed to analyse collected data. The results show that traditional open markets and street vendors dominate tomato retail patronage, reflecting the central role of informal retail channels in urban food provisioning. Proximity, affordability, and perceived freshness were the most frequently cited reasons for outlet choice. Factor analysis identified four major constructs. Quality, Price, Location, and Attitude which together explained 73.6% of the total variance in consumer preferences. Quality-related attributes associated with handling and freshness preservation emerged as the most influential determinants, followed by price-related factors and outlet accessibility. Attitudinal factors, including consumers' confidence in judging tomato quality, also played a significant role in shaping purchasing behaviour. The findings suggest that consumer preferences for tomatoes in Kano Metropolis are multidimensional, driven primarily by freshness cues, price sensitivity, and convenience. The study highlights the need for improved post-harvest handling practices, better hygiene in informal markets, and enhanced retail infrastructure to improve product quality and consumer satisfaction. These results provide useful insights for policymakers and value chain actors seeking to strengthen urban tomato marketing systems and improve food access in rapidly growing cities.

Keywords: Consumer Preferences; Tomato Retailing; Perceived Quality; Factor Analysis; Kano Metropolis; Urban Food Markets

INTRODUCTION

Tomato (*Solanum lycopersicum*) is one of the most widely consumed vegetables in Nigeria, forming an essential component of daily meals across both urban and rural households. Its importance in household nutrition, income generation, and food systems has positioned tomato as a strategic commodity within Nigeria's agricultural and marketing landscape (FAO, 2017; Adeoye, Yusuf, & Balogun, 2019). Despite Nigeria's status as one of the leading tomato producers in sub-Saharan Africa, the tomato value chain remains characterized by significant inefficiencies, particularly at the post-harvest and retail stages, where quality deterioration, price volatility, and substantial product losses are prevalent (Akinyele & Akinkulore, 2017).

In urban areas, tomato consumption is largely dependent on market purchases rather than own production. Consequently, the structure and performance of retail tomato markets play a critical role in shaping consumer welfare and food access (Reardon et al., 2012). Kano Metropolis, one of the largest urban centres in northern Nigeria, hosts a complex tomato retail system comprising open markets, roadside vendors, and formal retail outlets. These outlets differ considerably in pricing strategies, handling practices, accessibility, and perceived product quality, thereby presenting consumers with heterogeneous

purchasing environments (Oyinbo & Rekwot, 2014; Muhammad et al., 2021). Consumers navigating these markets must therefore make choices based on a combination of economic, quality-related, and convenience factors.

Economic theory suggests that consumers derive utility not from goods themselves but from the attributes embodied in those goods, such as quality, appearance, and freshness (Lancaster, 1966). In fresh produce markets, attributes such as firmness, colour, absence of physical damage, and overall visual appeal serve as critical quality signals, particularly in contexts where formal grading and certification systems are weak or absent (Okello, Lagerkvist, & Karanja, 2015; Mukurumbira et al., 2020). Complementarily, the Theory of Planned Behaviour posits that consumer attitudes, perceived behavioural control, and contextual constraints influence purchasing decisions, especially in food markets where choices are shaped by income limitations and market accessibility (Ajzen, 1991).

Empirical studies on tomato marketing in Nigeria have predominantly focused on production constraints, post-harvest losses, and price behaviour (Shehu, Iyortyer, & Mshelia, 2018; Adeoye et al., 2019). While these studies provide valuable insights into supply-side challenges, there remains limited empirical evidence on consumer-

side decision-making, particularly regarding how perceived quality attributes and retail outlet characteristics influence purchasing behaviour in urban markets. Specifically, little is known about how socio-economic characteristics interact with retail outlet attributes and quality cues to shape consumer preferences for tomatoes in Kano Metropolis. This gap constrains the ability of policymakers, marketers, and value chain actors to design interventions that align retail market improvements with consumer priorities. Against this background, this study analyses consumers' preferences for retail tomato purchases in Kano Metropolis, Nigeria. The study describes the socio-economic characteristics of tomato consumers, identifies preferred retail outlets for tomato purchases, and examines the key factors influencing consumers' preferences for retail tomato purchases.

METHODOLOGY

Study Area

The study was conducted in Kano Metropolis, located in northern Nigeria between latitudes 11°25'N and 12°47'N and longitudes 8°22'E and 8°39'E, at an elevation of approximately 472 meters above sea level. Kano Metropolis comprises major urban Local Government Areas, including Dala, Fagge, Gwale, Kano Municipal, Nassarawa, Tarauni, and parts of Ungogo and Kumbotso. It is one of Nigeria's largest commercial centres, with a projected population of about 4.35 million as of 2023 (NPC, 2023). The area experiences a tropical savannah climate characterized by distinct wet and dry seasons. Annual rainfall averages about 800 mm, occurring mainly between June and September, while temperatures typically range from 22°C to 40°C, with peak temperatures recorded between March and May (Abaje et al., 2016; Olofin, 2019).

Kano Metropolis has a vibrant economy dominated by trade, services, and agriculture. Urban and peri-urban vegetable production, including irrigated dry-season tomato farming, plays a significant role in meeting the fresh produce needs of the growing urban population. Tomatoes are marketed through multiple retail channels, notably open markets, roadside vendors, and supermarkets, with major markets such as Yankaba, Tarauni, and Rimi serving as key distribution hubs for fresh tomatoes across the metropolis (Ayanwale & Amusan, 2020; Muhammad et al., 2021).

Sampling Procedure and Sample Size

A multistage sampling procedure was employed to select tomato consumers for the study. In the first stage, three Local Government Areas (LGAs) within Kano Metropolis namely Nassarawa, Tarauni, and Kano Municipal were purposively selected due to their high concentration of tomato retail activities, making them suitable for examining consumer purchasing behaviour (Tongco, 2007). In the second stage, major tomato retail locations

within the selected LGAs were purposively identified. These included prominent traditional markets such as Kasuwar Yankaba, Kasuwar Tarauni, Kasuwar Rimi, and Kasuwar Sharada. In addition, other retail outlets, including street vendors, vegetable stands, and supermarkets, were incorporated to capture the diversity of tomato retail formats in the metropolis. In the third stage, retail outlets were stratified into four categories: traditional open markets, street vendors, vegetable stands, and supermarkets. Within each category, respondents were selected using convenience sampling, based on availability and willingness to participate at the time of data collection (Etikan, Musa, & Alkassim, 2016). A total sample size of 144 respondents was obtained. This sample size was considered adequate for descriptive analysis and exploratory multivariate techniques such as factor analysis, and was appropriate given the scope of the study and field constraints (Hair et al., 2019).

Data Collection and Analysis

Primary data were collected using a structured questionnaire designed in line with the study objectives. The questionnaire captured information on respondents' socio-economic characteristics, perceived tomato quality attributes, retail outlet choice, and constraints associated with tomato purchasing in Kano Metropolis. Quantitative information on study attributes was elicited using a summative Likert scale framework, which enabled the aggregation of individual perception items into composite measures for analysis.

Data were collected electronically using Kobo Toolbox, an online data collection platform, to enhance data accuracy, minimize entry errors, and facilitate real-time monitoring of field activities. Face-to-face interviews were conducted by trained enumerators at selected retail locations within the study area, with responses recorded directly on mobile devices. This approach ensured clarity of questions, improved response completeness, and reduced non-response bias. Enumerators systematically administered the questionnaire to willing respondents at the point of purchase across different retail formats, including traditional open markets, roadside vendors, vegetable stands, and supermarkets.

Data were analysed using descriptive and multivariate statistical techniques. The analytical procedures were structured to address the study objectives relating to perceived tomato quality attributes and retail outlet choice.

Descriptive Analysis

Descriptive statistics, including frequencies and percentages, were used to summarize respondents' socio-economic characteristics and preferred retail outlets. Perceptions of tomato quality attributes were measured using a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Mean scores and standard deviations were computed to assess the relative

importance of quality attributes influencing consumer choice. Constraints encountered by consumers were similarly ranked based on mean scores to establish their relative significance.

Factor Analysis

Exploratory factor analysis was employed to identify the underlying dimensions of perceived tomato quality influencing retail outlet choice. This technique was appropriate given the interrelated nature of the perception variables and its ability to reduce multiple observed variables into a smaller set of interpretable latent constructs (Hair, Black, Babin, & Anderson, 2014). The analysis directly addressed the objective of identifying key quality perception factors shaping consumer purchasing behaviour.

Observed variables included freshness, firmness, colour, size, absence of bruises, taste, shelf life, and aroma. Principal Component Analysis (PCA) was used as the extraction method, followed by Promax rotation to improve interpretability while allowing for correlation among factors. Factor retention was based on eigenvalues greater than one, cumulative variance explained, and inspection of the scree plot (Yong & Pearce, 2013).

Reliability and Validity Testing

Reliability of the perception scales was assessed using Cronbach's Alpha to evaluate internal consistency. A threshold value of $\alpha \geq 0.70$ was considered acceptable (Nunnally, 1978; Tavakol & Dennick, 2011). Items that reduced scale reliability were reviewed and removed where necessary.

Sampling adequacy and suitability of the data for factor analysis were evaluated using the Kaiser–Meyer–Olkin (KMO) measure and Bartlett's Test of Sphericity. KMO values of 0.60 and above and statistically significant Bartlett's test results ($p < 0.05$) were considered indicative of adequate inter-item correlations (Kaiser, 1974; Field, 2018). Communalities and factor loadings were examined to ensure robust factor structure, with items retained based on substantial loadings on a single factor.

All statistical analyses were conducted using IBM SPSS Statistics.

RESULTS AND DISCUSSIONS

Socio-Economic Characteristics of Tomato Consumers

Table 1 presents the socio-economic characteristics of tomato consumers in Kano Metropolis. The age

distribution shows that the majority of respondents fall within the economically active age groups, with about 57% aged between 21 and 35 years. This suggests that tomato purchasing decisions in the metropolis are largely made by young and middle-aged consumers who are actively involved in household provisioning. Similar age patterns have been reported in urban food consumption studies, where economically active individuals dominate fresh food purchases due to their role in household food management (Adeoye et al., 2019).

Educational attainment among respondents was relatively high, with over 74% having at least secondary education and about 40% possessing tertiary education. Higher education levels are often associated with better awareness of food quality and safety attributes, which may influence how consumers evaluate tomato freshness, appearance, and handling conditions at retail outlets. This supports the argument that education plays a critical role in shaping consumers' perceptions of quality and outlet choice in fresh produce markets (Mukurumbira et al., 2020).

Household income levels indicate that tomato consumers in Kano Metropolis span diverse income categories, with approximately 78% earning ₦100,000 or less per month. This distribution reflects the price-sensitive nature of tomato consumption, particularly among low- and middle-income urban households. Income constraints may therefore influence consumers' preference for informal retail outlets, such as open markets and roadside vendors, where prices are perceived to be lower and negotiable.

Household size was predominantly moderate, with nearly 88% of respondents living in households of between 1 and 9 persons. Larger household sizes are typically associated with higher food demand and more frequent tomato purchases, which may increase sensitivity to price fluctuations and perceived quality deterioration. This further underscores the importance of affordable and accessible retail outlets in meeting household consumption needs. The socio-economic profile of respondents suggests that tomato purchasing decisions in Kano Metropolis are shaped by a combination of income constraints, educational background, and household consumption requirements. These characteristics provide an important context for understanding consumers' perceptions of tomato quality and their choice of retail outlets, which are examined in subsequent sections.

Table 1: Socio-Economic Characteristics of Tomato Consumers

Variable	Frequency	Percentage
Age (Yrs)		
15-20	18	12.5
21-25	35	24.3
26-30	28	19.4
31-35	19	13.2
36-40	16	11.1
Above 40	28	19.4
Total	144	100
Educational Status		
No Formal Education	15	10.4
Primary	22	15.3
Secondary	49	34.0
Tertiary	58	40.3
Total	144	100
Household Income		
Below ₦20,000	35	24.3
₦20,000 - ₦50,000	37	25.7
₦50,000 - ₦100,000	40	27.8
Above ₦100,000	32	22.2
Total	144	100
Household size (no.)		
01-04	60	41.7
05-09	67	46.5
10-14	14	9.7
15-19	01	0.7
20-Above	02	1.4
Total	144	100

Source: Field Survey, 2025

Preferred Retail Outlets for Tomato Purchases

The results indicate that consumers patronize different retail outlets for tomato purchases, with traditional open markets and street vendors accounting for the majority of purchases. This pattern reflects the central role of informal retail channels in urban food provisioning, particularly for perishable commodities such as tomatoes. Proximity to residence or workplace, affordability, and perceived freshness were the most frequently cited reasons for outlet choice, suggesting that convenience and daily consumption needs strongly influence purchasing behaviour.

Street vendors and open markets are often perceived as offering fresher tomatoes due to rapid stock turnover and shorter marketing chains, which reduces the likelihood of quality deterioration. In contrast, supermarkets, although less frequently patronized, were associated with perceptions of better quality consistency, cleanliness, and packaging. However, their limited patronage may be attributed to higher prices, reduced accessibility, and consumer perceptions that tomatoes in formal outlets are less fresh compared to those in informal markets.

These findings are consistent with earlier studies emphasizing the dominance of informal food retail systems in urban Africa, where price sensitivity and convenience outweigh formal quality assurances in shaping consumer choice (Mukurumbira et al., 2020). The

results underscore the importance of perceived quality cues at the point of sale rather than formal grading systems in determining retail outlet preference among urban tomato consumers.



Figure 1: Preferred Retail Outlets for Tomato Consumers

Factors Influencing Consumer Preferences for Tomato Purchases

Table 4.5 presents the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy and Bartlett’s Test of Sphericity, which were conducted to assess the suitability of the data for factor analysis. The KMO value of 0.811 exceeds the recommended minimum threshold of 0.60 (Kaiser, 1974), indicating adequate sampling and sufficient common variance among the variables. According to Hutcheson and Sofroniou (1999), KMO values between 0.80 and 0.89 are classified as

meritorious, further confirming the appropriateness of the dataset for factor analysis.

Bartlett’s Test of Sphericity yielded a chi-square value of 2595.916 with 231 degrees of freedom, which was statistically significant at $p < 0.001$. This result rejects the null hypothesis that the correlation matrix is an identity matrix, confirming the presence of significant inter-item correlations necessary for factor extraction (Hair et al., 2019).

The results of the KMO measure and Bartlett’s Test indicate that the dataset is suitable for factor analysis and supports the extraction of underlying latent constructs.

Table 2: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.811
Bartlett's Test of Sphericity	Approx. Chi-Square	2595.916
	Df	231
	Sig.	.000

Source: Authors’ Analysis

The factor analysis identified four key constructs. Quality, Price, Location, and Attitude. Which together explained 73.6% of the total variance in consumer preferences for tomato purchases. This high cumulative variance indicates that the extracted factors provide a robust

representation of the underlying dimensions influencing tomato purchasing behaviour in Kano Metropolis.

Quality emerged as the most influential factor, accounting for 25.9% of the explained variance. High factor loadings on attributes related to minimal transport or stacking damage and proper shading and cooling highlight

consumers’ strong emphasis on freshness-preserving practices and visible product condition. This finding reflects the perishable nature of tomatoes and the high risk of spoilage in informal retail environments, where handling and storage practices vary considerably. Similar observations have been reported by Eman et al. (2017), who noted that physical quality attributes such as freshness and cleanliness strongly influence vegetable purchase decisions. Likewise, Adegbola and Bamishaiye (2010) emphasized that quality considerations often dominate consumer choices for perishable food commodities in Nigerian markets.

Price was the second most important factor, explaining 22.6% of the total variance. Variables related to price stability, transparency, and perceived value-for-money loaded strongly on this factor, underscoring the sensitivity of consumers to price fluctuations in urban food markets. While affordability remains a key constraint, the findings suggest that consumers are not purely price-driven but are willing to pay modest premiums when price signals are associated with better quality. This supports earlier findings by Onu and Iliyasu (2008), who observed that Nigerian consumers often balance price considerations against perceived product quality. Similar conclusions were drawn by Idah et al. (2007), who highlighted the role of fluctuating tomato prices in shaping consumer purchasing behaviour.

The Location factor accounted for 15.1% of the explained variance, indicating the importance of convenience in retail outlet choice. Proximity to home or workplace, ease of access, and avoidance of traffic or parking challenges

were key considerations for consumers. This reflects the routine and frequent nature of tomato purchases, which are often integrated into daily commuting and household food acquisition patterns. Consistent with this finding, Oladejo and Adetunji (2012) reported that outlet proximity and reduced transaction costs significantly influence consumer choice in urban food markets. Eman et al. (2017) similarly noted that accessibility plays a critical role in determining where households source fresh produce.

Attitude was the least dominant factor, explaining 9.9% of the variance, but it remains an important behavioural dimension. Consumers’ satisfaction from purchasing good-quality tomatoes and their confidence in judging freshness by sight and touch suggest that personal beliefs and experiential knowledge influence buying decisions. This aligns with Ajzen’s (1991) Theory of Planned Behaviour, which posits that attitudes shape purchase intentions and actual behaviour. Empirical support is also provided by Adegbola and Bamishaiye (2010), who found that consumers’ confidence in assessing produce quality contributes to repeat patronage and outlet loyalty.

The findings confirm that consumer preferences for tomato purchases in Kano Metropolis are multidimensional. While quality and price are the dominant determinants, purchasing decisions are also shaped by location-related convenience and individual attitudes. These results reinforce existing empirical evidence that consumer behaviour in perishable food markets reflects an interplay of economic, perceptual, and behavioural factors.

Table 3: Factors Influencing Consumer Preferences for Tomato Purchases

Factor	Retained Variables (Key Attributes)	Factor Loadings	Variance %
Quality	Minimal transport damage	0.960	25.93
	Proper shading and cooling	0.955	
	Clean display and handling	0.895	
	Packaging / grading	0.845	
Price	Consistent size/variety supply	0.935	22.62
	Frequent price changes	0.894	
	Transparent pricing	0.892	
	Willingness to pay for quality	0.867	
Location	Proximity to home/workplace	0.904	15.10
	Ease of access	0.884	
	Traffic/parking avoidance	0.797	
Attitude	Satisfaction from buying good tomatoes	0.857	9.92
	Confidence judging quality	0.739	
	Preference for visual freshness	0.738	
Total Variance Explained			73.56

Source: Field Survey, 2025

CONCLUSION

This study provides empirical evidence on consumers' preferences for retail tomato purchases in Kano Metropolis, Nigeria. The findings indicate that consumer preferences are shaped by an interplay of socio-economic characteristics, retail outlet attributes, and perceived quality cues. Among these factors, freshness-related attributes associated with handling and storage practices emerged as the most influential determinants of purchase decisions. Price considerations and outlet convenience also play significant roles, reflecting the cost sensitivity and routine nature of tomato purchases in urban households.

The results carry important implications for tomato market development and urban food policy.

RECOMMENDATION

- i. Efforts to improve tomato retail systems in Kano Metropolis should prioritize improved post-harvest handling practices, including better shading, reduced stacking damage, and cleaner retail environments, to preserve product freshness and reduce losses.
- ii. Enhancing basic retail infrastructure, particularly in traditional open markets and street vending locations, would improve hygiene and reinforce positive quality perceptions among consumers.
- iii. Policies that support transparent pricing practices and improve access to tomato retail outlets within residential and high-traffic areas could enhance consumer welfare and market efficiency.
- iv. Capacity-building initiatives for tomato retailers on quality maintenance and simple grading practices may further strengthen consumer confidence and satisfaction.
- v. Overall, aligning retail market improvements with consumer preferences offers a practical pathway for enhancing the performance of urban tomato markets and strengthening food access in Kano Metropolis.

REFERENCES

- Abaje, I. B., Ati, O. F., & Iguisi, E. O. (2016). Recent Trends and Fluctuations of Annual Rainfall in the Sudano-Sahelian Ecological zone of Nigeria: Risks and Opportunities. *Journal of Geography and Regional Planning*, 9(3), 45–55.
- Adegbola, A. J., & Bamishaiye, E. I. (2010). Economic Analysis of Tomato Losses in Ibadan Metropolis, Oyo State, Nigeria. *African Journal of Basic & Applied Sciences*, 2(3–4), 87–92.
- Adeoye, I. B., Yusuf, S. A., & Balogun, O. L. (2019). Tomato Value Chain and Post-Harvest Losses in Nigeria. *Journal of Agricultural Economics and Development*, 8(2), 45–55.
- FUDMA Journal of Agriculture and Agricultural Technology, Volume 12 Number 2, June 2026, Pp 1-8
- Ajzen, I. (1991). The Theory of Planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Akinyele, B. O., & Akinkulore, R. O. (2017). Post-Harvest Handling and Losses of Tomato in South-West Nigeria. *Journal of Stored Products and Postharvest Research*, 8(4), 21–28.
- Ayanwale, A. B., & Amusan, L. M. (2020). Structure and Performance of Vegetable Markets in Kano State, Nigeria. *Nigerian Journal of Agricultural Economics*, 10(1), 67–79.
- Bartlett, M. S. (1954). A Note on the Multiplying Factors for various Chi-Square Approximations. *Journal of the Royal Statistical Society: Series B (Methodological)*, 16(2), 296–298.
- Emana, B., Afari-Sefa, V., Dinssa, F. F., Ayana, A., Balemi, T., & Temesgen, M. (2017). Characterization of Vegetable Production and Marketing Systems in Ethiopia. *Agricultural & Food Economics*, 5(1), 1–20.
- Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of Convenience Sampling and Purposive Sampling. *American Journal of Theoretical and Applied Statistics*, 5(1), 1–4. <https://doi.org/10.11648/j.ajtas.20160501.11>
- FAO. (2017). *Food and Agriculture Data: Crops and Livestock Products*. Food and Agriculture Organization of the United Nations.
- Field, A. (2018). *Discovering Statistics using IBM SPSS Statistics* (5th ed.). Sage Publications.
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2014). *Multivariate Data Analysis* (7th ed.). Pearson Education.
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate Data Analysis* (8th ed.). Cengage Learning.
- Hutcheson, G., & Sofroniou, N. (1999). *The Multivariate Social Scientist: Introductory Statistics using Generalized Linear Models*. Sage Publications.
- Idah, P. A., Ajisegiri, E. S. A., & Yisa, M. G. (2007). Assessment of Postharvest Losses of Tomato (*Lycopersicon esculentum* Mill.) in Selected Markets in Minna, Niger State, Nigeria. *African Journal of Agricultural Research*, 2(7), 335–338.
- Kaiser, H. F. (1974). An Index of Factorial Simplicity. *Psychometrika*, 39(1), 31–36. <https://doi.org/10.1007/BF02291575>
- Lancaster, K. J. (1966). A New Approach to Consumer Theory. *Journal of Political Economy*, 74(2), 132–157.
- MacCallum, R. C., Widaman, K. F., Zhang, S., & Hong, S. (2001). Sample Size in Factor Analysis. *Psychological Methods*, 6(1), 84–99.
- Mukurumbira, A. R., Mlambo, S., & Chagwiza, C. (2020). Consumer Preferences and choice of

- Fresh Produce Retail Outlets in Urban Markets. *Journal of Agribusiness and Rural Development*, 55(1), 35–47.
- Muhammad, S., Oyinbo, O., & Rekwot, G. Z. (2021). Structure and Conduct of Tomato Marketing in Northern Nigeria. *Nigerian Journal of Agricultural Economics*, 11(2), 89–101.
- Nunnally, J. C. (1978). *Psychometric Theory* (2nd ed.). McGraw-Hill.
- Okello, J. J., Lagerkvist, C. J., & Karanja, N. (2015). Consumers' Willingness to Pay for Safer Vegetables in Urban Markets. *Food Policy*, 55, 80–90.
- Oladejo, J. A., & Adetunji, M. O. (2012). Consumer behaviour and Retail Outlet choice in Urban Food Markets in Nigeria. *Journal of Agricultural Science*, 4(4), 230–239.
- Onu, J. I., & Iliyasu, A. (2008). Economics of Tomato Production in Yola North and South LGAs of Adamawa State, Nigeria. *Journal of Social Sciences*, 17(3), 243–249.
- Olofin, E. A. (2019). Climate and Weather in Kano Region. In E. A. Olofin (Ed.), *Geography of Kano State* (pp. 45–62). Kano University Press.
- Oyinbo, O., & Rekwot, G. Z. (2014). Marketing Efficiency of Tomato in Selected Markets of Kaduna State, Nigeria. *International Journal of Agricultural Economics and Rural Development*, 7(1), 45–54.
- Reardon, T., Timmer, C. P., Barrett, C. B., & Berdegue, J. (2012). The Rise of Supermarkets in Africa, Asia, and Latin America. *American Journal of Agricultural Economics*, 85(5), 1140–1146.
- Shehu, A., Iyortyer, J. T., & Mshelia, S. I. (2018). Analysis of Tomato Marketing in Borno State, Nigeria. *Journal of Agricultural Economics and Development*, 7(3), 38–47.
- Tavakol, M., & Dennick, R. (2011). Making Sense of Cronbach's Alpha. *International Journal of Medical Education*, 2, 53–55.
- Tongco, M. D. C. (2007). Purposive Sampling as a Tool for Informant Selection. *Ethnobotany Research and Applications*, 5, 147–158.
- Yong, A. G., & Pearce, S. (2013). A Beginner's Guide to Factor Analysis. *Tutorials in Quantitative Methods for Psychology*, 9(2), 79–94.