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VALUE ADDITION IN PRACTICE: IDENTIFIED PRODUCTS AMONG TOMATO PROCESSORS IN KADUNA AND OYO STATE, NIGERIA

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ABSTRACT: *This study analysed value-added tomato products and pricing structures to assess the depth of value addition in the processing sectors of Kaduna and Oyo States. Primary data were used to identify key products, including blended/ground tomato, purée tomato, sun-dried tomato, oven-dried tomato, and chopped tomato. The results showed that processing activities are dominated by blended and sun-dried tomato products, reflecting a concentration on low-technology, traditional processing methods. However, significant price differentials existed across products, with dried and chopped tomato forms commanding higher prices, indicating higher levels of processing associated with greater economic value. The study concluded that tomato processing has substantial potential to improve profitability and food security, but is constrained by limited technological advancement and limited diversification. Promoting investment in improved processing technologies, strengthening market access, and supporting small-scale processors in transitioning to higher-value activities are critical to unlocking the full potential of the tomato value chain.*

KEYWORDS: Value-addition, Tomato processing and Post-harvest loss.

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INTRODUCTION

Tomatoes are the most widely processed vegetable crop globally and rank second among the most consumed crops after potatoes (Gatahi, 2020). According to the Food and Agriculture Organisation (FAO, 2023), global tomato production reached approximately 186 million tonnes in 2022, cultivated over about 4.5 million hectares. Leading producers include China, India, Turkey, the United States, Egypt, Italy, Mexico, Brazil, Spain, and Nigeria (FAO, 2023). Within this global landscape, Nigeria stands out as the largest producer of tomatoes in sub-Saharan Africa and ranks among the top fifteen producers worldwide (FAO, 2024). This production advantage is supported by favourable agroecological conditions and a large domestic market, positioning the country as a strategic hub for developing the tomato value chain.

Despite its production strength, Nigeria continues to face significant challenges related to post-harvest losses and seasonal gluts, which undermine market stability and farmers' income. Globally and domestically, tomato processing is a vital component of the agro-processing industry, offering substantial potential for value addition, reducing post-harvest losses, and enhancing food security (Kundal et al., 2024). This also helps extend shelf life, enhance product utility, and stabilise supply across seasons. Processing not only mitigates wastage during peak harvest periods but also creates opportunities for industrial growth, employment generation, and income diversification within the agricultural sector.

The increasing demand for processed tomato products reflects shifting consumer preferences, especially in urban centres where convenience and time-saving food options are highly valued (Vidyarthi & Evans, 2019). As lifestyles evolve and urbanisation intensifies, the reliance on semi-processed and fully processed tomato products continues to grow, further underscoring the importance of strengthening tomato processing systems in Nigeria.

LITERATURE REVIEW

Concept of Value Addition

The concept of value addition is grounded in several economic and business theories, including Value Chain Theory (Porter, 1985). This theory explains how businesses can gain a competitive advantage by optimising different stages of production, processing, and marketing to maximise product value (Ceil, 2019). The theory posits that a business's activities can be disaggregated into primary and support functions, and by optimising and coordinating these activities, firms can reduce costs, improve efficiency, and enhance customer value (Porter, 1985). In the context of tomato processing, the value chain includes multiple stages: input procurement (seeds, fertilisers), cultivation, harvesting, transportation, processing (into paste, powder, canned, or dried forms), packaging, storage, distribution, and marketing. Each of these stages presents opportunities for value addition, cost savings, or improved product quality.

Application of the Concept of Value Addition to Tomato Processing

1. Inbound Logistics (Sourcing of Raw Tomatoes): Efficient input sourcing strategies such as contract farming, vertical integration with local farmers, and cold chain systems can reduce post-harvest losses and ensure a steady supply of quality tomatoes. Studies

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by Muhanji et al. (2011) emphasised the importance of timely, efficient sourcing of raw materials to avoid spoilage and quality deterioration.

2. Operations (Processing Activities): Investment in modern processing equipment, skilled labour, and mechanised systems can improve yield, reduce waste, and enhance the consistency of processed products. Omotayo and Aremu (2020) noted that the mechanisation of tomato processing in Nigeria has been hindered by high energy costs and a lack of technical skills.

3. Outbound Logistics (Storage and Distribution): Effective packaging, cold storage, and transport logistics help maintain product quality and expand market reach. Tomato processors can reduce spoilage and access distant markets if cold chains and warehousing infrastructure are in place (Kitinoja et al., 2011)**.**

4. Marketing and Sales**:** Differentiation through branding, certifications (e.g., NAFDAC registration), and ICT-based marketing can enhance product visibility and consumer trust. Adekoya et al. (2019) highlighted that ICT tools help agro-processors in Nigeria reach more customers and improve price negotiation.

5. Service (After-Sales, Customer Feedback): Engaging customers for feedback and building long-term relationships can inform quality improvement and product development.

History of Tomato Processing

Tomato processing originated in the United States in the early 1920s. By the mid-20th century, Greece's tomato processing industry had expanded to about 53 plants, with over half established during the 1960s and 1970s to manage surplus production (Ronald, 1977). Over time, the Mediterranean Basin became the second-largest global hub for tomato processing, with Italy leading in output, reflecting the early industrialisation and regional specialisation of the sector.

The global demand for tomato products has driven significant expansion in processing activities. Tomato is now one of the most widely cultivated and consumed horticultural crops worldwide, with global production exceeding 180 million tonnes annually, of which approximately 40 million tonnes are processed into various products (Kaundal et al., 2024). This demand for processed tomato products continues to grow for several reasons, including population growth, urbanisation, rising incomes, ethnic diversity, and changing lifestyles and dietary patterns (Vidyathi & Evans, 2019). As a result, processing has become a crucial strategy for managing seasonal surpluses, preventing spoilage, and ensuring all-year-round availability.

Nigeria produces about 1.8 million tonnes of fresh tomatoes per year, the largest area harvested for tomatoes in Africa (541,800 hectares), yet over 50% is lost to poor storage, transport, and lack of processing infrastructure (Ugonna et al., 2015). Yields are among the lowest on the continent at roughly 4 tonnes per hectare, compared to Egypt's 39 tonnes/ha and South Africa's 79 tonnes/ha (Akinniran, 2020). Smallholder farmers on 0.5–4 hectares account for about 90% of production, and sun drying remains the most common processing technique at the farm level (Oyediran, 2014).

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The industrial processing landscape across Africa remains thin. A detailed 2024 overview from Tomato News reports that while about 25% of the global tomato harvest is processed, less than 15% is processed in Africa (The processing tomato, 2024). Only five African countries: Algeria, Tunisia, Egypt, South Africa, and Senegal have meaningful processing capacity, together handling 2.5 million tonnes in 2022. Tunisia has the oldest processing industry on the continent, dating to 1903, while Algeria has made the most dramatic recent progress, increasing triple-concentrate production from 9,000 tonnes in 2013 to over 70,000 tonnes by 2021.

In Nigeria, the most prominent industrial venture is Aliko Dangote's processing factory in Kadawa, Kano State, launched in March 2016 with a $20 million investment covering 17,000 hectares and a daily capacity of 1,200 tonnes. Tomato Jos, a Nigerian company, established a $5 million unit in Kaduna State, sourcing from 350 local growers. In April 2025, Nigeria launched what was described as "Africa's largest tomato processing plant", a $30 million facility in the north aimed at reducing reliance on tomato paste imports, particularly from China (Chilamphuma, 2025).

Advantages of Tomato Processing

Tomato processing offers a wide range of advantages that address both food security and economic development concerns. One of its most fundamental benefits is that it enables year-round consumption of tomato products, overcoming the seasonal and perishable nature of the fresh fruit.

Processing enhances the health value of tomatoes rather than diminishing it. Thermal processing has been shown to increase the bioaccessibility of lycopene content by two- to nearly four-fold compared to fresh fruit, the primary health-promoting carotenoid in tomatoes (Dewanto et al., 2002; Kamiloglu et al., 2014). This enhances household nutrition, particularly in communities where dietary diversity is limited.

Proper packaging of processed products, whether canned, bottled, or dried, improves convenience for transport and reduces the mechanical and biological damage that fresh tomatoes suffer during handling and transit (Arah et al., 2015). Product diversification supports farmer income, rather than depending solely on the volatile fresh market.

Tomato processing encourages cooperative ventures among small-scale producers. Studies in Nigeria and Kenya highlighted that farmers who participate in organised groups gain better access to resources, markets, and bargaining power, reducing exploitation by middlemen (Amurtiya & Adewuyi, 2020).

Types of Processed Tomato Products

1. Whole Pack Tomatoes

Whole pack tomatoes are processed by blanching and peeling fresh tomatoes, which are then packed whole in containers. The peels and drippings are often recovered and returned to the cans. No food colouring is used, preserving the product's natural look. This method is suitable for both open-field and greenhouse varieties (Hanf, 2014; Santos et al., 2017; Stepanova & Nurgalieva, 2018; Soares et al., 2019).

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2. Tomato Juice

Juice production requires specific tomato varieties. Tomatoes are cured, crushed, and centrifuged to separate the juice from seeds and skins. The juice may be seasoned with salt or acidified with lemon juice or citric acid to improve shelf stability. The juice is then canned, sealed, pasteurised, and stored (Hanf, 2014; Santos et al., 2017).

3. Tomato Paste and Ketchup

- Tomato purée is made by reducing fresh pulp (with ~5–6% solids) to about half its original volume to reach 10–12% solids.
- Tomato paste involves further reduction to achieve 35–40% solids, resulting in a thick, dark red product with a robust flavour.
- Ketchup is produced similarly but includes spices like garlic, cloves, pepper, vinegar, and sugar. After concentration, the paste is jarred and pasteurised (Thalib, 2019; ShahMonarch & ShahHarshada, 2019).

4. Dried Tomatoes

Sun drying is a cost-effective technique suitable for small-scale processors. Tomatoes are halved, placed cut-side up on mesh trays, and left to dry in the sun, covered with muslin or netting. Drying takes 2–5 days, resulting in a leathery product with a moisture content of 15–20%. Further drying yields brittle flakes or powder. In poor weather, solar or mechanical driers are used to maintain temperatures below 65°C, preserving taste and nutrients (Šrámek et al., 2015; Zubkova et al., 2023).

Common Types of Processors and Processed Tomatoes in Nigeria

1. Smallholder Farmer-Processors (Nano/Micro): They are the most common type, where tomato farmers rely on open-air sun-drying as their primary processing technique. These are essentially subsistence-level operations using minimal equipment, producing dried tomatoes of variable (often poor) quality due to contamination with dirt and inconsistent drying.

2. Small and medium Enterprises (SMEs): These operate semi-mechanised facilities producing tomato paste, dried tomato, and powder on a modest scale. These are agro-allied companies in Nigeria. They are found among listed and non-listed firms, with SMEs representing a significant but struggling segment. The challenges of this group include poor electricity supply, high interest rates, and difficulty procuring equipment parts.

3. Large Industrial Processors: These include companies like Tomato Jos (Kaduna), Dangote Tomato Processing, and Erisco Foods, which operate large-scale canning and paste production lines. These industrial processing and packaging enterprises work with partner farmers to secure supply.

Empirical Review of Related Studies

Ugonna et al., (2015) noted that Nigeria produces about 1.8 million tonnes of fresh tomato annually but loses over 50% to poor storage, transportation, and a lack of processing enterprises. However, it was noted that the development of tomato for industrial use is currently

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gaining momentum in the area of production of tomato juice, paste, ketchup,purée, and powder, but only a few Nigerian tomato varieties are suitable for industrial processing.

Tijani (2022) found that 54.9% of the beneficiaries trained on Tomato Value Addition Technology (TVAT) in Oyo State had high knowledge of TVAT, 60.6% had favourable attitudes, and actual utilisation was low at only 69.7%. Major barriers identified were lack of funds (68.3%), NAFDAC registration requirements (66.9%), and high cost of processing equipment (57.0%). Income, cooperative membership, and knowledge predicted utilisation of specific products: paste, ketchup,purée, and dried slices.

Adesiyan et al., (2022) showed that the willingness to process tomatoes among farmers in Ogun State was constrained by income, operating system, and family size, which positively influenced willingness, while lack of awareness had a negative effect.

Adeoye et al. (2018) showed that consumers in Ibadan had a strong preference for tomato paste (86.05%), with much lower demand for ketchup/whole peel (3.72%), dried tomato/powder (1.86%), and juice/sauce (1.40%). Weekly purchases increased from 293.3g in peak season to 397.6g in lean season, confirming that processed products serve as substitutes when fresh supply is scarce.

METHODOLOGY

Sampling and Data Collection

A quantitative cross-sectional research design was adopted for the study. Primary data were collected from 317 tomato processors (156 in Oyo and 161 in Kaduna) using a semi-structured questionnaire. The study employed a near-census approach by leveraging the full population of identifiable tomato processors in Oyo State and Kaduna State. A comprehensive mapping exercise conducted under the "Research Supporting African MSMEs to Provide Safe and Nutritious Food (RSM2SNF)" project, anchored by Michigan State University, systematically identified processors operating within wholesale markets and recognised processing clusters. Snowball sampling was further applied within the already-mapped network to trace additional operators who were not formally registered but were actively engaged in tomato processing. Two processor categories were identified: regular processors and custom millers. Regular processors procure raw tomatoes and transform the produce into various value-added forms, while the custom millers function as specialised service providers who process tomatoes on behalf of clients who supply their own raw produce.

RESULTS AND DISCUSSION

Identified Value-Added Products by Processors in the Study Area

The distribution of value-added tomato products across the study area in Table 1 showed clear differences in product specialisation by processor type and location. Overall, sun-dried tomato emerged as the most dominant value-added product, accounting for 56% of total processors. This is followed by blended/ground tomato at 38%**,** while other products, such as chopped

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tomato (3.2%), oven-dried tomato (3.2%), and purée tomato (1.6%) were produced at low levels.

Across processor types, custom millers showed a strong concentration in blended/ground tomato production (96%), indicating their primary role in providing basic processing services. On the other hand, regular processors demonstrated a higher level of diversification, particularly in sun-dried tomato production (87%), as well as slight engagement in oven-dried (4.5%) and chopped tomato (4.5%) production. However, both processor groups exhibited minimal involvement in purée tomato production. This result suggested limited engagement in semi-industrial or higher-value processing activities.

Geographically, notable differences were seen between Kaduna and Oyo States. In Kaduna State, processors engaged more in sun-dried tomato (65%), moderate participation in blended tomato (24%), while chopped and oven-dried products (5%) had low participation. On the other hand, Oyo State showed a relatively balanced distribution between sun-dried tomato (46%) and blended tomato (52%), but had negligible participation in chopped tomato processing and low engagement in drying technologies. Overall, purée tomato production remained consistently low across the two states (1.9% in Kaduna and 1.3% in Oyo), reflecting a wide gap in advanced processing capabilities.

Table 1. Identified Value-Added Products by Processors in the Study Area

	All (%)	Processor type (%)		State (%)	
		Regular processors	Custom millers	Kaduna	Oyo
Products produced:					
Blended/Ground tomato	38	3	96	24	52
Purée tomato	1.6	2.5	0	1.9	1.3
Oven-dried tomato	3.2	4.5	0.85	5	1.3
Sun-dried tomato	56	87	2.5	65	46
Chopped tomato	3.2	4.5	0.85	6.2	0

Source: *Computed from field survey data, 2024/2025*

Identified Value-Added Product by Price

The results in Table 2 showed value-added tomato products by price, revealing significant variation in average volume of value-added products produced, the number of observations per product, and the price received per unit across products. Among all product categories, sun-dried tomato recorded the highest number of observations (176 processors) but a relatively moderate production volume (15,849 kg) by the processors, coupled with the highest average price (₦3,204/kg). This indicated a strong market valuation despite lower aggregate output compared to some other alternatives.

Oven-dried tomato recorded a relatively small number of observations (10 processors) but the highest production volume (27,720 kg) among all categories, with a high unit price of ₦2,662/kg. Similarly, chopped tomato (10 observations) showed moderate production (9,690

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kg) and a relatively high price (₦2,626/kg), suggesting its positioning as a semi-processed, higher-value product.

Blended/ground tomato dominated in terms of participation (119 observations) after sun-dried tomato product and substantial production volume of 25,702 kg, but recorded a significantly lower average price of ₦618/kg, indicating its status as a low-value, bulk processing product. Meanwhile, purée tomato, despite having the lowest participation (5 observations), showed a relatively high price (₦2,000/kg) and moderate output of 2,926 kg. This reflected its higher level of processing and value addition.

Table 2: Identified Value-Added Product by Price

	Number of observations	Mean values Quantity produced (kg)	Price or fee per kg (naira)
Blended/Ground tomato	119	25,702	618
Purée tomato	5	2,926	2,000
Oven-dried tomato	10	27,720	2,662
Sun-dried tomato	176	15,849	3,204
Chopped tomato	10	9,690	2,626

Source: *Computed from field survey data, 2024/2025*

DISCUSSION

The dominance of sun-dried and blended tomato products observed in the study, as shown in Table 1, reflected the technological and economic realities of small- and medium-scale tomato processors in developing economies, especially in Kaduna and Oyo States. Generally, dried tomatoes attracted a higher price and produced more volumes than others. Oven-dried is better in terms of volume of production and food safety, even though the average price is lower.

Unfortunately, very few processors engage oven-dried tomato processing method. Sun drying is a low-cost, accessible preservation method that requires minimal capital investment and infrastructure, making it highly suitable for rural processors (Mercer, 2008; Abdulmaliki et al., 2014). In Ogun State, Nigeria, for instance, sun drying was found to be the most common processing technique adopted by tomato farmers, used by nearly 85% of respondents (Oyediran, 2014). However, while sun drying extends shelf life and effectively reduces moisture content, the quality of sun-dried products is often inferior due to contamination with dirt and sand and slower drying rates compared to solar or oven methods (Abdulmaliki et al., 2014; Shuaibu, 2022).

Solar drying has been shown to extend tomato shelf life by up to six months and offers an emerging low-technology post-harvest preservation method particularly suited to developing countries (Al Maiman et al., 2021). The high prevalence of sun-dried tomato production, especially among regular processors and in Kaduna State, suggests adaptation to post-harvest loss challenges and seasonal gluts, where drying during harvest seasons when prices are low and selling in off-seasons when prices are high can improve producers' income (Mukaminega, 2008)

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Similarly, the prominence of blended and ground tomato production, particularly among custom millers, reflected the dominance of primary processing activities within the value chain. Primary processing, such as cleaning, milling, and blending, constitutes the first stage of value addition and is typically less capital-intensive than secondary processing, such as paste, purée, and powder production (Abdulmaliki et al., 2014; Ugonna et al., 2015). In Nigeria, the development of tomato for industrial use is gaining momentum in products such as juice, paste, ketchup, purée, and powder, yet most products are still sold in fresh or minimally processed forms (Ugonna et al., 2015; Amurtiya & Adewuyi, 2020). Custom millers' concentration in blending and grinding positions them as service providers rather than value creators, limiting their ability to capture the higher margins associated with secondary processed products (Ramappa & Manjunatha, 2017; Ja'afar-Furo et al., 2011). The capital-intensive nature of canning and paste production meant that only a small percentage of Nigeria's tomato output is absorbed by the industrial processing sector (Abdulmaliki et al., 2014).

Globally, processed tomato markets are dominated by products such as paste, sauce, ketchup, and purée, with paste alone accounting for the largest single outlet for processing tomatoes (Kaundal et al., 2024; Vidyarthi & Evans, 2019). The negligible engagement with higher-value products such as purée and chopped tomato in the study area reflects barriers such as inadequate processing technology, high capital requirements, limited technical expertise, and weak market linkages. Specifically, the lack of funds, the high cost of processing equipment, and regulatory requirements such as NAFDAC registration have been identified as prominent constraints on the utilisation of tomato value-addition technologies in Nigeria (Tijani, 2022). Despite strong domestic demand for processed products like paste and sauces, the sector remains constrained by infrastructure deficits and inconsistent supply chains, with over 50% of fresh tomatoes lost post-harvest (Ugonna et al., 2015; Danmaigoro et al., 2024). Addressing these barriers would enable processors to better align with evolving consumer preferences while maximising economic returns within Nigeria's tomato sector.

The observed state-level differences further reflect variations in agro-processing ecosystems. Kaduna State's higher engagement in drying and product diversification is consistent with its location within Nigeria's major tomato-producing belt in the north, where post-harvest losses are particularly severe and estimated at over 45%, and drying serves as a critical preservation strategy (Korie et al., 2023). Storage alone accounts for 70.5% of farmer-level losses in Kaduna, indicating the importance of drying as a coping mechanism (Korie et al., 2023). Similarly, across northern Nigeria's tomato belt, including Kano and surrounding states, farmers commonly resort to primary processing such as drying during glut periods to salvage produce that would otherwise be lost (Olayemi et al., 2011; Suleiman et al., 2024). In contrast, Oyo State's stronger involvement in blended tomato production suggests a more market-oriented processing system, likely driven by urban demand in cities such as Ibadan, where consumers purchase tomato products frequently, over 50% at least once weekly and show a strong preference for paste and fresh forms for stew preparation (Adeoye et al., 2018; Oladejo & Oladiran, 2014).

The overall pattern of the value addition remains skewed toward low-value, minimally processed products, indicating underutilisation of the full potential of the tomato value chain. Global trends increasingly favour convenience-oriented and shelf-stable products such as paste, purée, ketchup, and sauces, driven by urbanisation, rising incomes, and changing lifestyles (Vidyarthi & Evans, 2019; Kaundal et al., 2024). Expanding into these segments could significantly enhance profitability, reduce waste, and improve food security outcomes,

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particularly given that Nigeria currently loses over 50% of its fresh tomato output to post-harvest deterioration (Ugonna et al., 2015). Demand for processed tomato products in comparable developing economies has been growing at approximately 30% annually (Kaundal et al., 2024), yet the Nigerian processing sector remains constrained by infrastructure deficits, inadequate capital, and weak market linkages (Abolarin et al., 2022; Danmaigoro et al., 2024).

The established demand for dried tomato across both northern and southern Nigeria presents an immediate opportunity to strengthen the processing segment of the value chain. Rather than pursuing capital-intensive industrial processing technology, a more pragmatic way can begin with investment in improved sun-drying technologies, such as a solar cabinet. This will address the problem of quality and hygiene limitations of traditional open-air drying while remaining affordable and accessible to smallholder processors. This will enable tomato processors in the study area to compete in both domestic and global markets

The observed price differences across tomato products in Table 2 reflected the degree of processing, shelf-life extension, and market demand dynamics within the tomato value chain. Products such as sun-dried and oven-dried tomatoes, which command the highest prices in this study, have significantly longer shelf life and reduced perishability. Drying reduces moisture content from over 90% to as low as 9%, decreasing product weight and volume by up to 92% and substantially extending storage duration (Mukaminega, 2008). This is consistent with broader evidence that drying technologies, whether sun, solar, or mechanical, are critical value-addedstrategies that increase product marketability and reduce post-harvest losses (Khandezod, 2018; Abdulmaliki et al., 2014). In Nigeria, fresh tomato prices exhibit pronounced seasonal variation, with off-season prices averaging approximately ₦18,000 per basket, compared to ₦6,400 during the peak season, a nearly threefold difference (Achoja & Gbigbi, 2019).

This seasonal price gap creates strong economic incentives for value addition through drying, which transforms a highly perishable commodity into a shelf-stable, tradeable product with markedly higher returns per unit (Beaulah et al., 2025; Ugonna et al., 2015). Farmers involved in such processing have been found to increase their income by 15–40% compared to those selling unprocessed produce (Bhai et al., 2026), and studies of dried tomato products show that processor income becomes inversely related to fresh tomato prices—rising precisely when raw material is cheapest (Harahap, 2020).

Similarly, oven-dried tomato, though less common, combines improved quality control with reduced contamination risk compared to traditional sun-drying, justifying its relatively high price. Sun-dried products, while more accessible, are often "infested with dirt" due to direct exposure during drying (Abdulmaliki et al., 2014). The high production volume observed for oven-dried tomato in this study may indicate emerging adoption of improved processing technologies among a subset of processors, a trend consistent with the broader push toward value addition in Nigerian tomato processing (Ugonna et al., 2015).

On the other hand, the dominance of blended/ground tomato production, coupled with its low price (₦618/kg), reflects its classification as a primary processing activity with minimal value addition. The fivefold price difference between blended tomato and sun-dried tomato observed in this study underscores the economic returns associated with greater processing and shelf-life extension. This is consistent with evidence that basic processing activities, such as blending, add limited economic value compared to secondary processing into paste, purée, or dried products, where the capital-intensive nature of industrial processing restricts entry but yields

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higher margins (Abdulmaliki et al., 2014; Akinniran, 2020). The high participation in blending suggests low entry barriers requiring minimal equipment and technical expertise (Azeez et al., 2025).

The relatively high price of purée and chopped tomatoes indicated the importance of intermediate processing stages in value creation. These products require additional steps, most notably concentration into a purée/paste base, followed by preservation and packaging, which improve usability and help processors meet demand for more convenient, shelf-stable tomato ingredients (Kumari & Singh, 2018).

Expanding into higher-value, more shelf-stable products such as dried and purée forms remains a plausible pathway to reduce losses and, hence, improve profitability, though the binding constraints appear to be equipment, finance, and compliance capacity rather than consumer interest alone. The pricing structure observed in this study highlighted the economic advantage of transitioning from bulk, low-value processing (blending) to high-value preservation and transformation (drying and semi-processing). Strengthening access to improved processing technologies, enhancing market linkages, and supporting product diversification will be critical for enabling processors to capture greater value within the tomato value chain.

CONCLUSION AND RECOMMENDATION

Nigeria's tomato sector stands at a critical crossroads rich in production potential, yet constrained by limited value realisation. This study clearly demonstrates that although a large proportion of processors are actively transforming tomatoes, the overwhelming focus remains on primary processing activities, such as blending and sun-drying. At the same time, high-value products, including purée and chopped tomatoes, which command premium prices but remain underutilised due to technological, financial, and market constraints. The evidence presents a compelling case that value addition is not merely an option; it is the pathway to profitability, resilience, and sustainability within the tomato value chain. By shifting from volume-driven, low-margin processing to quality-driven, high-value transformation, processors can significantly increase incomes, reduce post-harvest losses, and stabilise market supply across seasons. Unlocking this potential, however, requires deliberate action. Investments in processing infrastructure, modern preservation technologies, capacity building, and market linkages are essential to reposition the sector. Also important is the need to support small and medium-scale processors in overcoming entry barriers into higher-value segments. Ultimately, transforming Nigeria's tomato production into real economic gains depends on one strategic shift: moving beyond processing for survival to processing for value. Such a transition will not only enhance profitability for processors but also contribute meaningfully to national food security, employment generation, and agro-industrial development.

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