



PROFITABILITY ANALYSIS OF VALUE-ADDED PORK PRODUCTS IN MAKURDI METROPOLIS, BENUE STATE, NIGERIA

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ABSTRACT: *The study evaluated the profitability of marketing value-added pork products in Makurdi Metropolis. Multi-stage sampling technique was used in selecting the marketers of pork products. Data were collected from 90 respondents, randomly selected using a structured questionnaire. Data analysis was carried out using descriptive statistics such as frequency distributions, percentages, mean scores, and net return analysis. Sensitivity analysis was carried out to capture how responsive the outcome is to fluctuations in prices. The major value-added methods are peppering (64%) and smoking (46.67%). The result showed that pork marketing is profitable and viable with an annual profit of N146,240, a benefit-cost ratio of 1.13 and a 13% return on investment. The major challenges encountered are competition from other meat products and regulatory compliance issues. The major recommendations are capacity building and funding.*

KEYWORDS: Profitability, Pork products, Marketing, Value-Added, Makurdi Metropolis.



INTRODUCTION

Livestock marketing plays an important role in the generation of income and food security in Nigerian households. Pork consumption is on the increase in urban centers due to its affordability and nutritional value (Chauvin et al. 2012). It enriches the consumer food with protein and other essential macro- and micronutrients (Song et al. 2021). It has a variety of cuts, and value-added products that are available in the market and reported as the most consumed red meat globally (Kim et al. 2023). With increasing urbanization, consumers' tastes and preferences become modified. Hence pork is mostly processed into value-added forms such as grilled, smoked, fried, peppered, and cured products to enhance flavor and shelf-life and appeal more to consumers (Lebret and Čandek-Potokar, 2022). The area is dominated by informal small-scale operators with value-added strategies that enhance market value and shelf life and widen distribution options. These farmers process their produce and package and brand their products so as to increase the prices and gain access to higher-value marketplaces (Napitupulu et al. 2009).

It was also reported by Gage et al. (2024) that value addition deals with product differentiation through quality packaging and shelf-stability with notable implications on market competitiveness, price risks in fresh produce markets, and financial viability.

The concept of value addition in agriculture in the developing economies is becoming an acceptable strategy for both government and other stakeholders so as to improve the income generation potential of the rural communities. The value-added products address the evolving consumer preferences for convenience and health while offering opportunities for farmers and processors to diversify their products and penetrate new market segments. Therefore, value addition techniques not only enhance the economic value of agricultural produce but also provide a resilient sector geared towards sustainable innovation and growth.

The diversification of pork products through value-added processes is expected to address the demand by consumers while increasing sales and profit of the marketers

However, marketers are still faced with various obstacles that may negatively impact market performance. These obstacles or challenges come in different forms. The challenges that affect the marketing of pork comprise low quality standards, policy enforcement inconsistencies, and infrastructure weaknesses (Gage et al., 2024; Ajala and Adesehinwa, 2007). Previous studies demonstrate that value addition in pork products is a highly profitable venture in North Central and Southern Nigeria, driven by urban demand (Akomaye, 2025; Odoh et al., 2022; Ezeibe 2010). However, there is a paucity of localized, empirical data focusing specifically on the profitability of value-added pork products in Makurdi Metropolis of Benue State.

The study, therefore, analyzes the cost-return analysis in marketing pork products so as to contribute to target-driven policies for value addition enhancement in pork marketing. The objectives are to:

- i. identify the methods of adding value to pork
- ii. estimate the profitability of the pork products,
- iii. analyse the marketing challenges.



Theoretical Literature

Profitability analysis of value-added pork products evaluates the economic viability, cost efficiency, and revenue-generating potential of transforming live pigs into processed items (e.g., dressed, smoked, sausages, and roasted pork). This significantly boosts revenue for local agribusinesses (Odoh et al. 2022). In Makurdi Metropolis, the analysis highlights how local pork marketers transform farm produce to maximize returns and meet market demand. To satisfy market demand involves the theory of marginal utility. The theory considers the satisfaction derived from consumption of the products. This implies that the consumers are willing to pay a premium price for the convenience, flavor, and ready-to-eat nature of processed pork, thereby increasing revenue generated. Profitability is heavily optimized when processors successfully minimize variable costs like seasoning, packaging, and fuel wood while maximizing shelf stability. In addition, value-added activities capture the untapped profits between farm-gate prices and retail (Odunuga et al. 2026).

The study centers on value addition and production theory. Production theory examines the technical relationship between physical inputs and final processed outputs. It posits that a firm operates within a specific production function where value-added output (e.g., smoked, fried, and ready-to-eat pork) depends on a combination of variable inputs as provided by the processors, such as pork, fuel wood, and spices against some fixed structures. The value added was evaluated using the Net Return Analysis model. The total expenses of all items utilized in adding value and returns generated were critically analyzed for their profitability. The profitability ratios: Return on investment Return on Investment (ROI), Operating Ratio (OR), and Benefit Cost Ratio (BCR), were employed to evaluate the profitability and viability of the enterprise (Nwankwo et al. 2025). In the study carried out by Akomolafe et al.2025, calculated the gross margin and used it as a proxy for value-added to confirm that pig production and pork marketing are profitable. Ezeibe employed net return analysis to show that pig production is profitable.

METHODOLOGY

Study Area

Makurdi Metropolis is located in the North Central geopolitical zone along the lower Benue River valley. It lies approximately between latitudes 7°44'–7°50'N and longitudes 8°29'–8°38'E. The area experiences a tropical sub-humid climate, with a 7-month wet season (April to October) and a short dry season (November to March), which has its effects on livestock farming.

It has highly commercial locations such as Wadata, Modern Market, and Wurukum, where the processing and marketing of pork are concentrated. Makurdi is often recognized as a regional distribution center for livestock and other agricultural products and is therefore a strategic place to study value-added pork enterprises.



Sampling Techniques

Multistage, purposive, and simple random sampling techniques were used in the selection of respondents. In the first stage, six markets were purposively selected based on the large concentration of pork marketers. The sampled markets are: Modern market, High level market, Wadata market, Kanshio market, Wurukum, and North Bank.

In the second stage, with the assistance of market union leaders, a reconnaissance survey was carried out to identify the respondents in each of the six selected markets. A total of 90 respondents were sampled for data needed.

Data Collection

A structured questionnaire was administered to pork vendors selected. Cost and revenue data were collected for profitability analysis, while data on various value-added methods and challenges were also generated.

Study Limitation: Some of the respondents were not literate enough to address the questions effectively. However, trained enumerators were engaged to facilitate the dissemination of the questionnaire.

Data Analysis

Data were analyzed using descriptive and inferential statistical tools.

Descriptive statistics was used to summarize value-added practices.

The cost-return analysis was estimated using Net Return analysis and profitability ratios analysis.

Net Return Analysis model

$$NR = TR - TC$$

$$TC = TVC + TFC$$

Where TC = Total cost

TR = Total revenue

NR = Net return

TFC = Total fixed cost

TVC = Total variable cost

Profitability Ratios Analysis

Benefit-Cost ratio (BCR): $\text{Total Revenue} \div \text{Total Cost}$

Rate of Return on investment (ROI): $\text{Net Profit} \div \text{Total Cost}$

Sensitivity analysis was carried out to show profitability changes under price variations.



The marketing challenges were analyzed using mean output from a 5-point likert scale with the following options: Always = 5, Often = 4, Sometimes = 3, Rarely = 2, and Never = 1.

The cutoff point for the decision rule is 3.

Decision rule: Any item with mean >3 is positive. This means that challenges rating 3.00 or higher were accepted as major challenges for pork marketing whereas those that were rated below 3.00 were considered minor challenges.

RESULTS AND DISCUSSION

Value-Addition Methods in Pork Marketing

Table 1 shows value added to pork by pork marketers who process fresh pork in various methods to enhance its flavor, texture, presentation, and overall appeal.

Table 1: Frequency Distribution of Respondents by Primary Method of Value-Addition

Method	Percentage
Grilling	40.00
Peppering	64.00
Curing	30.00
Marinating	33.33
Frying	36.00
Smoking	46.00

Source: *Survey, 2025.*

The result in Table 1 shows that the preferred methods are peppering (64%), smoking (46.67%), and grilling (40%). These methods are targeted at improving the quality of the product and in line with market demand. This shows some level of consumer-driven value addition. This corroborates the study by Ugwu (2026), which indicates that the most preferred pork products were peppered and smoked pork. Odoh et al. (2022) also indicated that cooked and smoked pork are major products in pork-based agribusiness in Abakaliki Metropolis. Curing, marinating, and frying are moderately used (30–36%).

The results have strong indications for spicy and smoked pork, which enhances taste and increases the willingness of consumers to pay. The marketers focus on techniques that align with market demands and hence increase their profit.

Cost and Return Analysis

Table 2 presented results on the costs, returns, and profitability analysis of the major method of marketing value-added pork products in the study area.

**Table 2: Average Annual Costs and Returns of Pork Products**

Items	Value (₦) / Ratio
Total Fixed Cost (Depreciation/yr)	165,260
Total Variable Cost	988,500
Total Cost (TC)	1 153,760
Total Annual Revenue (TR)	1,300,000
Net Profit (NP)	146,240
Benefit-Cost Ratio (BCR: TR ÷ TC)	1.13
Return on Investment (ROI: NP ÷ TC)	0.13
Operating Ratio (OR: TVC ÷ TR)	0.76

Source: Survey, 2025.

The results in Table 2 show that pork marketing is profitable with a net profit of ₦146,240. The BCR of 1.13 shows that every ₦1 invested yields ₦1.13 in return. The value is greater than one; therefore, it is profitable. In addition, the return on investment of 13% shows that for every ₦1 spent, ₦0.13 is realized as net profit. Ezeibe, 2010 reported that pig production is profitable and viable with a BCR of 1.30. This corroborates the work by Nwankwo et al (2025), which indicated an ROI of 40% and BCR of 1.40 in pig production in Ogun State. The study by Odoh et al. (2022) also indicated that pork-based agribusinesses are profitable with an ROI value of 1.37. The results indicate that value addition in pork is profitable and viable. The high demand may be driven by the desire of consumers to improve on their protein intake. In the study carried out by Akomolafe et al. (2025) on pig value chain, the value added to pork by pork marketers who process fresh pork into roasted pork per month was ₦216,073.63, while the value added by pig farmers who raise pigs to table size per month was ₦474,832.04. The result indicates that both sectors are viable and should be integrated. And according to James et.al (2016), integration leads to high gross margin, influences choice of marketing channel, and improves market participation, thereby encouraging commercialization of smallholder dairy farming.

Sensitivity analysis was carried out in Table 3 to show how changes in price affect revenue from sales.

Table 3: Sensitivity Analysis

Items	TR (₦)	NP (₦)	BCR	Decision
Survey Result	1,300,000	146,240	1.13	Profitable
+10% Increase in TR	1,430,000	276,240	1.24	Better return
-10% Decrease in TR	1,170,000	16,,240	1.01	Still profitable

Source: Survey, 2025.

Two case scenarios were analyzed in Table 3: a 10% increase in Total revenue and a 10% decrease in Total revenue. The results show that pork marketing is still profitable, despite a 10% reduction in the total revenue. This indicates that the demand for pork is quite high in the area. The reason may be attributed to the relative ease of raising pigs when compared to other animals. Secondly, pork is regarded as a rich alternative source to protein (Ochugbua, 2020; Anyiro et al., 2013). In Enugu State, Ezeibe (2010) also reported that a pig is one of the major items presented during marriage and burial ceremonies. According to Pluhar (2010), pork consumption is becoming increasingly popular as a substitute for traditional meat sources such



as beef, chicken, mutton, and chevon, with chicken being the primary competitor to pork consumption.

Challenges in Marketing Value-Added Pork Products

Mean output from likert scale was employed in analyzing challenges in pork marketing. Challenges with values of 3.00 and above have more effect than values lower than 3.00.

Table 4: Challenges in Marketing Value-Added Pork Products

Challenges	Always 5	Often 4	Sometimes 3	Rarely 2	Never 1	ΣFX	Mean	Decision Rule
Distribution and Logistics	50	44	35	27	16	231	2.60	Reject
Regulatory and compliance issues	142	80	39	18	12	328	3.64	Accept
Competition from other meat products	185	84	48	14	5	356	4.00	Accept
Low income	40	18	47	52	20	220	2.44	Reject
Consumer preferences and Tastes	120	44	72	30	80	309	3.43	Accept
Poor funding	45	25	51	42	29	228	2.53	Reject
Lack of awareness by consumers of the benefits of pork	71	51	63	21	20	270	3.00	Accept

Source: *Field Survey, 2025.*

The result in Table 4 shows that the main challenges faced in pork marketing are competition from other meat products (4.00) and regulatory compliance issues (3.64). Adiele (2020) also pointed out that the demand for other meat is one of the major challenges facing the pork industry in Umuahia, Abia State. In addition, Akinyele et al. (2024) reported that the swine fever in September 2020 led to a downward trend for pig and pork prices relative to other meat products, which shows more preference for those products. In another study carried out in Taraba State, it was indicated that consumers prefer chicken, beef, and fish to pork (Efken, 2022). This may have implications for the prices of the meat products. In addition, the challenges identified in slaughterhouses such as inadequate returns, security, poor working environment, unregistered facilities, and unskilled workers, may result in regulatory compliance issues for the marketers (Akhigbe and Akaeze 2023, Adesola, et al 2024). Overcoming these challenges would pave way for higher quality of the products and more profit for the marketers.



CONCLUSION

Value addition in agriculture is needed to enhance profitability for the farmers and equip them on how to provide safe, quality brands and varieties of well-packaged food to the consumers. In the area, pigs are usually marketed live by farmers in local slaughter slab, where little or no value is added to the product. There is need for investment in processing and value addition of pigs in the area to harness the full potential of the enterprise. To realize the full potential of pig production, it is crucial to channel efforts towards further research on how to develop a robust and sustainable pig value chain.

Although the study showed a high profitability rating, competition from other meat products and regulatory compliance are major challenges.

Based on the findings, the following recommendations are made:

Government and non-governmental organizations and stakeholders should put up capacity-building and training programs that will improve on market strategies, product quality, and regulatory compliance issues. Secondly, an awareness campaign is required to sensitize the consumers on the nutritional benefits of pork. This will pave the way for more demand, higher profit, and income for the marketers.

Marketers should form cooperative groups. This will enhance access to funding, which will facilitate the acquisition of processing facilities such as cold rooms, which increase the shelf life of pork.

Extension workers through the cooperative groups should encourage the marketers to have their own pig farms so as to reduce the total cost of production.

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