

Advancing Sustainable Packaging Practices: Benchmarking and Standardization in Ghana's Food Industry



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ABSTRACT

This study investigates the state of packaging standards and benchmarking practices within Ghana's food packaging sector, with particular attention to the sustainability implications of regulatory compliance. Using a cross-sectional survey of 530 respondents, including consumers, manufacturers, and packaging experts in Accra and Kumasi, the study assessed awareness, knowledge, and adoption of key packaging standards, including the Codex Alimentarius and Ghana's LI 1541 labelling law. The findings revealed low compliance levels among SMEs, stemming from limited regulatory enforcement, knowledge gaps, and cost-related barriers. In contrast, multinational firms demonstrated stronger alignment with international standards. The study identified consumer distrust in local product labeling as a significant hurdle to market competitiveness and outlined how proper adherence to packaging benchmarks could enhance product credibility, public health, and export potential. Drawing on the Sustainable Development Goals (particularly SDG 12.3 and 12.5), the paper offers policy recommendations to bridge the compliance gap and proposes collaborative efforts between regulators and industry. The study contributes to sustainability discourse by linking packaging standardization to circular economy principles, responsible production, and trade inclusion for developing economies.

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INTRODUCTION

Despite being rich in natural resources and a net exporter of raw materials to the European Union, India, the United States of America (USA) and China, Ghana, like many other developing African nations, struggles to export, at profitably higher values, packaged food products. The problem of poor packaging or sub-standard packaging of locally produced and packaged consumer products still persists.¹ Despite its significance to food processing, preservation and quality, many small and medium-sized African

¹ Moro Ismaila, "Packaging in Ghana: Challenges in the Packaging Design and Production Chain" (2010); Ebenezer Odji and Emmanuel Bankole Oladumiye, "Adopting Improved Need-Analysis, Persuasion and Aesthetics for Alleviating Local Product Design Fiasco," *International Journal of Research and Scientific Innovation (IJRSI)* 3, no. 11 (2019): 409–18; Evans Yeboah, Yu Jing, and Anning Lucy, "Overview of Ghana's Export and Import, FDI Inflow and Outflow: Is There Any Connection between Its Trading Partners and the Source of Its Foreign Investing Countries?," *Asian J. Interdiscip. Res* 64, no. 77 (2020): 64.

businesses have difficulty sourcing affordable quality packaging for their products.² Few packaging suppliers exist within the region, and even fewer have the ability to create packaging that meets international standards and satisfies consumer preferences.³ Poor packaging has been identified in previous studies as one of the major reasons for the failure of locally manufactured goods to compete favourably with imported goods.⁴ Several products made in Ghana are poorly packaged and as a result, they are not accepted on the local and especially in the international markets. One key reason for this trend is the absence or non-enforcement of packaging standards and specifications.⁵ Hence, this study aims to evaluate the extent of implementation of packaging design standards in the Ghanaian food packaging industry and corresponding compliance or non-compliance by manufacturers. Recommendations are subsequently made to ensure a move towards a normative application of standards and benchmarks. The objectives of this study are to:

- Ascertain the levels of awareness and compliance of manufacturers and packaging companies on existing standards in food packaging;
- Access the impact of product packaging standards' compliance on local product credibility/acceptance and competitiveness.

The following research questions underlie the study:

- To what extent are food packaging manufacturers and SMEs in Ghana aware of, and compliant with, national and international packaging standards?
- How does packaging quality and labelling influence consumer trust and preference for locally packaged food products in Ghana?

LITERATURE REVIEW

The case of application of standards in packaging design continues to receive global attention. In the U.S.A., for example, a former First Lady was reported to have proposed that the nutritional facts label on food packages be overhauled to aid consumers and ensure health sustainability.⁶ There are also the disturbing phenomena of information on labels not providing the full picture of the products' true nutritional values. Indeed, misleading claims, ranging from promises that a food can strengthen one's immune system to misleading pictures on the fronts of food labels that misrepresent the type, quality and quantity of fruits, vegetables or other contents in a processed food package, are out of control and interfere with the consumer's ability to make healthy food choices.⁷

Standardisation of packaging has therefore been a major concern among experts, policymakers and stakeholders in the Ghanaian food packaging industry.⁸ Ghanaian businesses are unable to compete

² Ebenezer Odji, Peter Oluwagbenga Odewole, and Emmanuel Bankole Oladumiye, "Application of Design Theories and Principles for Improving Local Agricultural Products and Packaging Design Aesthetics for Optimized Economic Value," *International Journal of Agriculture and Earth Science* 5, no. 2 (2019).

³ Naji Choueiri and Micah Frumkin, "Packaging in West Africa Resource Guide," *Overview. West Africa Trade Hub Technical Report. Dakar, Senegal*, 2007.

⁴ Olaleke Ogunnaiké, "Nigerians' Perception of Locally Made Products: A Study on Textile Fabrics Consumers in Kaduna State," *Petroleum-Gas University of Ploiesti Bulletin* 62, no. 1 (2010): 30–36; Ebenezer Odji, Emmanuel Bankole Oladumiye, and Femi Kayode, "The Impact of Product Discredibility on Consumer Behaviour, the Manufacturing Sector and the Designer's Interest," in *Conference of Visual Communication Design. Design in the Nigerian Context: Evolving Indigenous Design, Approaches, Concepts, Praxis and Education*, ed. T. L. Akinbogun et al. (Akure: Department of Industrial Design, Federal University of Technology, Akure., 2019), 75–92.

⁵ Agnes Obeesi, "Packaging as a Vehicle for Promoting Made-in-Ghana Products" (Kwame Nkrumah University of Science and Technology, Kumasi., 2010); Agnes Decardi-Nelson, Adam Rahman, and Ebenezer Mante, "Perceptions of Shop Operators on Packaging of Made-in-Ghana Products," *Journal of Applied Packaging Research* 11, no. 1 (2019): 3.

⁶ Dan Roberts, "Michelle Obama Unveils Food Label Proposals: 'This Will Be the New Norm,'" *The Guardian*, February 27, 2014, <https://www.theguardian.com/world/2014/feb/27/michelle-obama-proposal-food-labelling-calories-serving>.

⁷ Julie A Caswell and Daniel I Padberg, "Toward a More Comprehensive Theory of Food Labels," *American Journal of Agricultural Economics* 74, no. 2 (1992): 460–68; Alexander E Saak, "Identity Preservation and False Labeling in the Food Supply Chain," 2002; Jill J McCluskey, "A Game Theoretic Approach to Organic Foods: An Analysis of Asymmetric Information and Policy," *Agricultural and Resource Economics Review* 29, no. 1 (2000): 1–9; Ramin Khaksar et al., "Unmasking Seafood Mislabeling in US Markets: DNA Barcoding as a Unique Technology for Food Authentication and Quality Control," *Food Control* 56 (2015): 71–76.

⁸ Albert Ahenkan and Emanuel Boon, "Commercialization of Non-Timber Forest Products in Ghana: Processing, Packaging and Marketing," *Journal of Food, Agriculture and Environment* 8, no. 2 (2010): 962–69; Timothy Afful-Koomson and William Fonta,

favourably in both the local and international markets due to poor packaging.⁹ Improvement in this critical area with a global outlook will inure to the benefit of investors and exporters. It is imperative to note that companies that have been successful, made the needed investment in research and development of appropriate kinds of packaging for their products. Conducting a comparative analysis of local market available products, a previous study revealed that there was an ignorable difference in the utility derivable from local African products and their available foreign alternatives, identifying poor packaging, dwindling aesthetics and persuasiveness as the principal differentiating factors.¹⁰

A good package is not only expected to tell the truth but should also persuade the consumer to purchase the packaged product.¹¹ As indicated in previous studies, consumers make approximately 50 to 70 per cent of their buying decisions at the point of sale¹² meaning that the packaging details is the last marketing statement a producer makes before the consumer makes a decision to accept or reject a product.¹³ Proper packaging of local products could also afford local manufacturers the chance to compete favourably in the global markets. Many locally manufactured herbal medicines fail to meet international standards because of poor packaging and a lack of scientific data on the products' poorly designed packages. Although most of the locally available orthodox medicines are of quality standards, the lack of effective packaging continues to mitigate the development of local companies. Substandard product packaging is immensely degrading the actual values of locally manufactured African products, and Ghanaian products are not exempt.

In spite of over a decade's effort made by stakeholders to resolve the issue of poor packaging and labelling of locally made products, Ismaila, yet noted that the problem still persists among manufacturers within the brackets of small and medium scale enterprises.¹⁴ A country's exports would not be accepted in the international market if the product, including its packaging, does not meet established internationally accepted standards. The market competition and the consumers' desire for quality products should compel manufacturers to ensure quality in both their products and packaging. However, poor adherence to quality practices and regulations could lead to poor packaging and dwindling product quality.¹⁵ The consistent and significant growth of the Ghanaian economy in recent years has resulted in increased competition in the local market from food products imported from regions and countries such as the U.S.A., Europe, India and the Far East (China, Indonesia, Malaysia, Thailand) and so on. Consumers have thus been exposed to high-quality packaging and presently demand well-packaged, clearly labelled and environmentally friendly products.¹⁶

Although much has been done with regard to standardisation in packaging, careful observation has revealed that local manufacturers are not implementing these standards. A corollary provided by Manalili, Dorado and Otterdijk indicates that while Trade-Without-Borders is putting pressure on the packaging industries, which in turn respond in terms of fast-changing packaging technologies and practices, national quality regulatory bodies are not keeping pace, thereby limiting trade access, specifically of developing countries.¹⁷ Generally, the Ghanaian food packaging industry, with regard to standards application, has been falling short of expectations.

Economic and Financial Analyses of Small and Medium Food Crops Agro-Processing Firms in Ghana (United Nations University Institute for Natural Resour, 2015).

⁹ Daniel Agyapong, "Micro, Small and Medium Enterprises' Activities, Income Level and Poverty Reduction in Ghana-A Synthesis of Related Literature," *International Journal of Business and Management* 5, no. 12 (2010): 196.

¹⁰ Odji and Oladumiye, "Adopting Improved Need-Analysis, Persuasion and Aesthetics for Alleviating Local Product Design Fiasco."

¹¹ S. Stroh, "The Daily Challenges of Consumer Packaging," May 12, 2011, <https://graphicartsomag.com/articles/2011/05/the-daily-challenges-of-consumer-packaging/>; Odji and Oladumiye, "Adopting Improved Need-Analysis, Persuasion and Aesthetics for Alleviating Local Product Design Fiasco."

¹² S. K. Platt, "The 70 Percent Rule Revisited: Consumer In-Store Decision-Making and the Transformational Impact of Digital Signage. (Platt Retail Institute LLC.)," 2012, https://nrf.com/sites/default/files/70_Percent_Rule_Revisited_1.pdf; E. Bankole Oladumiye, "Graphic Design Theory Research and Application in Packaging Technology," *Art and Design Review* 06, no. 01 (2018): 29–42, <https://doi.org/10.4236/adr.2018.61003>.

¹³ C. Whan Park, Sung Youl Jun, and Deborah J MacInnis, "Choosing What I Want versus Rejecting What I Do Not Want: An Application of Decision Framing to Product Option Choice Decisions," *Journal of Marketing Research* 37, no. 2 (2000): 187–202; Odji and Oladumiye, "Adopting Improved Need-Analysis, Persuasion and Aesthetics for Alleviating Local Product Design Fiasco."

¹⁴ Ismaila, "Packaging in Ghana: Challenges in the Packaging Design and Production Chain."

¹⁵ Ismaila, "Packaging in Ghana: Challenges in the Packaging Design and Production Chain."

¹⁶ Decardi-Nelson, Rahman, and Mante, "Perceptions of Shop Operators on Packaging of Made-in-Ghana Products."

¹⁷ Nerlita M. Manalili, Moises A. Dorado, and Robert van Otterdijk, *Appropriate Food Packaging Solutions for Developing Countries* (Rome: FAO, 2014).

The Codex Alimentarius

Of course, a major reason for being in business, manufacturing or service-based, is to make profit.¹⁸ The wellbeing of the consumer is paramount and must be protected. The Codex Alimentarius was developed by the Codex Alimentarius Commission (CAC) to this end. It is a collection of international food standards, codes of practice, guidelines, and recommendations developed to protect the consumers' wellbeing and ensure fair practices in the food trade.¹⁹ Unfortunately, not all packaged food manufacturers adhere to the guidelines in the Codex Alimentarius. This problem is not unique to Ghana and Africa alone, as other nations, such as India, are also facing similar anomalies.²⁰

Packaging Standards and Benchmarks, SMEs and National Economic Growth

Obviously not the sole determinant of economic growth due to various reasons,²¹ SMEs are, however, significant contributors to the economic growth of developing countries.²² Previous studies have shown that the outputs of SMEs are significant factors enhancing economic growth.²³ Sustainable national growth depends partly on the thriving and sustainability of SMEs, whose sustainability is consequently dependent on the acceptance of the products and/or services rendered. Previous studies have linked the successes and failures of SMEs to the design, persuasiveness, prospects and fiascos of products and contents from the manufacturing and packaging sector.²⁴ It is therefore a truism that the application of standards in the Ghanaian food packaging industry could play an important role in breaking international trade barriers. Thus, standardised food packages could contribute to the socio-economic development of Ghana.

METHODOLOGY

The survey method was adopted for this research. Accra and Kumasi are two major commercial hubs in Ghana and, therefore, were adopted for the study. Since sample sizes between 202, 213 and 385 were adopted in similar previous studies,²⁵ a sample size of 530 was adopted, thus: Consumers = 500 (Table 1), manufacturers = 20, package producing industries = 5 and packaging experts = 5.

Table 1: Sample size

S/N	Study Area	Consumers	Manufacturers	Package Producing Industries (SME)	Packaging Experts	Total
1	Accra	250	10	5	3	268
2	Kumasi	250	10	0	2	262
Total		500	20	5	5	530

¹⁸ Ebenezer Odji, Emmanuel Bankole Oladumiye, and Oluwafemi Samuel Adelabu, "The Recall and Communicative Effectiveness of Computer Generated Imagery in Television Advertisements; A Case Study of Lagos, Nigeria," in *KEER 2016 International Conference on Kansei Engineering and Emotion Research. University of Leeds*, vol. 31, 2016, 1–16.

¹⁹ Joint FAO/WHO Food Standard Programme, "Codex Alimentarius Commission," accessed October 7, 2025, http://www.codexalimentarius.net/download/standards/34/CXG_002e.pdf; WHO/FAO., "Guidelines on Food Fortification with Micronutrients," 2006, http://www.unscn.org/layout/modules/resources/files/fortification_eng.pdf.

²⁰ Elizabeth K Dunford et al., "The Adherence of Packaged Food Products in Hyderabad, India with Nutritional Labelling Guidelines," *Asia Pacific Journal of Clinical Nutrition* 24, no. 3 (2015): 540–45.

²¹ Túlio A. Cravo, Adrian Gourlay, and Bettina Becker, "SMEs and Regional Economic Growth in Brazil," *Small Business Economics* 38, no. 2 (February 12, 2012): 217–30, <https://doi.org/10.1007/s11187-010-9261-z>.

²² Normah Mohd Aris, "SMEs: Building Blocks for Economic Growth," *Department of National Statistics, Malaysia*, 2007.

²³ Michael Oluseye Afolabi, "Growth Effect of Small and Medium Enterprises (SMEs) Financing in Nigeria," *Journal of African Macroeconomic Review* 3, no. 1 (2013); Joseph N. Taiwo and Temitope O. Falohun, "SMEs Financing and Its Effects on Nigerian Economic Growth," *European Journal of Business, Economics and Accountancy* 4, no. 4 (2016).

²⁴ Ebenezer Odji, "Influencing Children: Limitations of the Computer-Human-Interactive Persuasive Systems in Developing Societies," *International Journal of Modern Education and Computer Science* 12, no. 5 (October 8, 2020): 1–15, <https://doi.org/10.5815/ijmecs.2020.05.01>.

²⁵ O Iyiola et al., "Attitude of Customers towards Made in Nigeria Textile Industry Products," *International Journal of Civil Engineering and Technology (IJCIET)* 9, no. 12 (2018): 214–28; Odji, Odewole, and Oladumiye, "Application of Design Theories and Principles for Improving Local Agricultural Products and Packaging Design Aesthetics for Optimized Economic Value"; Odji and Oladumiye, "Adopting Improved Need-Analysis, Persuasion and Aesthetics for Alleviating Local Product Design Fiasco."

Primary data was collected through a field survey, while secondary data was collected from monographs, encyclopaedias and unpublished theses, catalogues, periodicals, newsletters, brochures, journal articles, charts, and books. Questionnaires, supported with interviews and direct observations, were adopted for the collection of study data pertaining to respondents’ preferences and thoughts. Applying the purposive sampling method, 250 structured questionnaires were administered to 250 consumers in Accra and 250 in Kumasi, respectively, making up a total of 500 consumers with a 100% return rate. Questionnaires were issued to 5 food manufacturing companies in Accra and 5 in Kumasi, making 10 food processing companies. 5 packaging producing industries were visited, and 5 packaging experts were interviewed. The sample population comprised 150 public/private workers and 150 students, 20 CEOs of SMEs from Accra and Kumasi, respectively, due to the fact that this category of people can read and make informed choices. The rest included two CEOs of regulatory bodies, three packaging authorities, and five CEOs of packaging converters in Accra. Descriptive statistics were adopted for the purpose of data analysis.

Research Hypothesis

H₀₁: There is no association between perceived credibility ratings and consumer preferences for local products expressed in grading. The Spearman's rank correlation coefficient (Equation 1) or Spearman's ρ (rho) was adopted for testing the study hypothesis. ρ = 1 means a perfect positive correlation and the value r = -1 means a perfect negative correlation.

$$\rho = 1 - \frac{6 \sum d_i^2}{n(n^2 - 1)}$$

Where ρ = Spearman rho, d² = difference in paired ranks and n = number of cases.

It was used to measure the possible correlation between consumers’ preferences (measured via product grading on a scale of 1 - 10) for local Ghanaian products and their individual perceived product credibility level of the same products. Credibility levels were scored thus: Credible = 3, Not credible = 2 and Neutral =1. Since there were paired ranks in the data collected, Equation 2 was adopted instead.

$$\rho = \frac{\sum_i(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_i(x_i - \bar{x})^2 \sum_i(y_i - \bar{y})^2}}$$

Where i = paired score.

The Pearson correlation coefficient, r was also used at p-value =.05 and N=500.

Ethical Considerations

Prior to data collection, the study adhered to ethical standards for research involving human participants. Respondents were informed about the objectives of the study and their role in it. Participation was entirely voluntary, and informed consent was obtained verbally or in writing, depending on the context. No personally identifiable information was collected, ensuring respondent anonymity and confidentiality. The data gathered were used solely for academic purposes, and all participants were assured of their right to withdraw at any point without penalty. Ethical approval was internally secured through departmental oversight at the host academic institution.

PRESENTATION OF RESULTS AND DISCUSSION

The questionnaire combined both open and closed-ended questions. Respondents were given one to two weeks to finish answering the three-page questionnaires. Efforts were made by the researchers to retrieve all questionnaires administered. The table below shows the number of responses retrieved per stratum.

Table 2: Questionnaires retrieved per stratum

Strata	Number of Questionnaires administered	Number of Questionnaires received
Stratum 1 (Consumers)	500	500
Stratum 2 (SMEs)	20	20

Stratum 3(Regulatory Bodies & Packaging Experts)	5	5
Stratum 4 (Packaging Producing Industries)	5	5
Total	530	530

A 100% return rate was recorded across all strata, indicating a high level of engagement and commitment from the selected respondents. This comprehensive response enhances the reliability of the dataset and allows for balanced representation of perspectives across consumer, regulatory, and industry stakeholders.

Objective One: The first research objective ascertained the levels of awareness, knowledge and compliance of manufacturers and packaging companies on existing standards in food packaging. Executives of selected packaging companies were assessed through a structured questionnaire, complemented with direct observations and interviews where necessary. The results are presented in Figures 1, 2, and 3.

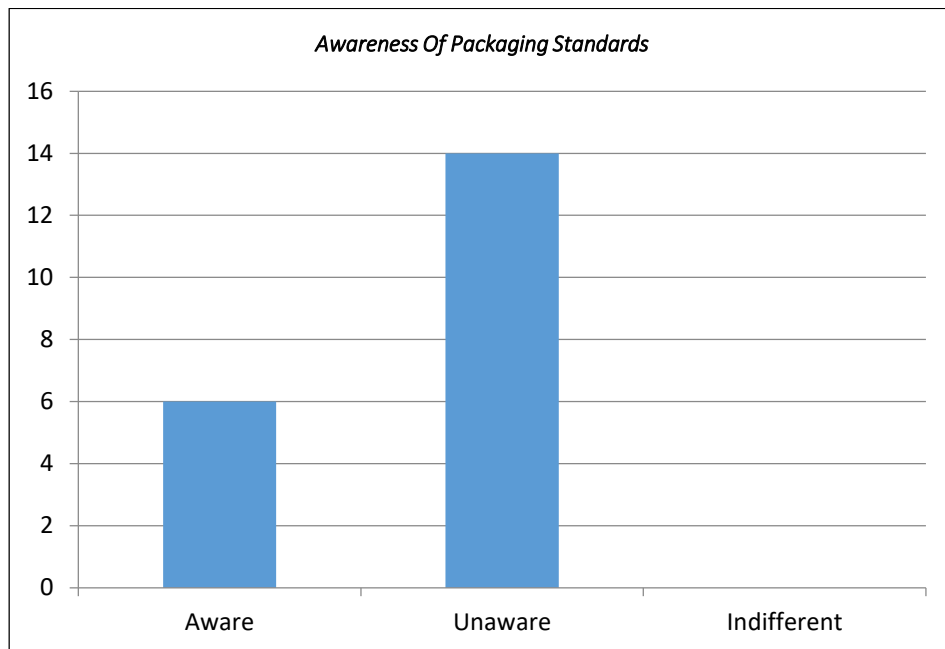


Figure 1: Awareness of Official Standards in the Packaging of Food Products

As shown in Figure 1, 70% of the surveyed packaging company executives were not aware of official packaging standards. This suggests that their packaging decisions were based largely on internally defined practices rather than formal regulatory guidelines. Only 30% of respondents demonstrated awareness of existing official packaging standards.

This low level of awareness aligns with findings by Ocloo, Akaba, and Worwui-Brown, who observed that many small-to-medium Ghanaian food businesses lack engagement with institutional packaging standards, often due to limited access to training or resources.²⁶ The absence of an authoritative local body enforcing or promoting packaging benchmarks exacerbates this disconnect, reinforcing the call for structured institutional support.

²⁶ Chosniel Elikem Ocloo, Selorm Akaba, and David Kwaku Worwui-Brown, “Globalization and Competitiveness: Challenges of Small and Medium Enterprises (SMEs) in Accra, Ghana,” 2014.

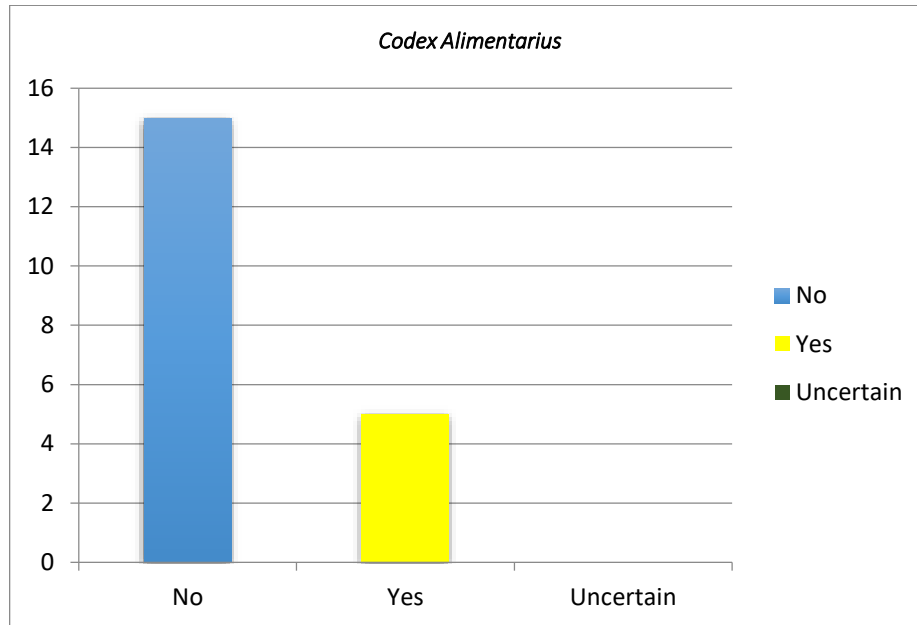


Figure 2: Knowledge of the Codex Alimentarius

Further assessment of respondents' knowledge of international guidelines revealed that 75% of companies lacked familiarity with the Codex Alimentarius, a key global standard for food safety and packaging (see Figure 2). Only 25% demonstrated an appreciable understanding.

The implications are noteworthy. As Lindh, Olsson, and Williams point out, knowledge of packaging regulations and sustainability benchmarks is foundational for aligning local industry practices with global trends — especially in emerging economies seeking export competitiveness.²⁷ This knowledge gap suggests the need for targeted capacity building within Ghana’s packaging ecosystem.

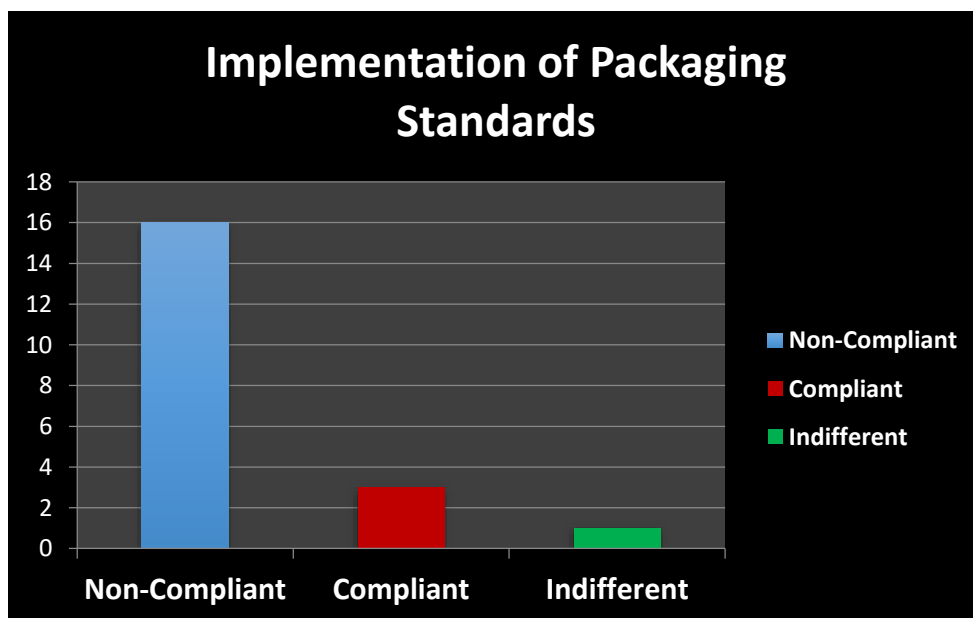


Figure 3: Level of Adherence to Packaging Standards

²⁷ Helena Lindh, Annika Olsson, and Helen Williams, “Consumer Perceptions of Food Packaging: Contributing to or Counteracting Environmentally Sustainable Development?,” *Packaging Technology and Science* 29, no. 1 (January 2016): 3–23, <https://doi.org/10.1002/pts.2184>.

As shown in Figure 3, 80% of the companies surveyed did not implement any formal standards in their food packaging processes. Only 15% of respondents indicated both awareness and application of relevant standards during the manufacturing and packaging of food products, while 5% remained indifferent or unsure in their responses.

Several reasons were cited for this low level of compliance. These included the high costs associated with meeting regulatory requirements, bureaucratic inefficiencies within oversight institutions, and concerns over the competence of regulatory personnel—factors that often led to delays and procedural bottlenecks in the certification process. Additionally, inadequate education and awareness of packaging standards, coupled with the perceived rigidity of existing frameworks, further discouraged compliance. These findings support the assertions of Nordin and Selke, who observed that in many developing economies, mere awareness of sustainability standards does not translate into actual practice without clear institutional support and implementation mechanisms.²⁸ Similarly, Ocloo et al. highlighted the limited interaction between Ghanaian SMEs and regulatory frameworks, often due to resource constraints and perceived inaccessibility.²⁹ This underscores the need for a simplified, industry-aligned regulatory approach to build greater adherence to packaging standards in Ghana's food sector.

It can be inferred from the gathered results that most Ghanaian food packaging companies, particularly small and medium-sized enterprises (SMEs), lack adequate knowledge of formal food packaging standards. Observations by the researchers indicated that companies with international affiliations, such as Coca-Cola, Nestlé, Cadbury, and the Cocoa Processing Company, consistently demonstrated a stronger understanding of, and compliance with, established packaging standards. Their adherence appeared closely tied to institutionalised internal processes, global market requirements, and corporate policy enforcement.

This finding is consistent with the work of Nordin and Selke, who argue that multinational firms typically exhibit higher compliance with packaging standards due to their exposure to international regulatory frameworks and structured quality assurance systems.³⁰ Similarly, Ocloo et al. highlight the challenges faced by Ghanaian SMEs in navigating complex regulatory environments, citing capacity gaps, limited training, and resource constraints as key barriers to compliance.³¹ Moreover, Mutsikiwa and Marumbwa observed that in Sub-Saharan Africa, multinationals are more likely to invest in standardised packaging design and consumer safety due to brand reputation concerns and global accountability mechanisms.³²

The literature further suggests that non-compliance among SMEs often stems from a perceived disconnect between regulation and practical business realities.³³ These perceptions, combined with low enforcement and limited incentives, can result in the relegation of packaging standards to a secondary concern. However, as Ampuero-Canellas and Vila contend, consistent adherence to packaging norms enhances consumer perception, product reliability, and overall brand value.³⁴

Taken together, these findings point to the urgent need for enhanced regulatory support systems, targeted SME training, and increased collaboration between local authorities and industry stakeholders to bridge the compliance gap and promote standardisation across Ghana's food packaging sector.

²⁸ Norbisimi Nordin and Susan Selke, "Social Aspect of Sustainable Packaging," *Packaging Technology and Science* 23, no. 6 (2010): 317–26.

²⁹ Ocloo, Akaba, and Worwui-Brown, "Globalization and Competitiveness: Challenges of Small and Medium Enterprises (SMEs) in Accra, Ghana."

³⁰ Nordin and Selke, "Social Aspect of Sustainable Packaging."

³¹ Ocloo, Akaba, and Worwui-Brown, "Globalization and Competitiveness: Challenges of Small and Medium Enterprises (SMEs) in Accra, Ghana."

³² Mutnyaradzi Mutsikiwa and John Marumbwa, "The Impact of Aesthetics Package Design Elements on Consumer Purchase Decisions: A Case of Locally Produced Dairy Products in Southern Zimbabwe," *IOSR J. Bus. Manag* 8 (2013): 64–71.

³³ Pinya Silayoi and Mark Speece, "The Importance of Packaging Attributes: A Conjoint Analysis Approach," *European Journal of Marketing* 41, no. 11/12 (2007): 1495–1517.

³⁴ Olga Ampuero-Canellas and Natalia Vila, "Consumer Perceptions of Product Packaging," *Journal of Consumer Marketing*, 2006.

Objective Two: This accessed the impact of product packaging standards compliance on local product credibility/acceptance and competitiveness. To evaluate the implications of compliance with packaging standards on consumer perceptions of credibility and competitiveness of locally manufactured products, an opinion-based consumer survey was conducted. The results are summarised in Figures 4, 5, and 6.

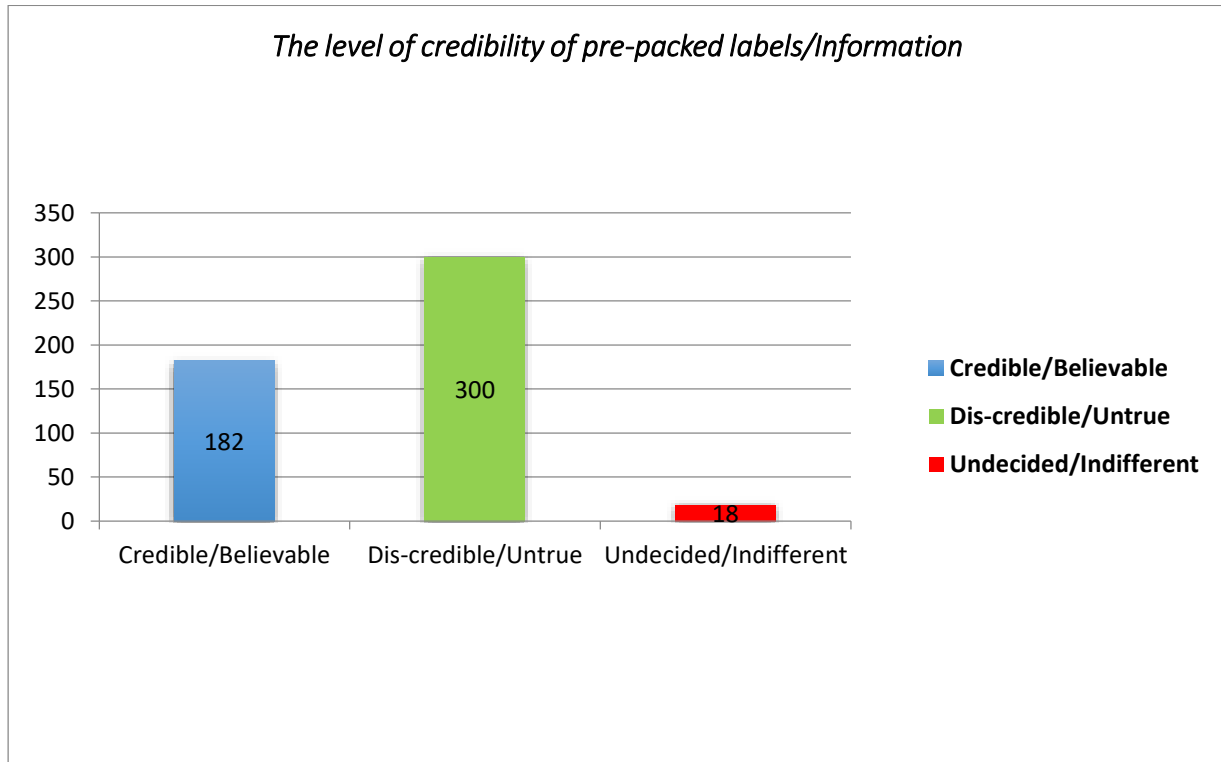


Figure 4: Opined Level of Credibility of Product Labels

Credibility of Package Labelling

As depicted in Figure 4, 60% of the respondents expressed disbelief in the claims made on the labels of local food packages. Only 36.4% found such claims credible, while 3.6% were indifferent. These results suggest a widespread scepticism among Ghanaian consumers regarding product information, reinforcing the critical role of packaging as a trust-building interface between brands and buyers.

This aligns with Rahman, Afrifah, and DeCardi-Nelson, who observed that consumer scepticism often stems from inconsistent regulatory enforcement and limited visibility of quality assurance systems.³⁵ Similarly, Byrne argues that packaging credibility is essential in shaping initial impressions and fostering long-term brand trust.³⁶ The findings also affirm Silayoi and Speece’s conclusion that informational elements on packaging significantly influence consumer behaviour, especially in contexts where brand familiarity is low.³⁷

Importantly, the disparity between producer claims and consumer perceptions underscores the communication gap in the Ghanaian food sector, a gap that packaging design and standardisation can help bridge.

Market Competitiveness of Local Packaged Products

³⁵ Adam Rahman, K A Afrifah, and Agnes DeCardi-Nelson, “Packaging Design and Environmental Sustainability: Evaluating the Plastic Carry Bag for Effective Design,” *Africa Development and Resources Research Institute Journal* 28, no. 5 (2019): 1–22.

³⁶ Derek Victor Byrne, “Current Trends in Multidisciplinary Approaches to Understanding Consumer Preference and Acceptance of Food Products,” *Foods* (MDPI, 2020).

³⁷ Silayoi and Speece, “The Importance of Packaging Attributes: A Conjoint Analysis Approach.”

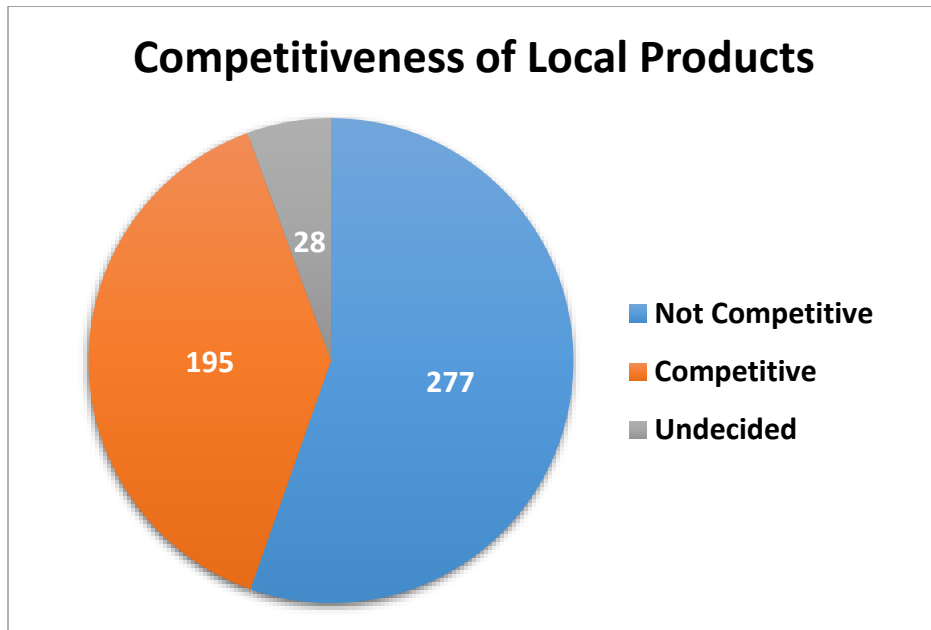


Figure 5: Market Competitiveness Of Ghanaian Products

Figure 5 presents insights into consumer perceptions of competitiveness. Here, 55.4% (277) of respondents indicated that Ghanaian food packaging does not measure up to its foreign counterparts. Only 39% (195) believed local packaging could compete favourably, while 5.6% (28) were undecided. This perception supports earlier research by Odji and Oladumiye, which documented similar sentiments in Nigeria.³⁸ They concluded that African-made products often suffer not from functional inferiority, but from weaker visual and branding presentation, making packaging design a major limiting factor in global market competitiveness. Ampuero-Canellas and Vila further reinforce this by emphasising that packaging plays a crucial role in brand positioning and consumer preference in competitive retail spaces.³⁹

Consumer Ratings and Preference Levels

The perception gap was further evident in Figure 6, where consumers rated local food packaging on a scale of 1 to 10. No respondent gave a perfect score of 10. While 46.8% rated local packaging as average (scores of 5 and 6), 33.6% rated it below average (1 to 4), and only 13.2% scored it above average (7 to 9). This suggests that although there is a base level of acceptability, local packaging is still not perceived as excellent or highly competitive.

³⁸ Odji and Oladumiye, “Adopting Improved Need-Analysis, Persuasion and Aesthetics for Alleviating Local Product Design Fiasco.”

³⁹ Ampuero-Canellas and Vila, “Consumer Perceptions of Product Packaging.”

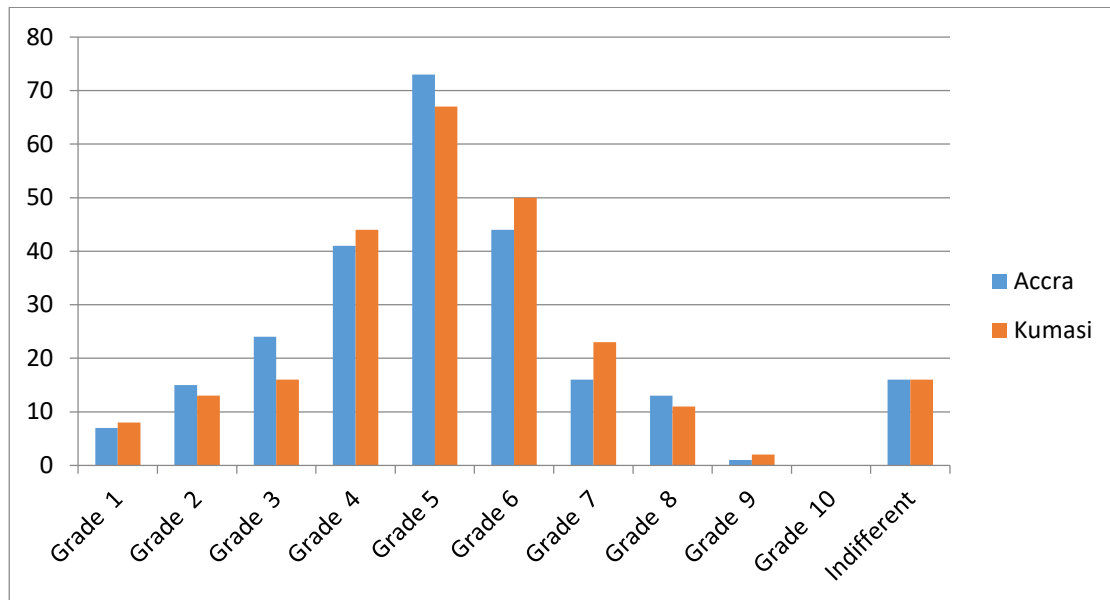


Figure 6: Consumer Ratings Of Local Ghanaian Packaged Products

These findings echo the conclusions of Mutsikiwa and Marumbwa, who observed that packaging aesthetics and perceived quality are central to product acceptance.⁴⁰ When these attributes are perceived as lacking — even when product utility is high — consumers are likely to gravitate towards better-presented foreign alternatives.

Taken together, the results affirm that local Ghanaian food packaging suffers from both credibility and competitiveness deficits in the eyes of consumers. Despite possible parity in utility with foreign alternatives, the packaging design, from label credibility to visual appeal, is not meeting the expectations necessary for market advantage. A more robust application of packaging standards, clearer labelling, and investment in design innovation are critical for enhancing acceptance and competitiveness.

Expert Insights from Regulatory Authorities

In-depth interviews conducted with officials from the **Ghana Standards Authority (GSA)** and the **Food and Drugs Authority (FDA)** provided valuable qualitative insights that contextualise the quantitative findings of this study. Five key themes emerged:

1. **Public Availability of Packaging Standards:** GSA officials confirmed that documented packaging standards exist and are publicly accessible via an online standards catalogue. Despite this, over 70% of surveyed manufacturers and packaging companies reported being unaware of these standards. This points to a significant disconnect between regulatory dissemination and industry uptake. The finding echoes **Odji and Oladumiye's** assertion that African manufacturers often exhibit shallow pre-production research practices, neglecting thorough needs assessments and compliance readiness, thereby limiting product competitiveness.⁴¹
2. **Existence of Defined Packaging Regulations:** Ghana's regulatory framework includes **Legislative Instrument (L.I.) 1541**, which outlines general labelling requirements for food, drugs, and general goods. While this framework is clear and accessible, awareness and implementation remain limited among local enterprises. This mirrors the challenges documented by **Ocloo et al.**, who noted that regulatory clarity does not necessarily lead to adoption without structured engagement and enforcement mechanisms.⁴²
3. **Low Levels of Industry Compliance:** Officials from both GSA and FDA confirmed widespread non-compliance with established standards. Only a small proportion of manufacturers were

⁴⁰ Mutsikiwa and Marumbwa, "The Impact of Aesthetics Package Design Elements on Consumer Purchase Decisions: A Case of Locally Produced Dairy Products in Southern Zimbabwe."

⁴¹ Odji and Oladumiye, "Adopting Improved Need-Analysis, Persuasion and Aesthetics for Alleviating Local Product Design Fiasco."

⁴² Ocloo, Akaba, and Worwui-Brown, "Globalization and Competitiveness: Challenges of Small and Medium Enterprises (SMEs) in Accra, Ghana."

reportedly meeting required packaging criteria. This corroborates the consumer perception data presented earlier and supports studies like Mutsikiwa and Marumbwa, which identify regulatory apathy and lack of enforcement as common barriers to packaging advancement in African contexts.⁴³

4. **Voluntary Compliance Model:** Regulatory experts clarified that, as of the time of study, standard adoption was not mandatory. Manufacturers bore the full responsibility of initiating and financing compliance efforts. This voluntary model often results in standards being sidelined, particularly by SMEs, due to perceived cost burdens and limited return on investment. The situation reflects broader concerns raised by Nordin and Selke about the need for institutional incentives and support structures to improve voluntary compliance in emerging markets.⁴⁴
5. **Consumer-Centric Enforcement Reality:** Both GSA and FDA emphasised the pivotal role of consumers in influencing industry adherence to standards. Market forces, they argued, often determine the survival or rejection of non-compliant products. This observation affirms **Silayoi and Speece’s** emphasis on the role of consumer perception in enforcing quality indirectly, even in the absence of regulatory compulsion.⁴⁵

Taken together, these expert perspectives reinforce the study’s conclusion that while Ghana possesses a functional packaging standards regime, systemic issues, ranging from weak dissemination and non-mandatory compliance to underdeveloped research culture among SMEs, hamper the realisation of its full impact on local product credibility and competitiveness.

Hypothesis Testing

The hypothesis guiding this analysis was:

H₀₁: There is no association between perceived credibility ratings and consumer preferences for local products expressed in grading.

Data presented in Figures 4 and 5 were used to develop a contingency table (Table 3) comparing consumers’ perceived credibility ratings of local Ghanaian packaged products with their grading of such products. Credibility was scored on a 3-point scale: **Credible** = 3, **Not Credible** = 2, and **Neutral** = 1. The product of each consumer’s credibility score and product grade formed an individual score used in further analysis.

Table 3: Contingency table of allotted grades versus perceived credibility of local Ghanaian packaged products

	Credible [Score = 3]	Not Credible [Score = 2]	Neutral [Score = 1]	Row Total
Grade 1	6	8	1	15
Grade 2	11	16	1	28
Grade 3	16	22	2	40
Grade 4	33	47	5	85
Grade 5	55	78	7	140
Grade 6	37	52	5	94
Grade 7	15	21	3	39
Grade 8	9	13	2	24
Grade 9	1	2	0	3
Grade 10	0	0	0	0
Indifferent	12	18	2	32
Column Total	182	300	18	

⁴³ Mutsikiwa and Marumbwa, “The Impact of Aesthetics Package Design Elements on Consumer Purchase Decisions: A Case of Locally Produced Dairy Products in Southern Zimbabwe.”

⁴⁴ Nordin and Selke, “Social Aspect of Sustainable Packaging.”

⁴⁵ Silayoi and Speece, “The Importance of Packaging Attributes: A Conjoint Analysis Approach.”

Spearman's rho correlation coefficient was used to test the relationship between consumer grading and perceived credibility. The analysis revealed a strong, positive correlation between the two variables ($\rho = 0.80$, $p < .05$, $N = 500$). A Pearson correlation analysis further confirmed this relationship, yielding a significant result, $r(498) = .84$, $p < .00001$.

Based on these findings, the null hypothesis was rejected in favour of the alternative hypothesis, affirming a statistically significant association between perceived product credibility and consumer preference for local Ghanaian packaged products.

This correlation implies that improved credibility, likely achieved through adherence to regulatory standards and packaging best practices, positively influences consumer acceptance. Proper alignment with design parameters, packaging regulations such as Ghana's L.I. 1541, the Codex Alimentarius, and frameworks from regulatory bodies such as the GSA and FDA, is thus critical to increasing product acceptability and competitiveness. This finding corroborates similar observations from Odji, Oladumiye, and Kayode, who noted that credibility perception significantly affects consumer preference for locally manufactured goods in African markets.⁴⁶

RECOMMENDATIONS

Based on the literature reviewed and the findings of this study, it is recommended that regulatory bodies such as the FDA and the GSA adopt a more robust and proactive approach to enforcing compliance with product manufacturing and packaging standards. Such enforcement should extend to SMEs, which constitute a significant portion of Ghana's food production landscape. Strengthening compliance is expected to enhance the credibility of local packaged products and positively influence consumer preferences.

Furthermore, the study identified that ignorance and limited education on packaging standards remain key barriers to compliance. It is therefore necessary for the FDA, GSA, and relevant stakeholders to implement regular orientation and capacity-building programs for manufacturers and packaging professionals. Public education should accompany these efforts to raise awareness about the importance of standards and their benefits for product quality and marketability. Institutions such as the IOPG, and other public-private advocacy platforms could play a pivotal role in these initiatives by supporting information dissemination and hosting sensitisation campaigns.

Finally, the government is encouraged to implement supportive policies that improve SMEs' access to financing for compliance-related upgrades, especially where cost has been cited as a deterrent. Beyond financing, efforts must be made to address structural challenges within the regulatory system, including bureaucratic delays, certification bottlenecks, and the perceived rigidity of certain standards. By addressing these constraints comprehensively, Ghana can create a more enabling environment for packaging innovation, standardisation, and improved product competitiveness at both the local and international levels.

CONCLUSION

Non-compliance with packaging standards remains a significant challenge within Ghana's manufacturing and packaging industry. The findings of this study point to several contributing factors, including the high cost of compliance, bureaucratic inefficiencies within regulatory bodies, limited technical competence among regulatory staff, ignorance or inadequate awareness of existing standards, and the perceived rigidity of certain regulatory frameworks. These challenges highlight the shared responsibility of government agencies, regulators, and industry actors in addressing the systemic barriers to standard adoption and implementation.

To mitigate these challenges, there is an urgent need for sustained advocacy, training, and educational interventions targeting both industry practitioners and consumers. Public sensitisation campaigns on packaging standards could increase consumer demand for quality, thereby encouraging manufacturers to adopt best practices. In addition, this study recommends the development of a comprehensive national policy for the packaging sector. Such a policy should be spearheaded by the

⁴⁶ Odji, Oladumiye, and Kayode, "The Impact of Product Discredibility on Consumer Behaviour, the Manufacturing Sector and the Designer's Interest."

IOPG, in close collaboration with the GSA, the FDA, and the Ministry of Trade, Agribusiness and Industry. A coordinated policy framework and the implementation of voluntary certification systems could drive compliance, strengthen quality assurance across the value chain, and ultimately enhance the global competitiveness of locally manufactured products.

There should be a collaborative effort between the IOPG, the Ministry of Trade, Agribusiness and Industry, and other stakeholders to develop a policy for the packaging value chain and to review the current regulatory framework to promote compliance among stakeholders in the industry.

BILIOGRAPHY

- Afful-Koomson, Timothy, and William Fonta. *Economic and Financial Analyses of Small and Medium Food Crops Agro-Processing Firms in Ghana*. United Nations University Institute for Natural Resourc, 2015.
- Afolabi, Michael Oluseye. “Growth Effect of Small and Medium Enterprises (SMEs) Financing in Nigeria.” *Journal of African Macroeconomic Review* 3, no. 1 (2013).
- Agyapong, Daniel. “Micro, Small and Medium Enterprises’ Activities, Income Level and Poverty Reduction in Ghana-A Synthesis of Related Literature.” *International Journal of Business and Management* 5, no. 12 (2010): 196.
- Ahenkan, Albert, and Emanuel Boon. “Commercialization of Non-Timber Forest Products in Ghana: Processing, Packaging and Marketing.” *Journal of Food, Agriculture and Environment* 8, no. 2 (2010): 962–69.
- Ampuero-Canellas, Olga, and Natalia Vila. “Consumer Perceptions of Product Packaging.” *Journal of Consumer Marketing*, 2006.
- Aris, Normah Mohd. “SMEs: Building Blocks for Economic Growth.” *Department of National Statistics, Malaysia*, 2007.
- Byrne, Derek Victor. “Current Trends in Multidisciplinary Approaches to Understanding Consumer Preference and Acceptance of Food Products.” *Foods*. MDPI, 2020.
- Caswell, Julie A, and Daniel I Padberg. “Toward a More Comprehensive Theory of Food Labels.” *American Journal of Agricultural Economics* 74, no. 2 (1992): 460–68.
- Choueiri, Naji, and Micah Frumkin. “Packaging in West Africa Resource Guide.” *Overview. West Africa Trade Hub Technical Report. Dakar, Senegal*, 2007.
- Cravo, Túlio A., Adrian Gourlay, and Bettina Becker. “SMEs and Regional Economic Growth in Brazil.” *Small Business Economics* 38, no. 2 (February 12, 2012): 217–30.
<https://doi.org/10.1007/s11187-010-9261-z>.
- Decardi-Nelson, Agnes, Adam Rahman, and Ebenezer Mante. “Perceptions of Shop Operators on Packaging of Made-in-Ghana Products.” *Journal of Applied Packaging Research* 11, no. 1 (2019): 3.
- Dunford, Elizabeth K, Rama K Guggilla, Anenta Ratneswaran, Jacqueline L Webster, Pallab K Maulik, and Bruce C Neal. “The Adherence of Packaged Food Products in Hyderabad, India with Nutritional Labelling Guidelines.” *Asia Pacific Journal of Clinical Nutrition* 24, no. 3 (2015): 540–45.
- Ismaila, Moro. “Packaging in Ghana: Challenges in the Packaging Design and Production Chain,” 2010.
- Iyiola, O, T T Borishade, O Ogunnaike, O J Kehinde, H Falola, C Omotoyinbo, and J Ogazi. “Attitude of Customers towards Made in Nigeria Textile Industry Products.” *International Journal of Civil Engineering and Technology (IJCIET)* 9, no. 12 (2018): 214–28.
- Joint FAO/WHO Food Standard Programme. “Codex Alimentarius Commission.” Accessed October 7, 2025. [codexalimentarius.net](http://www.codexalimentarius.net/):
http://www.codexalimentarius.net/download/standards/34/CXG_002e.pdf.
- Khaksar, Ramin, Traci Carlson, Donald W Schaffner, Mahni Ghorashi, Dieter Best, Srikanth Jandhyala, Julie Traverso, and Sasan Amini. “Unmasking Seafood Mislabeling in US Markets: DNA Barcoding as a Unique Technology for Food Authentication and Quality Control.” *Food Control* 56 (2015): 71–76.

- Lindh, Helena, Annika Olsson, and Helen Williams. “Consumer Perceptions of Food Packaging: Contributing to or Counteracting Environmentally Sustainable Development?” *Packaging Technology and Science* 29, no. 1 (January 2016): 3–23. <https://doi.org/10.1002/pts.2184>.
- Manalili, Nerlita M., Moises A. Dorado, and Robert van Otterdijk. *Appropriate Food Packaging Solutions for Developing Countries*. Rome: FAO, 2014.
- McCluskey, Jill J. “A Game Theoretic Approach to Organic Foods: An Analysis of Asymmetric Information and Policy.” *Agricultural and Resource Economics Review* 29, no. 1 (2000): 1–9.
- Mutsikiwa, Mutnyaradzi, and John Marumbwa. “The Impact of Aesthetics Package Design Elements on Consumer Purchase Decisions: A Case of Locally Produced Dairy Products in Southern Zimbabwe.” *IOSR J. Bus. Manag* 8 (2013): 64–71.
- Nordin, Norbisimi, and Susan Selke. “Social Aspect of Sustainable Packaging.” *Packaging Technology and Science* 23, no. 6 (2010): 317–26.
- Obeesi, Agnes. “Packaging as a Vehicle for Promoting Made-in-Ghana Products.” Kwame Nkrumah University of Science and Technology, Kumasi., 2010.
- Ocloo, Chosniel Elikem, Selorm Akaba, and David Kwaku Worwui-Brown. “Globalization and Competitiveness: Challenges of Small and Medium Enterprises (SMEs) in Accra, Ghana,” 2014.
- Odji, Ebenezer. “Influencing Children: Limitations of the Computer-Human-Interactive Persuasive Systems in Developing Societies.” *International Journal of Modern Education and Computer Science* 12, no. 5 (October 8, 2020): 1–15. <https://doi.org/10.5815/ijmecs.2020.05.01>.
- Odji, Ebenezer, Peter Oluwagbenga Odewole, and Emmanuel Bankole Oladumiye. “Application of Design Theories and Principles for Improving Local Agricultural Products and Packaging Design Aesthetics for Optimized Economic Value.” *International Journal of Agriculture and Earth Science* 5, no. 2 (2019).
- Odji, Ebenezer, and Emmanuel Bankole Oladumiye. “Adopting Improved Need-Analysis, Persuasion and Aesthetics for Alleviating Local Product Design Fiasco.” *International Journal of Research and Scientific Innovation (IJRSI)* 3, no. 11 (2019): 409–18.
- Odji, Ebenezer, Emmanuel Bankole Oladumiye, and Oluwafemi Samuel Adelabu. “The Recall and Communicative Effectiveness of Computer Generated Imagery in Television Advertisements; A Case Study of Lagos, Nigeria.” In *KEER 2016 International Conference on Kansei Engineering and Emotion Research*. University of Leeds, 31:1–16, 2016.
- Odji, Ebenezer, Emmanuel Bankole Oladumiye, and Femi Kayode. “The Impact of Product Discredibility on Consumer Behaviour, the Manufacturing Sector and the Designer’s Interest.” In *Conference of Visual Communication Design. Design in the Nigerian Context: Evolving Indigenous Design, Approaches, Concepts, Praxis and Education*, edited by T. L. Akinbogun, I. B. Kashim, E. L. Etsename, O. F. Kayode, and O. S. Adelabu, 75–92. Akure: Department of Industrial Design, Federal University of Technology, Akure., 2019.
- Ogunnaike, Olaleke. “Nigerians’ Perception of Locally Made Products: A Study on Textile Fabrics Consumers in Kaduna State.” *Petroleum-Gas University of Ploiesti Bulletin* 62,no.1(2010):30–36.
- Oladumiye, E. Bankole. “Graphic Design Theory Research and Application in Packaging Technology.” *Art and Design Review* 06, no. 01 (2018): 29–42. <https://doi.org/10.4236/adr.2018.61003>.
- Park, C Whan, Sung Youl Jun, and Deborah J MacInnis. “Choosing What I Want versus Rejecting What I Do Not Want: An Application of Decision Framing to Product Option Choice Decisions.” *Journal of Marketing Research* 37, no. 2 (2000): 187–202.
- Platt, S. K. “The 70 Percent Rule Revisited: Consumer In-Store Decision-Making and the Transformational Impact of Digital Signage. (Platt Retail Institute LLC.),” 2012. https://nrf.com/sites/default/files/70_Percent_Rule_Revisited_1.pdf.
- Rahman, Adam, K A Afrifah, and Agnes DeCardi-Nelson. “Packaging Design and Environmental Sustainability: Evaluating the Plastic Carry Bag for Effective Design.” *Africa Development and Resources Research Institute Journal* 28, no. 5 (2019): 1–22.
- Roberts, Dan. “Michelle Obama Unveils Food Label Proposals: ‘This Will Be the New Norm.’” *The Guardian*, February 27, 2014. <https://www.theguardian.com/world/2014/feb/27/michelle-obama-proposal-food-labelling-calories-serving>.

- Saak, Alexander E. "Identity Preservation and False Labeling in the Food Supply Chain," 2002.
- Silayoi, Pinya, and Mark Speece. "The Importance of Packaging Attributes: A Conjoint Analysis Approach." *European Journal of Marketing* 41, no. 11/12 (2007): 1495–1517.
- Stroh, S. "The Daily Challenges of Consumer Packaging," May 12, 2011.
<https://graphicartsomag.com/articles/2011/05/the-daily-challenges-of-consumer-packaging/>.
- Taiwo, Joseph N., and Temitope O. Falohun. "SMEs Financing and Its Effects on Nigerian Economic Growth." *European Journal of Business, Economics and Accountancy* 4, no. 4 (2016).
- WHO/FAO. "Guidelines on Food Fortification with Micronutrients," 2006.
http://www.unscn.org/layout/modules/resources/files/fortification_eng.pdf.
- Yeboah, Evans, Yu Jing, and Anning Lucy. "Overview of Ghana's Export and Import, FDI Inflow and Outflow: Is There Any Connection between Its Trading Partners and the Source of Its Foreign Investing Countries?" *Asian J. Interdiscip. Res* 64, no. 77 (2020): 64.

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