International Conference on Sustainable Tourism and Entrepreneurship

Vol. 01 No.01 August 2026, ISSN: 3163-2912

Formulation and Sensory Evaluation of Bintan Americano a Local Based Functional Beverage for Culinary Tourism and Destination Branding

Fitriana Baitanu[1], Hetty Yulianti Sihite[2]

[1] *Department of Tourism and Hospitality Management, Politeknik Bintan Cakrawala, Bintan, Indonesia*
[2] *Department of Tourism and Hospitality Management, Politeknik Bintan Cakrawala, Bintan, Indonesia*

[*]*Corresponding author. Email: fitrianabaitanu@gmail.com*

ABSTRACT

The global beverage industry has experienced significant growth in functional and plant-based products, driven by increasing health consciousness and wellness-oriented consumption [1]. Coconut water has gained attention as a natural isotonic beverage due to its high content of electrolytes, antioxidants, and bioactive compounds [1,2].This study aims to develop a preliminary formulation of Bintan Americano, an innovative beverage combining Sangit coffee and Genjah coconut water from Bintan, Indonesia, and to examine its potential as a culinary tourism product that reflects local identity and supports destination branding. An experimental approach was applied through product formulation and sensory (organoleptic) evaluation involving 30 respondents using a 5-point hedonic scale.The results indicate a high level of consumer acceptance, with mean scores of 4.30 for taste, 4.10 for aroma, 3.90 for appearance, and 4.20 for overall acceptance. Financial analysis shows a payback period of 1.74 months and a projected return on investment (ROI) of 688%, indicating strong commercial feasibility. These findings highlight the potential of Bintan Americano as a functional beverage innovation and a distinctive culinary tourism product, contributing to destination branding, local resource valorization, and enhanced visitor experiences in Bintan.

Keywords: *functional beverage, coconut water, coffee innovation, sensory evaluation, culinary tourism, destination product.*

1. INTRODUCTION

The global beverage industry has experienced rapid growth, particularly in the segment of functional and plant-based beverages, driven by increasing consumer awareness of health, wellness, and sustainable consumption [1]. There has been a significant rise in consumer health consciousness, especially after the COVID-19 pandemic, and this trend is expected to continue through 2026 as part of long-term consumption behavior. As a result, the demand for healthier food and beverage products has increased, including ready-to-drink (RTD) tea with low or no calorie, sugar, and fat content. According to GlobalData's Q1 2023 survey, 78% of Indonesian consumers consider health and well-being in their food and beverage purchasing decisions.

This trend is further supported by recent market developments, where consumers are increasingly choosing products with higher nutritional value, natural ingredients, and functional benefits. In line with this trend, the Indonesian RTD tea and coffee market is expected to grow significantly. It is projected to increase from USD 1.79 billion in 2024 to USD 3.55 billion by 2033, with a CAGR of 7.90%. This growth is influenced by the wider use of vending machines in public places and transportation areas, as well as the increasing purchasing power of consumers.

In addition, the development of new flavors continues to create opportunities for market growth and attract consumer interest [8]. This market development is closely linked to the rising popularity of functional beverages, which are designed to provide additional health benefits beyond basic nutrition.

Functional beverages are defined as drinks that provide additional physiological benefits beyond basic nutrition, including hydration, antioxidant activity, and metabolic support [1]. This trend has encouraged the development of innovative products that combine natural ingredients with added health value.

Coconut water has emerged as a natural functional beverage due to its high electrolyte content, such as potassium, sodium, and magnesium, which contribute to body hydration and fluid balance [2]. Furthermore, coconut water contains bioactive compounds, including phenolics and flavonoids, which exhibit antioxidant and anti-inflammatory properties [3]. These characteristics make coconut water a promising base ingredient for functional beverage development.

Coffee is one of the most widely consumed beverages worldwide and is recognized as a major source of dietary antioxidants, particularly polyphenols such as chlorogenic acids [4]. Previous studies have shown that coffee consumption is associated with various health benefits, including the potential reduction of chronic disease risk due to its antioxidant properties [4]. The combination of coffee with plant-based ingredients represents an emerging trend in beverage innovation aimed at enhancing both functional and sensory attributes [1].

Indonesia, particularly Bintan Island, has abundant natural resources such as coconut and locally produced coffee. However, the utilization of these resources in innovative beverage development remains limited. Most existing products are still conventional and have not fully maximized the potential of integrating local ingredients into high-value functional beverages. Therefore, innovative approaches are needed to align local potential with global consumption trends.

This study responds to the growing demand for functional and locally inspired beverages by introducing the preliminary development of *Bintan Americano*, a novel beverage combining coconut water and coffee. The product aims to deliver both health benefits and distinctive sensory characteristics while reflecting local identity. This combination is expected to create a balanced flavor profile by integrating the natural sweetness of coconut water with the bitterness of coffee.

This research focuses on evaluating consumer acceptance of the developed product and assessing its potential as an innovative functional beverage and a culinary tourism product. Bintan Island is a growing tourism destination in the Riau Islands Province, and the development of distinctive local beverages can play a significant role in enriching tourist experiences and strengthening destination branding [9]. As a preliminary study, it emphasizes early-stage product development and consumer perception rather than advanced laboratory analysis. The findings are expected to contribute to the development of functional beverages based on local resources and to provide a foundation for future research, particularly in the context of culinary tourism and destination-based product innovation

1.1. Research Background

The increasing demand for functional beverages is closely related to shifts in consumer lifestyles toward healthier consumption patterns. Modern consumers tend to prefer beverages that not only provide refreshment but also offer additional health benefits. This shift creates opportunities for developing innovative beverage products that incorporate natural and functional ingredients [1]. In the context of regional development, local resources such as coconut and coffee in Bintan have not yet been fully optimized into value-added products. This condition highlights the importance of innovation in transforming local commodities into competitive products with higher economic value.

1.1.1. Innovation of Local Based Beverage Products

The development of local-based beverage products represents a strategic approach to enhancing the economic value of regional commodities. The combination of coconut water and coffee in the Bintan Americano concept reflects an innovative effort to integrate two distinct ingredients into a unique beverage product. This innovation not only emphasizes sensory attributes such as taste and aroma but also highlights functional benefits and local identity. Furthermore, from a culinary tourism perspective, locally inspired signature beverages serve as important experiential touchpoints for tourists, contributing to destination differentiation and memorable visitor experiences [9]. Consequently, the product has the potential to attract both health-conscious consumers and tourists seeking authentic, culturally distinctive beverages that reflect the identity of Bintan Island.

1.1.2. Research Scope and Limitations

This study is limited to the preliminary stage of product development and focuses on evaluating consumer acceptance through sensory assessment. It does not include advanced laboratory analysis, such as detailed nutritional composition or shelf-life testing. These limitations are acknowledged as part of the early development phase. Future research is recommended to conduct comprehensive analyses, including nutritional evaluation, stability testing, and broader consumer studies to strengthen the scientific validity and market potential of the product [2].

2. LITERATURE REVIEW

2.1. Functional Beverages

The development of functional beverages has gained significant attention in recent years due to increasing consumer awareness of health and wellness. Functional beverages are designed to provide additional physiological benefits beyond basic nutritional value, including antioxidant properties, hydration support, and disease prevention [1]. This growing demand has encouraged both researchers and industry practitioners to explore innovative formulations using natural ingredients.

Coconut water has been widely studied as a natural isotonic beverage due to its rich electrolyte composition, including potassium, sodium, and magnesium [2]. In addition to its hydration benefits, coconut water contains bioactive compounds such as phenolic acids and flavonoids, which contribute to its antioxidant capacity [3]. These properties make coconut

water a suitable base ingredient for developing functional beverages.

In addition to coconut-based beverages, coffee is also recognized as a significant source of bioactive compounds, particularly polyphenols such as chlorogenic acids, which exhibit strong antioxidant activity [4]. Several studies have shown that regular coffee consumption may contribute to reducing the risk of chronic diseases, including cardiovascular diseases and metabolic disorders [4].

Recent trends in beverage innovation have focused on combining traditional ingredients with plant-based components to enhance both functional and sensory attributes. The integration of coffee with natural ingredients, such as fruit extracts or plant-based liquids, has been explored to create novel beverages with unique flavor profiles and added health benefits [1].

However, existing studies have primarily examined these ingredients separately, with limited research exploring their combined functional and sensory potential, particularly in the context of locally developed beverage products in Indonesia. Therefore, this study contributes to the existing literature by investigating the potential of combining coconut water and coffee into an innovative functional beverage with a distinct local identity.

2.2. Previous Studies

Previous studies have investigated the development of functional beverages using natural ingredients with health-promoting properties. For example, L. De La Fuente-Carmelino et al. [1] examined plant-based functional beverages and highlighted their nutritional composition and bioactive compounds. Similarly, A. Panou and I. K. Karabagias [2] explored the composition and health benefits of functional beverages, particularly their roles in hydration and metabolic support.

In addition, T. Pinto and A. Vilela [3] emphasized the importance of phenolic compounds due to their antioxidant activity. Furthermore, R. Peng et al. [4] demonstrated that coffee contains bioactive compounds that may contribute to reducing the risk of chronic diseases.

However, most of these studies have focused on single-ingredient functional beverages and have not extensively explored the combination of coconut water and coffee in a single formulation, particularly in locally developed beverage products.

2.3. RESEARCH GAP

Despite the increasing number of studies on functional beverages, most existing research has focused on the individual properties of coconut water and coffee as separate functional ingredients. Limited studies have explored the integration of these two ingredients into a single beverage formulation that combines both functional and sensory attributes.

Furthermore, research on functional beverage innovation based on locally sourced ingredients in Indonesia remains limited. The utilization of local commodities such as Sangit coffee and Genjah coconut water from Bintan has not been widely developed into value-added beverage products.

In addition, previous studies tend to emphasize either nutritional benefits or sensory evaluation, with limited integration of consumer acceptance and preliminary economic feasibility. Notably, the potential of local-based functional beverages as culinary tourism products has rarely been examined, despite the growing recognition of food and beverage experiences as core components of destination attractiveness and tourist satisfaction [9,10]. Therefore, this study aims to fill these gaps by developing a novel beverage formulation, evaluating its sensory acceptance, assessing its initial commercial potential, and exploring its relevance as a culinary tourism product for Bintan Island.

2.4. Culinary Tourism

Culinary tourism is increasingly recognized as a form of experience-based tourism in which food and beverages play a central role in shaping tourist satisfaction and destination image. Recent studies highlight that tourists seek not only physical consumption but also meaningful and memorable experiences through local gastronomy.

For instance, C. Michael Hall [13] emphasizes that food experiences contribute significantly to destination differentiation and cultural representation. In addition, Per Björk and Hanna Kauppinen-Räisänen [14] argue that local food and beverages function as experiential elements that enhance tourists' emotional engagement and place attachment.

More recent research also suggests that gastronomic products can act as strategic tools for destination branding, particularly when they incorporate local identity and authenticity. According to Alison Ellis et al. [15], culinary experiences contribute to the co-creation of value between tourists and destinations, strengthening both satisfaction and revisit intention. Therefore, locally developed beverages such as Bintan Americano can be positioned not only as functional products but also as experiential tourism assets that reinforce destination identity and enhance visitor experience**.**

3. METHOD

This study employs a preliminary experimental approach to develop and evaluate a functional beverage product known as Bintan Americano, focusing on product formulation and sensory evaluation to assess consumer acceptance. Purposive sampling was applied to ensure that respondents had familiarity with coffee-based beverages and basic sensory evaluation ability.

3.1. Research Design

The research design follows a product development approach consisting of formulation, preparation, and evaluation stages. The study is initiated by developing several beverage formulations through the

combination of coconut water and coffee in different ratios namely 70:30, 50:50, and 30:70 to achieve a balanced flavor profile. Each formulation is prepared and evaluated to determine the most acceptable composition based on sensory attributes.

Table 3.1. Ingredient Composition

Formulation	Coconut Water (ml)	Coffee (ml)
F1	70	30
F2	50	50
F3	30	70

Source: Processed data by the researcher (2026)

3.2. Materials and Instruments

The primary materials used in this study include fresh coconut water and brewed coffee. Supporting materials consist of ice and basic preparation tools such as measuring cups, mixing containers, and serving glasses.

The instrument used for data collection is a sensory evaluation questionnaire based on a 5-point hedonic scale. This scale is applied to measure consumer preferences in terms of taste, aroma, appearance, and overall acceptability.

3.3. Data Collection Procedure

The prepared beverage samples are presented to respondents for sensory evaluation. A sample size of 30 respondents is considered acceptable for preliminary sensory evaluation in early-stage product development, particularly when the objective is to obtain initial consumer insights rather than statistical generalization. Consumer hedonic tests typically involve 25–50 untrained panelists for exploratory studies, while larger samples are recommended for more robust analysis [11, 12].

The respondents consisted of 30 individuals aged between 18–35 years, representing young adult consumers who are familiar with coffee-based beverages. The majority of respondents were students and young professionals, reflecting the primary target market of contemporary functional beverages. All respondents had prior experience consuming coffee products, ensuring their ability to evaluate sensory attributes reliably.

The respondents are asked to evaluate each sample based on several attributes, including taste, aroma, appearance, and overall acceptability. The respondents were selected using purposive sampling to ensure familiarity with coffee-based beverages.

The evaluation is conducted using a 5-point hedonic scale, where 1 represents strongly dislike and 5 represents strongly like. The data collected from the respondents reflect their level of acceptance toward each formulation.

3.4. Data Analysis

The collected data are analyzed using descriptive statistical methods. The mean score for each sensory attribute is calculated to determine the level of consumer acceptance for each formulation. The formulation with the highest average score is considered the most preferred by consumers.

The results are then interpreted to evaluate the feasibility of the product as a functional beverage and to identify the most suitable formulation for further development.

This approach is appropriate as the study focuses on preliminary product acceptance rather than inferential statistical testing.

3.5. Research Limitations

This study is limited to the preliminary stage of product development and focuses on sensory evaluation. It does not include advanced laboratory analyses such as nutritional composition testing or shelf-life evaluation. These limitations are acknowledged as part of the initial research phase.

Future studies are recommended to conduct more comprehensive analyses, including nutritional evaluation, product stability testing, and broader consumer studies to enhance the scientific validity and market potential of the product.

4. FINDINGS AND DISCUSSION

The developed Bintan Americano beverage presents a distinctive visual profile characterized by a light brown color with a slightly translucent effect. The product is typically served cold to enhance its refreshing properties. The appearance of the beverage is an important factor in influencing initial consumer perception and acceptance. A unique visual presentation may attract consumer curiosity, especially for innovative beverage products.

Table 4.1. Sensory Evaluation Results

Attribute	Mean Score
Taste	4.30
Aroma	4.10
Appearance	3.90

Source: Processed data by the researcher (2026)

The results are summarized in Table 4.1. A sensory evaluation was conducted involving 30 respondents using a 5-point hedonic scale (1 = strongly dislike, 5 = strongly like). The results indicate that the taste attribute received the highest score (4.30), suggesting that respondents appreciated the balance between the natural sweetness of coconut water and the bitterness of coffee. The aroma also showed a high level of acceptance (4.10), reflecting a pleasant combination of coffee fragrance and coconut notes. The appearance attribute received a slightly lower score (3.90), indicating that some respondents were less familiar with the beverage's appearance compared to conventional coffee.

Among the tested formulations, F2 (50:50 ratio) demonstrated the highest overall acceptance and was identified as the optimal formulation."

4.1. Discussion

The findings indicate that the Bintan Americano beverage has strong potential as an innovative functional product. The high acceptance scores, particularly in taste and overall evaluation, suggest that the formulation successfully achieved a balanced flavor profile.

This study contributes to the emerging discourse on experience-based culinary tourism by demonstrating how locally developed functional beverages can serve as experiential products that integrate health value, sensory appeal, and destination identity.

From a tourism perspective, the Bintan Americano can be positioned as a signature local beverage that enhances tourist experience through sensory engagement and cultural representation. The integration of local ingredients such as coconut water and Sangit coffee creates an authentic narrative that aligns with experiential tourism and destination branding concepts. This supports the idea that food and beverages are not only consumption products but also strategic tools in tourism development.

From a functional perspective, coconut water contributes hydration and electrolyte content, while coffee provides antioxidant compounds such as polyphenols [1,4]. This combination supports the positioning of the beverage as a functional beverage aligned with current health-oriented consumption trends. Beyond its functional attributes, Bintan Americano also holds significant relevance as a culinary tourism product. Culinary tourism, defined as travel motivated by the desire to experience local food and beverage culture [9], has become an increasingly important component of destination development. A signature local beverage such as Bintan Americano, rooted in local ingredients and crafted with a distinct local identity, has the potential to serve as an experiential tourism touchpoint that enhances visitor satisfaction and supports destination branding for Bintan Island [10].

From a sensory perspective, the balance between the natural sweetness of coconut water and the bitterness of coffee plays a key role in consumer acceptance. This result is consistent with previous studies highlighting the importance of flavor harmony in beverage development [1].

The integration of functional beverage innovation with tourism experience design represents a novel approach in destination development. This study demonstrates that locally derived products can serve dual functions as both health-oriented consumables and experiential tourism assets, thereby strengthening destination competitiveness.

4.2. Implications

The results of this study suggest that local ingredients such as coconut water and coffee can be effectively combined into a value-added beverage product. This innovation not only enhances the utilization of local resources but also creates opportunities for developing competitive products in the functional beverage market. From a tourism perspective, Bintan Americano can be positioned as a signature culinary tourism product that contributes to the experiential richness of visiting Bintan Island. The product can be integrated into tourism activities at resorts, cafes, and local stalls, offering tourists an authentic taste of local identity. This alignment with culinary tourism principles strengthens the product's role not only as a commercial beverage but also as a medium for destination promotion and cultural representation [9,10].

5. CONCLUSIONS

This study highlights that local-based functional beverages can play a strategic role in culinary tourism development by enriching tourist experiences and strengthening destination identity. The findings indicate that the product has good potential for consumer acceptance, particularly in terms of taste and overall sensory experience. The balance between the natural sweetness of coconut water and the bitterness of coffee was identified as a key factor contributing to its positive evaluation.

In addition, the combination of these two ingredients offers complementary functional benefits, including hydration from coconut water and antioxidant properties from coffee. This supports the positioning of the product as an innovative functional beverage aligned with current consumer trends toward health-oriented and plant-based drinks. Equally important, Bintan Americano demonstrates meaningful potential as a culinary tourism product that can enhance the tourist experience, support destination branding, and contribute to the economic development of Bintan Island through the valorization of local commodities [9,10].

However, this study is limited to preliminary product development and sensory evaluation conducted with 30 respondents, without detailed profiling of respondent characteristics and sampling methodology. Further research is recommended to conduct comprehensive analyses, including nutritional composition, shelf-life testing, and broader consumer studies involving a more diverse respondent profile that includes domestic and international tourists. More rigorous statistical methods should also be applied to strengthen the validity of sensory findings. Additionally, future studies are encouraged to explore the product's integration within culinary tourism itineraries and to assess its effectiveness as a destination branding tool for Bintan Island.

Overall, this study provides an initial contribution to the development of functional beverages based on local resources and highlights the strategic intersection between food innovation and tourism development, positioning local beverages as potential drivers of destination competitiveness.

APPENDIX SUMMARY OF COMMERCIAL POTENTIAL

Business Model of GENJAHNE (Bintan Americano)

Based on the organoleptic evaluation and financial analysis, the Bintan Americano product, branded as GENJAHNE, has potential for commercial development. The following is a summary of the business model designed to support the commercialization of this product.

Figure 1. GENJAHNE

"GENJAHNE" is a novel brewed functional beverage from the Riau Islands, formulated using Sangit coffee beans and Genjah coconut water sourced from Bintan. The resulting Americano-style beverage exhibits a sensory profile of sweet acidity, tropical sweetness, and a clean, slightly sweet aftertaste, reflecting its distinctive tropical character



GENJAHNE

1. **Value Proposition**
   a. A functional beverage with a distinctive tropical flavor profile (*sweet acidity*, *tropical sweetness*, *clean aftertaste*)
   b. Healthy, refreshing, and naturally isotonic (rich in electrolytes from coconut water)
   c. Convenient to order via WhatsApp or social media
2. **Customer Segments**
   a. Local community of Bintan
   b. Domestic and international tourists
   c. Resorts, restaurants, local stalls (*warung*), and cafes in the Riau Islands
3. **Channels**
   a. Social media (Instagram, TikTok)
   b. Personal selling to partners (cafes, resorts)
   c. Student resellers
   d. Landing page and email marketing
4. **Cost Structure**
   a. Operational costs (electricity, water, transportation, internet)
   b. Production costs (raw materials, equipment, packaging)
   c. Labor costs
   d. Marketing and promotion costs
5. **Revenue Streams**
   a. Direct sales per cup (B2C)
   b. Distribution to partners (B2B): local stalls, cafes, resorts
6. **Financial Estimates**
   a. Payback Period: 1.74 months
   b. Return on Investment (ROI): 688%

Limitations and Recommendations

As part of a preliminary study, this business model remains initial and has not yet been tested on a full operational scale. Further research is needed to test market feasibility, pricing strategies, and the effectiveness of distribution channels in real-world settings

ACKNOWLEDGMENTS

The authors would like to express their gratitude to all respondents who participated in the sensory evaluation and provided valuable feedback for this study. Appreciation is also extended to the institution for supporting the research process and facilitating the development of this study.

REFERENCES

[1] L. De La Fuente-Carmelino, M. Anticona, F. Ramos-Escudero, S. Casimiro-Gonzales, and A. M. Muñoz, "Commercial plant-based functional beverages: A comparative study of nutritional composition and bioactive compounds," *Beverages*, vol. 11, no. 1, p. 26, 2025, doi: 10.3390/beverages11010026.

[2] A. Panou and I. K. Karabagias, "Composition, properties, and beneficial effects of functional beverages on human health," *Beverages*, vol. 11, no. 2, p. 40, 2025, doi: 10.3390/beverages11020040.

[3] T. Pinto and A. Vilela, "Phenolic compounds as constituents of functional beverages," *Beverages*, vol. 6, no. 4, p. 68, 2020, doi: 10.3390/beverages6040068.

[4] R. Peng et al., "Transforming coffee from an empirical beverage to a targeted nutritional intervention: Health effects of coffee's core functional components on chronic diseases," *Frontiers in Nutrition*, vol. 12, 2025, doi: 10.3389/fnut.2025.1690881.

[5] M. R. Corbo, A. Bevilacqua, L. Petruzzi, F. P. Casanova, and M. Sinigaglia, "Functional beverages: The emerging side of functional foods," *Comprehensive Reviews in Food Science and Food Safety*, vol. 13, no. 6, pp. 1192–1206, 2014, doi: 10.1111/1541-4337.12109.

[6] M. Sugajski, M. Buszewska-Forajta, and B. Buszewski, "Functional beverages in the 21st century," *Beverages*, vol. 9, no. 1, p. 27, 2023, doi: 10.3390/beverages9010027.

[7] R. Hemalatha et al., "Development and quality evaluation of ready-to-serve beverage,"

Beverages,vol. 4, no. 2, p. 42, 2018, doi: 10.3390/beverages4020042.

[8] Research and Markets. (2025). *Indonesia ready drink tea and coffee market size and share analysis: Growth trends and forecast report 2025–2033*. Retrieved March 30, 2026.

[9] E. Wolf, "Culinary tourism: A tasty economic proposition," *International Culinary Tourism Association*, Portland, OR, USA, 2002.

[10] C. M. Hall and L. Sharples, "The consumption of experiences or the experience of consumption? An introduction to the tourism of taste," in *Food Tourism Around the World: Development, Management and Markets*, C. M. Hall et al., Eds. Oxford, UK: Butterworth-Heinemann, 2003, pp. 1–24.

[11] H. T. Lawless and H. Heymann, Sensory Evaluation of Food: Principles and Practices, 2nd ed. New York: Springer, 2010.

[12] G. Ares and P. Varela, Methods in Consumer Research, Volume 1: New Approaches to Classic Methods. Cambridge: Woodhead Publishing, 2018.

[13] Hall, C. M. (2020). *Food tourism and regional development: Networks, products and trajectories*. Routledge.

[14] Björk, P., & Kauppinen-Räisänen, H. (2021). The impact of food experiences on tourist satisfaction and destination loyalty. *Tourism Management Perspectives*, 37, 100785.

[15] Ellis, A., Park, E., Kim, S., & Yeoman, I. (2022). What is food tourism? A systematic review of definitions and frameworks. *Journal of Tourism Futures*, 8(2).

.

.