



The purchase intentions of consumers towards counterfeit fruit: A proposed framework

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ABSTRACT

The expansion of the fresh fruit trade has exacerbated the prevalence of counterfeit fruits, posing risks to consumers and causing economic and reputational damage to the supply chain. Research on counterfeit fruits appears yet to emerge but given the increase of counterfeit fruit an in-depth investigation is timely. This paper employs a systematic literature review, combined with bibliometric analysis and VOSviewer co-occurrence analysis, to examine the emergence and research trends of counterfeit products. The results suggest that consumer-centred research has become a key approach to exploring the emergence of counterfeit products. Studies of consumer attitudes and purchase intentions towards counterfeit products suggest potential factors that influence consumer decisions regarding counterfeit fruits. The factors include demographic, socio-cultural, psychological, purchase purpose, food safety, and perceived value. The findings are used to establish a framework for future studies on counterfeit fruits and to propose an agenda for further research in this field.

1. Introduction

The escalating prevalence of counterfeit products across various sectors has attracted recent attention in the academic, industrial, and regulatory spheres [1,2]. A 2021 report by the Organisation for Economic Co-operation and Development (OECD) and European Union Intellectual Property Office (EUIPO) estimated that the global trade in counterfeit and pirated products amounted to approximately USD 464 billion in 2019, accounting for around 2.5 % of total international trade [3]. Counterfeit products not only threaten consumer safety and damage brand reputation but also disrupt fair market competition [4].

The rise of counterfeiting and piracy poses a significant threat to multiple industries and is increasingly prevalent across various product categories including common consumer products (clothing and bags) [5], electronic products (mobile phones and video equipment) [6], and luxury items (luxury watches and fashion apparel) [7]. The proliferation of counterfeit products has also led to severe health and safety risks, particularly for food, cosmetics, medical devices and chemicals [3]. This is occurring at a time when consumers are increasingly health-conscious, environmentally aware, becoming more discerning, and seeking safe, reliable, and high-quality products [8].

Within agricultural supply chains, issues of opacity, and information

asymmetry persist, leading to concerns about product authenticity and safety [9]. Counterfeiting influences consumer attitudes and preferences towards agricultural products [10]. Incidents of food fraud, such as the infamous horsemeat scandal in Europe and cases of tainted milk in China, exemplify these concerns and highlight the need for increased transparency and market integrity [11,12]. The increasing incidence of counterfeiting in agricultural products poses significant risks to public health and erodes consumer trust [13,14].

The globalisation of supply chains has enabled trade in high-value fruits worldwide, while also leading to the emergence of trade in counterfeit fruits. The appeal of premium fruits motivates counterfeiters to produce products that exploit consumers' trust in recognised brands [15]. Recent incidents involving lower-quality fruit presented in imitation packaging of 'Zespri' kiwifruits and 'Tasmanian' cherries in Hong Kong exemplify the challenge [16,17]. For instance, Hong Kong Customs recently seized lower-quality cherries falsely packaged as a premium Tasmanian brand ('43 Degrees South') during the Lunar New Year period [16]. Consumer perceptions of fruit authenticity and quality directly influence purchasing decisions [2], and therefore a deep understanding of their attitudes may inform approaches to address the increasing trend of counterfeit fruit. As the phenomenon of counterfeit fruit has not been systematically defined in the academic literature, this

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study develops its working definition from industry cases and reported incidents. Table 1 summarises representative examples, such as domestic fruit sold under false origin labels, kiwifruit packaged with counterfeit Zespri branding, and citrus misrepresented with incorrect variety or certification. These cases reveal recurring patterns of purposive mislabelling, brand imitation, and falsified provenance, which directly mislead consumers regarding authenticity and quality. On this basis, counterfeit fruit is defined in this study as fruit that is deliberately mislabelled, falsely identified by origin or variety, or misleadingly packaged to appear as originating from legitimate premium brands or regions, thereby deceiving consumers about its true provenance or quality.

By examining past counterfeiting development and consumer behaviour studies, this paper develops a theoretical framework of consumer attitudes toward counterfeit fruit and their purchase intention. This study is among the first to investigate consumer behaviour in the context of counterfeit fruits, providing a novel theoretical framework for this emerging issue. However, rather than using the traditional view of the consumer as the user of a product, this paper includes both users and purchasers (often referred to as customers) under the term of consumer because for many products the purchaser may be the decision-maker instead of the user. This approach will provide a more comprehensive view of the factors that drive engagement with counterfeit products.

To address the counterfeiting of high value fruit, a thorough understanding of consumer behaviour and attitudes towards high-value fruit purchases is warranted. This requires an in-depth exploration of consumer perception, motivations, and responses. This paper addresses the following four research questions (RQ) by utilising a systematic literature review to explore the under-researched phenomenon of counterfeit fruit.

RQ1: What insights can historical trends and developments in counterfeit product research provide for understanding and advancing the study of counterfeit fruits?

RQ2: What are the potential key factors influencing consumer purchase intentions towards counterfeit fruits?

RQ3: What similarities and differences exist between consumer purchase intentions for counterfeit fruits and those for other counterfeit product categories?

RQ4: How can a theoretical framework enhance the understanding of consumer purchase intention towards counterfeit fruits and guide future research?

2. Method - systematic literature review

The systematic literature review used in this paper follows the

Table 1
Documented cases of counterfeit fruit worldwide.

Fruit/Product	Counterfeiting form	Where/When	Source
Cherries (Tasmania '43 Degrees South')	Mislabelled with brand; counterfeit packaging.	Hong Kong, 2021	[16]
Kiwifruit (Zespri)	Fake 'Zespri' labels used on locally grown fruit.	China, Southeast Asia, 2024	[17, 18]
Lemons (Unifrutti)	Fake Unifrutti-branded cartons used in exports.	China to Bahrain, 2020	[19]
Citrus	Chinese domestic fruit is falsely labelled as Australian imports.	China, 2015	[20]
Durian	Exporters used counterfeit GAP/GMP certificates to disguise Vietnamese durians as Thai origin.	Thailand, Vietnam, 2021	[21]
Grapes	Unauthorised and mislabelled grapes to Italy.	Egypt, 2023	[22]
Oranges (Sunkist)	North African oranges relabelled with counterfeit 'Sunkist' brand.	Hong Kong, 2014	[23]

principles and methodology outlined in the latest version of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMS) guidelines, specifically the PRISMA 2020 version [24]. The PRISMA guidelines are widely recognised and accepted as an appropriate approach to systematic reviews, providing a structured and transparent process to identify, select, evaluate, and synthesise relevant research [25].

2.1. Defining the research topic, database and keywords

The Web of Science was used for this systematic literature review due to its extensive coverage of peer-reviewed articles and advanced search options [26]. A three-phase approach was adopted. In the first phase, a broad exploration of counterfeit products was conducted using key search terms 'counterfeit', and 'fake product'. The search strategy for retrieving articles on counterfeit products in this phase was limited to searching through the title, abstract, and keywords to identify highly relevant papers. In the second stage, the scope was narrowed to 'fruit' to ensure a focus on relevant studies. After discovering a research gap in counterfeit fruits, it became necessary to reference research approaches from other counterfeit products. In the third stage, the 'AND' operator was used to add additional terms 'consumer attitude', 'purchase behaviour', 'consumer behaviour' or 'purchase intention' to the first phase search results. The third stage primarily aimed to explore consumer attitudes and purchase intentions towards other counterfeit products, providing direction and insights for studying counterfeit fruits.

To maximise the search scope, no temporal constraints were imposed during the three phases of the search process. The search was confined to articles published in English. A total of 9503 articles were identified. The top 50 articles, sorted by citation count, were manually reviewed, and the results showed that some papers focused on anti-counterfeiting measures and technologies. These papers mainly discussed chemical substances, such as luminescence nanomaterials. Given that the main research aim of this paper is to provide a theoretical framework for studying emerging counterfeit fruits by examining past trends in counterfeit products and consumer attitudes towards them, articles on materials science and detection methods applied to anti-counterfeiting were considered irrelevant. To refine the search, the 'NOT' operator was employed to exclude articles with titles related to 'anti-counterfeiting', 'detection', and 'prevention'. From the initial 9503 papers, 5594 were considered irrelevant to the research focus, leaving 3909 articles that met the specified criteria (Fig. 1).

Analysis of the search results was conducted using the Bibliometrix data package in the R programming language. A total of 3909 articles related to the topic of counterfeiting were imported into R in BibTeX format. The minimum keyword occurrence frequency of 25 was selected as it struck a balance between capturing meaningful trends and filtering out less relevant terms. The determination of keyword frequency was based on the total number of articles; if the frequency had been set too high, each year would yield fewer keyword samples. For each year, the top five keywords that met this criterion were selected, representing the most frequent topics in counterfeit research. By using this Bibliometrix data package, it is possible to understand the main areas of focus in past counterfeit research and their evolution over time. Additionally, VOSviewer software was employed to analyse data. This utilises network and overlays visualisation to identify key trends and focal points in the history of counterfeit research. The software was also used to examine co-occurrence patterns and thematic clusters, thereby highlighting the direction and emphasis of counterfeit research over time. VOSviewer's cluster analysis was applied to the 3909 selected articles. To ensure meaningful clustering, a minimum keyword occurrence of 15 was chosen as the filtering criterion. Setting the keyword filter too high would result in too few terms, making clustering difficult. Through multiple trials, a threshold of 15 was found to achieve a balance between capturing similarity and avoiding over-filtering.

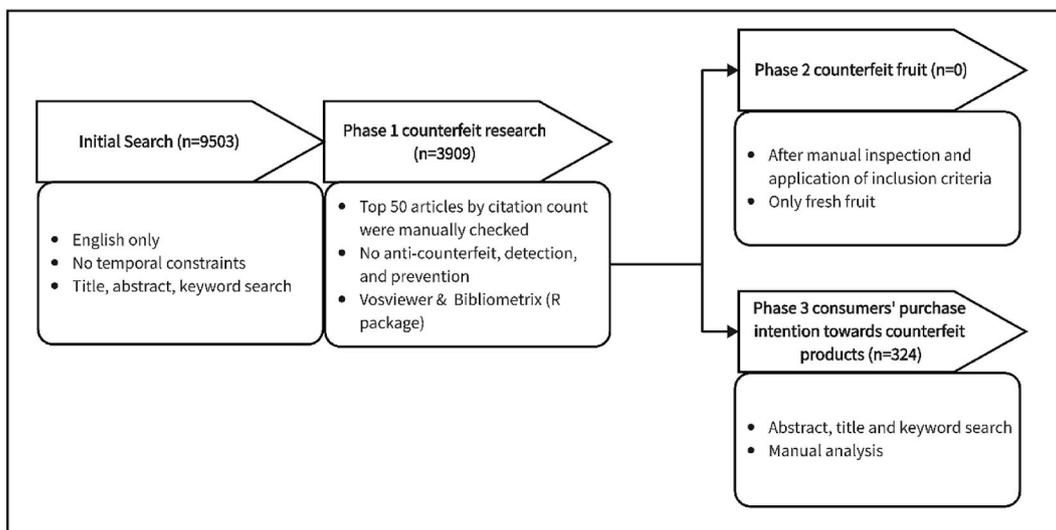


Fig. 1. Article selection for studies on consumer attitudes toward counterfeit products.

In the second phase, a more precise title search was conducted, focusing on fruits, resulting in only four articles. One of these focused on fruit juice [27], while the other three discussed fruit identification and the detection of fruit-related substances [28–30]. During the third phase, through the application of operational rules, 324 articles were identified from the initial 3909 articles. A manual analysis was conducted on the 324 articles, including an examination of the methods used and the influencing factors.

3. Research findings – systematic literature review

This section describes the findings from the systematic literature review using a three-phase progressive approach. The first stage introduces the trend of counterfeit research, including the evolution of research over time, and highlights five clusters identified through VOSviewer’s co-occurrence patterns. The second stage identifies research gaps in the study of counterfeit fruits and highlights the necessity for further investigation. The third stage reviews studies on consumer attitudes and purchasing behaviours in the context of other counterfeit products, by statistically categorising and analysing the

method used.

3.1. Historical and contemporary perspectives on counterfeit research

In the first stage, the breadth and depth of counterfeit research were investigated by studying the evolution of keywords, revealing the interdisciplinary nature of the field. At the same time, cluster classification for the counterfeit research area was obtained through co-occurrence analysis, and research patterns and methods for studying counterfeit products were identified through cluster discussions.

3.1.1. Trending topics

As demonstrated by the increasing number of articles published annually (Fig. 2), there has been a significant rise in scientific output on counterfeit research over the past few decades. This trend may be attributed to the growing concern over the global impact of counterfeit products across various industries, from pharmaceuticals to luxury items.

Fig. 3 provides a visual representation of these trends. The x-axis begins in 2004, indicating that research articles with a focus on

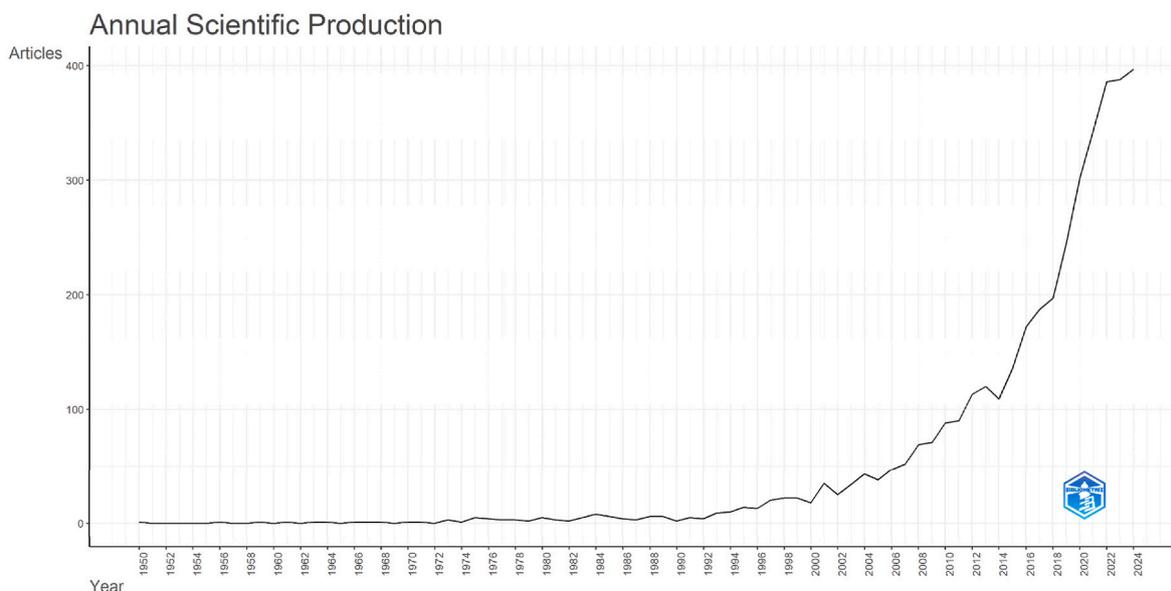


Fig. 2. Annual scientific production of counterfeit research (n = 3909).

intentions.

An analysis of the historical context suggests that the current rise in counterfeit products may be driven by factors such as the growth of international trade, advancements in technology, and increasing consumer demand [31,32]. This expanding consumer market has attracted unethical actors who engage in counterfeiting well-known brands to receive high profits [33]. Such illegal activities pose significant threats to both the original brands and consumers. This trend also reflects an increasing scholarly interest in exploring the psychological and sociological aspects of how consumers respond to the growing presence of counterfeit products.

3.1.2. Counterfeit research themes

Many topics have appeared in counterfeit research since the 1950s, of which some emerged in a particular period while others appeared repeatedly at various times. The filtering process yielded a total of 227 items, which were grouped into five distinct clusters based on their relevance. As shown in Fig. 4, each cluster, which is also discussed below, represents a distinctive theme or research approach, reflecting the multifaceted nature of counterfeiting research.

3.1.2.1. Cluster 1: counterfeit identification. The red cluster in Fig. 4 is dominated by terms including identification, spectroscopy, and classification, highlighting the strong focus on the technical detection and analysis of counterfeit products. The co-occurrence of these terms indicates that much of the research in this area is centred on developing and improving scientific methods to accurately identify counterfeit products. Techniques such as mass spectrometry, chemometrics, and spectroscopy are frequently discussed, emphasising the importance of precision in distinguishing authentic products from counterfeit, especially in fields such as pharmaceuticals, food safety, and luxury goods [34,35].

3.1.2.2. Cluster 2: counterfeit drugs. Drugs have been one of the earliest and most critical targets of counterfeiters. As medicines are important for public health and safety, counterfeit drugs have persisted for decades, particularly in regions with weak regulatory oversight [36]. For example, counterfeit drugs have caused significant public health crises in sub-Saharan Africa, where poor regulatory frameworks have facilitated the proliferation of counterfeit medicines [37]. The purple cluster in Fig. 4 is primarily centred around counterfeit drugs and related topics such as standard drugs, falsified medicines, and public health.

The appearance of this cluster indicates that a significant portion of past counterfeit research was focused on counterfeit drugs. However, as discussed in section 3.1.1, the nature of counterfeit products has changed significantly over time. The focus of research has shifted from limited topics, such as pharmaceuticals, to a broader exploration of counterfeit activities in various sectors, including luxury goods and food.

3.1.2.3. Cluster 3: purchase behaviour and attitudes. The blue cluster in Fig. 4 is primarily centred around consumer behaviour and attitudes towards counterfeit products. This cluster includes terms such as brand, luxury, perceptions, and intention, indicating a strong focus on how consumers interact with and respond to counterfeit products. The co-occurrence of these terms suggests that researchers are increasingly interested in understanding the psychological and social drivers behind the purchase of counterfeit products.

The presence of terms such as brand, luxury brands, and genuine, highlights the complex relationship between consumer perception of brand authenticity and their willingness to purchase counterfeit products [38,39]. Research in this cluster often explores why consumers might knowingly purchase counterfeit items, particularly luxury products, which are often perceived as symbols of social status [1]. Terms like attitude, perceptions, and intention further point to the central role

of consumer psychology in counterfeit research. This co-occurrence pattern suggests that the decision to purchase counterfeit products is often influenced by factors such as perceived value, trust, and social influence.

The implications of this cluster are significant for both academic research and practical applications. Understanding what drives consumers to buy counterfeit products—whether it's the allure of low prices, the perceived similarity to authentic items, or social pressures—can help in understanding the drivers of the counterfeit industry. The cluster indicates a shift in research focus from purely technical or legal approaches to more consumer behavioural and marketing-oriented studies. This suggests that future research will likely continue to explore the psychological, social, and cultural factors that influence counterfeit consumption.

3.1.2.4. Cluster 4: social influence and consumer perceptions. The yellow cluster in Fig. 4 highlights how external influences, particularly through social media, word-of-mouth, and online reviews, shape consumer intentions. This cluster emphasises the growing importance of peer recommendations, online reputation, and social influence in affecting consumer attitudes towards counterfeit products.

The co-occurrence of terms such as word-of-mouth, social media, and impact reflects the significant role that peer evaluations - such as those from friends, colleagues, and online communities - play in forming consumer perceptions [40]. The term trust also appears frequently in this cluster, suggesting that trust plays an important role in shaping consumer attitudes towards both counterfeit products and the platforms that sell them. Positive reviews from trusted sources can reduce the perceived risk of buying counterfeit products, thus increasing the likelihood of purchase [41,42].

In terms of future trends, this cluster illustrates a growing shift in counterfeit research towards understanding the psychological and social dynamics that drive consumer decisions. As counterfeit items expand into new product categories, such as luxury items, technology, and even food, it appears from the analysis that researchers are increasingly exploring how social factors influence consumers' willingness to purchase counterfeit products.

3.1.2.5. Cluster 5: supply chain. The green cluster in Fig. 4 is centred around terms such as blockchain, traceability, authentication, and supply chain. The co-occurrence of these terms suggests that research in this area is increasingly focused on using advanced technologies to ensure the authenticity of products and to prevent counterfeit products from infiltrating legitimate markets. Traceability emphasises the importance of being able to track a product from its origin to its final sale, ensuring that every stage is authenticated and free from counterfeit interference [31]. Authentication indicates a focus on developing technologies to verify the genuineness of products, particularly high-value or high-risk items such as pharmaceuticals, luxury goods, and electronics [43,44]. The appearance of this cluster reflects a growing trend in counterfeit research towards using technology-driven solutions to combat the problems. Overall, the visualisation in Fig. 4 highlights key themes that have emerged in counterfeit research, such as counterfeit identification, counterfeit drugs, and most notably, consumer behaviour.

The shift from purely technical detection methods to understanding consumer attitudes and social influences is an important change in the field. The co-occurrence of terms like brand and purchase intention shows that consumer motivations for engaging with counterfeit products are complex and multifaceted, often driven by perceived social status, value, and personal identity. These insights suggest that consumer psychology plays a key role in counterfeit consumption and provide a foundation for exploring how similar behaviours might apply to counterfeit fruits.

The above evolution in research focus on counterfeiting in products

is related to RQ1, which seeks to understand what historical trends and developments in counterfeit product research can provide for advancing the study of counterfeit fruits. Historical trends show that simply identifying counterfeit products is not sufficient because researchers also need to explore how consumer perceptions, purchase intentions, and social influences drive demand. For counterfeit fruits for example, factors such as perceived value and food safety in the marketplace may play a crucial role. The research history of counterfeit products can therefore provide important insights into the demand side of counterfeit fruit markets and how consumers might respond similarly to counterfeits in other product categories.

3.2. Research gap on counterfeit fruit

The emergence of counterfeit fruits can be attributed to several factors within the contemporary global marketplace. Firstly, the rising consumer demand for fresh and imported fruits, coupled with the increasing complexity of global supply chains, creates opportunities for counterfeiters to exploit gaps in traceability and authenticity [45]. Consumers' desire for a diverse and continuous supply of fresh fruits, irrespective of seasonal limitations, drives global trade in fruit. This expansion in trade routes and distribution channels provides counterfeiters with avenues to introduce fraudulent products into the market [46]. Secondly, advancements in technology and communication facilitate the rapid dissemination of information and the sharing of product images, making it easier for counterfeiters to replicate the packaging of authentic fruits [47,48].

As noted in the methodology, the initial search for articles related to counterfeit fruit resulted in only four papers, none of which were directly related to fresh fruits. This highlights the limited academic attention to counterfeit fruits and indicates a research gap. Counterfeiting within the fruit industry is a relatively new phenomenon, as previously discussed in this paper, with examples such as counterfeit kiwifruit and cherries in the market, which have had a significant impact on consumers. Unlike traditional counterfeit products such as clothing, watches, and pharmaceuticals, fruits as food items engage consumers' senses of touch and taste [49]. Fruits of the same type can look remarkably similar, but variations in variety, quality, origin, and branding can lead to substantial price differences, thus creating lucrative opportunities for counterfeiters. This complexity demonstrates the necessity for a new framework. By incorporating factors such as sensory attributes, perceived authenticity, and the role of branding and quality differentiation, the framework can provide insights into how consumers assess and respond to counterfeit risks in the fresh fruit market.

The consumer-centred trend identified in counterfeit research (as discussed in Section 3.1) reveals a shift from a focus on technical identification to understanding consumer attitudes and behaviour toward emerging counterfeit products, that is likely to also apply to counterfeit fruits. This shift is particularly relevant for addressing RQ2 and RQ3, as understanding the key factors influencing consumer attitudes and purchase intentions toward counterfeit fruits can provide deeper insights into why consumers may knowingly or unknowingly buy counterfeit products. This also aligns with RQ1, which seeks to understand historical trends in counterfeit research and how these developments can guide the study of counterfeit fruits. Just as luxury goods have transitioned to a focus on consumer perceptions, counterfeit fruits require similar attention, particularly in how product attribute and perceived value influence consumer decisions.

In summary, the current gap in counterfeit fruit research highlights the need for more comprehensive studies on consumer behaviour and purchase motivations. This shift presents opportunities for answering RQ4, which seeks to develop a theoretical framework to better understand consumer purchase intention toward counterfeit fruits and guide future research.

3.3. Consumers' attitude and purchase intention towards counterfeit products

The previous sections highlighted the emerging trend of consumer-centred studies. Consumer behaviour may influence market outcomes, and the characteristics of counterfeit fruits necessitate an examination of consumer attitudes and purchase intentions. Understanding these factors may be important for developing effective strategies to combat counterfeit fruits. However, as discussed in Section 3.2, there is a significant lack of research on counterfeit fruits, particularly in terms of consumer behaviour towards fresh counterfeit fruits. The search yielded very few relevant studies, and there is a complete gap in studies that specifically investigate consumer attitudes or purchase intentions related to counterfeit fresh fruits.

Given this gap, investigation of other counterfeit products, where consumer behaviour has been more thoroughly examined, may be instructive. Studies on luxury goods, pharmaceuticals, and electronics can provide valuable insights into the potential factors influencing purchase intentions for counterfeit fruits. For instance, factors such as perceived value, price sensitivity, social influence, and brand trust that impact the purchase of other counterfeit products may similarly apply to counterfeit fruits. Therefore, by learning from these studies, this paper proposes that a framework for investigating counterfeit fruits be developed, as discussed in section 4.2, by adapting the consumer behaviour framework used in other sectors.

3.3.1. Concepts and theories

The increased attention on counterfeiting has primarily focused on the prevalence of counterfeiting, legal aspects, and mitigation strategies [50–53]. There remains a dearth of research concerning consumer attitudes toward counterfeit products. A further refinement of the search explained in section 3.1, using 'AND' to connect 'consumer attitude', 'consumer purchase intention', or 'consumer behaviour' with the initial search on 'counterfeit' yielded only 324 articles. Consumer attitude and purchase intention are important concepts in consumer behaviour research because they help explain the underlying factors driving consumer choices [54,55]. Purchase attitudes are emotional responses of consumers to evaluation of a product, influencing how they perceive its value and appeal. Meanwhile, purchase intention relates to the likelihood that consumers will buy a product in the future, providing insight into their anticipated buying behaviour [56,57].

In previous research, consumer purchasing behaviour towards counterfeit products has been primarily investigated through the lens of the Theory of Reasoned Action and the Theory of Planned Behaviour [58]. The former explains the interplay between attitudes and behaviours [59], while the latter establishes a link between individual beliefs and actions, that builds upon the foundations of Theory of Reasoned Action [60]. Both two theories have been employed as analytical frameworks to understand the motives underlying counterfeit product purchases [61]. According to the Theory of Planned Behaviour, purchasing behaviour is influenced by purchase intentions, which in turn are shaped by subjective norms, perceived behavioural control, and other factors [62].

The impact of counterfeiting on consumer purchasing behaviour may involve various factors, encompassing the characteristics of counterfeit products, whether they are luxury items, pharmaceuticals, or electronic products, which can potentially influence consumers' willingness to purchase [63]. Simultaneously, the purpose behind consumers' purchases appears to be a significant influencing factor, potentially determining whether they are inclined to actively avoid purchasing counterfeit products [64].

While the Theory of Planned Behaviour and Theory of Reasoned Action provide foundational insights into how attitudes, subjective norms, and perceived behavioural control influence purchase intentions, these frameworks are not sufficient on their own to include the full complexity of consumer decision-making in the context of

counterfeit products. As highlighted in the Consumer Decision Process theory, consumer behaviour is influenced by a combination of internal and external factors [41,65,66]. This involves the interaction of external factors such as price and product features and internal factors such as perceived value, emotional needs, and trust relationships. Incorporating the concept of counterfeiting into the consideration of consumer purchasing behaviour highlights the heightened importance of psychological factors. Socio-economic, cultural, and consumer social status can influence these [67,68]. This indicates that a new, integrated framework that combines Theory of Planned Behaviour and Consumer Decision Process may be more appropriate. Such a framework could more effectively explore the multi-layered decision-making processes of consumers, especially when comparing different counterfeit products, such as luxury goods and fruits. By addressing these gaps, a more suitable theoretical framework (as suggested in RQ4) can be constructed that incorporates the complex interplay of psychological, social, and product attribute factors in shaping consumer behaviour towards counterfeit fruits.

3.3.2. Consumer purchase intentions: deceptive versus non-deceptive counterfeit

One of the challenges in studying consumer attitudes and behaviour towards counterfeit products is the broad and complex nature of the counterfeit market [4]. Counterfeit products can range from luxury goods to household items. Studies examining consumer attitudes and purchase intentions towards counterfeits suggest that consumers intentionally purchase counterfeit luxury products for their lower prices or their perceived expectations [69–71]. In contrast, for electronic products or food, consumers are often deceived while pursuing high-value products [72]. Previous research neglects to explore the attitudes of consumers who unknowingly purchased counterfeit products [72,73]. This gap in the literature largely stems from a scarcity of consumer-centric studies, particularly those exploring the psychological aspects of consumer purchasing decisions.

The distinction between deceptive and non-deceptive counterfeits is crucial for understanding consumer attitudes and purchase intentions towards counterfeit products. Deceptive counterfeiting refers to products that are deliberately mislabelled or mispackaged to mislead consumers into believing they are genuine [72,74]. For example, as shown in Table 1 of this paper, counterfeit fruit sold under a false origin label (e.g., domestic fruit misrepresented as premium imported produce) or

medicines marketed with falsified safety certifications can deceive consumers who trust the authenticity of what they are buying [70,72,75,76]. Conversely, non-deceptive counterfeiting applies where consumers knowingly purchase counterfeit products, such as luxury handbags or branded trainers, motivated by lower prices or the perception of value despite being aware of their illegitimacy [61,77]. Moreover, the consequences of purchasing deceptive and non-deceptive counterfeits differ. Consumers who knowingly purchase non-deceptive counterfeits do not consider ethical consequences. In contrast, deceptive counterfeits pose a greater risk to consumer safety and health, as consumers unknowingly purchase these products [78,79]. In addition, consumer awareness mediates these effects. When consumers are aware of counterfeit cues, they are more likely to adjust their attitudes and decisions based on price and perceived value [2]; however, when they lack awareness, their trust in labels, brands, and certifications makes them vulnerable to deception and erodes long-term confidence in food and consumer markets [80,81]. Therefore, understanding the differences between deceptive and non-deceptive counterfeits is important for comprehending the complexity of consumer behaviour towards counterfeit products.

3.3.3. Consumers' attitude and purchase intention to counterfeit products

The 324 articles identified in the third phase of the search were imported into RStudio for analysis using the Bibliometrix package. The analysis, visualised in Fig. 5, illustrates the annual scientific production of research articles on consumer behaviour towards counterfeit products from 1995. The graph highlights a significant increase in publications after 2015. Although direct evidence explaining this surge is limited, the rise of e-commerce is likely a contributing factor. The proliferation of online platforms has dramatically increased consumer exposure to counterfeit products, sparking academic interest in exploring consumer behaviour in this context [82,83]. Another potential reason for the increase may be the economic growth in developing countries, which has led to the expansion of the middle class [84]. With more people aspiring to display their social status through high-value products, there has been an indirect increase in demand for counterfeit products, as these offer a more accessible way to signal affluence [85].

Based on a manual review, it has been determined that over 64 articles focus on luxury products, including items such as clothing and watches. This finding illustrates the susceptibility of high-value products to counterfeiting due to the lucrative profit margins associated with

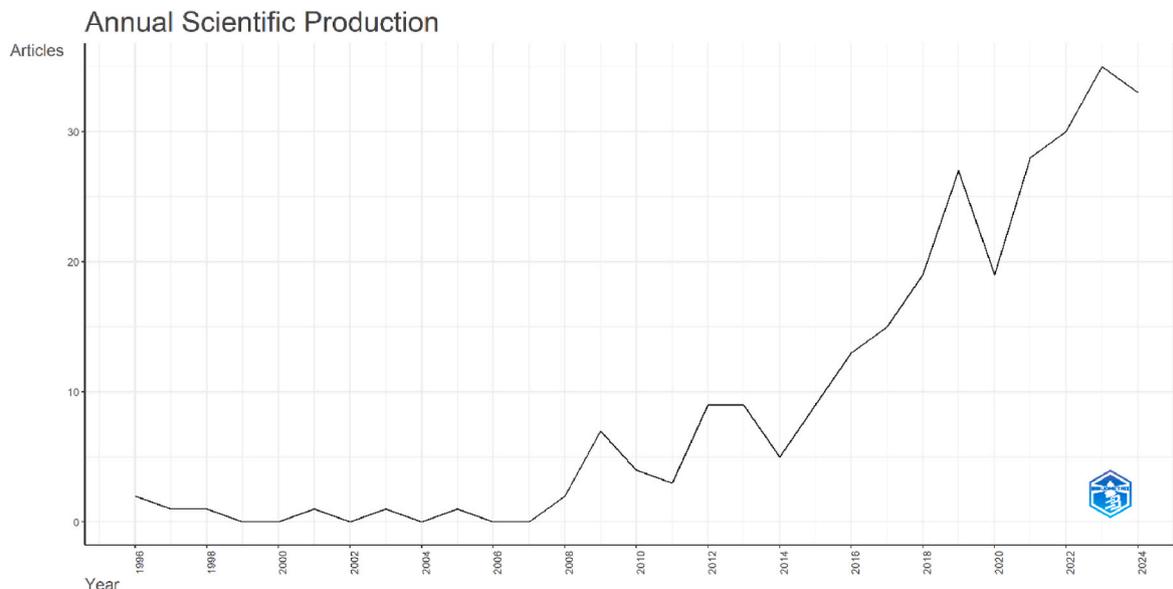


Fig. 5. Number of articles published per year ($n = 324$, Until Oct 2024) from Web of science with keywords 'counterfeit', 'fake product' AND 'consumer attitude', 'purchase behaviour', 'consumer behaviour', 'purchase intention'.

them. Research on other types of products is more scattered, encompassing pharmaceuticals, software products, and food. This diversity reflects the novelty of consumer-centric research perspectives in the study of counterfeit products.

Several key factors that influence consumer attitudes and behaviours towards counterfeit products can be drawn from existing research. These factors fall broadly into internal and external drivers, which provide a foundation for understanding how consumers might approach counterfeit products.

3.3.3.1. Internal factors. Perceived value is consistently cited as an important internal motivator across counterfeit product categories [86–89]. Consumers often justify purchasing counterfeit products based on the perceived balance between the lower cost and the acceptable quality of the product [90]. For luxury goods, consumers may be motivated by the desire to access high-status items at a fraction of the price [1].

Psychological factors also play a significant role. Some studies show that consumers exposed to counterfeit products may experience negative emotions such as anger, distrust, and disappointment [91]. Consumers of counterfeit luxury items often experience mixed emotions, such as pride in obtaining a product perceived as valuable at a lower cost, or angry when they realise the product's counterfeit nature. Therefore, as discussed in the previous section, deceptive and non-deceptive counterfeit products exhibit significant differences in consumer motivations and subjective intentions [2,61]. It is important to first investigate whether the counterfeit product is purchased knowingly by the consumer or intentionally sold by the seller to make a higher profit. This distinction leads to different psychological factors influencing decisions. For example, in the case of non-deceptive counterfeit products, consumers may intentionally choose high-value counterfeit products to display status, whereas with deceptive counterfeit products, consumers may feel ashamed if they are discovered purchasing or using counterfeit products [48,61].

3.3.3.2. External factors. Social influence is another significant driver of consumers' purchase intentions. Research shows that peer pressure and social media heavily impact consumer decisions regarding counterfeit luxury products. In these cases, consumers may seek approval from others or follow trends to align with certain social groups [86,92]. This social influence may lead consumers to consider the impact and opinions of others during the purchasing process, especially for high-value products, as they seek greater social approval.

Purchase purpose is another differentiating factor. In the case of luxury items, consumers often purchase counterfeits to project social status or affluence without paying the premium for authentic products [93]. Consumers' purchase purposes vary depending on the type of product. For example, if buying a product as a gift, they may pay more attention to the packaging style; when purchasing a high-value smartphone, they may focus on the product's performance; and when buying food, they may prioritise its taste [94].

Demographic factors such as age, income level, education, and cultural background, also play a role in shaping consumer purchase intention towards counterfeit products. Some studies suggest that younger consumers and those with lower income levels are more likely to purchase counterfeit products, driven by limited financial resources and a higher tolerance for risk [95]. However, other research provides inconsistent findings, suggesting that demographic factors like age or family size do not consistently predict counterfeit consumption [93].

By reviewing the consumer purchase intentions for various counterfeit products, it appears that perceived value, psychological factors, social influence, and purchase purpose play significant roles in shaping consumer behaviour. However, it is also evident that these factors may vary in their importance depending on the type of product. For example, in the case of counterfeit electronics, consumers may be less willing to

purchase counterfeits due to concerns about performance and usability. In contrast, for luxury goods, where the primary goal is often to signal social status, consumers may knowingly choose counterfeit products due to price considerations or vanity.

These distinctions highlight the complexity of consumer behaviour and suggest that each product type may generate different consumer motivations and concerns. When applied to counterfeit fruits, their unique nature as consumable products needs to be considered. Further food safety concerns may become another factor in purchases of counterfeit fruit, as consumers are likely to prioritise health and quality when they purchase food. Integrating these considerations into the study of consumer behaviour towards counterfeit fruits allows for the development of a new framework.

4. Discussion

Based on the research findings, this section focuses on identifying the key factors that may influence consumer purchase intentions towards counterfeit fruits. By exploring the implications of these findings, it compares the influencing factors for counterfeit fruits with those identified in other counterfeit product categories. Furthermore, to address RQ4, this section proposes a theoretical framework to enhance an understanding of consumer behaviour in the context of counterfeit fruits. In doing so, RQ2 and RQ3 will also be addressed by examining the factors that shape consumer attitudes towards counterfeit fruits and how they compare to other counterfeit products. This section concludes with a consideration of the limitations of the paper and outlining potential directions for future research.

4.1. Potential factors influencing purchase intention towards counterfeit fruit

Based on previous studies of consumer behaviour towards counterfeit products, eight factors are outlined that may influence purchase intentions for counterfeit fruits. Of note, attention must also be given to the unique characteristics of fruits as a food product, where safety concerns play a significant role for consumers.

(1) Perceived value

Perceived value is a consistent driver in the purchase of counterfeit products across categories such as luxury goods and electronics. For counterfeit fruits, perceived value extends beyond just price and accessibility—it also encompasses how well the fruit meets consumers' sensory expectations. Given that fruits are typically chosen for their taste, appearance, and freshness [96], consumers may be more inclined to overlook authenticity if these qualities are satisfactory. If a counterfeit fruit looks appealing, tastes good, and is offered at a lower price, consumers may view it as a practical and acceptable alternative, other than check the authenticity. Therefore, in the context of counterfeit fruits, price combined with the fruit's ability to meet sensory standards may play an important role in shaping purchase decisions, such as flavour and texture. As a result, when discussing perceived value, all the factors that shape the overall experience for consumers during their purchasing decisions should be considered. This experience may lead consumers to overlook the motivation to seek authentic products when they encounter deceptive counterfeit products [48], or in the case of a non-deceptive purchase, they might deliberately choose alternatives [61].

(2) Psychological factors

In deceptive cases, where consumers unknowingly buy counterfeit fruits, they may experience feelings of anger, betrayal, or disappointment upon discovering the deception. These emotions can reduce their likelihood of making repeat purchases and damage trust in the seller or brand. For non-deceptive purchases, consumers may feel satisfaction or

pride in securing a product at a lower price, knowing it is counterfeit but valuing the cost savings.

These psychological responses are complex and highlight the need for further empirical research. It may be important to explore whether the emotional experience of purchasing counterfeit high-value fruits is similar to that of luxury goods (driven by status and emotional resonance) or to electronics (where functionality and performance are key) [97] or both aspects. Understanding these differences may provide deeper insights into how psychological factors shape purchase intentions in the context of counterfeit fruits.

(3) Food safety

Food safety is expected to play a significant role in the decision-making process for counterfeit fruits. Unlike counterfeit luxury items, where the risks are largely financial or reputational [98], the risks associated with counterfeit fruits involve health and safety concerns that may cause sickness or death. Consumers may be hesitant to purchase counterfeit fruits if they perceive them to be a threat to their, or others, well-being. However, the extent to which consumers are aware or concerned about these risks could vary based on their level of education and food safety awareness [99].

(4) Social influence

Social influence is another important factor, but it may function differently for counterfeit fruits compared to luxury goods. Instead of being driven by status or peer pressure, consumers may be more influenced by word-of-mouth recommendations, local market practices, or online reviews regarding the quality and safety of fruits [100].

(5) Purchase purpose

An essential factor in understanding consumer behaviour towards counterfeit fruits is the purpose of the purchase. For instance, it is valuable to explore whether consumers feel a sense of embarrassment or concern if others discover they are buying counterfeit fruits. Additionally, the context of the purchase plays a significant role; consumers may buy counterfeit fruits for personal use or, alternatively, for gift-giving. In cases where high-value fruits are intended as gifts, consumers may prioritise the product's appearance (including factors around packaging) and perceived quality to impress or satisfy the recipient [101]. This suggests that purchase purpose can influence whether authenticity is a primary concern for the consumer, depending on the intended use or recipient of the product, along with the value and price.

(6) Demographic influence

Demographic factors may also influence consumer behaviour towards counterfeit fruits. For example, low-income consumers might focus on affordability rather than whether the fruit is genuine [102]. Even if they are deceived, they may not be overly concerned. In contrast, high-income consumers may be more cautious, fearing deception and therefore choose purchase from more trustworthy channels [103]. Additionally, it may be of interest to explore if different educational backgrounds influence the level of priority given to the authenticity of the fruit's origin.

(7) Other factors

Social and cultural factors are also important influences on consumer behaviour, particularly in countries where fruits hold special significance, such as in East Asian countries [104]. In these cultures, fruits are often associated with status and gift-giving. For example, during holidays like Chinese New Year, it is common for people to give premium high-value fruits as gifts [105]. In such cases, consumers may prefer to

purchase authentic fruits, as being found giving counterfeit products could result in a loss of 'face' or social standing [106]. The cultural pressure to present genuine, high-quality fruits in these contexts may make consumers more cautious about where and how they purchase.

(8) Consumer attitudes pre-purchase

In the Theory of Planned Behaviour, consumer attitude is a key factor influencing purchase intentions [58]. If consumers view counterfeit products positively, they are more likely to prioritise price and availability over authenticity [2]. However, if they have a negative attitude towards counterfeit fruits, concerns about health risks and quality may discourage them from purchasing.

In summary, the factors influencing purchase intentions for counterfeit fruits are multifaceted, encompassing both internal and external influences such as perceived value, psychological factors, and social influence, alongside specific considerations like food safety and socio-culture. These insights highlight the complexity of consumer behaviour in the context of counterfeit fruits and suggest that motivations for purchasing them can differ significantly from those in other counterfeit product categories. By examining purchase purpose, demographic influences, and consumer attitudes, future research can better understand the unique factors shaping consumer decisions in this area. Addressing these will contribute towards RQ2 and RQ3 by identifying the key elements driving purchase intentions for counterfeit fruits and comparing them to other counterfeit products. Additionally, these findings contribute to developing a comprehensive theoretical framework, as outlined in the next section, that may guide future research and practical strategies to combat the proliferation of counterfeit fruits in the market.

4.2. Theoretical framework of consumer purchase intention to counterfeit fruit

The theoretical framework is based on the Theory of Planned Behaviour, which emphasises the role of attitude in shaping purchase intentions. The framework also integrates elements from the Consumer Decision Process theory, which takes a more detailed approach in evaluating the internal and external factors that influence consumers' purchasing decisions. By combining these two theories, both of which were discussed earlier in this paper, this framework seeks to offer a comprehensive understanding of the factors influencing purchase intentions towards counterfeit fruits.

The framework outlines several key variables:

1. Independent variables: These consist of both internal and external factors that directly influence the consumer's purchase intention:

Internal Factors: These include psychological factors and perceived value. Psychological elements, such as brand loyalty, emotional resonance, and consumer trust, are expected to influence consumer purchase intention towards purchasing counterfeit fruits. Similarly, perceived value is an important factor, where consumers weigh the price and quality of counterfeit fruits against genuine ones.

External Factors: These include social influence, purchase purpose, food safety, demographic characteristics, and social culture. For example, social influence might impact the decision to purchase counterfeit fruits through peer recommendations or online reviews, while purchase purpose could range from everyday consumption to gift-giving. Food safety concerns are particularly significant in this context, as they directly influence whether consumers view counterfeit fruits as a potential health risk. Demographic factors such as income and education may further shape purchase intentions, particularly with regard to price sensitivity and awareness of authenticity. Social culture also may affect purchase intentions, especially in contexts where fruits hold symbolic or cultural value. In some cultures, fruits are traditional gifts during holidays and celebrations.

2. Mediator variables

In this framework, consumer attitude plays a mediating role between the independent variables and the dependent variable (purchase intention). According to the Theory of Planned Behaviour, attitude is a key determinant of behaviour. Factors such as perceived value, social influence, and purchase purpose affect purchase intention indirectly by first influencing consumer attitude. For example, if consumers perceive counterfeit fruits to offer good value based on price and quality, they may develop a positive attitude, which could increase the likelihood of purchase or reduce the motivation to check for authenticity.

Attitude also mediates the effect of external and internal factors. For instance, social influence or food safety concerns may shape whether the consumer holds a positive or negative attitude, which then affects their purchase decision.

3. Dependent variable

The final outcome in the framework is the purchase intention of counterfeit fruits. Purchase intention is influenced by the interaction of internal and external factors, mediated by the consumer’s attitude towards counterfeit fruits. A favourable attitude is more likely to lead to positive purchase intentions, while an unfavourable attitude will reduce the likelihood of purchase.

The framework in Fig. 6 provides one of the key outcomes of the study and directly addresses RQ4, which asks whether a theoretical framework can enhance the understanding of consumer attitudes and purchase intentions towards counterfeit fruits. Given the significant differences between emerging counterfeit products and traditional counterfeit products, the framework integrates insights from both the Theory of Planned Behaviour and Consumer Decision Process theories and theories on purchase intentions from other counterfeit products to highlight the important role of attitude and provide a structured approach to understanding the various factors influencing counterfeit fruit consumption. By categorising the influencing factors into internal and external, the framework simplifies the complexity of the potential influences. This can assist in designing the research agenda, including how to conduct empirical studies and develop appropriate questions for survey questionnaires and interviews.

4.3. Limitations of the framework and research methods

The framework, although developed based on a review of existing

literature, requires empirical testing to ensure it is fit for purpose. Its applicability to different geographic regions, cultural contexts, and socio-economic conditions may also vary. For example, consumers in regions with strong trust in regulatory enforcement might respond differently to counterfeit produce than those in regions where trust is low [42,107,108]. Thus, the proposed framework may require adaptation across different cultural contexts, and future research should examine these context-specific factors to assess the framework’s generalisability.

Consumer behaviour is inherently complex and influenced by different factors. While the framework attempts to integrate a wide range of variables, it may not fully encompass all potential influences on consumer attitudes and purchase intentions. Other unexplored factors may significantly impact consumer behaviour towards counterfeit fruits. Collecting reliable and valid data on consumer attitudes and behaviours towards counterfeit products can be challenging. Consumers may be reluctant to admit to purchasing counterfeit fruits or may provide socially desirable responses, making data accuracy and representativeness important for empirical research. Furthermore, the measurement of certain variables, such as perceived authenticity, consumer trust, and socio-cultural influences, can be complex. Developing precise and reliable measurement instruments is essential for the validity of the research findings. Ethical considerations also play a significant role, especially when studying consumer behaviour involving illegal activities.

Despite these limitations, the proposed theoretical framework is presented to progress the study of counterfeit fruits by providing a structured approach to explore the factors influencing consumer attitudes and purchase intention. By addressing the identified limitations through future research, scholars can contribute to a deeper understanding of counterfeit fruit consumption and the development of effective anti-counterfeiting strategies.

4.4. Future studies of counterfeit fruit

This paper explored the evolution of counterfeit product research and its focal areas, culminating in a synthesis of the prevailing trends that enable investigation of novel counterfeit products from a consumer-centric perspective, and highlights an under-explored topic. Based on this review, future research proposed within the scope of counterfeit fruit could include the following:

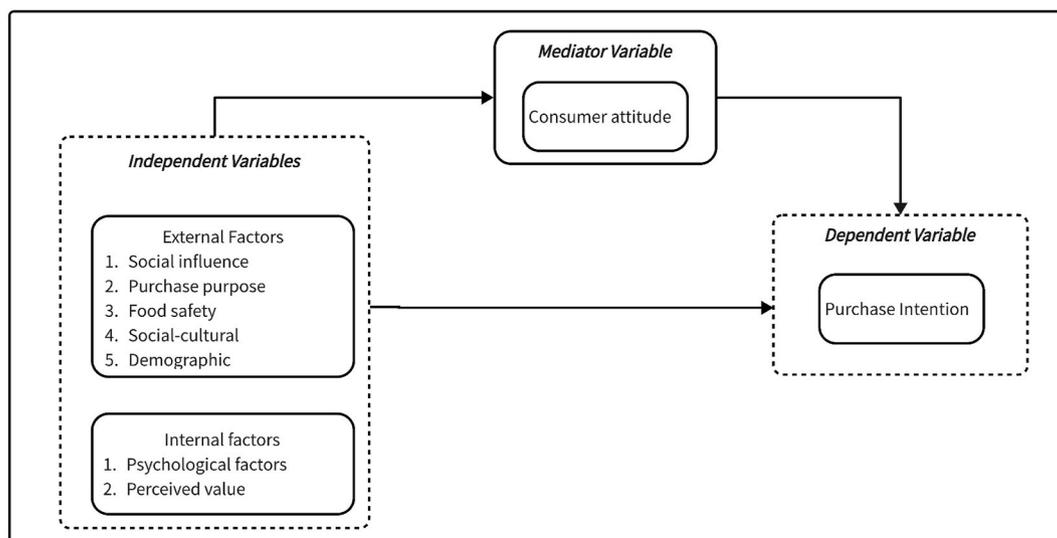


Fig. 6. Framework for analysing consumers’ attitudes and purchase intention towards counterfeit fruit.

- (1) **Exploring the psychological underpinnings of consumer behaviour:** Studying consumers' attitudes and emotions when making decisions about counterfeit fruits can reveal the cognitive and emotional processes that guide their choices. This includes whether they are willing to check for authenticity, whether they care about accidentally purchasing counterfeit fruits, or if they intentionally buy counterfeit fruits at a lower price. Exploring these psychological processes may inform if fraudulent producers are deceiving consumers for profit gain, or, if similar to luxury products, intentional behaviour of consumers contributes to the proliferation of counterfeiting.
- (2) **Empirical analysis using Structural Equation Modelling (SEM):** Future research could focus on empirically analysing the factors influencing consumer purchase behaviour towards counterfeit fruit through Structural Equation Modelling (SEM). SEM is a powerful statistical technique that has been widely utilised in consumer behaviour research to examine complex relationships among variables [109]. For example, previous studies have applied SEM to explore the role of perceived authenticity, emotional responses, demographic influences, and socio-cultural factors in shaping consumer attitudes and purchase intentions in other counterfeit product contexts [110,111]. By employing SEM, researchers can trace both direct and indirect effects of these variables, offering deeper insights into how various factors collectively influence consumer decisions.
- (3) **The role of consumer education in mitigating counterfeit fruit transactions:** Researchers may examine the efficacy of education in reducing purchase intention of counterfeit fruit, which can explore the effectiveness of education campaigns in changing consumer behaviour and mitigating the demand for counterfeit fruit.
- (4) **Counterfeit fruit in the global food supply chain:** Future research can focus on quantifying the prevalence of counterfeit fruit throughout the global food chain. Exploration of anti-counterfeiting measures and traceability systems will highlight their impact on the security and trust within the supply chain.

5. Conclusion

This study highlights the emerging issue of counterfeit fruits and provides the first systematic examination of this phenomenon from a consumer perspective. The review identifies seven key factors that shape consumer purchase intentions, including demographic, social influences, socio-cultural contexts, psychological drivers, purchase motivations, food safety concerns and perceived value. Based on these findings, a new theoretical framework is proposed by integrating the Theory of Planned Behaviour with the Consumer Decision Process. The findings also highlight that counterfeit fruits differ from traditional counterfeit products, as they are primarily associated with mislabelling, false origin claims and brand imitation. The proposed framework contributes to theory by extending established models of consumer behaviour into a new context and to practice by offering guidance for anti-counterfeiting strategies in food supply chains. Future research should empirically validate this framework and explore how cultural and contextual differences influence consumer responses to counterfeit fruits.

CRedit authorship contribution statement

Jie Deng: Writing – original draft, Formal analysis, Conceptualization. **Stephen Cahoon:** Writing – review & editing, Supervision. **Dugald Close:** Writing – review & editing, Supervision. **Jiangang Fei:** Supervision.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Data availability

No data was used for the research described in the article.

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