ORIGINAL ARTICLE

DESIGN EXPERTS' INSIGHTS ON OPTIMISING COMMUNICATION AND READABILITY IN BAKERY FOOD LABELLING

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Abstract

Bakery food labels are essential tools for conveying ingredient information, yet poor readability and inconsistent design practices limit their effectiveness. Issues such as small fonts, low colour contrast and cramped layouts make ingredient information difficult to interpret, particularly for health-conscious consumers. This study explores design experts' insights on how to optimise communication and readability in bakery food labelling, focusing on practical design elements and innovative solutions. Semi-structured interviews were conducted with ten design experts with over 20 years of professional experience in graphic design, packaging and visual communication. Experts emphasised the importance of clear background, text contrast, minimum font size standards, adequate spacing and simplified layouts. Recommendations included the integration of QR codes and Front-of-Pack labelling systems to enhance accessibility, especially for parents managing children's dietary needs. However, spatial and financial constraints remain barriers for many bakery manufacturers. Experts' perspectives highlight the critical role of user-centred design in optimising bakery food labelling. Prioritising readability through appropriate typography, colour contrast and digital innovations ensures more effective communication of ingredient information, supporting safer and healthier consumer choices.

Keywords: Food labelling, readability, communication design, design experts, bakery packaging

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Introduction

Background of the Study

Food labels serve as a primary communication tool for conveying essential information about ingredients, allergens, nutrition, and safety. They support consumer decision-making and play a critical role in food protection legislation. Soon and Wahab (2021) reported that consumers most frequently read expiration dates, ingredient lists, and countries of origin. Their findings also documented 2,470 product recalls and alerts due to labelling errors, including incorrect or missing allergen information, inaccurate ingredient declaration, and misleading claims.

Doshi et al. (2025) found that although higher secondary school students were aware of nutrition labels, only 56% could correctly interpret them. Between 20% and 70% of young individuals lacked knowledge of fatty acids, recommended sugar intake, harmful additives, or packaging dates, and many demonstrated poor consumption practices regarding processed foods. In Malaysia, bakery products increasingly replace traditional staples among busy families (The Star Online, 2017; Consumers Association of Penang, 2017). However, research indicates that these products often contain high levels of sugar, additives, and trans fats, contributing to childhood obesity, allergies, and diet-related illnesses (Crouch, 2019; Azimah et al., 2013; Tierney et al., 2017). Parents' ability to interpret ingredient information is frequently hindered by small fonts, low colour contrast, decorative typography, and crowded layouts (Shafie & Azman, 2015; Anith Liyana et al., 2016).

Although the Malaysian Food Act 1983 and Food Regulations 1985 mandate accurate ingredient disclosure (Tee, 1995), many manufacturers prioritize branding aesthetics over readability (Hebrok & Heidenstrøm, 2019). Corporate colour use, decorative typography, and limited packaging space often compromise visibility (Zorko et al., 2017; Soares et al., 2024), potentially endangering children with allergies or dietary restrictions (Kostecka et al., 2022). Poorly designed labels also lead to consumer misinterpretation or neglect of ingredient information (Joshi et al., 2002; Silayoi, 2007; Ramli et al., 2018).

Given rising bakery food consumption and diet-related health concerns, the gap between information availability and accessibility represents a significant public health issue (MOH Malaysia, 2013).

Statement of the Problem

Research shows that between 50% and 60% of consumers read nutrition labels and ingredient lists (Kumar & Kapoor, 2017; Saha et al., 2013). Malaysian consumers demonstrate considerable engagement with ingredient lists (Zafar et al., 2022). Pfledderer et al. (2024) found that young

people who frequently used Nutrition Facts labels had healthier eating patterns, higher Healthy Eating Index and Healthy Food Indicator scores, and lower Unhealthy Food Indicator scores. Similarly, Pan et al. (2025) reported that young consumers perceived interactive labels and educational videos as helpful, and preferred brief videos featuring highlighted keywords. Graham and Laska (2012) showed that consistent label use predicted healthier food selection and increased intake of nutrient-dense foods.

Although labels provide valuable information, many consumers do not use them consistently or cannot interpret them effectively. This is exacerbated when design elements such as text size, layout, and colour reduce readability. Therefore, understanding design experts' perspectives on improving bakery food ingredient information is essential for enhancing consumer understanding and safety.

Research Objective and Research Question

In this study, parallel with a research objective, research questions were formulated: To determine the factors that influence the effectiveness of bakery food ingredients information based on the perspectives of design Experts. What influences the effectiveness of bakery food ingredients' information based on the design experts' perspectives?

Theoretical Framework

It is important to understand the role of theory in research. Cezzar (2014) defines theory as a system of ideas that helps explain or speculate about why people act in certain ways. In this study, graphic design theory is viewed as a system of ideas that explains or speculates why designers make particular design choices. Although unique in design, graphic design theories often draw from other disciplines such as art, architecture, economics, anthropology, sociology, technology, or science. Through reading and writing design theories, designers communicate, discover shared perspectives, and adapt theories in response to cultural and technological changes (Oladumiye, 2018).

Theoretical frameworks are essential in guiding mixed methods research and exploring associations among variables Evans, C., Coon, D. W., & Ume, E. (2011). This study applies two theories to examine the effectiveness of BFII and address the identified issue. The first is extreme formalist theory, which emphasises the use of design elements, while the second is visual rhetoric theory, which helps assess BFII's effectiveness and supports the development of design solutions. These two theories form the basis of the conceptual framework for this research.

Conceptual Framework

Figure 1
Conceptual framework for the bakery product ingredient information

Figure 1 illustrates the conceptual framework of this study, demonstrating the relationship between design elements and the effectiveness of bakery food labelling information based on the experts' view. This research aims to evaluate the factors that influence the effectiveness of bakery food ingredients information based on the perspective of design experts.

Literature Review

Food Labelling Act in Malaysia

Food labelling helps consumers make informed choices and ensures food safety, a shared responsibility of governments, manufacturers, and consumers. Food regulations control the content and design of labels, providing essential information such as expiry dates, instructions, and allergy warnings to prevent foodborne diseases and allergic reactions. For example, the Nutrition Labelling and Education Act has mandated labelling in the U.S. since 1994, and in Canada since 2005, requiring all packaged foods to carry accurate nutrition labels (Mediouni & Cheikhrouhou, 2019; Jakubowska & Pachołek, 2022). In 2016, the FDA revised the Nutrition Facts label with updated scientific information. In Malaysia, food producers and suppliers comply with the Food Act 1983 and Food Regulations 1985, which safeguard public health while aligning with Codex Alimentarius standards, though adapted for local needs. These regulations require permanent labelling on food packages and mandate nutrition labels for products such as cereals, bread, milk products, flour confections, canned foods, soft drinks, and fruit juices. Labels must also provide details, including food descriptions, ingredient lists, allergens, company information, genetically modified ingredients, and irradiated food.

The Australia-New Zealand Food Standard Code, introduced through the Food Act 1984 in Victoria, establishes legal requirements for food labelling, composition, safety handling, and food production processes. It mandates that all ingredients be listed in decreasing weight, with additives and colourings identified by their specific name or code number, while New Zealand regulations also require declaring the percentage of characteristic ingredients. Additives must be listed by class names (e.g., emulsifier), followed by their specific name or code number in brackets, whereas flavourings are generally listed as "flavour" or "flavouring," or given a more specific description due to the large number approved for use. Certain substances, such as monosodium glutamate (MSG), must always be explicitly declared. These requirements enable consumers to identify additives, colourings, and flavourings of interest, with strategies like placing such details in a separate but co-located ingredient box suggested to enhance clarity (European Union, 2012).

Methodology

Research Design

Although the overall study adopted a sequential explanatory mixed-method design, this article focuses exclusively on the qualitative component, presenting only the qualitative findings and discussion. Guided by Creswell's (2018) framework for mixed-method research, the qualitative phase was designed to provide an in-depth exploration of expert perspectives on bakery food ingredient information. This component aimed to generate rich, interpretive insights that complement and extend the quantitative phase, emphasizing experts' professional interpretations and evaluations of the communication effectiveness of bakery food ingredient information. The analysis and discussion align with the principles outlined in the Malaysian Food Act (1983) and the Food Regulations (1985), ensuring both contextual and regulatory relevance.

Participants

The expert interviewee demographics are shown in Table 1. The demographic profile shows that Experts have 20–21 years of expertise, supporting the claim that all study experts had extensive graphic design expertise. Their demographic information implies that their experiences were sufficient to grasp bakery food ingredient design and design features. Nine experts were male and one was female. This study was voluntary, and the researcher did not consider gender, age, education, tenure, or religion.

Table 1

Demographics of Expertise in Interview

Abbreviations	Gender	Age	Industry	Year of Experience
Expert 1	Male	40's	Brand identity design Packaging Design Graphic Design	26 years
Expert 2	Male	40's	Corporate identity (CSI) Packaging Design Iconography User interface Graphic Design Environmental Design Design Consultant	21 years
Expert 3	Male	50's	Graphic Design Consultant Graphic	31 years 29 years
Expert 4	Male	30's	Packaging Design Design Consultant	12 years 6 years
Expert 5	Male	30's	Corporate Identity (CSI) Packaging Design Graphic Design Consultant	16 years
Expert 6	Male	60's	Corporate Identity (CSI) Packaging Design Fine Art	30 years

Expert 7	Female	30's	Graphic Design, Environmental Design Graphic Design Consultant Corporate Identity (CSI) Packaging Design	11 years
Expert 8	Male	20's	Graphic Design Consultant Graphic Design Videography Photography	6 years
Expert 9	Male	20's	Digital Design User Interface, Graphic Design Animation, Web Design	5 years

Based on the interviews conducted with the Experts, seven (7) primary themes emerged: (1) background colour, (2) text colour, (3) font size, (4) layout arrangement or format, (5) the manufacturer, (6) government or ministry and (7) materials. Most Experts emphasised that using appropriate background and text colour, suitable font size, and layout enhanced the effectiveness of brands' labels.

Sampling Procedure

This study used expert qualitative sampling, which requires field experts to respond. The qualitative sample frame was based on three criteria from Mediouni and Cheikhrouhou's (2019) research. Initially, three experts were considered, but to define a data saturation threshold and develop a solid and valid study comprehension, the number of experts was increased to 10.

For the qualitative strand, face-to-face interviews were conducted with creative sector experts using a semi-structured format that allowed for both focus and conversational flexibility. The qualitative sample frame was constructed based on three criteria outlined by Mediouni and Cheikhrouhou (2019), with a total of ten graphic designers chosen for their extensive professional experience.

Instruments

Expert sampling was employed to ensure that only practitioners with relevant knowledge contributed to the study. The number of participants was expanded from three to ten in order to achieve data saturation and strengthen the validity of the findings. Interview questions were open-ended and built upon themes identified in the literature review, enabling experts to provide detailed reflections on the labelling of different types of bread. Semi-structured interviews facilitated in-depth exploration while maintaining analytical focus (Kostera & Modzelewska, 2021).

Demographic profiles revealed that most experts had over 20 years of industry experience, with nine male and one female participant. Despite challenges in recruiting female experts and managing time constraints, the researcher successfully gathered rich qualitative data. Information sheets describing the study were provided in advance to ensure informed participation, which supported cooperation during interviews and enhanced the credibility of the data collection process.

Data Collection Procedure

During data collection, the researcher found that male experts approved interviews faster than female experts, while many female experts denied interview and correspondence requests. Despite time restrictions and other obstacles, the researcher successfully collected and analysed data, with experts receiving information sheets describing the study's research terms to support understanding and cooperation during interviews.

Plan of Data Analysis

The qualitative data were analysed thematically using NVivo 12, allowing key themes to emerge inductively. In the qualitative phase, semi-structured interviews were conducted with ten design experts selected for their professional experience in graphic design, packaging, and visual communication. This strand of the research examined expert views on the effectiveness of colour, typography, layout, and the potential of digital tools such as QR codes in improving food label readability.

Result

Table 2 summarises the experts' assertion that this traditional combination not only complies with accessibility criteria but also adheres to recognised best practices in information design.The results of the statistical analysis of the data collected are summarised in this section. Experts from several domains, such as design, health, and food regulation, underscore the significance of readability and accessibility in presenting Back-of-Pack Food Ingredient Information (BFII). The prevailing guideline is to utilise black text on a white background, as this pairing provides optimal contrast, thereby markedly improving legibility for a diverse audience, including individuals with visual impairments, low literacy, or cognitive difficulties.

Table 2
Summary of Background Colour

Expert	Background & Text Colour Recommendation	Corporate Colour Use	Font Colour Comments	Additional Notes
E1	White background with black text for best contrast and readability	Corporate colour on BFII is irrelevant	Black is globally preferred; avoid coloured fonts for info; small white text on black is hard to read	Designers may use colours sparingly for emphasis, but not in BFII
E2	Light background (white) and dark text (black) for legibility	Important for brand identity, but overuse causes design failure	Best legibility=high contrast, black on white is ideal	Clients often overrule design best practices

E3	White background and black text are ideal, especially for consumers with optical issues	Inappropriate for BFII, design marketing goals	Text should contrast clearly with the background	Standard contrast avoids complications for all users
E4	Plain white background; black text for readability	Should be limited to logo/ branding, not BFII	Text should be in black or a matching dark tone, depending on the background	Design should cater to all age groups
E5	A white background with dark/black text is most effective	Impractical for BFII use	Avoid mixing multiple colours with black; black text ensures accessibility	Address colour-blind readers and printing accuracy
E6	White background preferred, but corporate colour can be used in tinted form	Use corporate colour in tint only (mixed with white)	The right colour choice is crucial for visibility	Highlights the importance of printing material
E7	Background and text colour are less critical than font style and layout	Corporate colour for overall packaging look; white box for info	Serif fonts are avoided for small text	Advocates compromise; white box for BFII
E8	White background and black text for clarity	Corporate colours are okay for packaging, not for BFII	Background/ text clashes hurt legibility	Consistency and contrast are essential
E9	A white background improves readability	Corporate colour is fine, but must not affect legibility	Avoid using the same colour for background and text	Poor colour choices make labels ineffective
E10	Fix the BFII background to white for clarity	Not explicitly opposed, but focuses on purpose	The right combination ensures the info is visible	Labels must meet design, cost, and printing needs

Table 3 Experts 1 and 4 highlight this range in particular, noting that smaller fonts sometimes require magnification, which hinders user experience, especially for older adults. According to Experts 2 and 5, font readability is affected by typeface, x-height, design context, and point size. According to them, it is crucial to use appropriate font styles like Arial instead of Bodoni because even two fonts with the same point size might have vastly different legibility. According to Expert 3, avoiding too dense or elaborate text styles is best to ensure readability across all age groups.

Table 3
Summary of Font Size

Expert	Recommended Font Size	Key Concerns/Points	Additional Notes
E1	8-12 pt (prefer 9 pt)	Space constraint: Avoid all caps; use Helvetica (sans-serif), prefer mixed case	Font size plays a key role in effective information delivery
E2	11 pt (min x-height)	Font readability depends on typeface and x-height. avoid narrow fonts at small sizes	Corporate fonts may be unsuitable; font choice should match the packaging layout
E3	≥5 pt	Text must be clean, readable, and not cluttered; no fancy designs	Emphasizes readability for older consumers
E4	6-7 pt (min 5.5 pt)	Large fonts are good, but can affect design aesthetics	Support increasing font size within reason
E5	≥6 pt	Typeface and x-height vary in appearance; avoid all caps; limit words per line	Emphasizes line tracking and overall readability
E6	≥5 pt	Avoid set and narrow fonts; font size varies with packaging space/layout	Letter spacing is also crucial
E7	7 pt	The layout is more important than font size alone	Suggests focusing on arrangement rather than size adjustment
E8	≥4 pt	Font size should not dominate the design	Believes current sizes are suitable
E9	≥6 pt	Depends on the packaging size and dimensions	Echoes, layout and content density impact readability
E10	Contextual	Font size is more complex than colour; it depends on the info hierarchy and label size	Mock-ups differ from screen views; a holistic approach is needed

Table 4 Expert 4 suggested using European packaging icons and symbols in Front-of-Pack (FOP) labelling systems instead of many firms' inflexible and monotonous layout patterns. Few experts (Experts 3, 4, and 10) supported FOP and Traffic Light labelling for improved communication, but most agreed that spatial and financial constraints limit both systems. Redesigning packaging to include more information is often considered impractical and expensive.

Most experts recommend using QR codes or barcodes to solve these layout issues because they are practical and cost-effective. Experts 2, 5, 6, 7, 8, and 9 recommended QR codes because they give consumers, especially parents, ingredient information without sacrificing container space or visual clarity. This follows digital trends and ensures ingredient transparency, including scientific terminology explanations on linked microsites. Hence, standardising the BFII structure is difficult, but experts agree that digital solutions, especially QR codes, are sustainable and user-friendly. These solutions address spatial constraints, improve accessibility, readability, consumer interaction, and food labelling policies.

Table 4
Summary of Layout Arrangement of Format

Expert	Key Issues Identified	Recommendations	Tech/Design Suggestions
E1	Space constraints, cost of redesign	Keep the layout clean and simple	Use a barcode to access info
E2	Tight spacing, font readability	Improve layout legibility	Use QR/ barcode for access
E3	Small text, disjointed printing	Prioritize information over design	Use FOP or barcode
E4	Copy-paste layout culture	Change mindset, adopt a flexible design	Use icons/symbols (FOP)
E5	Too much space for irrelevant info	Allocate space wisely	Use QR codes
E6	Packaging too small	Avoid redesign	Use QR codes for extra info
E7	Poor alignment, costly redesign	Align left, basic formatting	Use QR code for all info
E8	Cramped fonts, poor spacing	Clear fonts, good spacing	

Discussion

The interviews revealed several interrelated challenges affecting the clarity and accessibility of Bakery Food Ingredient Information (BFII). Spatial constraints were consistently identified as the most significant barrier, limiting font size, reducing spacing, and forcing manufacturers to condense essential information. This compromise frequently results in unreadable ingredient lists, especially for older adults or parents seeking allergen information.

Although conventional BFII formats—title, ingredient list, and nutrition count—are widely used, experts argued that these layouts are often formulaic and inflexible, failing to account for variations in packaging size and consumer needs. The uniform approach used in Malaysian bakery packaging tends to prioritize branding over legibility, reinforcing issues highlighted in earlier sections.

Experts strongly agreed that BFII should consistently use a white background with black text, regardless of corporate branding. This ensures compliance with best practices in contrast sensitivity and accessibility. Variations in font size recommendations reflected differing perspectives on minimizing design intrusion while maintaining legibility. However, experts concurred that decorative fonts, narrow typefaces, and all caps should be avoided due to their negative impact on readability.

Digital solutions emerged as the most practical and widely supported enhancement. QR codes, in particular, allow manufacturers to circumvent spatial limitations by linking consumers to extended ingredient explanations, allergen notes, and translations. QR codes also align with contemporary digital behavior, offering convenience and improved clarity. Barcodes, while more limited, were considered cost-efficient alternatives.

Front-of-Pack and Traffic Light labelling systems were acknowledged as potentially helpful but financially impractical for small-scale bakery manufacturers. Experts highlighted that regulatory enforcement of improved layout practices remains challenging due to material constraints and cost considerations.

Overall, improving BFII requires a balance between consumer-centred readability, regulatory compliance, design practicality, and manufacturing constraints. Expert insights offer clear direction for enhancing label effectiveness, particularly through optimized typography, consistent colour contrast, and strategic adoption of digital tools.

Conclusion

This study demonstrates that readability and communication effectiveness are key concerns in bakery food labelling. Design experts highlighted pervasive challenges, including limited packaging space, small or decorative fonts, and inadequate colour contrast. High-contrast colour schemes, legible sans-serif typefaces, careful spacing, and structured layouts were identified as essential for improving clarity.

Digital tools, especially QR codes, were strongly recommended for expanding access to ingredient information without overcrowding the packaging. While branding and regulatory considerations remain important, the findings emphasize that consumer-centred design must take precedence to support informed decision-making.

The insights gathered from design experts provide a valuable foundation for developing labelling strategies that address industry constraints while safeguarding public health.

Recommendations for Future Research

This study focused on expert perspectives within the Klang Valley. For broader generalizability, a nationwide survey involving Malaysian parents is recommended. Investigating information distribution methods, consumer acceptance, and nutritionists' perspectives would also contribute new insights into improving ingredient communication and label design.

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