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**How Behavioural Influences and Cognitive Biases Shape Food Safety
Perceptions Among Cardiff Metropolitan Students**

(Final Project submitted under the SHS6200 area)

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Abstract

Foodborne illness remains a significant public health concern globally and within the United Kingdom, with a substantial proportion of cases linked to unsafe food handling in domestic environments. University students represent a particularly relevant group due to their transition to independent living and increased responsibility for food preparation. This study aimed to explore how behavioural influences and cognitive biases shape food safety perceptions among Cardiff Metropolitan University students.

A qualitative research design was adopted, using semi-structured interviews with eight undergraduate students. Data was analysed using reflexive thematic analysis, resulting in four key themes: (1) food safety knowledge is socially acquired, uneven and informal; (2) risk perception is shaped by cognitive biases and personal experience; (3) decision-making is guided by heuristics, habits and routine shortcuts; and (4) behaviour is socially negotiated and influenced by environmental and contextual factors.

The findings demonstrate that, although participants possessed elements of food safety knowledge, behaviour was largely driven by intuitive judgement, prior experience and social context. Cognitive biases, including optimistic bias and the normalisation of risk, contributed to the underestimation of food safety hazards. Participants frequently relied on sensory cues and past outcomes rather than formal guidance, while habits and environmental constraints further reinforced unsafe practices. Social influences, including peer behaviour and shared living conditions, also played a significant role.

The study highlights the limitations of knowledge-based interventions and emphasises the need for behaviourally informed approaches that address cognitive, social and environmental determinants of food safety behaviour. These findings contribute to a more integrated understanding of the knowledge-behaviour gap and have important implications for public health strategies targeting young adult populations.

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Introduction

Foodborne Illness and Public Health Context

Foodborne diseases are caused by the consumption of food contaminated with pathogenic microorganisms, including bacteria, viruses and parasites, and can occur at multiple points across the food chain (World Health Organisation, 2024). Foodborne illness presents a major global public health concern, imposing substantial human and economic costs. Worldwide, unsafe food is estimated to cause approximately 600 million cases of illness and 420,000 deaths annually, leading to millions of healthy life years being lost as a result of contaminated food consumption (World Health Organisation, 2025). Globally, foodborne pathogens such as *norovirus*, *Campylobacter*, *E. coli* and *non-typhoidal Salmonella* remain major causes of diarrhoeal disease, despite many cases being preventable through safer food practices and improved consumer behaviour (World Health Organisation, 2015).

In the United Kingdom, foodborne illness remains a significant public health concern, with an estimated 2.4 million cases occurring annually (Food Standards Agency, 2022). These illnesses place considerable pressure on healthcare systems and can lead to wider socioeconomic impacts, including productivity losses and increased healthcare costs (World Health Organisation, 2019). Many consumers underestimate the extent to which foodborne illnesses are associated with domestic or household environments, often perceiving food safety as the responsibility of public authorities (Kasza et al., 2022). Consumer behaviour, therefore, plays a critical role in prevention. Unsafe handling, poor hygiene and misinterpretation of risk cues can increase illness risk, while safer practices can reduce pathogen exposure and ease pressure on healthcare systems (Menini et al., 2022).

University Students as a High-Risk Group

University students represent an important population within this context. As individuals transition to independent living, they often become responsible for their own food purchasing, storage and preparation for the first time. Research indicates that consumers demonstrate inconsistencies in food safety knowledge, attitudes and behaviours (Saadat, Siddique and Hashim, 2024). These inconsistencies may increase students' vulnerability to foodborne illnesses, particularly within shared living environments where food safety practices are influenced by others (Food Standards Agency, 2023). Ma, Bo and Zhou (2024) highlight that strengthening food safety behaviours in this age group is essential for reducing preventable illness and improving long-term public health outcomes.

Student living conditions can further heighten exposure to food safety risks. A UK-wide survey conducted by the Food Standards Agency identified several unsafe practices among students, including washing raw poultry, inadequate hand hygiene after handling meat, and the consumption or storage of food beyond its use-by date. Additionally,

shared kitchen environments can present challenges for maintaining hygienic practices, with issues such as limited refrigeration space and poor coordination of food storage, increasing the risk of cross-contamination (Food Standards Agency, 2023). These findings suggest that food safety behaviours in this population are shaped not only by knowledge but also by environmental and social factors. Given that many undergraduate students at Cardiff Metropolitan University live in shared housing or halls and manage their own food preparation, this population provides a relevant context for investigating food safety perceptions and practices.

Food Safety Knowledge Vs Behaviour

Despite widespread awareness of food safety guidance, research consistently demonstrates a gap between knowledge and behaviour. Zanin et al. (2017) stated knowledge alone does not reliably predict safe food handling behaviour. Studies across student populations show that even when individuals possess reasonable knowledge of food safety concepts, their practices often fall short of recommended standards (Islam et al., 2025; Sambo, 2023). For example, students frequently rely on subjective cues such as smell or appearance to assess food safety, rather than applying formal guidance (Food Standards Agency, 2026), highlighting that knowledge does not consistently translate into behaviours that reduce risk (Afrin et al., 2024).

However, evidence exploring socio-behavioural influences suggests that inadequate knowledge is only one component of this knowledge-behaviour gap (Steur et al., 2025). While consumers may be aware of recommended practices, behaviour is often shaped by habit and perceived risk rather than conscious decision-making (Charlesworth et al., 2022). Similarly, Young and Waddell (2016) found that behaviours are frequently guided by common-sense reasoning and social influences, with individuals more likely to adopt safer practices when preparing food for others perceived as vulnerable. These findings highlight that food safety behaviour is influenced by a complex interaction of psychological, social and contextual factors (Freivogel and H. M. Visschers, 2020).

Charlesworth and Mullan (2023) further emphasise this limitation, stating that “further research is needed to better understand where and how to improve safe food handling,” highlighting a clear gap in the evidence base.

Literature Review

Cognitive Biases Relevant to Food Safety Perceptions

Cognitive processes are likely to play a key role in explaining this gap. Earlier research by Redmond and Griffith (2004) identified patterns such as optimistic bias and perceived control, whereby individuals underestimate their personal risk of foodborne illness, particularly when preparing food for themselves. More recent studies have built on this,

demonstrating that cognitive biases and heuristics (mental shortcuts) can distort risk perception and influence decision-making in everyday food handling contexts (e.g. Shan et al., 2019). However, there remains limited research exploring how these cognitive processes operate specifically within UK student populations.

Within this context, cognitive biases and heuristics play a key role in shaping how individuals perceive and respond to food safety risks (Trumbo and McComas, 2003). Individuals often rely on heuristics when making decisions, which simplify complex information but can lead to systematic errors in judgement (Blumenthal-Barby and Krieger, 2015). These processes are particularly influential in routine food practices, where risks are often invisible and consequences delayed, leading individuals to rely on past experience rather than formal guidance (Evans et al., 2020; Zanetta et al., 2022).

Optimistic bias is particularly relevant in food safety contexts. Individuals tend to perceive themselves as less likely than others to experience negative outcomes, leading to an underestimation of personal risk (Da Cunha et al., 2015). Wang and Yueh (2020) found that among student populations, this bias has been shown to reduce perceived susceptibility to foodborne illness, even when individuals are aware of potential hazards. As a result, individuals may be less motivated to follow recommended practices, assuming that adverse outcomes are unlikely to affect them (Rodrigues et al., 2020).

Overconfidence bias further reinforces this pattern. Individuals often overestimate their ability to manage food safety risks, for example by trusting their judgement of food freshness based on sensory cues, despite evidence that such cues are unreliable indicators of contamination (Guo et al., 2025). This misplaced confidence can lead to complacency and continued engagement in unsafe practices (Arni et al., 2021).

Anchoring and confirmation biases play an important role in food safety decision-making. Anchoring bias refers to the tendency to rely on initial information or pre-existing beliefs when assessing risk, which can distort judgement and lead to inaccurate risk estimations (Zong and Guo, 2022; Qiu et al., 2024). In food safety contexts, individuals may anchor to past experiences, such as previously consuming food without adverse effects, thereby underestimating potential hazards (Shan et al., 2019). Confirmation bias further reinforces this process, as individuals tend to favour information that aligns with their existing beliefs while dismissing contradictory evidence (Cao, Just and Wansink, 2019). Together, these biases can contribute to the continuation of unsafe practices despite awareness of food safety guidance.

Familiarity and normalisation processes contribute to the underestimation of food safety risks. Familiarity bias leads individuals to perceive routine or well-known practices as less risky, even when the objective risk remains unchanged (Fischer and Frewer, 2009). Repeated engagement in unsafe behaviours without negative consequences can further reinforce this perception, resulting in the normalisation of risk over time (Kaptan et al., 2022). As a result, individuals may rely on past experience rather than objective risk information, reducing perceived susceptibility to foodborne

illness and reinforcing habitual unsafe practices (Evans and Redmond, 2019; Young et al., 2015).

These biases do not operate in isolation but interact to shape behaviour. Cognitive biases can distort risk perception, reduce motivation and reinforce habitual behaviours, helping to explain why increasing knowledge alone is often insufficient to change food safety practices (Korteling, Brouwer and Toet, 2018; Frewer et al., 2015). Therefore, interventions that focus solely on disseminating knowledge may fail to address underlying cognitive processes that influence how people perceive and respond to risk (Michie, van Stralen and West, 2011).

Theoretical Frameworks

Behavioural science frameworks provide important insight into this knowledge-behaviour gap. The COM-B model proposes that behaviour is shaped through the interaction of capability, opportunity and motivation (Michie, van Stralen and West, 2011). While knowledge contributes to psychological capability, behaviour is also influenced by environmental opportunities, such as time constraints, access to resources and equipment, as well as practical skills required to implement safe practices effectively (Makhunga and Hlongwana, 2025). Motivational processes, including habits and risk perceptions, further influence behaviour (Mucinhato et al., 2026). This helps explain why individuals may fail to adopt safe practices despite being aware of them.

Similarly, the Theory of Planned Behaviour (TPB) highlights the role of attitudes, subjective norms and perceived behavioural control in shaping intentions and behaviour (Hagger and Hamilton, 2025). However, TPB also highlights the intention-behaviour gap, where intentions do not always translate into actions due to practical, social and contextual barriers (Gonçalves et al., 2021; Conner and Norman, 2022).

The Health Belief Model further emphasises the importance of perceived risk, suggesting that protective behaviours are more likely when individuals feel susceptible to a severe health threat and perceive greater benefits than barriers (Alamer, 2024). Empirical research supports this, indicating that perceived susceptibility, severity and self-efficacy significantly influence food safety behaviours (Nong, Zhao and Chien, 2022), reinforcing the central role of risk perception in motivating behaviour change.

However, these models largely assume rational decision-making (Alyafei and Carr, 2024). Dual-process theories challenge this assumption, proposing that behaviour is shaped by both automatic (intuitive) and deliberate (analytical) processes (Konishi et al., 2025). As a result, heuristics and cognitive biases can distort risk perception, leading individuals to underestimate food safety risks, particularly when previous experiences have not resulted in harm (Manning and Grant, 2025). Consequently, subjective risk perception may outweigh objective knowledge, meaning individuals continue unsafe practices despite awareness of guidelines (Bass et al., 2022).

These frameworks highlight the complex interaction between cognitive, social and psychological factors influencing behaviour (Simpson et al., 2025).

Behavioural influences and social norms among young adults and students

Alongside cognitive biases, broader behavioural influences also shape food safety practices (Anderson Steeves et al., 2016). Social norms and peer influence play a significant role, particularly among young adults living in shared environments. Individuals are more likely to adopt behaviours that are perceived as typical or acceptable within their social group (Bosnjak, Ajzen and Schmidt, 2020). In student settings, this may lead to unsafe practices becoming normalised through collective behaviour rather than individual decision-making. Etim et al. (2024) highlights that perceived social expectations can influence behaviours such as food handling and waste, with individuals adjusting their actions to align with what they believe others do. These influences help explain why safe practices are not always adopted despite adequate knowledge, highlighting behaviour as context-dependent rather than purely rational (Lin and Roberts, 2020).

Habit and routine are another key determinant (Ersche et al., 2017). Food preparation behaviours are often repeated in stable contexts and become automatic over time, reducing conscious decision-making (Gardner, Lally and Labudek, 2020). Once established, these habits can be resistant to change, particularly when they are reinforced by convenience or time pressures. This automaticity can make behaviour change particularly challenging, as interventions must disrupt existing routines rather than simply provide information (Verplanken and Roy, 2016; Gardner et al., 2021).

Environmental and situational factors further influence behaviour by shaping opportunity. Constraints such as limited time, inadequate facilities or financial pressures may lead individuals to prioritise convenience over safety (Aguirre Sánchez et al., 2021; Paquet, 2019). These factors highlight that behaviour is often shaped by practical realities rather than purely by knowledge or intention (Manning and Grant, 2025).

Together, these findings demonstrate that food safety behaviour is influenced by a complex interaction of cognitive, social and environmental factors (Safefood, 2011). While behavioural models such as COM-B and the TPB provide useful frameworks for understanding these influences, cognitive biases offer a more detailed explanation of how individuals interpret and respond to risk in everyday contexts (Korteling, Brouwer and Toet, 2018).

Gap summary and conceptual framework/ hypotheses

Despite this, existing research has largely examined these factors in isolation. While studies have explored knowledge, risk perception and behavioural influences independently, there is limited integration of cognitive biases within broader behavioural frameworks. In particular, there is a lack of empirical research examining how dual-process mechanisms interact with risk perception to influence real-world food safety behaviour (Petrescu et al., 2025; Shakeri, Evangelopoulos and Zavalina, 2018).

This represents an important gap in the literature. Understanding how intuitive and analytical processes interact to shape behaviour may help to explain inconsistencies between knowledge and practice and inform the development of more effective interventions. Addressing this gap is therefore critical to improving food safety behaviours and reducing the burden of foodborne illness.

Methodology

Research design and rationale

The research adopted a qualitative design using semi-structured interviews to explore how behavioural influences and cognitive biases shaped food safety perceptions among Cardiff Metropolitan University students. A qualitative approach was appropriate as food-related decisions, risk perceptions and cognitive biases are rooted in lived experiences and shaped by everyday contexts, which are best explored through detailed, contextual accounts (Hunt, Pettinger and Wagstaff, 2023). Stickley, O’Cathain and Homer (2022) state qualitative research provides insight into lived experiences and helps bridge the gap between scientific evidence and public health practice. It is also essential for understanding how individuals interpret health and illness within everyday contexts and the social and cultural influences shaping behaviour (Isaacs, 2014).

Semi-structured interviews allowed for an in-depth yet flexible exploration of participants’ perspectives, combining guided questioning with the opportunity for participants to elaborate on their experiences (O’Keeffe et al., 2016). This approach was particularly suited to investigating cognitive processes such as heuristics, habits and biases, as well as the influence of shared living environments and social norms, which may not be adequately captured through structured surveys (DeJonckheere and Vaughn, 2019). This approach also enabled participants to articulate experiences of optimistic bias and the normalisation of risky behaviours in their own terms.

A mixed-methods approach was considered; however, the study aimed to understand how and why perceptions were shaped rather than to achieve generalisability. A qualitative design was therefore most appropriate for capturing the complexity of behavioural and cognitive influences (Van Griensven, Moore and Hall, 2014).

Participants and sampling

The study population consisted of undergraduate students at Cardiff Metropolitan University. Students studying Environmental Health, Food Science and Nutrition, Human Nutrition and Dietetics, Biomedical Science, International Hotel and Hospitality Management, International Hospitality Management and International Tourism Management were excluded to avoid the influence of specialist food safety knowledge. Risk perception differs between experts and non-experts, with experts drawing on technical knowledge rather than everyday experience (Van Der Vossen-Wijmenga et al., 2022).

A non-probability sampling strategy combining purposive and snowball sampling was used. Purposive sampling targeted students responsible for their own food preparation. Recruitment took place through posters across Llandaff and Cyncoed campuses, including QR codes linking to a Qualtrics screening survey. This collected basic demographic information and confirmed eligibility. Eligible participants were contacted via email and provided with the Participant Information Sheet, consent form, withdrawal form and interview questions in advance.

Snowball sampling was used to extend recruitment by encouraging participants to share study information with peers. These approaches are commonly used in qualitative research to access participants with relevant lived experience and to generate rich, detailed data (Etikan, Musa and Alkassim, 2016; Palinkas et al., 2015).

A pilot interview was conducted to assess clarity and structure of the interview guide (Hennink, Hutter and Bailey, 2020). Following this, refinements were made to improve question clarity and flow. Additional questions were introduced to ensure understanding of key concepts, specifically food hygiene and food safety, and participants' ability to distinguish between them. The order of questions was adjusted to avoid premature responses, and new questions were added to explore risk thresholds and trust in food sources, including perceptions of homemade versus takeaway food. These changes enhanced the clarity and depth of data collected.

Following this, eight semi-structured interviews were conducted lasting approximately 30-60 minutes each and were conducted via Microsoft Teams. Although the sample size was small, qualitative research prioritises depth over breadth. Research suggests code saturation can be achieved within a limited number of interviews, with Hennink, Kaiser and Marconi (2017) identifying substantial thematic coverage within nine interviews. This sample size was therefore appropriate for the nature of the study (Ahmed, 2025).

Ethics and consent

Participation in the study was voluntary, and informed consent was obtained from all participants prior to data collection. Individuals who expressed interest received a

Participant Information Sheet outlining the study's purpose, procedures, potential risks, data handling processes and contact information for further enquiries. Participants completed an online consent form before taking part, in accordance with British Psychological Society (2021) guidance and Cardiff Metropolitan University ethical requirements.

Participants were informed of their right to withdraw at any stage, up until the data had been anonymised. To ensure confidentiality, participants were assigned unique identifiers, and no identifiable information was included in the final report. All data was securely stored on a password-protected university OneDrive accessible only to the researcher and supervisor and was used solely for research purposes.

Ethical approval for this study was granted through the Cardiff Metropolitan University Ethics Governance process.

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Data collection

Data was collected through semi-structured interviews exploring students' food safety knowledge, risk perception, and behavioural and cognitive influences. An interview guide ensured consistency while allowing flexibility to explore emerging topics, enhancing credibility (Kallio et al., 2016).

Interview topics included participants' understanding of food safety, confidence in knowledge, sources of information and trust, and social and environmental influences. Participants were also asked about perceived vulnerability to foodborne illness and decision-making processes, including the use of cues such as use-by dates, sensory indicators and storage duration. Risky practices, such as consuming food beyond recommended dates, and the influence of cost, convenience and food waste were also explored.

These topics were developed based on the key concepts identified within the literature review and were aligned with the study's focus on behavioural influences, cognitive biases and risk perception. In particular, the interview guide was informed by theoretical frameworks such as the Theory of Planned Behaviour (Brookes, 2023) and the Health Belief Model (Houlden et al., 2021), which emphasise the role of attitudes, perceived risk, social norms and behavioural control in shaping behaviour. Additionally, concepts from dual-process theory (Murphy, 2023) and cognitive bias literature informed the inclusion of questions exploring heuristics, habitual decision-making and reliance on sensory cues. This ensured that the interview questions were both theoretically grounded and directly relevant to the research aims.

Participants were encouraged to describe specific scenarios, such as handling leftovers or cooking meat, to explore cognitive processes including heuristics, optimistic bias

and normalisation of risk (Pereira et al., 2024). This approach supported deeper insight into how decisions were made in real-world contexts.

All interviews were audio recorded with consent and transcribed to support analysis. Hill et al., (2022) state that transcripts enhance the rigour and accuracy of data collected in interviews. Data collection continued until the sample size was reached and saturation occurred.

Data analysis

Data was analysed using reflexive thematic analysis, following Braun and Clarke's six-phase framework. This enabled systematic identification and interpretation of patterns while remaining grounded in participants' accounts (Braun and Clarke, 2021).

Analysis began with familiarisation through repeated reading of transcripts. Key words and phrases were highlighted and annotated to capture initial meanings. Initial coding was conducted manually using colour coding to identify patterns across participants. Codes were reviewed and refined repeatedly, with similar codes grouped and clarified through ongoing engagement with the data.

Key quotes were compiled alongside brief participant summaries to support comparison and ensure individual perspectives were retained. Codes were then organised into broader themes by identifying patterns across the dataset. Four main themes were developed and mapped using a mind map to support organisation and transparency.

Reflexivity was maintained throughout, with consideration of how the researcher's background and assumptions may have influenced interpretation. Continuous reflection during coding ensured interpretations remained grounded in participants' accounts. Transcripts were revisited to confirm accurate representation of meaning, and analytical notes were maintained to support transparency in theme development.

Results

This section presents the themes emerging from a thematic analysis of eight semi-structured interviews exploring how Cardiff Metropolitan University students perceive food safety. Four key themes were identified: (1) food safety knowledge is socially acquired, uneven and often informal; (2) risk perception is shaped by cognitive biases and personal experience; (3) food safety decisions are guided by heuristics, habits and routine shortcuts; and (4) food safety behaviour is socially negotiated and shaped by responsibility, environment and trust. These themes highlight the interaction between knowledge, perception and behaviour in shaping food safety practices.

Food safety knowledge is socially acquired, uneven and often informal

Participants demonstrated varying levels of food safety knowledge, predominantly shaped through informal learning rather than formal education. Family emerged as a key source of knowledge, with several participants describing how practices had been learned through upbringing. For example, one participant explained that *“my mum has always been like ‘check it’ growing up”* (P4), while another stated, *“I think that’s just the way I’ve grown up”* (P5). These responses suggest that food safety knowledge is embedded within routine family practices rather than explicitly taught.

In addition to family influence, participants described learning through experience and observation. Several referred to “common sense” approaches, indicating that knowledge was developed through everyday cooking practices rather than structured instruction. For example, one participant stated that *“that’s what my family have always done”* (P1), suggesting behaviours had become habitual over time. Participants frequently described checking food based on appearance or smell, indicating that knowledge was operationalised through repeated behaviours, although this was not always accompanied by a clear understanding of underlying risks.

There was also notable variation in knowledge across participants. While some demonstrated structured understanding, others relied on more basic principles. For example, one participant outlined a systematic process, stating, *“firstly would be the expiry date... second... smell... then visual”* (P8). In contrast, others relied on generalised rules, such as checking whether food “looked okay” or “smelled fine”. For example, one participant explained that they *“just go through the senses”* (P4), while another stated that *“if it smells fine and looks fine, I think it’ll be okay”* (P7).

Furthermore, participants often demonstrated procedural rather than conceptual knowledge. Many could describe actions such as separating raw and cooked foods or checking expiry dates but did not always articulate why these practices were important. This suggests that food safety knowledge is frequently enacted through routine behaviours rather than informed by a deeper understanding of risk.

Overall, these findings indicate that food safety knowledge among students is largely socially acquired and varies in depth and application across individuals.

Risk perception is shaped by cognitive biases and personal experiences

Participants’ perceptions of food safety risk were highly subjective and strongly influenced by personal experience. A common pattern was the perception of reduced personal vulnerability, particularly among those who had not experienced foodborne illness. For example, one participant stated, *“I’ve like gone through three years of uni... I’ve not had any problems”* (P5), suggesting that the absence of negative outcomes contributed to a lower perception of risk.

Similarly, some participants indicated that risks were more likely to affect others than themselves. One participant explained that they were “*not too bothered*” personally but believed risks might affect others more (P6), highlighting a tendency to externalise risk.

Risk perception was also selective, with participants identifying certain foods as inherently more dangerous. Meat, particularly chicken, and dairy products were consistently described as high-risk foods. For instance, one participant stated, “*chicken scares me a lot*” (P6). In contrast, foods such as bread or dry goods were often perceived as low risk and treated with less caution, suggesting a hierarchical understanding of risk.

In addition to personal experience, participants’ perceptions were influenced by indirect sources, including stories from peers and the media. For example, one participant described hearing about a case where “*a boy left lasagna out a bit too long... and died or was very ill*” (P6), which shaped their perception of risk. These types of accounts appeared to have a strong emotional impact, influencing perceptions even in the absence of direct experience.

The normalisation of risk was also evident. Several participants described continuing behaviours that may pose risks, such as consuming food past its expiry date, particularly when previous experiences had not resulted in illness. For example, one participant stated that “*it was only like one day out of date... I thought I’ll be fine*” (P7), while another explained, “*I’d just be like if it looks alright it’ll be fine*” (P2). These responses suggest that repeated safe outcomes reinforced perceptions of safety.

Overall, these findings demonstrate that food safety risk perception is shaped by personal experience, perceived vulnerability and socially transmitted information.

Food safety decisions are guided by heuristics, habits and routine shortcuts

Participants’ food safety decisions were largely guided by heuristics and habitual practices rather than formal guidelines. A dominant pattern was reliance on sensory cues, such as smell, appearance and texture, to determine whether food was safe to consume. For example, one participant stated that they relied on “*touch more than anything*” (P1), while another explained, “*I’d look at it... touch it... then smell*” (P7). Indicating that sensory evaluation plays a central role in decision making.

Expiry dates were commonly used as an initial reference point, however, they were not always treated as strict rules. Many participants described using dates as a guideline rather than a definitive indicator of safety. For instance, one participant stated that “*I think I try anyway to minimise waste... why I still use things past the use by... if it does still look fine to eat, then I don’t see any reason why not to have it*” (P3), while another explained that they would “*just base it off of if it looks alright*” (P2). This suggests that

expiry dates act as an anchor in decision-making but are often overridden by personal judgement.

Participants also relied on simplified decision rules, such as consuming food within a certain timeframe, removing visibly spoiled portions or discarding entire items if contamination was suspected. For example, one participant explained that *“if that bit isn’t mouldy yet... it’s still being sat in the package with the bit that’s already been mouldy... bin the whole loaf”* (P6), while another stated that *“I’ve done it in the past with... a piece of bread... if there’s been a little bit on there, then I’ve been fine with still having that piece of bread”* (P3), indicating variation in how these rules were applied.

These decision-making processes were often habitual and automatic. Participants described their behaviours as routine, suggesting that decisions were made with minimal deliberate thought. For example, one participant stated that *“I’ve always eaten after the best before date”* (P1), reflecting a consistent pattern of behaviour.

Overall, these findings indicate that food safety decisions are shaped by intuitive, experience-based processes rather than systematic evaluation.

Food safety behaviour is socially negotiated and shaped by responsibility, environment and trust

Food safety behaviours were strongly influenced by social context and environmental factors. A key finding was that participants often adjusted their behaviour depending on whether they were cooking for themselves or others. Many reported being more cautious when preparing food for others, indicating a heightened sense of responsibility. For example, one participant explained that when cooking for others, they would *“doubly make sure I’ve washed my hands”* (P4).

Peer influence and social comparison also played a role. Participants frequently compared their behaviours to those of friends and flatmates, often perceiving others as either more or less cautious. Some participants described observing unsafe practices among peers, which influenced their own awareness of food safety. For instance, one participant noted that *“coming to uni... opened my eyes to how little people know about like food storage and like cooking”* (P4). Another described unsafe practices among flatmates, explaining that *“one of my flatmates... had like a big Tupperware full of frozen fish and he’d defrost the whole thing... take one out and then put it all back in the freezer”* (P5). These experiences highlight how shared accommodation can expose individuals to unsafe practices and variability in behaviour.

Trust also played a significant role in decision-making, particularly for food purchased outside the home. Participants reported using hygiene ratings, customer reviews and personal recommendations to assess food establishments. For example, one participant explained that they would *“look at reviews before”* (P2), while another stated that they would go off what *“people have told me”* (P7). However, levels of trust varied.

Some expressed conditional trust in official hygiene ratings, while others placed greater emphasis on reviews. One participant stated that *“I would say I’m a lot more heavily influenced on customer reviews than I am food hygiene ratings”* (P1), while another questioned the reliability of ratings, explaining that *“is that from a reputable corporation... or something that the restaurant can alter”* (P8). Additionally, homemade food was often perceived as more trustworthy, with one participant stating, *“I kind of know what’s gone into it”* (P6), reflecting a preference for familiar and controllable environments.

Finally, practical and personal factors influenced behaviour, including cost, convenience and food waste. Several participants expressed reluctance to discard food unnecessarily. For example, one participant stated that *“wasting food is a no-go... I’ll find a way to use it”* (P8). This highlights how food safety decisions are shaped by competing priorities.

Overall, these findings highlight that food safety behaviour is not solely determined by individual knowledge or perception, but is influenced by social interactions, environmental conditions, and personal circumstances.

Discussion

This study explored how behavioural influences and cognitive biases shape food safety perceptions among Cardiff Metropolitan University students. The findings provide insight into the mechanisms underlying food safety behaviour, suggesting that decision-making is shaped by a combination of cognitive, behavioural and contextual factors rather than knowledge alone. These findings contribute to existing literature by highlighting how informal learning, habitual processes and social environments interact to influence behaviour, offering further explanation for the persistence of the knowledge-behaviour gap.

Food safety knowledge as socially acquired and inconsistently applied

The findings indicate that food safety knowledge was primarily socially acquired through informal processes such as family practices and everyday experience. Participants frequently relied on what they had “always done”, suggesting knowledge is embedded within routine behaviours rather than formally learned. This aligns with research indicating that food safety behaviours are often shaped through socialisation and habitual practice rather than structured education (Young and Waddell, 2016). Similarly, Syeda et al. (2021) found that students commonly rely on family household practices, reinforcing early-life learning influences.

However, this contrasts with research suggesting that university students often demonstrate adequate food safety knowledge when formally assessed (Masiku et al.,

2024). While knowledge may exist at a theoretical level, these findings suggest it is not consistently translated into practice. Participants demonstrated procedural knowledge without fully understanding underlying risk, indicating a gap between knowledge and application.

Dual-process theory helps explain why food safety knowledge often fails to translate into safe behaviour. The theory proposes that decision-making is shaped by two interacting systems: System 1, which is fast, automatic and intuitive, and System 2, which is slower, analytical and requires effort (Loo, n.d.). In everyday food preparation, decisions are frequently made under time pressure and low perceived risk, meaning that System 1 dominates. As a result, individuals rely on familiar routines, heuristics and past experiences rather than consciously applying formal food safety principles.

From this perspective, the knowledge-behaviour gap reflects the tendency for intuitive, habitual processes to override analytical reasoning. Behaviour is guided less by what people know and more by ingrained habits and social norms (Loo, n.d.). This helps explain why increasing knowledge alone often has limited impact. Consequently, even when students understand food safety concepts, their actions continue to be shaped by automatic, intuitive responses rather than deliberate, risk-reducing practices.

Risk perception is subjective and influenced by cognitive bias

The findings demonstrate that food safety risk perception is highly subjective and strongly influenced by personal experience. Participants often perceived themselves as being at low risk, particularly when they had not previously experienced foodborne illness. This aligns with research indicating that individuals tend to underestimate their susceptibility to food-related risks, particularly in familiar contexts (Van Der Vossen-Wijmenga et al., 2022; Fischer and Frewer, 2009). Similarly, Evans, Redmond and Alwan (2023) found that young adults often perceive foodborne illness as unlikely to affect them personally, reducing motivation to engage in protective behaviours.

However, this contradicts research suggesting that increased awareness of foodborne illness risk can indirectly promote safer behaviour (Mihalache et al., 2021). The findings of this study suggest that awareness alone may be insufficient where cognitive biases are present. In particular, optimistic bias and the normalisation of risk appear to play a central role, with participants justifying unsafe practices based on the absence of previous negative outcomes.

This can be understood through the Health Belief Model, which argues that behaviour is influenced by perceived susceptibility and severity. In this study, low perceived susceptibility appears to reduce motivation to engage in protective behaviours, even when knowledge is present. Furthermore, cognitive biases distort how risk information is interpreted, reinforcing reliance on personal experience over objective evidence. This suggests that risk perception is not a rational evaluation of hazards, but a subjective process shaped by cognitive shortcuts and prior outcomes.

Heuristics are dominant in food safety decision-making

Food safety decisions were predominantly guided by heuristics, particularly sensory cues such as smell, appearance and texture. Participants frequently relied on these indicators rather than adhering to formal guidance. This supports research by Sustainability Directory (2025) and Azad, Firestone and Young (2026), which found that consumers commonly rely on sensory evaluation despite its limited reliability in detecting microbial risk.

In contrast, previous research suggests that consumers rely more heavily on formal indicators such as expiry dates (Mohamad Hashim et al., 2022). However, in this study, expiry dates were often treated as flexible guidelines, with participants overriding them based on personal judgement. This suggests that while formal guidance is recognised, it is not always prioritised in practice.

These findings indicate that heuristic decision-making plays a dominant role in everyday food safety behaviour. While heuristics are efficient, they can lead to systematic errors, particularly in contexts where risk is not visible. This highlights a limitation of knowledge-based interventions, as individuals may continue to rely on intuitive judgement even when aware of formal guidance.

Habit and routine as barriers to behaviour change

Participants consistently described their practices as routine and automatic, indicating that food safety practices were often habitual rather than consciously evaluated. This aligns with research suggesting that food-related behaviours become automatic through repetition and are resistant to change (Gardner et al., 2021). While habits enable efficient decision-making, they can reinforce unsafe practices when not critically evaluated.

Although some research suggests that behaviour can be influenced through intention and conscious decision making (Mucinhato et al., 2026), the findings of this study indicate that habitual processes often override deliberate intentions. This reflects limitations within rational models such as the Theory of Planned Behaviour, where intentions do not always translate into action.

From a behavioural perspective, this can also be interpreted through the COM-B model, where behaviour is influenced by capability, opportunity and motivation (Michie, van Stralen and West, 2011). Even where individuals have the capability (knowledge), habitual routines and environmental constraints may limit motivation to change behaviour. This suggests that interventions must focus on disrupting existing habits and creating new behavioural cues, rather than relying solely on increasing awareness.

Social and environmental influences on behaviour

The findings highlight the significant role of social and environmental factors in shaping food safety behaviour. Participants frequently described how shared living environments and peer behaviours influenced their own practices, particularly through exposure to unsafe behaviours. This supports research suggesting that social norms and peer influence play a key role in shaping behaviour among young adults (Bosnjak, Ajzen and Schmidt, 2020). Similarly, Veflen, Scholderer and Langsrud (2020) found that students' food safety behaviours are influenced by the practices of those around them.

While some participants recognised unsafe practices in others rather than themselves, these behaviours still contributed to variability and increased exposure to risk.

Environmental factors also played a key role, particularly in shared kitchens where participants had limited control over hygiene and storage practices. This supports research highlighting the influence of environmental constraints on behaviour (Aguirre Sanchez et al., 2021). Within the COM-B framework, this reflects the role of opportunity, where environmental conditions enable or restrict behaviour.

These findings suggest that food safety behaviour is not solely an individual responsibility but is shaped by wider social and environmental contexts, reinforcing the importance of considering these factors in behaviour change strategies.

Competing priorities and the intention behaviour gap

The findings demonstrate that food safety decisions are influenced by competing priorities, particularly food waste, cost and convenience. Participants often prioritised reducing waste over strict adherence to guidance, even when aware of potential risks. This aligns with research by Food Standards Agency (2023) which highlights the influence of cost and waste considerations on food-related decision-making.

However, this contrasts with studies suggesting that individuals prioritise food safety when perceived risk is high (Evans et al., 2020). The findings of this study suggest that when perceived risk is low, competing priorities become more influential, leading to behaviours that may increase risk.

This reflects the intention-behaviour gap within the Theory of Planned Behaviour, where intentions do not consistently translate into action due to contextual and motivational barriers. In this case, competing priorities override intentions to engage in safe practices particularly when behaviours are perceived as low risk.

This highlights the complexity of behaviour, suggesting that food safety practices are shaped by multiple interacting factors rather than a single determinant, reinforcing the limitations of models that assume rational decision-making.

Overall interpretation

Overall, the findings demonstrate that food safety perceptions and behaviours are shaped through a complex interaction of cognitive, behavioural and contextual factors. While the results largely support existing literature, they extend current understanding by illustrating how cognitive biases, habitual processes and social influences interact in real-world student settings.

The study highlights that food safety behaviour cannot be fully understood through knowledge-based or rational models alone. Instead, behaviour is shaped by the interplay between intuitive decision-making, environmental constraints and social context. This reinforces the importance of adopting a more holistic, behaviourally informed approach to food safety interventions, addressing not only knowledge but also the cognitive and contextual factors influencing behaviour.

Limitations

The study contains limitations relating to both internal and external validity.

In terms of internal validity, the researcher acknowledges that their academic background and prior exposure to food safety knowledge may have influenced interpretation of responses. Although reflexivity was maintained through critical reflection, neutral questioning and allowing participants to articulate their own experiences, there remains potential for researcher bias in interpretation and thematic coding. This may have influenced emphasis on certain themes, particularly cognitive biases and behavioural influences. However, steps were taken to minimise this risk, including consistent use of an interview guide, a pilot study and verbatim transcription. These measures strengthen credibility and trustworthiness of the findings, although complete objectivity cannot be assumed in qualitative research (Johnson, Adkins and Chauvin, 2020).

A further limitation relates to reliance on self-reported data. Participants may have been subject to recall or social desirability bias, potentially underreporting unsafe practices or presenting behaviour more favourably. This may result in discrepancies between reported and actual behaviour. However, semi-structured interviews allowed for probing and clarification, encouraging more reflective responses.

In terms of external validity, the study utilised a small, non-probability sample from a single university population. While appropriate for qualitative research aiming to generate in-depth insights, this limits the generalisability of the findings beyond Cardiff Metropolitan University students. Food safety behaviours are likely to vary across populations, cultural contexts and living arrangements. However, qualitative research prioritises transferability rather than generalisability (Korstjens and Moser, 2018; Lincoln and Guba, 1985, pp.288–326).

Overall, while the study is subject to limitations in both internal and external validity, the qualitative design, reflexive approach and systematic data collection enhance the trustworthiness and dependability of the findings. These limitations do not undermine the value of the research but provide important context for interpreting the results.

Transferability and implications

As a qualitative study, the findings are not intended to be statistically generalisable; however, they provide valuable insights that may be transferable to similar contexts. Participants included undergraduate students living independently, often within shared accommodation, suggesting that the findings are most applicable to comparable student populations. The influence of informal learning, peer behaviours and shared living environments reflects conditions that are common across many university settings, meaning findings may be transferable to other UK universities and similar young adult populations.

The cognitive processes identified, including reliance on heuristics, habitual decision-making and past experience, may also extend beyond student populations, reflecting broader mechanisms of everyday decision-making. However, transferability may be limited by contextual factors such as age, cultural background, level of responsibility for food preparation and prior experience. For example, individuals with greater cooking experience or responsibility for vulnerable groups may demonstrate higher risk awareness and different behavioural patterns (Canham, Wright and Masrani, 2011).

The findings may be less transferable to populations with formal food safety training or professional experience, who are more likely to rely on structured knowledge and regulatory guidance (Adesokan, Akinseye and Adesokan, 2015). Cultural differences in food practices and risk perception may also limit applicability in non-UK contexts. These limitations highlight the importance of considering context when applying findings.

The study also has important practical implications. The identification of cognitive biases, habitual behaviours and social influences suggests that interventions should move beyond knowledge-based approaches. Educational strategies that focus solely on awareness may have limited effectiveness if they do not address how individuals interpret and apply information in real-world contexts (Food Standards Agency, 2020). Instead, interventions may benefit from incorporating behavioural approaches, such as targeting habits, addressing cognitive biases and leveraging social norms to promote safer practices.

Furthermore, the influence of shared living environments highlights the need for context-specific interventions within university settings. This may include targeted guidance for students in shared accommodation and initiatives promoting collective responsibility for hygiene and storage practices.

Overall, while context-specific, the findings provide meaningful insights into the behavioural and cognitive factors shaping food safety practices and highlight the importance of a holistic, behaviourally informed approach to intervention designs.

Conclusions

This study set out to explore how behavioural influences and cognitive biases shape food safety perceptions among Cardiff Metropolitan University students. The findings demonstrate that food safety behaviour is not primarily driven by knowledge but instead emerges from a complex interaction of informal learning, cognitive biases, habitual practices and social and environmental influences.

A key conclusion from this research is that food safety knowledge among students is largely socially acquired, uneven and informal. While participants demonstrated awareness of some food safety practices, this knowledge was frequently shaped by family habits, personal experience and “common sense” approaches, rather than formal guidance. As a result, knowledge was not always consistently understood or applied, contributing to variability in behaviour.

Secondly, the findings highlight the significant role of cognitive biases in shaping risk perception. Participants often underestimated their personal vulnerability to foodborne illness, particularly when previous behaviours had not resulted in harm. This led to the normalisation of potentially unsafe practices, such as consuming food past the expiry dates or relying on sensory cues. Risk perception was therefore subjective and influenced by experience rather than by objective knowledge.

Thirdly, food safety decisions were largely guided by heuristics, habit and routine behaviours. Participants frequently relied on simplified decision-making processes, such as smell, appearance and past experience, rather than formal food safety guidance. These behaviours were often automatic and embedded within daily routines, making them resistant to change.

Finally, the findings demonstrate that food safety behaviour is shaped by social and environmental contexts. Shared living environments, peer behaviours and practical constraints such as cost, convenience and food waste influenced decision making. These factors often led individuals to prioritise competing needs over strict adherence to food safety practices, reinforcing the gap between knowledge and behaviour.

The most important takeaway from this study is that food safety behaviour is not simply a matter of knowledge, but is shaped by how individuals interpret, apply and negotiate that knowledge within everyday contexts.

Recommendations

Based on the findings, several recommendations can be made for professional practice. Interventions aimed at improving food safety among students should move beyond traditional knowledge-based approaches and instead incorporate behaviour strategies. This may include addressing common misconceptions, challenging reliance on sensory cues and promoting awareness of cognitive biases that influence decision making. Additionally, interventions should consider the social context of behaviour, for example by promoting shared responsibility within student households and encouraging consistent food safety practices in shared environments.

The findings also suggest the need for more targeted and context specific approaches within university settings within the UK. Practical guidance tailored to shared accommodation, including food storage, hygiene and risk awareness, may help to reduce variability in practices.

In terms of future research, further qualitative studies could explore how these behavioural and cognitive influences develop over time, particularly as students transition into independent living. Additionally, experimental or intervention-based research could examine how strategies target habits, social norms and cognitive biases influence food safety behaviour in real world settings. Comparative studies across different student populations or cultural contexts may also help to identify how transferable these findings are and whether similar patterns of behaviour are observed elsewhere.

Overall, this study provides important insight into the factors shaping food safety perceptions among university students and highlights the need for a more holistic approach to improving behaviour, one that recognises the interplay between knowledge, cognition and context.

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