Food Safety and Food Choice Motives among Workers in the Ubud Tourism Area, Gianyar Regency, Bali Province

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Abstract: Food security is a critical issue that not only pertains to public health but also affects productivity and well-being, particularly among tourism sector workers who face demanding work patterns and limited access to nutritious food. This study aims to examine the demographic characteristics of tourism workers in Ubud, analyze the relationship between socioeconomic factors and their food safety awareness, risk perception, and trust, and assess the association between socioeconomic factors and their food purchasing and food handling behaviors. Furthermore, it seeks to identify the main Food Choice Questionnaire (FCQ) indicators that influence workers' food choice motives. The research employed a quantitative survey method using a modified 29-item FCQ, administered to workers in the accommodation and culinary sectors through purposive and snowball sampling techniques. Data were analyzed using descriptive statistics, Spearman's rank correlation, and Principal Component Analysis (PCA). The findings indicate that the tourism workforce in Ubud is predominantly composed of young workers with secondary-level education and low to middle-income levels. Socioeconomic factors, particularly education and the number of household dependents, are significantly associated with food safety awareness and risk perception, but show weak relationships with trust in the food safety system. Practical considerations, especially price and convenience, primarily drive food purchasing behavior, while the number of dependents and monthly expenditure are associated with food handling and processing practices. PCA identifies five principal dimensions of food choice motives: food awareness, practicality and price, nutritional components, trust in food sources, and consumption culture.

Keywords: FCQ, Food safety, Tourism, Workers, Consumption patterns

1. Introduction

Food is a fundamental human necessity that serves not only as a source of energy but also plays a crucial role in maintaining health, productivity, and overall well-being (Handayani et al., 2024). In the context of national development, as explained by Njatrijani (2021) and Pakpahan et al. (2022), food security is a critical issue due to its direct correlation with the quality of human resources and the achievement of the Sustainable Development Goals. However, the challenge of fulfilling the need for safe and nutritious food has become increasingly complex, driven by modern lifestyle changes, economic constraints, and individual preferences that shape consumption patterns, particularly among workers in the tourism sector. Previous research has consistently emphasized the importance of understanding food choice motives as a key determinant in daily consumption. Studies by Chávez-Dulanto et al. (2021), Darmawan et al. (2024) and Fernqvist et al. (2024) suggest that health, convenience, price, and socio-cultural factors are the dominant influences on food-related decisions.

The Food Choice Questionnaire (FCQ) is an instrument designed to measure the various factors that influence an individual's food choices (Daly et al., 2023). The FCQ consists of 36 items reflecting a range of consumer considerations in selecting or avoiding certain types of food, which are driven not only by physiological needs but also by psychological, social, and cultural factors. Sudewo (2024) stated that the FCQ has been applied in numerous studies across various developing countries, including Indonesia, Malaysia, and Brazil, to identify community food consumption patterns within a local context. Nevertheless, the majority of research has

predominantly focused on the general public or urban consumers, as seen in studies by Fajri et al., (2024) and Utami & Ani (2024). However, studies that highlight the relationship between food choice motives and food security among workers in the tourism sector are still limited, especially in Bali.

The Ubud tourism area in Gianyar Regency is one of the leading destinations that reflects the unique dynamics between tourism, culture, and food consumption (Sari, 2021). Tourism workers in this region face intense working conditions, irregular working hours, and limited time to access nutritious food, so they often opt for convenient meals from informal vendors that may not meet food safety standards. These conditions pose health risks due to the potential for biological, chemical, and physical contamination. This fact highlights a research gap, as studies on the relationship between food choice motives and food safety aspects for tourism workers are still scarce, despite the context being crucial for the sustainability of the tourism industry and the welfare of its workers.

The urgency of this research lies in the need for a deep understanding of how food choice motives such as practicality, price, health, and socio-cultural influences are related to the food security of tourism workers. This study also aims to address the need for empirical data that can serve as a basis for developing more contextually informed and evidence-based food policies. Using the FCQ approach, this study has the potential to make theoretical contributions through the expanded use of this instrument in the local context of Bali, while also offering practical benefits in supporting public health policies and food consumption management in the tourism sector. Based on this background, this study aims to: (1) analyze how do socioeconomic factors influence the food safety awareness, risk perception, and personal food handling behaviors of tourism workers in Ubud; (2) analyze the primary FCQ dimensions that drive the daily consumption motives of these workers.

2. Methodology

This study used a survey method with a quantitative approach. The population in this study was the entire tourism workforce in the Ubud tourism area, Gianyar Regency, who worked in the accommodation (hotels/villas) and culinary (restaurants/food outlets) sectors. The sample of this research focused on operational-level workers such as chefs, servers, housekeeping staff, and front office staff who represent the majority of tourism workers and have direct or indirect involvement in food handling. In addition, semi-managerial workers such as restaurant supervisors and department heads in hotels/villas were also included to capture variations in socioeconomic factors and perceptions of food safety.

FCQ instrument was initially developed with 36 items representing various dimensions of food choice motives (Ratih et al., 2022; Trinh et al., 2023). FCQ instrument was initially developed with 36 items representing various dimensions of food choice motives (Ratih et al., 2022; Trinh et al., 2023). However, in this study only 29 items of the FCQ were used, having undergone a validity and reliability test previously conducted on 30 tourism worker respondents. The test showed that seven items did not meet the validity and reliability criteria, so they were excluded to ensure that the instrument used was truly capable of accurately measuring the research variables. Thus, the remaining 29 items were deemed suitable for further analysis.

The number of samples in this study was determined based on the requirements of Principal Component Analysis (PCA). According to Maugeri et al. (2023), the minimum number of samples recommended for PCA is five times the number of items analyzed. Since this study employed the FCQ instrument with 29 items, the ideal sample size was approximately 145 respondents, comprising 73 (50.34%) workers from the accommodation sector and 72 (49.66%) workers from the culinary sector. To ensure suitability with the research objectives, a purposive sampling technique was used, with the criteria of active workers in the Ubud tourism sector who had at least six months of work experience. In addition, a snowball sampling approach was employed, whereby sampling began with a select group of initial workers who met the criteria, and then expanded through respondent referrals until the required sample size was achieved. The data collection was conducted through offline, face-to-face interviews, where the researchers recorded the respondents' answers directly into a digital platform (Google Forms). This interview method was chosen to minimize the burden on workers with high mobility and irregular shifts, ensuring data accuracy and completeness. The average duration for each interview session was approximately 15 minutes/person.

Data analysis was conducted in accordance with the research objectives. First, descriptive analysis was used to examine the demographic characteristics of workers in the Ubud tourism area, including frequency and percentage distributions for variables such as age, gender, education level, income, number of dependents, and length of employment. Second, to analyze the relationship between socioeconomic factors and workers' awareness, risk perception, and confidence in food safety, Spearman's rank correlation test was used, as the analyzed data were ordinal and did not fully meet the parametric assumptions. Third, to analyze the relationship between socioeconomic factors and workers' behavior in shopping, food handling, and processing, Spearman's rank correlation test was also used. Fourth, to identify the FCQ indicators that influence workers' food choice motives, PCA was used, which serves to reduce the indicators into more concise and interpretable main factors. The data analysis chart used in this study can be seen more clearly in Figure 1.
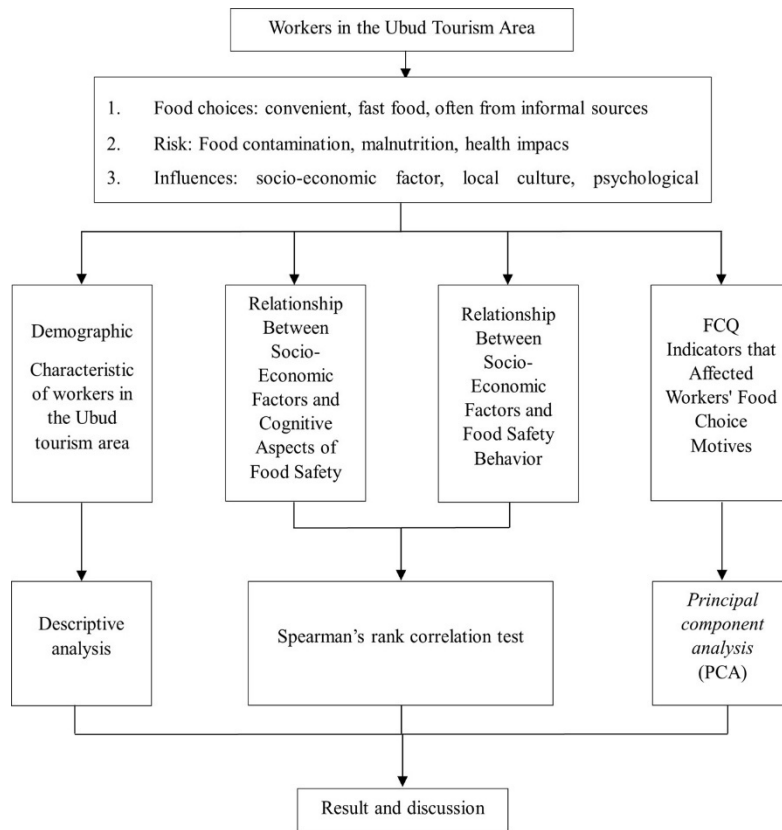
Figure 1. Data analysis chart

3. Results and Discussion

3.1 Demographic Characteristics of Workers in the Ubud Tourism Area, Gianyar Regency, Bali Province

The demographic characteristics of workers are a crucial aspect that needs to be understood in this study, as the socioeconomic and personal backgrounds of workers will influence their behavior and food choice motives (Wronska et al., 2022). Demographic analysis covers several key variables, namely gender, age, education level, industry of employment, marital status, income level, number of dependents, monthly expenses, and religion. Information on these characteristics will provide a more comprehensive picture of the actual conditions of workers in the Ubud tourism area, as well as a basis for understanding the relationship between socioeconomic factors and their awareness, risk perception, beliefs, and behavior in the context of food safety.

Table 1. Demographic characteristics of workers in the Ubud Tourism Area, Gianyar Regency, Bali Province

No.	Characteristics	Maximum	Percentage (%)	Minimum	Percentage (%)
1	Gender	Male	50.34	Female	49.66
2	Age	19–23	40.69	48–51	0.69
3	Education level	High school graduate	39.31	No degree	1.38
4	Industry of employment	Accommodation	50.34	Culinary	49.66
5	Marital status	Unmarried	62.76	Widow/widower	0.69
6	Income level (IDR)	IDR 1,500,000–IDR 3,200,000	55.86	IDR 8,300,000.01–IDR 10,000,000	0.69
7	Number of dependents	none	51.03	6 people	0.69
8	Monthly expenses (IDR)	IDR 1,000,000–IDR 1,700,000	29.66	IDR 3,100,000.01–IDR 3,800,000	5.52
9	Religion	Hindu	93.79	Muslim	6.21

Table 1 shows a relatively balanced profile in terms of gender composition, with male workers reaching 50.34% and female workers 49.66%. This condition demonstrates that the tourism sector, particularly in accommodation and culinary services, offers relatively equal employment opportunities for both genders. This is consistent with

the research by Adnyani & Purnamawati (2024) which reveals that the characteristics of the tourism industry require workers in various functions, both those typically associated with men, such as security or technical roles, and those typically associated with women, such as service and housekeeping roles. In terms of age, the majority of workers are in the 19–23 age group (40.69%), while the smallest proportion is in the 48–51 age group (0.69%). These findings suggest that productive young workers primarily drive the tourism industry in Ubud. This dominance of young workers also reflects the characteristics of the tourism sector, which demands high energy, flexibility, and quick service skills.

The majority of workers are high school graduates (39.31%), while only 1.38% of workers do not hold a high school diploma. This data indicates that the tourism sector in Ubud absorbs more workers with secondary education qualifications. This is because many operational positions, such as waiters, front office staff, or housekeeping, do not require higher education but emphasize practical skills and work experience. When viewed from the industry perspective, workers in the accommodation sector (hotels and villas) account for 50.34%, slightly higher than workers in the culinary sector (49.66%). This balance reflects the economic structure of Ubud's tourism industry, which is almost equally strong in its two main subsectors, namely accommodation and culinary. Based on marital status, unmarried workers dominate, accounting for 62.76%, while widows and widowers account for only 0.69%. The dominance of unmarried workers reaffirms that the tourism industry in Ubud is predominantly staffed by young workers, who tend to be at the early stages of their careers.

Regarding income, the majority of workers receive salaries in the range of IDR 1,500,000–IDR 3,200,000 (55.86%), while those with high incomes, between IDR 8,300,000.01 and IDR 10,000,000, only make up about 0.69%. This shows that most tourism workers in Ubud are in the low to middle income bracket, which is closely related to their operational work positions. This condition aligns with the findings on the number of family dependents, where 51.03% of workers have no dependents, while those with more than six dependents account for only 0.69%. This data indicates that workers with limited income tend to be single or do not yet have large families to support. The majority of workers' monthly expenses fall within the range of IDR 1,000,000 to IDR 1,700,000 (29.66%), which is proportionate to the income level of most workers. This indicates a balance between income and spending patterns, suggesting that the majority of workers are in a relatively limited economic position, which means that food consumption decisions are likely to be significantly influenced by price and affordability.

From the religious perspective, the majority of workers are Hindu (93.79%), while the remaining 6.21% are Muslim. The dominance of Hinduism is in line with the demographic structure of Balinese society, particularly in Gianyar, where Hindu customs and traditions are powerful and influence consumption patterns and food choices. Overall, these demographic characteristics confirm that the majority of tourism workers in Ubud are young, have a secondary education, are unmarried, and have low to middle incomes. These factors will influence their consumption behavior, particularly in terms of shopping, food handling, and food choice motives, where practicality, price, and cultural traditions are the primary considerations.

3.2 The Relationship Between Socio-Economic Factors and Cognitive Aspects of Food Safety of Workers in the Ubud Tourism Area, Gianyar Regency, Bali Province

Food safety is a multidimensional issue influenced not only by the quality of food materials and the physical environment in which food is handled, but also by individuals' socio-economic characteristics that shape knowledge, attitudes, and daily food consumption behavior (Pakravan-Charvadeh et al., 2022). In the context of tourism workers, particularly in the Ubud Tourism Area, socio-economic factors such as education level, income, number of household dependents, and monthly expenditure play a crucial role in shaping cognitive aspects of food safety, including awareness, risk perception, trust, and sources of information related to safe food. The results of the analysis reveal variations in the influence of each socio-economic factor, as presented in Table 2.

As shown in Table 2, education exhibits a moderate relationship with food safety awareness ($r = 0.318$; $p < 0.05$) and risk perception of food safety ($r = 0.343$; $p < 0.05$). These findings indicate that education functions as a key cognitive asset that enables workers to better understand the importance of food safety and to identify potential risks associated with the food they consume. However, the relationship between education and trust in food safety systems, as well as sources of food safety information, remains very weak. This suggests that formal education is not sufficiently accompanied by access to structured food safety information systems within the workplace. This condition reflects the social reality of accommodation and culinary workers in Ubud, where the workforce is predominantly composed of individuals with secondary-level education and employed in a tourism industry that demands speed, efficiency, and high work flexibility. Food safety knowledge among this group is generally acquired through daily work experience, direct instructions from supervisors, and inherited workplace practices rather than through certified formal training. Consequently, workers' understanding of food safety tends to be limited to basic practices such as hand hygiene and food storage, without in-depth knowledge of biological and chemical hazards or the risks of cross-contamination.

Table 2. The relationship between socio-economic factors and cognitive aspects of food safety of workers in the Ubud Tourism Area, Gianyar Regency, Bali Province

No.	Variable	Correlation Coefficient	Sig. (2-tailed)	Level of Relationship
1	Education and food safety awareness	0.318	0.000	Moderate
2	Education and perceived food safety risk	0.343	0.000	Moderate
3	Education and trust in the food safety system	0.189	0.023	Very weak
4	Education and sources of food safety information	0.168	0.043	Very weak
5	Income and food safety awareness	0.175	0.035	Very weak
6	Income and perceived food safety risk	0.221	0.008	Very weak
7	Household dependents and food safety awareness	0.317	0.000	Moderate
8	Household dependents and perceived food safety risk	0.168	0.043	Very weak
9	Household dependents and sources of food safety information	0.195	0.019	Very weak
10	Monthly expenditure and food safety awareness	-0.165	0.047	Negative
11	Monthly expenditure and trust in the food safety system	-0.215	0.009	Negative

Income shows a very weak relationship with both food safety awareness and risk perception. This finding is consistent with Ngo et al. (2021) who emphasized that economic conditions influence individuals' ability to access safe food and high-quality information. In the context of Ubud, limited income encourages workers to rely on inexpensive and easily accessible food options, such as ready-to-eat meals or food sold near the workplace, whose safety standards cannot always be guaranteed. Although workers with higher income may have greater opportunities to choose food perceived as safer, time constraints and heavy workloads often overshadow these considerations. The number of household dependents demonstrates a moderate relationship with food safety awareness. Workers with family responsibilities, particularly those with children, tend to exhibit higher levels of food safety awareness. This pattern is driven by social responsibility and internal motivation to protect the health of family members. However, the relationship between the number of dependents and both risk perception and sources of information remains very weak, indicating that increased awareness is not necessarily accompanied by improved formal food safety literacy.

Interestingly, monthly expenditure shows a negative relationship with food safety awareness and trust in food safety systems. This finding suggests that workers with higher expenditures who typically experience longer working hours and heavier workloads are more likely to consume ready-to-eat food without thoroughly considering hygienic aspects. Such consumption patterns are commonly observed among restaurant, hotel, and café workers in Ubud who have limited rest time between shifts. This condition not only increases the risk of consuming unsafe food but also reduces workers' trust in food safety systems overall. Low levels of trust are further reinforced by shared negative experiences among workers, such as mild gastrointestinal disturbances or doubts regarding the quality of ingredients used by small food vendors. These findings are consistent with Bai (2023) who reported that eating outside the home is often associated with negative perceptions of food quality and safety due to consumers' limited control over food production and handling processes.

From a theoretical perspective, these findings reinforce the argument that cognitive aspects of food safety cannot be separated from socio-economic conditions and the work environment. The significant relationship between education and both awareness and risk perception supports the findings of Gebeyehu & Tsegaye (2022) and Jenkins et al. (2021), who emphasized that education enhances individuals' capacity to understand and evaluate food-related risks. Furthermore, the results align with the consumer behavior and food literacy framework proposed by Su et al. (2021), which posits that food safety knowledge and risk perception are shaped by a combination of education, work experience, economic conditions, and access to information. Within the local context of Ubud as an international tourism destination characterized by high work intensity and dynamic operational demands, these findings have important practical implications. The low level of formal food safety literacy highlights the need for more systematic and context-specific interventions. Existing food safety training, which is often sporadic and dependent on individual workplace policies, should be strengthened through structured, continuous, and needs-based training programs. Tourism-related industries, restaurants, and cafés in Ubud play a strategic role in implementing more transparent operational standards, including the provision of information on food sources, processing procedures, and consistent internal monitoring. Enhancing food safety practices not only contributes to workers' health but also strengthens Ubud's image as a safe and sustainable tourism destination.

3.3 The Relationship Between Socio-Economic Factors and Food Safety Behavior of Workers in the Ubud Tourism Area, Gianyar Regency, Bali Province

The relationship between socio-economic factors and food safety behavior among tourism workers in the Ubud Tourism Area highlights the role of individual social and economic characteristics in shaping daily food-related decisions. In this study, socio-economic variables include age, education, income, number of dependents, and monthly expenditure, while food safety behavior is examined through two main dimensions: food purchasing behavior and food handling and processing practices based on the World Health Organization's Five Keys to Safer Food. This relationship reflects how social and economic conditions influence workers' behavioral responses to food safety within an occupational context characterized by long working hours and high operational flexibility.

Table 3 indicates that education has a statistically significant but very weak relationship with food handling practices ($\rho = 0.192$; $p = 0.021$). This finding suggests that higher educational attainment is associated with a slight increase in the likelihood of applying proper food handling practices, although the magnitude of its influence remains limited. In contrast, the number of household dependents shows a stronger and more meaningful association with food handling practices, with a moderate level of correlation ($\rho = 0.266$; $p = 0.001$). This result indicates that workers with more dependents tend to demonstrate greater caution in applying food safety practices compared to those with fewer household responsibilities. These findings are consistent with field observations among accommodation and culinary workers in Ubud, where the majority possess secondary-level education (senior high school or vocational school) and acquire work-related skills primarily through on-the-job experience rather than formal food safety training. While formal education provides a basic foundation of knowledge, it does not necessarily ensure adequate technical understanding of food safety practices, particularly those related to the WHO's Five Keys to Safer Food, such as maintaining cleanliness, separating raw and cooked foods, ensuring thorough cooking, keeping food at safe temperatures, and using safe water and raw materials. Consequently, the implementation of food safety practices is largely shaped by workplace routines, supervisory instructions, and organizational culture rather than by conceptual knowledge derived from formal education.

Table 3. The relationship between socio-economic factors and food safety behavior of workers in the Ubud Tourism Area, Gianyar Regency, Bali Province

No.	Variable	Correlation Coefficient	Sig. (2-tailed)	Level of Relationship
1	Education and food handling practices	0.192	0.021	Very weak
2	Household dependents and food handling practices	0.266	0.001	Moderate

Conversely, workers with a higher number of household dependents tend to exhibit more cautious food handling behavior. The responsibility to safeguard the health of family members encourages greater attentiveness to food safety, both in domestic food preparation and in the selection of food consumed outside the home. These workers are generally more concerned with food storage practices, cleanliness of eating utensils, and the overall suitability of food for consumption. Within the tourism sector in Ubud, where work pressure and limited rest periods often lead workers to rely on ready-to-eat food or meals purchased outside the workplace, those with greater household responsibilities tend to apply additional filtering mechanisms, such as choosing food vendors perceived as cleaner or relying on prior consumption experiences. This finding aligns with previous studies emphasizing the role of education in enhancing individuals' understanding of food safety risks and procedures. Ardianto et al. (2024) reported that education is associated with an individual's capacity to comprehend food safety risks and procedures, while Borda et al. (2021) found that education influences the ability to interpret information related to foodborne hazards. However, the weak relationship observed in this study suggests that formal education among tourism workers in Ubud is insufficient to significantly improve food safety practices. This supports the argument proposed by Kabiesz (2024) that knowledge alone does not guarantee the adoption of safe food handling behavior, as behavior is also shaped by workplace environments, organizational culture, and habitual operational practices. Meanwhile, the stronger relationship between the number of dependents and food handling practices is consistent with the findings of Luu et al. (2023), who emphasized that household responsibilities can enhance individual motivation to engage in food safety behavior. Individuals responsible for the health of children and other family members are more likely to adopt precautionary measures in food handling and processing. In the context of this study, this finding illustrates the importance of moral and social dimensions in shaping food safety behavior among tourism workers, particularly in a destination such as Ubud where high work intensity and service demands are inherent to daily operations.

From an academic perspective, this study contributes to the literature on food safety behavior by demonstrating that workers' behavior is not solely a function of knowledge or cognitive capacity, but rather the outcome of interactions between socio-economic conditions, household responsibilities, and the work environment. While food safety knowledge serves as a fundamental prerequisite, the results indicate that the number of household

dependents plays a more influential role in encouraging the application of safe food handling practices than formal education alone. This finding reinforces the relevance of the household decision-making model, in which food consumption and handling decisions are influenced by family structure, responsibility burdens, and perceived health risks to household members. Furthermore, the findings support a multidimensional perspective on food safety, as highlighted by Yeargin et al. (2021), which argues that educational interventions alone are insufficient to change behavior if they are not accompanied by an understanding of social dynamics and work-related pressures. In the Ubud Tourism Area, workers facing long working hours and high operational demands may lack the time and cognitive resources to fully apply food safety principles, regardless of their level of knowledge. Therefore, this study underscores the need for food safety interventions that extend beyond knowledge enhancement and explicitly consider the structural and social conditions shaping food safety behavior among tourism workers.

3.4 FCQ Indicators that Affected Workers' Food Choice Motives in the Ubud Tourism Area, Gianyar Regency, Bali Province

To understand the food choice motives of tourism workers in the Ubud area, this study employed the FCQ, a 29-item instrument. This instrument was designed to measure various dimensions that influence consumption decisions, ranging from health considerations, taste, price, practicality, to socio-cultural factors and trust in food sources. Through PCA, these indicators were reduced to several main factors that can explain workers' consumption patterns in a more straightforward and comprehensive manner. Table 4 shows the Rotated Component Matrix values using the Varimax rotation method.

Table 4. Total explained variance values

Factor	Indicator	Loading Factor
1 (Sensory and health orientation)	Has a pleasant taste	0.777
	Looks delicious	0.757
	Does not contain synthetic chemicals	0.754
	Smells good	0.746
	Contains natural ingredients	0.745
	Packaged in an ecofriendly way	0.722
	Good value for money	0.714
	Low in fat	0.696
	Does not contain additives	0.690
	Helps me control my weight	0.660
	Low in calories	0.612
	Makes me feel good	0.573
	Helps me cope with life	0.561
2 (Practicality and price motives)	Not expensive	0.840
	Cheap	0.831
	Can be purchased at stores near where we live or work	0.775
	Easy to find in stores and supermarkets	0.745
	Tastes good	0.625
	Easy to prepare	0.551
3 (Food components)	Keeps me healthy	0.840
	Nutritious	0.814
	Contains many vitamins and minerals	0.773
4 (Food source trust)	Comes from a country that I agree with politically	0.841
	Has a clear country of origin	0.802
	Is the same as the food I ate when I was a child	0.646
	Is good for my skin/teeth/hair/nails, etc.	0.504
5 (Consumption behavior)	Keeps me awake	0.638
	Helps me relax	0.557
	Entertains me	0.553

Table 4 provides a mapping of the FCQ indicators that formed the food choice motives of tourism workers in Ubud. In this way, each indicator can be categorized into the most relevant group based on its strength of association. In the first indicator, namely sensory and health orientation, indicators such as chemical-free food, containing natural ingredients, low fat, and nutritious have high loading values (≥ 0.70). This confirms that tourism workers tend to prioritize hygiene and health aspects when choosing food. These results align with the research by McKenna et al. (2025), which states that health considerations are one of the primary dimensions in the FCQ that most consistently influence food choices across various community groups. The second indicator, practicality and price, is characterized by high loadings on aspects such as ease of obtaining food, low price, and food that is easy

to prepare. These results reinforce that time constraints influence workers' consumption patterns, resulting from long working hours, which leads them to prioritize efficiency and affordability over ideal nutritional quality, as found in the study by Wronska et al. (2022).

The third indicator is nutritional content, which encompasses the vitamin and mineral content, as well as the health benefits. This indicator suggests that some workers still prioritize nutritional aspects, even though they are not a top priority. Its existence illustrates that there is a group of workers who are more aware of balanced nutrition. The fourth indicator, trust in food sources, is demonstrated by factors such as the country of origin, the producer's reputation, and the connection to childhood consumption experiences. The high loading value on this indicator indicates that tourism workers also base their choices on beliefs and trust, whether in certain vendors, brands, or familiar consumption experiences. The fifth indicator is consumption culture, which is demonstrated by family habits, social influences, and local cultural values. The significant loading value on this indicator confirms that food preferences are not only determined by individual aspects, but also by social norms and cultural ties, especially in the context of Bali, which highly values togetherness and family traditions. "Consumption Culture" in Bali is deeply influenced by the philosophy of *Menyama Braya* (brotherhood), which fosters strong communal eating habits.

The Rotated Component Matrix clarifies the structure of indicators formed from PCA analysis, allowing each indicator to be mapped more specifically to a particular dimension (Ao & Wu, 2025). This indicates that the food choice motives of tourism workers in Ubud are influenced by a combination of factors, including food awareness, practicality and price, nutrition, trust in food sources, and consumption culture. These findings underscore the importance of understanding food preferences from various dimensions, as workers' consumption decisions are not only rational but also closely related to their experiences, work environment, and cultural values.

The results of PCA on 29 FCQ indicators are shown in Table 5 show a Total Variance Explained value of 73.336%. This figure indicates that the five leading indicators derived through PCA can explain 73.336% of the variation in the overall data. In other words, most of the diversity in the food choice motives of tourism workers in Ubud can be understood simply by looking at these five indicators, while the remaining 26.664% is influenced by other aspects outside the model. In social research, a cumulative value above 60% is considered sufficient to represent a stable indicator structure; therefore, achieving more than 70% can be categorized as very good. This value also shows that the indicators in the FCQ instrument have strong interconnections and can be effectively reduced to simpler dimensions without losing important information. These results are supported by research by Castanho et al. (2023) who used the FCQ in various countries and reported Total Variance Explained values ranging from 65% to 72%, indicating that the indicator structure formed in this study falls within a reasonable range.

Table 5. Total variance explained value

Component	Eigenvalue	% of Variance	Cumulative %
(1) Has a pleasant taste	13.846	47.745	47.745
(2) Looks delicious	3.406	11.746	59.492
(3) Does not contain synthetic chemicals	1.559	5.375	64.866
(4) Smells good	1.336	4.608	69.474
(5) Contains natural ingredients	1.120	3.862	73.336

4. Conclusions

This study demonstrates that food safety awareness, behavior, and food choice motives among tourism workers in the Ubud Tourism Area are closely linked to their socio-economic characteristics and working conditions. The workforce is dominated by young, low- to middle-income workers with secondary education, a profile that explains the moderate role of education and household dependents in shaping food safety awareness and food handling practices. In contrast, trust in the food safety system and access to formal information remain weak, indicating limited institutional support and reliance on informal knowledge sources. The findings further reveal that food choices are primarily driven by practicality and price, alongside food awareness, nutritional considerations, trust in food sources, and consumption culture. Long working hours and economic constraints encourage workers to prioritize affordability and convenience, often at the expense of food safety considerations. Importantly, household responsibility appears to be a stronger motivator of safe food handling behavior than formal education alone.

Based on these results, three specific recommendations are proposed. First, tourism businesses should collaborate with local leaders to deliver regular, brief, and practical food safety training tailored to young operational workers. Second, food safety messages should emphasize low cost and practical strategies, such as safe storage and reheating of ready-to-eat foods, to align with dominant price and practicality motives. Third, food safety interventions should adopt family-oriented narratives that highlight the protection of household members' health, thereby strengthening workers' internal motivation to apply safe food practices.

Data Availability

The data used to support the research findings are available from the corresponding author upon request.

Conflicts of Interest

The authors declare no conflict of interest.

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