

DO HOME-BASED FOOD BUSINESS ENTREPRENEURS AWARE ABOUT FOOD SAFETY? A CHOICE EXPERIMENT DURING SHOCK PERIOD IN INDONESIA

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Abstract: This study aims to assess the practices of Home-based Food Businesses (HBFB) concerning food safety standards and their preference for food sanitation and hygiene certification in Indonesia. This study employed an online choice experiment approach to discover whether home-based food business owners preferred hygienic certification. This study involved 322 participants recruited through social media as respondents. Descriptive statistics and a conditional logistic model were applied to analyse the data. The results indicate that most respondents emphasise the need for appropriate personal hygiene, handling and food cross-contamination prevention, but fall short in terms of preventing delivery contamination. In addition, respondents preferred sanitation hygiene certification for food entrepreneurs with online registration and inspection. These findings provide the first attempt at providing empirical insights into HBFB food safety practices in Indonesia during the COVID-19 pandemic and suggest a novel policy for the food delivery standard process.

Keywords: Home-based Food Business, food safety practice, hygiene certification, food handler's certification preferences.

Introduction

The outbreak of the COVID-19 pandemic in Indonesia prompted the government to impose broad-scale restrictions intended to prevent the spread of the virus (Syuhada *et al.*, 2021; Toiba *et al.*, 2022). As a result, certain business sectors were prohibited from operating for an unspecified period of time, forcing many enterprises to either close down or reduce their workforce to cope with the economic challenges (Campbell *et al.*, 2021; Yilmaz & Şahin 2021). This pandemic situation also resulted in a widespread shift to remote work, heavily reliant on internet access, which persisted for more than a year and became the new norm (Zhang *et al.*, 2021). In response to the shift to remote work, some people started micro-scale businesses, including those in the food sector, operating from their homes. The food business emerged as a logical alternative as it was relatively easy to establish and provided a product that was essential to human needs, namely food.

During the pandemic, many people began selling food from their homes, giving rise to what is commonly referred to as Home-based Food Businesses (HBFBs). HBFB is a term used to describe entrepreneurs who prepare and sell food from their homes (Reuschke & Mason, 2020). In Indonesia, this business model falls under the category of household industries. Previously, HBFBs have emerged as a substantial economic component in the largest population in several developed countries (Newbery & Bosworth, 2010). However, due to the challenges in accurately identifying them statistically, they often go overlooked in local, regional, and national economic development efforts (Clark & Douglas, 2014).

As a small business sector, HBFBs play an essential role in the food system during the pandemic. When traditional food services face limitations, HBFB steps in and offers residents the option to order food online. They also

operate with a more flexible business model, as they are part of the informal sector. Additionally, there are several advantages associated with running HBFBs, including cost savings, reduced commercial space requirements, and convenience (Daniel *et al.*, 2015). For women, in particular, home-based businesses offers them flexibility to manage their enterprises while caring for children and handling household responsibilities. Consequently, HBFBs contribute to food availability solutions and serve as sources of income (Gooptu & Chakravarty, 2018), particularly for urban communities during a pandemic.

In general, food, being a fundamental human need, should not only be a focal point in business development, but also in terms of consumer safety, despite the claim by the European Food Safety Authority that food is not a source or the primary route of transmission of COVID-19 (EFSA, 2020). Nevertheless, other studies have suggested that food could act as an intermediary in COVID-19 transmission (McIntosh *et al.*, 2020; Zhang *et al.*, 2020). In Hong Kong, for instance, up to 18% of COVID-19 patients exhibited gastrointestinal symptoms, and viral RNA from SARS-CoV-2 was detected in faecal samples (Cheung *et al.*, 2020). However, the details of the infection pathway remain unclear (Duda-Chodak *et al.*, 2020). Consequently, it is critical to investigate food as a possible mode of COVID-19 transmission.

The primary issue with HBFB is that the products often lack validation against food safety standards (Temen *et al.*, 2020; Limon, 2021c). In contrast, public awareness of food safety is on the rise (Grashuis *et al.*, 2020; Kohli *et al.*, 2020). However, imposing stringent food safety regulations carries the risk of shutting down this industry, especially when consumers are unable to inspect the food production process, underscoring the importance of food safety certification. Therefore, it is incumbent upon the government to recognise that establishing a procedure for food hygiene certification is a proper approach to developing appropriate regulations for this sector.

This study aims to investigate the problem in two stages: First, by investigating HBFB entrepreneurs' food safety practices; and, second, uncovering HBFB preferences regarding food hygiene certification procedures. Previously, the Choice Experiment (CE) method was utilised to elicit respondents' preferences for policy programmes still under discussion, based on McFadden's random utility theory (McFadden, 1974) and Lancaster's consumer theory (Lancaster, 1966). According to this approach, individuals choose a product based on its attributes rather than the product itself. In essence, individuals select the alternative that offers the most advantageous or utilitarian attributes compared to other options. In this study, the CE method was employed to understand the responses of HBFB actors to the proposed certification programme, with the goal of developing appropriate regulatory guidelines.

This study has two main objectives: To investigate the food safety practices of HBFB actors in Indonesia and to analyse HBFB preferences regarding food safety certification schemes. The findings of this study are expected to contribute to the scientific discourse surrounding the implementation of food safety standards within the context of HBFB. In Indonesia, HBFBs are considered micro-businesses operating informally, and, as a result, there is inadequate documentation on these businesses. Despite the widespread presence of HBFBs in Indonesia, the literature on their food safety practices remains limited. Therefore, this study aims to bridge this knowledge gap by pioneering research into the food safety practice adopted by HBFB actors in Indonesia.

Literature Review

Home-based Food Business

Home-based Businesses (HBBs) typically operate as sole proprietorships or partnerships with low sales and turnovers. HBB owners often rely on personal financing methods, such as credit cards and savings, rather than debt financing schemes, such as loans, overdrafts,

and leveraging (Anwar & Daniel, 2017). In the context of micro-companies, HBBs can be defined as businesses with fewer than 10 employees (Pretorius *et al.*, 2005). These businesses are known for their adaptability and innovative nature, often seizing new opportunities and adapting to changing contexts (Baines & Wheelock, 2000). Entrepreneurially oriented, HBBs are frequently described as “closely connected to consumers” (Anwar & Daniel, 2017). Micro-businesses have also been linked to economic development (Clark & Drinkwater, 2010). Despite these advantages, HBBs are prone to failure due to their relatively underdeveloped management (Keith *et al.*, 2016).

HBFBs specifically refer to micro-businesses that prepare food at home and sell it to local consumers. During the pandemic, HBFBs have played a crucial role in the food supply chain and have served as an alternative source of income due to lockdown policies (FSAN, 2021). However, both HBFBs and HBBs share common challenges in management and day-to-day operations. In many developing countries, the food safety standards certification system primarily applies to restaurants and small-scale food enterprises (Truong *et al.*, 2021; Watanabe *et al.*, 2021), leaving HBFBs, as micro-scale businesses, largely unaffected by these regulations. One significant factor influencing food safety is the knowledge of food handlers (Unusan 2007; Jevšnik *et al.*, 2008; Rebouças *et al.*, 2017). Therefore, implementing a certification system that includes training can be highly beneficial in promoting food safety practices among food handlers, particularly HBFB owners (Kassa *et al.*, 2010).

Food Safety Certification

The procedures and measures necessary to ensure the safety of food from preparation to consumption are collectively known as food hygiene. Every step in the food processing chain begins with the fundamental premise that the end product must be safe for consumption (Kamboj *et al.*, 2020). The World Health

Organisation (WHO) has long recognised the importance of educating food handlers about their roles regarding food safety, a recognition reaffirmed during World Health Day 2015, which highlighted the critical role of healthy food in human health and the need to guarantee consumer protection (Subba Rao *et al.*, 2007). During the pandemic, food safety emerged as a popular issue in scientific discussions, with several studies (Duda-Chodak *et al.*, 2020; Ceniti *et al.*, 2021; Marty *et al.*, 2021) investigating the potential transmission of COVID-19 through food or beverages. Hence, food safety certification plays an important role in protecting consumers (Ha *et al.*, 2019), and providing consumers with assurance regarding food quality and safety (Chalak & Abiad, 2012). However, because the majority of HBFBs lack official business compliance, the administrative process to acquire certification is challenging. Therefore, the government, as policy regulators, can play a pivotal role in encouraging food security practices among HBFBs without stifling this sector’s growth.

Choice Experiment

The Choice Experiment (CE) approach is a stated preference technique, clearly and firmly supported by Lancaster’s consumer theory and McFadden’s random utility theory. Unlike other stated preferences such as Contingent Valuation, CE boasts superior external validity (Domonko *et al.*, 2018; Noor *et al.*, 2022) as it places respondents in a choice scenario with trade-off options, mirroring real-life decision-making. Although initially developed for consumer studies, this method is now frequently employed in policy development by involving stakeholders in the policymaking process to craft effective policies (Abrate *et al.*, 2016; Van den Broeck *et al.*, 2017). In this study, the CE approach was utilised to investigate HBFB operators’ preferences regarding the Food Safety Certification Policy scheme. This preference data provides insights for policymakers to implement the certification programme in a participatory manner.

The essential premise of this study is that CE reflects individuals' rationality towards the programme's attributes. Previous studies have indicated that individuals will select the one with the greatest utility when faced with several alternatives (Louviere & Woodworth, 1983). If none of the alternatives possesses the preferred attributes, individuals may refrain from making any choice (Parker & Schrifft, 2011). Furthermore, a multinomial logit model was employed to analyse the responses of HBFB entrepreneurs to the CE questionnaire (Gensler *et al.*, 2012). However, there has been limited literature addressing the vital role of HBFB in the food supply chain and as a source of income for many during a pandemic. Due to its micro-scale business classification, food safety regulations often do not apply to HBFB. Nevertheless, the issue of food safety has gained prominence during the pandemic. Therefore, governments need a new policy programme to address this phenomenon. In light of these considerations, this study contends that the utilisation of the CE approach to formulate food safety standards for HBFB operators is a reasonably robust approach that incorporates individual preferences into the policy discourse.

Methodology

Sample and Data Collection

As the total population of HBFB entrepreneurs is uncertain, respondents were selected with a non-probability approach by employing a convenience sampling technique (Adams *et al.*, 2007), with the following inclusive criteria: (1) Respondents must be food business entrepreneurs that operate from home during the COVID-19 pandemic; and, (2) Respondents must produce and sell food from home, with products having a shelf life of no more than seven days. Respondents of this study were recruited through social media platforms (Facebook, Instagram, and Twitter) from July to September 2021, with the aim of identifying HBFB operators during the pandemic restrictions. On Facebook, potential respondents were identified through culinary groups and the marketplace feature,

while on Instagram and Twitter, the search features were utilised. Prospective respondents was also identified through their social media posts, and any account that fit the sample criteria was contacted via direct message.

The questionnaire consists of four parts: Screening questions, business characteristics, food safety practices items during the pandemic, CE. The screening questions were employed to identify participants who were a good fit for the study's objectives, specifically food business operators working from home and producing food with a maximum shelf life of seven days. Questions related to food safety practices were focused on four dimensions: Personal Hygiene (PH), Handling Contamination Prevention (HCP), Food Cross Contamination Prevention (FCCP), and Delivery Contamination Prevention (DCP), adapted from the instrument from Limon (2021a), and were measured using 5-point Likert scale. Finally, the CE section aimed to uncover HBFB operators' preferences for the food security certification programme. Ultimately, while approximately 682 respondents initiated the questionnaire, only 322 respondents passed the screening questions and completed all sections (resulting in a response rate of 47.24%).

Choice Model

CE is a method for expressing preferences based on McFadden's random utility theory and Lancaster's microeconomic theory (Lancaster, 1966; McFadden, 1974). Both theories posit that people derive utility from a product (e.g. goods, services, programmes) not from the product itself, but rather from the attributes it possesses. In CE, researchers are required to identify the attributes of a product or programme to be examined (Noor *et al.*, 2022). In the next step, more detailed levels of each attribute are determined and combined to form an alternative that is offered to respondents.

The random utility model implements utility as a random variable that can be divided into different utilities depending on the features or attributes of the object. The utility of individual i against option j is formulated as follows:

$$V_{ij} = W_{ij}(X_{ij}) + \varepsilon_{ij}$$

where W_{ij} and ε_{ij} refers to the deterministic and stochastic factors of utility, X_{ij} denotes an independent and identically distributed random error. Whereas, refers to a vector that contains the level of the alternative attribute j received by individual i . The levels of the attribute are defined as X_s with $s = 1,2,3,\dots,n$. Furthermore, the Alternative Specific Constant (ASC) is implemented to photograph the option of not selecting respondents. Afterwards, the utility obtained by individual i when choosing alternative j is formulated as follows:

$$V_{ij} = ASC + \beta_1 X_{1,ij} + \beta_2 X_{2,ij} + \dots + \beta_n X_{n,ij} + \varepsilon_{ij}$$

Experimental Design

The attributes and levels were determined through literature review and consultation with experts, as detailed in Table 1. In this study, the attributes encompass the following factors: The type of certification, registration methods, types of inspection, and the operational costs that HBFB operators are willing to incur. In general, Indonesia provides a range of food safety certification categories. However, entrepreneurs in small-scale food businesses are categorised into two groups based on the shelf life of their products.

At its most basic level, the certification for food products with a shelf life of more than seven days includes the home industry food licensing certification known as *Pangan Industri Rumah Tangga* (PIRT). Conversely, the certification for food products with a shelf life of less than seven days involves the certificate of eligibility for hygiene sanitary, referred to as the Laik Hygiene Certificate. As this study focused on HBFBs dealing with food products having a shelf life of less than seven days, various types of sanitation hygiene certification were discussed. These certification schemes include the Laik Hygiene Certification (LHC), Hygiene Course Certification for Entrepreneurs (HCCE), and Hygiene Course Certification for Food Handlers (HCCFH). Additionally, the study considers the registration and inspection processes, which are pertinent due to government policies aimed at crowd control and implementing restrictions on community activities during the pandemic. While the government may waive the registration fee for hygiene certification, HBFB operators still incur expenses related to preparation, transportation, accommodation, and other associated costs. Therefore, the cost aspect is included as a monetary attribute in the analysis.

Table 1: Attributes and levels employed in the study

Attributes	Levels
Certification	(1) Laik Hygiene Certification (LHC)* (2) Hygiene Course Certification for Entrepreneurs (HCCE) (3) Hygiene Course Certification for Food Handler (HCCFH)
Registration	(1) Arriving at the office* (2) Completing the online registration (3) Joining as groups/associations
Inspection	(1) Being visited by inspector* (2) Making a live video conference (3) Making a photo/video report
Cost	(1) IDR 50,000 (2) IDR 100,000 (3) IDR 150,000

*Reference level

The choice set was compiled using the Lighthouse Studio 9.12.1 software. The full factorial design of Table 1 is $3^4 = 81$, denoting the number of combinations of each level attribute. If there are at least a pair of alternatives, then the number of combinations in one choice set is $81^2 = 6561$. If the number of available alternatives is excessive, it must be reduced by selecting only the most effective combination (Jin *et al.*, 2017). In this study, the technique employed was a factorial fractional design with an orthogonal design principle. After completing the factorial fractional design, nine combinations were generated to form the questionnaire. Particularly in this study, each choice set consisted of three alternatives and one “none” option. An example of the choice sets used in the study is illustrated in Figure 1.

Results

The majority of respondents in this study were residents of Java Island, which is home to over 50% of Indonesia’s population (BPS, 2021). The remaining respondents hailed from various provinces across Indonesia. The demographic characteristics of the respondents are presented in Table 2.

Most of the respondents of this study were women, married, well-educated, and young people, with only a small number of elderly respondents. Most respondents were involved in other businesses alongside their food business; with 9.9% reported having no other employment, indicating that HBFB was their sole source of income.

The characteristics of the respondents’ business profiles are outlined in Table 3. The majority of respondents have been engaged in HBFB business for more than a year, primarily driven by the goal of increasing income. Their motivation for business operations reflects a strong commitment to growth. Interestingly, 23% of respondents viewed HBFB as a hobby, while 6.5% considered it an experiment. However, a significant portion (33.5%) of HBFB entrepreneurs were operating their food businesses from home due to challenging economic conditions, aiming to boost their family’s income. The housing situation also played a role in business capacity, with 60% of HBFB entrepreneurs not owning a home. Moreover, 54% of HBFB business owners reported a significant decrease in revenue during the micro-scale public activity restrictions. This

If there were only options below, which one you would choose?
Round 1 from 9

<p>Certification Hygiene Course for Entrepreneur (HCCE)</p> <p>Registration Completing online registration</p> <p>Inspection Making a photo/video report</p> <p>Cost IDR 150,000</p> <p>CHOOSE</p>	<p>Certification Hygiene Course Certification for Food Handler (HCCFH)</p> <p>Registration Arriving at office</p> <p>Inspection Making photo/video report</p> <p>Cost IDR 50,000</p> <p>CHOOSE</p>	<p>None of these choice!</p> <p>CHOOSE</p>
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Figure 1: Example of one of the choices sets in the study

Table 2: Demographic characteristics of respondents

	Variable	Frequency	Percentage
Gender	Male	115	35.7
	Female	207	64.3
Age (year)	17 - 25	101	31.4
	26 - 35	96	29.8
	36 - 45	69	21.4
	46 - 55	38	11.8
	56 - 65	11	3.4
	66 - 75	7	2.2
Marital status	Single	146	45.3
	Married	176	54.7
Other job	Having no other job	32	9.9
	Private employee	97	30.1
	Government employee	69	21.4
	Other sectors (non-food)	124	38.5
Education	Primary school	5	1.6
	Junior high school	12	3.7
	Senior high school	108	33.5
	Associate degree	49	15.2
	Undergraduate's degree	132	41.0
	Master's degree	8	2.5
	Doctoral Degree	8	2.5

Table 3: The business profile of HBFB

	Business Characteristics	Frequency	%
Business age	1 - 3 months	60	18.6
	4 - 6 months	47	14.6
	7 - 9 months	36	11.2
	10 - 12 months	33	10.2
	> 1 year	146	45.3
Motivation	Additional income	119	37.0
	Hobby	74	23.0
	Family economy	108	33.5
	Experiment	21	6.5
Owning their own home	Yes	126	39.1
	No	196	60.9
PPKM	Revenue increased	40	12.4
	Revenue decreased	174	54.0
	Nothing	108	33.5

finding suggests that HBFB may be a viable solution for some individuals to navigate the challenges posed by the pandemic, possibly due to its role in fostering resilience (Bartik *et al.*, 2020).

The reliability test of the food safety practice instrument, conducted through a pilot survey with 26 respondents, yielded a Cronbach's alpha of 0.781, confirming the instrument's reliability for use in the study. Table 4 presents descriptive statistics on food safety practices, with scores calculated as medians to provide a clearer overview of trends. The results indicated that HBFB operators prioritised Personal Hygiene and Handling Contamination Prevention in

their food safety practices. In terms of Food Cross Contamination Prevention, respondents implemented the procedure to prevent food contamination among different items. However, the score for food labelling practices, including precautionary allergen labelling, remained low. In contrast, the Food Delivery Contamination Prevention variable received a notably low score, suggesting deficiencies in food safety practices in this area.

The result of the multinomial logit analysis revealed respondents' preferences for food safety certification programmes, as shown in Table 5. The utility measurement was based on the zero-centered difference principle, where the

Table 4: Food safety practices of HBFB entrepreneurs during the COVID-19 pandemic

Items		Med	SE
Personal Hygiene (PH)			
I wash my hands before and after preparing food	4.71	5	0.04
I wash my hands after handling garbage and using the toilet	4.67	5	0.05
I cover my mouth when I sneeze or cough	4.70	5	0.04
I wear a clean apron and clothing when I prepare food	4.60	5	0.04
I take a bath before and after preparing the food	4.40	5	0.05
Handling Contamination Prevention (HCP)			
I use sanitiser for washing service utensils	4.34	5	0.05
I use gloves for handling raw foods	4.39	5	0.05
I use protective clothing (apron) when I handle raw foods	4.01	4	0.06
I use a cap when I handle foods	3.58	4	0.07
I use a cap and mouth cover/spit guard/mask during the handling of food	3.76	4	0.07
Food Cross Contamination Prevention (FCCP)			
I thaw frozen fish, meat and poultry using running water	4.01	4	0.07
I label my food products as to their ingredients	3.49	4	0.08
I label my food products as to their allergy risks	2.76	2	0.08
Delivery Contamination Prevention (DCP)			
I use an insulator bag in delivering my food products	2.63	2	0.08
I maintain the required temperature of the food during the delivery	3.02	3	0.08
I check the temperature control of the food product before the delivery	2.93	3	0.08
I limit my delivery area	2.66	2	0.08
I properly organise food items in the delivery bags based on food types	2.93	3	0.08
I use gloves for putting and removing food items from my delivery bag	2.77	2	0.08
I regularly clean and disinfect the vehicle used in delivering foods	2.79	2	0.08

Note: Measurements were conducted using a 5-point Likert scale (1 strongly disagree and 5 strongly agree).

calculation of the overall utility in one attribute was set to zero. In general, respondents showed a preference for hygiene course certification for entrepreneurs with online registration and video conference inspections. When considering the certification type attribute, respondents significantly favoured HCCE over HCCFH and LHC. Additionally, the data indicated that respondents were not inclined to register for food safety certification through the HBFB business association.

Additionally, respondents preferred live inspection processes involving video conferences over offline registration and sending reports via photos and videos. The utility coefficient for the cost attribute had negative values, indicating that respondents tended to prefer lower costs. Respondents also exhibited an active response, evidenced by the negative value of the utility coefficient for the “none” option, underscoring their interest in food safety certification.

Discussion

Based on demographic data, female entrepreneurs make up the majority of HBFB entrepreneurs. The relationship between femininity and food preparation is strong. However, when it comes to food safety, both men and women play an equally important role. Food safety practices require a combination of patience and discipline, regardless of gender. Several previous studies (Otieno & Nyikal, 2017; Olaimat *et al.*, 2020; Abdelhakeem *et al.*, 2021) have confirmed that women dominate as primary food handlers. This study aligns with earlier research, in which the majority of home-based business owners are women (Newbery & Bosworth, 2010; Wynarczyk & Graham, 2013; Temen *et al.*, 2020).

The data suggests that married individuals tend to be more conscious of food safety compared to singles. This finding aligns with previous research that has established a

Table 5: The utility of HBFB entrepreneurs on food safety certification programmes

Label	Utility	SD	Low.	Up.
Certification				
LHC	-0.08***	0.27	-0.11	-0.05
HCCE	0.17***	0.23	0.14	0.19
HCCFH	-0.09***	0.28	-0.12	-0.06
Registration				
Coming to the office	0.01	0.32	-0.02	0.05
Online registration	0.02	0.31	-0.01	0.05
By groups/association	-0.03*	0.29	-0.06	-0.00
Inspection				
Being visited by an Inspector	-0.04*	0.39	-0.08	0.00
Live video conference	0.03**	0.36	-0.01	0.07
Photo/video report	0.01	0.34	-0.02	0.05
Cost				
None	-0.25***	0.41	-0.30	-0.21
None	-0.69	2.39	-0.95	-0.43

Significance level: *** < 0.01; ** < 0.05; * < 0.1

connection between marital status and food safety practices and knowledge (Moreb *et al.*, 2017; Hassan *et al.*, 2018; Addo-Tham *et al.*, 2020). Furthermore, the level of education also serves as a parameter of knowledge regarding food safety (Akabanda *et al.*, 2017). However, it is important to emphasise that food safety training is essential for all food handlers (McFarland *et al.*, 2019), not only as an administrative certification but also as a food safety standard that should be followed by HBFBs (Zanin *et al.*, 2017; Yeargin *et al.*, 2021).

In general, the HBFB entrepreneurs in Indonesia have demonstrated good implementation of personal hygiene, HCP, and FCCP when processing food. This aligns with the increasing public awareness of food and food security during the pandemic (Mayurnikova *et al.*, 2020; Bhardwaj *et al.*, 2021). The findings of this study are consistent with a prior study conducted in the Philippines by Limon (2021b) which also found that food handlers there have a strong foundation in food safety practices. Along with public awareness, other factors includes the massive socialisation of food safety within the community by the Indonesian government (Safitri *et al.*, 2020). However, the results of this study have highlighted a weakness in the DCP dimension. This finding is consistent with the investigation by Osaili *et al.* (2022) in Jordan, which revealed that operators of home-based online food businesses there lacked adequate knowledge, held unfavourable attitudes, and exhibited improper behaviours regarding food safety practices during the COVID-19 outbreak. In Indonesia, HBFB entrepreneurs are still lacking in certain aspects of DCP, such as using insulator bags, implementing delivery area restrictions, wearing gloves, and utilising domestic vehicles for deliveries. Furthermore, it is important to note that food safety training in Indonesia is currently limited to the production and packaging processes and does not yet encompass the distribution process.

The CE results of this study indicated that HBFB entrepreneurs prefer a food safety certification process that is simple, low-cost, and can be conducted online. The results of this

study considered the potential and solutions that can be implemented in practising food safety standards, which was in contrast to the study by Abd Razak *et al.* (2022), which indicated that HBFB operators were hesitant to register their business through formal channels. The insights from this study suggest that policymakers should consider a more flexible approach to food certification, taking into account the preferences of participants to achieve more favourable outcomes, rather than imposing a top-down policy (Pinstrup-Andersen, 2021). The implementation of hygiene certification for HBFB entrepreneurs in Indonesia is crucial, especially considering that such certification is widely recognised for restaurants.

In summary, this study offers policy implications for the implementation of food safety certification based on the preferences of HBFB actors. The Indonesian government, particularly the Health Office, could play a role by introducing online registration, training, and inspection during the COVID-19 pandemic. For HBFB entrepreneurs, obtaining food safety certification is essential not only for building consumer trust but also for contributing to the reduction of COVID-19 transmission. Additionally, this study recommends the formulation of food safety standards for the delivery process.

Conclusion

HBFB have played a vital role in the food supply chain during the COVID-19 pandemic and contributes to the economic well-being of some communities.

This study has shown that HBFB entrepreneurs have adopted a significant portion of food safety practices, including personal hygiene, contamination prevention, and food safety measures, although there are areas where improvements are needed, particularly in the delivery process. Additionally, HBFB operators have expressed a preference for hygiene courses for entrepreneurs, online registration, and live video conferencing inspections as part of the food safety certification process.

This research highlights several policy implications for food safety certification. It suggests that registration and inspection processes could be made more flexible by incorporating online methods, as long as they can provide robust and reliable results. Furthermore, there is a need for standardisation in packaging and shipping operations to minimise the risk of contamination during the delivery process. Empowering and training HBBF entrepreneurs will be essential for the effective implementation of these standardisation policies.

However, it is important to acknowledge the limitations of this study, particularly the reliance on an online survey for investigating food safety practices. Direct inspections of equipment and food production locations were not conducted, which may have limited the depth of understanding in certain areas.

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