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Food Hygiene-Sanitation Labels: Is It Important? Analysis of Consumer Attention and Perception Across Age, Gender, Education and Income Groups

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ABSTRACT

The suitability of a product's perceived value to consumers' needs determines the success of offerings. Food safety labels as product attributes have not yet become a concern for most consumers. This research analyzed consumer attention to NKV certification and perceptions of choosing NKV-certified livestock food products regarding demographic profiles. This research was conducted using a survey and data collection was carried out online via social media between June and August 2023. Respondents were determined using a purposive sampling method with the criteria that they had ever shopped for processed livestock products in the last month and were over 18 years old. A total of 210 data were collected and analyzed using descriptive statistical methods and non-parametric Chi-Square. The results showed that behavior regarding NKV certification is positively related to age, education level, and income variables but not to gender. Further analysis showed that the perception of purchasing NKV products is wise and a first choice is greater in groups with older age and higher education levels. Furthermore, the perception of this purchase has the potential to occur in the group of respondents with an income of at least IDR 1,500,000. Furthermore, NKV has not been considered by all respondents, only 14.28% of respondents thought NKV was an important attribute. This study concluded that demographic variables such as age, education level, and income should be deliberated in profiling the market segment for NKV-certified livestock food products. Behavior to purchase NKV products increases in older age groups, higher levels of education, and income.

Keywords: Consumer Demographic Profiling, Livestock Food Products, Market Segmentation, Veterinary Control Number

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Introduction

Indonesia, with the fourth largest population in the world (Worldometers, 2023) requires a sufficient supply of both fresh and processed animal's source food that is also safe for consumption. This need opens up opportunities for the livestock sector to grow (Thongpalad *et al.*, 2019), as is generally the case in developing countries (Hosain *et al.*, 2021). The challenge currently faced by livestock business actors in Indonesia is to increase the supply of food products with guaranteed safety standards. Food safety is a basic human right (Fung *et al.*, 2018) and implementation of food safety becomes crucial because considering the influence of food safety on both human health and protecting countries' economies. Previous study shows that food-borne diseases are likely to increase following the increased livestock and fish products consumption (Grace, 2015b).

Safety food regulation for fresh and processed livestock foods is controlled by the government through Minister of Agriculture Regulation No. 11 of 2020. This regulation requires all business actors to carry out production processes for food of animal origin that are based on hygiene and sanitation principles and formalized by attaching Veterinary Control Number (Nomor Kontrol Veteriner, hereinafter NKV) certificates to the products produced. Since this regulation was established, as of 2023, not many livestock food products, either fresh or processed, have been NKV certified (Syahlani *et al.*, 2023). One of the factors causing the limited implementation of NKV certification has been that it is not yet a sufficient consideration for consumers when making purchasing decisions (Jaung *et al.*, 2018). The suitability of value offered to consumers' needs plays a crucial factor in determining the success of product and service offerings. Food labels have not yet become consumer attention widely, only for those who have perception of consumption risk

factors (Wibowo *et al.*, 2019). Previous studies show price plays an important role in buying decision-making, while safety aspects have been neglected in developing countries (Grace, 2015a). An earlier study shows that women have higher attitudes toward food safety and certification credibility compared to men (Syahlani *et al.*, 2024a).

In this regard, investigating to identify the consumer profile that considers food hygiene sanitation features in food buying decision-making becomes important. Previous research shows that consumer demographics such as age and education affect purchasing behavior (Kumar, 2019; Mohammed, 2021). Then, gender and income also have been found the demographic factors that may influence consumers' buying (Kumar, 2019). This research was conducted to analyze consumer attention to NKV certification and perceptions of choosing NKV-certified livestock food products regarding demographic profiles. The hypothesis tested in this research is behavior of consumers in paying attention to NKV certificates on livestock food products is related to the demographic variables of age, gender, education, and income.

Materials and Methods

This research was carried out between June and August 2023 involving a total of 210 respondents. The determination of the sample used a purposive sampling method with the criteria that the respondents (1) had shopped for processed livestock products in the last month; and (2) they were over 18 years of age. The reason of minimum age was 18 years old, because referring to laws in Indonesia, that age of 18 years old is declared as an adult and can provide opinion independently. The research instrument was a questionnaire containing questions related to the demographic characteristics of respondents and perceptions of purchasing NKV-certified food products on a 5-point Likert scale. Data collection was carried out online using Google-Forms and distributed through social media to reach the respondents.

This research used a quantitative descriptive approach with a survey design. The data analysis used descriptive statistical methods and Chi-Square using the software SPSS 18.0. Descriptive analysis was used to identify respondents' characteristics and perceived behavior concerning the purchase of NKV-certified livestock food products. Furthermore, Chi-square analysis was used to examine the relationship between perceived behavior regarding NKV certification and the demographic characteristics of the respondents.

Results and Discussion

Table 1 shows a total of 91.4% of respondents were between 18 - 35 years of age and the remaining 8.60% were more than 35 years

of age. Respondents consisted of 50.0% men and 50.0% women.

The majority of respondents, 52.6% had diploma/bachelor level education and the remaining 32.10% had secondary school education. A total of 52% respondents had permanent jobs, 7.2% worked part-time, 29.7% had student status and the rest were housewives and had other working statuses. Furthermore, 56.9% of respondents were not married and the remaining 43.1% were married. A total of 32.10% respondents had income less than IDR 1,500,00 per month, then 20.60% had a monthly income between IDR 5,000,001 and IDR 10,000,000, and 15.80% had an income between IDR 3,500,000 and IDR 5,000,000 per month.

The result relationship analysis of particular demographic variables is shown in Table 2. The behavior of paying attention to NKV certificates was positively related to the age variable. The increasing behavior of paying attention to NKV certification labels was related to an increase in a person's age. Previous research showed that group of people 31 years old and above read nutrition labels more often than younger groups (Çoşkun and Kayışoğlu, 2016; Trandafilović *et al.*, 2018). Likewise, (Ghvanidze *et al.*, 2017) found that people aged 45-54 are more likely to look for information from food labels. As people get older, their awareness of consuming safe and healthy food increases, therefore they tend to keep reading food labels on the product packaging. Gao *et al.* (2022) also agree that the aging population increases the demand for certain foods such as poultry and eggs. However, it should be noted that age structure has no significant effect on food consumption in the UK, with race being the only important factor (Astbury *et al.*, 2019).

Table 2 also shows that the behavior of paying attention to NKV certificates was also positively related to education level. Higher education levels were found to be associated with increased purchasing intentions and actual purchases of organic food products (Di Vita *et al.*, 2019; Shashi *et al.*, 2015). Education increases nutritional knowledge and strengthens health motives, easier to understand food labels, and stimulates to purchase of healthier food (Meijer *et al.*, 2021). Educational institutions and research institutes spread scientific information to society, therefore through education, people have a better chance to acquire and understand more new knowledge and use it to improve their living quality. In this context, the more people are educated then the more they are involved with the safety attribute of the products.

Furthermore, the result shows that the behavior of paying attention to NKV certificates was positively related to income (Table 2). The behavior of paying attention to NKV certificates was positively related to income because people with higher incomes have more flexibility to consider food product features in food buying decision-making. This finding is consistent with other prior research that food affordability (Pitt *et al.*, 2017)

and cost (Screti *et al.*, 2024) determine food buying behavior. Therefore, low-income families face greater difficulties in accessing better quality food, in this case, food that has passed hygiene sanitation standards.

Conversely, the behavior of paying attention to NKV certificates did not relate to gender. Table 2 shows the behavior of paying attention to NKV certificates was the same for both men and women. Prior research (Miranda-de la Lama *et al.*, 2017) shows that compared to men, women tend to perform behavior that is related to sustainability and prefer healthier food (Lassen *et al.*, 2016). However, regarding food buying behavior (Mohammed, 2021) explains that gender does not influence the attitude and behavior of food organic consumption. Similar behavior between men and women in NKV-certified food products, because NKV and organic certified are product features that offer benefits to the consumers themselves. While sustainability offers direct benefits to other parties, environments then at the end consumers will get indirect benefits. Naturally, women have an important role in nurturing nature (Farid and Sadée, 2023).

Following this result, we further examine the perception of groups of age, education, and income. Table 3 shows that the proportion of responses agreeing that purchasing NKV products is wise increased with increasing age, namely 71.20% at 18-25 years, 86.30% at 25-35 years, 92.90% and 100% in the age groups 36-49 years and over 50 years respectively. Likewise, the behavior of giving first choice to NKV-certified livestock food products also increased with increasing age, 100% of respondents aged over 50 years agree, followed by 92.9% in the 35-49 year age group compared to the younger age group. In this study, 67.90% of respondents were highly educated, so age was not a barrier to understanding the information contained in the certification information. The information on food labels can assist consumers to improve the food product quality assessment and purchasing decisions (Pettigrew *et al.*, 2024). Furthermore, the important role of food labels is confirmed by (Van Loo *et al.*, 2014) that consumers with better knowledge appreciate information about the production process and support livestock products certification system through product labels.

Table 1. Profile of respondents

| Characteristics | Number (n) | Percentage (%) |
|-----------------------------------|------------|----------------|
| Age group | | |
| - Age 18-25 | 94 | 45,0 |
| - Age 26-35 | 97 | 46,4 |
| - Age 36-45 | 15 | 6,7 |
| - Age 46-50 | 0 | 0,0 |
| - Age 51 and above | 4 | 1,9 |
| Gender | | |
| - Women | 105 | 50 |
| - Men | 105 | 50 |
| Educational level | | |
| - Elementary/middle school | 2 | 1,0 |
| - Senior high school | 66 | 31,1 |
| - Diploma/Bachelor | 110 | 52,6 |
| - Post graduate | 32 | 15,3 |
| Work | | |
| - Teacher/lecturer/trainer | 14 | 6,7 |
| - Government employees | 15 | 7,2 |
| - Private sector employees | 62 | 29,7 |
| - Entrepreneur | 20 | 9,6 |
| - Laborer | 3 | 1,4 |
| - Farmer | 1 | 0,4 |
| - Freelance | 15 | 7,2 |
| - Student | 62 | 29,7 |
| - Housewife | 9 | 4,3 |
| - Others | 8 | 3,8 |
| Status | | |
| - Not married | 119 | 56,9 |
| - Married | 91 | 43,1 |
| - Widow/widower | 0 | 0,0 |
| Income | | |
| - < IDR 1.500.000,- | 67 | 32,1 |
| - IDR 1.500.001,- 2.500.001 | 17 | 8,1 |
| - IDR 2.500.001 – Rp 3.500.000,- | 17 | 8,1 |
| - IDR 3.500.001 – Rp 5.000.000,- | 33 | 15,8 |
| - IDR 5.000.001 – Rp 10.000.000,- | 43 | 20,6 |
| - > IDR 10.000.000,- | 33 | 15,3 |

Table 2. Relationships taking into account NKV certificates and demographic variables

| Relationship analysis | Chi-Square | Significance |
|--|------------|--------------|
| Attention paid to NKV certificates and age | 14.237 | 0.003* |
| Attention paid to NKV certificates and gender | 0.080 | 0.777 |
| Attention paid to NKV certificates and education | 16.281 | 0.001* |
| Attention paid to NKV certificates and income | 16.889 | 0.005* |

*significant at $P < 0.01$.

Table 3. Perception of purchasing NKV food products is a good thing to do and first choice

| Respondent groups | Purchasing NKV products is wise (%) | | | | | Purchasing NKV products is a first choice (%) | | | | |
|--------------------------|-------------------------------------|-----|------|------|------|---|-----|------|------|------|
| | SD | D | N | A | SA | SD | D | N | A | SA |
| Age (years old) | | | | | | | | | | |
| 18-25(n=94) | 2.1 | 3.2 | 23.4 | 40.4 | 30.8 | 2.1 | 8.5 | 29.8 | 47.9 | 11.7 |
| 26-35 (n=97) | 0.0 | 3.1 | 10.3 | 44.3 | 42.3 | 3.1 | 3.1 | 24.7 | 41.2 | 27.8 |
| 36-49 (n=14) | 0.0 | 0.0 | 7.1 | 64.3 | 28.6 | 0.0 | 0.0 | 7.1 | 64.3 | 28.6 |
| ≥50 (n=5) | 0.0 | 0.0 | 0.0 | 40.0 | 60.0 | 0.0 | 0.0 | 0.0 | 20.0 | 80.0 |
| Education | | | | | | | | | | |
| Secondary school (n=67) | 1.5 | 3.0 | 25.4 | 40.3 | 26.9 | 1.5 | 4.5 | 28.4 | 52.2 | 13.4 |
| Diplome/Bachelor (n=110) | 0.9 | 3.6 | 11.8 | 41.8 | 41.8 | 3.6 | 6.4 | 21.8 | 42.7 | 25.5 |
| Graduate (n=33) | 0.0 | 0.0 | 9.1 | 51.5 | 39.4 | 0.0 | 3.0 | 30.3 | 39.4 | 27.3 |
| Income (IDR 000) | | | | | | | | | | |
| ≤1,500 (n=67) | 1.5 | 1.5 | 23.9 | 46.3 | 26.9 | 1.5 | 6.0 | 35.8 | 47.8 | 9.0 |
| 1,501 – 2,500 (n=17) | 5.9 | 0.0 | 0.0 | 58.8 | 35.3 | 0.0 | 5.9 | 23.5 | 64.7 | 5.9 |
| 2,501 – 3,500 (n=17) | 0.0 | 0.0 | 17.6 | 29.4 | 52.9 | 5.9 | 5.9 | 11.8 | 41.2 | 35.3 |
| 3,501 – 5,000 (n=33) | 0.0 | 3.0 | 21.2 | 42.4 | 33.3 | 0.0 | 6.1 | 30.3 | 36.4 | 27.3 |
| 5,001 – 10,000 (n=43) | 0.0 | 2.3 | 7.0 | 44.2 | 46.5 | 4.7 | 0.0 | 14.0 | 48.8 | 32.6 |
| ≥10,000 (n=33) | 0.0 | 9.1 | 12.1 | 39.4 | 39.4 | 3.0 | 9.1 | 21.2 | 36.4 | 30.3 |

SD = strongly disagree, D = disagree, N = neutral, A = agree, SA = strongly agree, n = total respondents.

Table 4. Priority of certification label considered by respondents

| Rank | Code | Description | Frequency (n=210) | Percentage (%) |
|------|---------|---|-------------------|----------------|
| 1 | MD-BPOM | Distribution licensing granted to medicine and food business entities | 192 | 91.43 |
| 2 | HALAL | Halal recognition following Islamic Sharia | 184 | 87.62 |
| 3 | SNI | Recognition that product quality has met the requirement of Indonesia's national standard | 102 | 48.57 |
| 4 | ORGANIC | Assurance that production process has met organic production system standards | 53 | 25.24 |
| 5 | NKV | Guarantee that the animal business unit has met the requirement to produce safe animal products | 30 | 14.28 |
| 6 | HACCP | Recognition of implementation of a systematic approach to determine food safety hazards and quality control to ensure that products are safe to consume | 16 | 7.62 |
| 7 | PIRT | Certification for food and beverages produced by home industry and sold for retail | 12 | 5.71 |

Regarding the level of education, the proportion of respondents who agree that purchasing NKV-certified livestock food products is wise was the highest (90.90%) in the group of respondents that had master's and doctoral degrees, followed by diplomas and bachelor's degrees (83.6%). Prior research shows different results, that education is not related to intention to buy organic food (Chen *et al.*, 2014; Irandoust, 2016; Tan *et al.*, 2022). However, some studies found that education is one of demographic variables that affected buying behavior of organic food (Katt and Meixner, 2020; Rana and Paul, 2017, 2020; Val *et al.*, 2017). The results of this study are consistent with research by (Munasinghe and Shantha, 2021), which stated that, in the context of organic food, consumers with higher education are more motivated to buy certified products than consumers with low levels of education. Higher education people are more aware of health problems (Hosein Baghiani-Moghadam *et al.*, 2015) and easier to understand food labels (Meijer *et al.*, 2021).

Proportion of respondents who agree and strongly agree that purchasing NKV products is wise is higher compared to those who stated that purchase NKV products as their first choice. The differences between these two perception among income groups were 16.4% (≤1,500K), 23.5% (1,501-2,500K), 5.8% (2,501-3,500K), 12% (3,501-5000), 9.3% (5,001-10,000K) and 12.1% (≥10,000K). The result indicated that positive consumer perception on affective was not always followed by consistent behavior. The highest discrepancy between affective and behavior was on the lowest income group ≤1,500 (23.5%). One

of the reasons is that certified food products are sold at higher prices than those that have not been certified, so a larger budget for shopping is required. A previous study in Vietnam showed that low-income people are 16% less likely to afford to buy certified food (My *et al.*, 2021).

Furthermore, a low percentage of purchasing behavior is also because there are several food certificates already known, as shown in Table 4. NKV certificates were only taken into account by 14.28% of respondents, while MD BPOM (*Makanan Dalam*, issued by Badan Pengawas Obat dan Makanan Republik Indonesia or BPOM RI (The Indonesian Food and Drug Authority and Halal certificates, both of which are considered by the majority of respondents, that is, 91.43% and 87.62% respectively (Table 4). Prior study showed that NKV certification of livestock processed food products is less likely to increase perceived product value compared to Halal certification (Syahlani *et al.*, 2024b). It can't be denied that currently, NKV certificates are still widely considered for purchasing decisions, therefore government needs to disseminate information and educate consumers about the importance of NKV certification. Consumer pressure influences company performance which is related to consumer satisfaction and the company's motivation to obtain certification. The benefits of consuming healthy food need to be communicated in this education of consumers as explained by (Rana and Paul, 2017) who found that the ego of consumers and personal needs, for example, healthiness, taste, food safety, and lifestyle influence consumer consumption.

Conclusion

The study revealed that NKV-certification has not yet been thought of as an important product attribute by majority of consumers. Therefore profiling the market and understanding the market thought about NKV becomes important. It can be concluded that demographic variables such as age, education level, and income should be deliberated in identifying the market segment for NKV-certified livestock food products. Age, education, and income are the three demographic variables that relate to the attention paid to NKV certification. Behavior to purchase NKV products increases in older age groups, higher levels of education, and income. Therefore, this study suggested that farmers and other business actors in the livestock industry should focus on the market segment profiled in this study, a market with mature age, high level of education, and income consumers. Then, together with government, all business actors need to execute more intensive socialization of NKV to improve better attention, perception and pursue consumption behavior of NKV products.

Conflict of interest

The authors state there is no conflict of interest in this paper.

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Author's contribution

C.P.S and S.P.S conceived of the presented ideas and developed questionnaire. C.P.S collected data and S.P.S monitored data collection. C.P.S analysed the data. C.P.S and S.P.S wrote the manuscript. S.P.S and F.T.H were in charge of overall research direction.

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