Vol. 15, No. 01, pp. 178-197, 2025 DOI: 10.23960/jpp.v15.i1.202513

Jurnal Pendidikan Progresif

e-ISSN: 2550-1313 | p-ISSN: 2087-9849

http://jurnal.fkip.unila.ac.id/index.php/jpp/

Fostering Food Sustainability: Enhancing Awareness of Local Food Consumption Among Secondary School Students

Nashar Nashar[1,2,*], Nana Supriatna[2], Kokom Komalasari[2] & Dadang Sundawa[2]

[1]Department of History Education, Universitas Sultan Ageng Tirtayasa, Indonesia

[2]Department of Social Sciences Education, Universitas Pendidikan Indonesia, Indonesia

*Corresponding email: nashar@upi.edu

Received: 16 January 2025 *Accepted: 06 February 2025* *Published: 17 February 2025*

Abstract: Fostering Food Sustainability: Enhancing Awareness Of Local Food Consumption Among Secondary School Students. Background and Objective: This study aims to explore the awareness of secondary school students regarding local food consumption, particularly in Serang City, Indonesia, through indicators of knowledge, attitudes, and behavior. **Method:** Involving 325 students, the research employed a quantitative approach with a cross-sectional survey design. **Findings:** The findings revealed that 70.2% of students demonstrated a good understanding of local food sustainability; however, only 61.4% showed positive attitudes, and 54.8% exhibited behavior aligned with local food consumption in daily life. Pearson correlation analysis indicated a significant but weak relationship between students' knowledge and attitudes ($r=0.112$; $p<0.05$), while the relationships between knowledge and behavior, as well as attitudes and behavior, were not statistically significant. These inconsistencies suggest that increasing knowledge does not automatically lead to positive attitude and behavior changes. Therefore, a more integrated approach to food sustainability education is required, including the incorporation of sustainability themes into school curricula, project-based learning, and policies to control the availability of unhealthy processed foods on school campuses. These strategies align with achieving Sustainable Development Goals (SDG) 3 (Good Health and Well-being), SDG 4 (Quality Education), and SDG 12 (Responsible Consumption and Production). **Conklusion**: In conclusion, while students demonstrate a good theoretical understanding, more effective interventions are needed to encourage the adoption of attitudes and behaviors that support sustainable and healthy local food consumption. This study recommends collaboration among the government, educational institutions, and communities to create a generation more conscious of food sustainability.

Keywords: education, food sustainability, local food consumption, SDGs.

To cite this article:

Nashar, N., Supriatna, N., Komalasari, K., & Sundawa, D. (2025). Fostering Food Sustainability: Enhancing Awareness of Local Food Consumption Among Secondary School Students. *Jurnal Pendidikan Progresif*, *15*(1), 178-197. doi: 10.23960/jpp.v15.i1.202513.

INTRODUCTION

Colonialism has ended since the second world war, however, the new colonialism and imperialism still occur these days (Ayelazuno & Graham, 2022; Giles & Stead, 2022; Higgins-Desbiolles, 2022; Lewis, 2022; Cornelissen, 2023). One of the types of it is gastrocolonialism (Perez, 2013; Fresno-calleja, 2017; Chao, 2022). The term of Gastrocolonialism describes a Hawaiian society relying on the imported food products made with low quality ingredients and produced by multinational companies, resulting in low nutritional conditions for local communities (Perez, 2013). This description also happens in Indonesia today. The shift in food patterns caused by the conversion of forests which were Gandara,

previously used for a living space for the indigenous communities in Papua is a form of gastrocolonialism. The expansion of oil palm plantations is ravaging the land right to the edges of villages, sago groves, hunting zones, protected forests and ceremonial feast grounds (Chao, 2022). The sago groves are now slowly being replaced with other plants or converted into residential and industrial areas (Musfira & Harina, 2019). The shift from forests with a variety of nutrients such as abundant supply of hunted animals, fishes, vegetables, fruits and tubers change to less nutritious diet, high salt and sugar content, for example, instant noodles, biscuits and carbonated drinks have resulted in stunting rates and unprecedented short body (Chao, 2022). In addition, the form of gastrocolonialism in Indonesia is illustrated by the high imports of wheat and soybeans. Even though Indonesia is the largest archipelago nation in the world with a land area of 1,922,570 km² which makes it most likely possible to become the biggest agricultural country across the globe (Ayun, Kurniawan, & Saputro, 2020). Its abundant natural resources are expected to be independently able to process and utilize the resources so that there is no much dependence on imported foods from other countries. However, 70% of soybean consumption and 104% of wheat consumption in Indonesia depend on the import (Panjaitan, Ingot, Mardiansyah, & Christoffel, 2020). On the contrary, this issue is not accordance with Sustainable Development Goals (SDGs) (Ferranti 2019; Perkins, Kurtiº & Velazquez 2022) comprising of no poverty, no hunger, healthy and prosperous lives, reduced inequality and responsible consumption and production. SDGs should be a program in development to improve economic prosperity and the quality of life of residents including food sustainability (Sachs, Kroll, Lafortune, Fuller, & Woelm, 2022). Food sustainability (Morawicki & González, 2018; Orago, 2018; García-Oliveira, Fraga-Corral, Pereira, Prieto, & Simal-2022; Torrico, Nie, & Serventi, 2023) refers to individual's ability to access sufficient, available, affordable and safe food to maintain a healthy, productive life and without malnutrition. Currently, food system problems pose persistent hunger, malnutrition and obesity (Afshin et al., 2019; Willett et al., 2019). As a result, food issues become one of the pivotal discussions in SDGs (Valentini, Sievenpiper, Antonelli, & Dembska, 2019; Mensi and Udenigwe, 2021; Mustafa, Mabhaudhi, Avvari, & Massawe, 2021; Dutta & Dutta, 2023) aiming to maintain sustainable development without hunger. The advent of technologies has been developed and applied to produce food in large quantities and at low prices, however food and nutrition security in Asia and the Pacific is concerning (FAO, ECA, & AUC, 2021; Montesclaros & Teng, 2021; Thow et al., 2022; Khan & Ali, 2023). In 2020, around 375.8 million people in the Asia and Pacific region experienced hunger, almost 54 million more than in 2019. This information shows that there has been a significant increase in the number of hungry people within one year. On the other hand, the fulfillment of people's nutritional and adequate nutrition needs is also problematic. The World Health Organization (WHO), United Nations Children's Fund (UNICEF) and The World Bank reported that in 2020 globally there were 149.2 million children under 5 years old suffering from stunting . Based on the 2021 Food Sustainability Index (FSI) released by The Economist Impact and Fondazione Barilla which measures the sustainability of food systems in 78 countries using three main pillars: food loss and waste, agricultural challenges and nutrition. The scoring system is from 0 to 100 in which the mark of 100 illustrates the highest sustainability and greatest progress in meeting environmental, social and economic key progress indicators (KPIs). Indonesia is ranked 51st out of 78 countries, with a score of 59 above Nigeria, Vietnam and Uganda (Economist Impact, 2024). It shows that the food problem in Indonesia needs very serious attention. Therefore,

the problem of food insecurity must be addressed immediately (Resilience, Peace, & Security, 2017). The solution is to raise awareness among the public, particularly the younger generation, specifically students, about the importance of a healthy lifestyle and the consumption of nutritious foods, where people must switch to healthier eating patterns, including switching from processed foods and red meat and reducing food waste and wastage (Poore & Nemecek, 2018; Afshin et al., 2019; Willett et al., 2019). Therefore, it is necessary to incorporate the theme of food sustainability in education curriculum. UNESCO claims that Education has a crucial role in producing critical generations in terms of sustainability issues (Neeser, Natura, Jain, Taylor, & Lenglet, 2010). Moreover, there is a general consensus that education is the driving force for needed change" (UNESCO, 2005). Margaret Crocco, chair of Teacher Education at Michigan State University, declared that there is a critical necessity for us to now integrate this topic in social studies (Crocco, 2013). His observations are relevant because of the fact-based construction that make it important to consolidate sustainability education (Gigauri, Vasilev, & Mushkudiani, 2022; Lafuente-Lechuga, Cifuentes-Faura, & Faura-Martínez, 2023; Stanciu and Condrea, 2023).

Thus, integrating the principles of sustainable development into learning is essential to improving the quality of human life, both in the present and the future. Moreover, the issue of sustainable development has recently become a significant concern that needs to be disseminated within society. Sustainable development is increasingly recognized as essential for societal well-being and environmental health, necessitating its integration into educational curricula and public discourse (Mylvaganam, Timmerberg, Halvorsen, & Viumdal, 2021). Thus, integrating the principles of sustainable development in learning to improve the quality of human life in the present and the future is very important (Supriatna & Anang, 2019). Moreover, sustainable development has become an important issue that needs to be socialized in the community (Sundawa, Fitriasari, & Iswandi, 2018). Therefore, education must be able to build students' self-awareness which is manifested in concrete actions through characterful behavior (Komalasari & Saripudin, 2017). One of the concerning behaviors today is consumerism. Consumer behavior is driven by the desire for pleasure, as the importance of acquiring and possessing material goods has become a central value in consumer society. Consumption is no longer based on needs but is instead focused on fulfilling desires to support a particular lifestyle. This is also evident in food consumption. Food consumption today is not merely oriented toward meeting bodily needs but is influenced by lifestyle desires to appear modern and prioritize efficiency. This phenomenon has given rise to the concept of fast food within the culinary capitalism system. One way the capitalist economy sustains consumers in the long term is through advertising in the media. The media promotes instant food alternatives that are affordable, practical and flavorful. Individuals perceive consuming ready-made meals and junk food as normal and without adverse health consequences.

A study found that 74.48% of students consume fast food at school, with 78.13% consuming instant food at home (Nabila, Haque, Morshed, & Bari, 2024). In Indonesia, 83.9% of students reportedly consume junk food (Yuniah, Feriandi & Yulianto 2023). Consuming fast food more than three times a week increases the likelihood of obesity by 2.42 times (Febriani, & Sudarti, 2019). According to the Ministry of Health, among children aged 5-12 years, 10.8% are obese and 18.8% are overweight (Buani, and Nuraeni, 2023). The prevalence of obesity among adolescents has also significantly increased, from 23.6% in 2013 to 31% in 2018 (Salsa, Dinengsih, & Syamsiah, 2024). In urban areas, lifestyle changes exacerbate this issue, with the majority

of adolescents consuming sugary drinks and those with higher education levels being at greater risk of becoming overweight (Pradigdo, & Putri, 2023). This indicates the fact that awareness of the impact of education on health is still relatively low among the public, professionals and policymakers (Zimmerman, Woolf, Blackburn, Kimmel, Barnes, & Bono, 2018). Therefore, the integration of sustainable food supply issue in education system is important (Shuttleworth, 2015). One of the methods is to combine the theme of food sustainability and awareness of local food consumption in learning activities. In this way, creative teachers play a crucial role in fostering students' problem-solving skills by observing the social environment and identifying relevant issues (Widodo, Katminingsih, Sulistyono, & Handayani, 2023). The main focus of this study is on students' awareness of sustainable food consumption that is healthy, nutritious, affordable, and accessible to everyone. This research aims to explore students' awareness of local food consumption by observing their knowledge, attitusdes, and behaviors in everyday situations. It is expected that this study will contribute to the achievement of SDG 3 (Good Health and Well-being), SDG 4 (Quality Education), and SDG 12 (Responsible Consumption and Production). This study was conducted in 2024 at a Junior High School in Serang City. Accordingly, the research question posed is: How is students' awareness of local food consumption observed through the indicators of knowledge, attitudes, and daily behavior?.

METHOD

Participants

The participants in this study consisted of 325 students from junior high schools in Serang City, Banten Province, Indonesia. Participants were randomly selected from several secondary schools in Serang City. The inclusion criteria for participants were that they were enrolled in junior high school and were willing to participate in the study. Each participant was provided with information regarding the purpose of the study and asked to give consent before participating. A specific map of the research location can be seen in Figure 1 below.

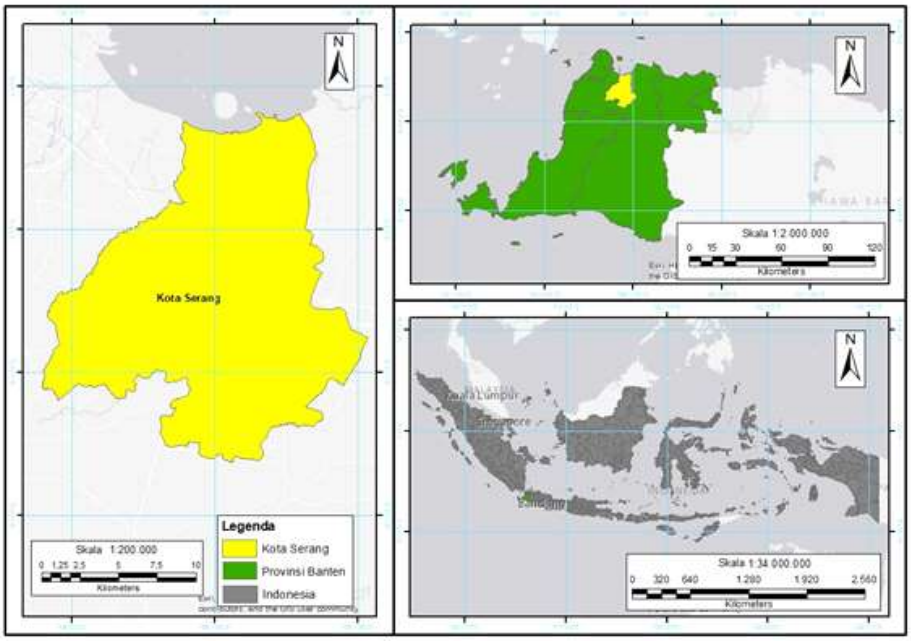

Figure. 1: Geographic location of the study area in Serang City, Banten Province, Indonesia

Research Design and Procedures

This study employed a quantitative research design with a cross-sectional survey approach, collecting data at a single point in time from a simple sample sample (Creswell, & David, 2018). This design was chosen for its efficiency in terms of time and cost, as well as its ability to provide a strong descriptive overview of the research variables at a specific point in time. Data collection took place in December 2024, using a questionnaire distributed to participants in a coordinated manner. The researcher gathered data on students' knowledge, attitudes, and behaviors related to the consumption of local food. The research procedure began with the distribution of questionnaires to randomly selected students. The questionnaire consisted of three main sections: knowledge of local food, attitudes toward local food consumption, and behavior in consuming local food. The data were then analyzed to assess the relationships between students' knowledge, attitudes, and behaviors regarding the sustainability of local food consumption.

Instruments

The instruments used in this study included three types of questionnaires designed to measure students' knowledge, attitudes, and behaviors related to local food consumption. The research instruments were developed by the researcher based on several self-awareness indicators (Goleman, 1999; Morin, 2011; Schoo, van Zandvoort, Biessels, Kappelle, & Postma, 2013; Stewart & Reinders, 2023; Sutton, 2016).

This study employed three different instruments to assess students' knowledge, attitudes, and behaviors related to local food consumption. The first instrument, the "Knowledge Test", consisted of eight multiple-choice questions aimed at measuring students' understanding of various aspects of local food. The aspects measured included general knowledge of local food, knowledge of the nutritional value and health benefits of local food, knowledge of food diversification, and understanding of the environmental impact of local food consumption.

The second instrument, the "Attitude Questionnaire", was designed to assess students' attitudes toward local food consumption using a Guttman scale. This questionnaire included nine statements with two response options: "agree" or "disagree." The indicators assessed included attitudes toward knowledge of local food, attitudes toward healthy local food consumption, attitudes toward food diversification, and attitudes toward environmental sustainability.

The third instrument, the "Behavior Questionnaire", also utilized a Guttman scale with eight statements offering two response options: "yes" or "no." This questionnaire focused on students' behaviors related to local food consumption. The behavior indicators measured included general behavior in consuming local food, behavior in consuming healthy food, behavior in applying food diversification, and behavior in supporting food sustainability. Overall, these three instruments provided a comprehensive assessment of students' knowledge, attitudes, and behaviors concerning local food consumption.

The research employed content validity for the research instruments by involving experts in education, quantitative research, and food sustainability. The instruments were reviewed for relevance, clarity, and alignment with the research objectives. Based on the feedback received, the instruments were revised and re-evaluated to ensure that all inputs were adequately addressed (Anderson, & Krathwohl, 2001).

Data Analysis

The collected data were analyzed using Pearson correlation techniques to test the relationships between the variables of knowledge, attitudes, and behaviors of students. This analysis

aimed to determine the extent to which students' knowledge of local food influenced their attitudes and behaviors in supporting healthy local food consumption, food diversification, and environmental sustainability. The results of this correlation analysis will provide insights into the strength and direction of the relationships between the variables, as well as support the research objective of describing students' awareness levels regarding local food consumption.

■ RESULT AND DISCUSSION

Local food consumption awaraness is the understanding and desire to consume locally-produced food. this activity encourages people to prioritize local food products produced by domestic farmers, breeders or producers over imported products. local food consumption will have an impact on the economy, environment and public health.

Local Food Knowledge of Student

A multiple choice test conducted to examine student understanding of local food. The indicators comprises 1) General knowledge of local food, 2) Knowledge of nutritional value and health benefits, 3) Knowledge of food diversification and (4) Knowledge of sustainable environmental impacts. The following data presents students' local food knowledge:

Table 1. Distribution of students' knowledge indicators on local food

No.	Indicator	n	True (%)	False (%)
A.1 Knowledge of local food				
1.	What does local food mean?	325	75.7	24.3
2.	In your opinion, what tree is the picture below?	325	86.5	13.5
A.2 Knowledge of nutritional value and health benefits				
3.	Which of the following foods are unhealthy if consumed continuously?	325	89.2	10.8
4.	Which of the following foods are the healthiest diet?	325	86.5	13.5
A.3 Knowledge about food diversification				
5.	What is the aim of food diversification?	325	49.2	50.8
6.	Which of the alternative food ingredients that can replace rice as a high carbohydrate intake?	325	84.6	15.4
A.4 Knowledge of sustainable environmental impacts				
7.	What impact does throwing away food waste pose on the sustainable environment?	325	44	56
8.	What is the most appropriate and sustainable positive impact of planting plants?	325	45.8	54.2
Average			70.2	29.8

Descriptively, Table 1 presents information about the level of students' knowledge regarding local food, where 70.2% of students provided correct answers, which is higher compared to those who answered incorrectly. The ability to distinguish between foods that are healthy for sustainable consumption and those that are not demonstrates that students have good knowledge of local food and awareness of sustainability and health through the availability of food sources. However, 29.8% of students provided incorrect answers, indicating that their knowledge of local food remains a concern. For instance, in the first indicator of the second question, which asked about the picture of a cassava plant, 13.5% of students answered incorrectly. As is well known, Indonesia is an agrarian country whose people are familiar with cassava plants. However, some

secondary school students are not acquainted with this plant.

Additionally, on the food diversification indicator, 50.8% of students did not understand the purpose of food diversification itself, even though diversification aims to change consumption patterns in society, ensure a variety of food choices, and maintain balance (Rahajeng & Khotimah, 2020; Jamili, 2022).. Understanding of food diversification remains limited, which is further exacerbated by the fact that 54.2% of students could not correctly identify alternative carbohydrate sources. These findings indicate that while some students are aware of alternative food sources, there is still a strong dependency on rice consumption. Indonesia remains trapped in a monoculture food policy that prioritizes rice as the primary food source, making the population less accustomed to consuming alternative staple foods. Therefore, introducing diverse food options to students in schools can have a positive impact on eating habits, even within a rice-centric culture (Cassar, 2022).

Furthermore, on another indicator regarding knowledge of the environmental sustainability impacts, questions seven and eight revealed that students' knowledge in this area tends to be inaccurate. In fact, the issue of food sustainability is critical, affecting health, the economy, and social stability. Students' lack of understanding in these two aspects represents a significant barrier to food diversification efforts. Therefore, joint efforts from the government, educational institutions, and the community are needed to enhance understanding and participation in this program. In conclusion, urban students' knowledge of local food is generally good, with 70.2% of the 325 students able to correctly answer questions related to local food.

Student Attitudes Towards Local Food Consumption

Guttman scale with the answer options "agree" and "disagree" is selected to measure the students' attitude on local foods. The indicators consisted of (1) Attitudes towards local food knowledge, (2) Attitudes towards healthy local food consumption, (3) Attitudes towards food diversification and (4) Attitudes towards environmental sustainability. The following information is the local food knowledge of students:

Table 2. Distribution of students' attitude indicators towards local food consumption

No.	Indicators	n	Agree (%)	Disagree (%)
B.1	Attitudes towards local food knowledge			
9	I choose local food because it is fresher and have better quality	325	75.4	24.6
10	I choose food not because of trends	325	43.4	56.6
11	I don't feel embarrassed if I bring boiled cassava to school	325	59.7	40.3
B.2	Attitudes towards healthy local food consumption			
12	Home-made food is tastier and healthier	325	72	28
13	I prefer long-processed food to fast food	325	67.4	32.6
B.3	Attitudes towards food diversification			
14	If I feel full from other foods, then I no longer consume rice	325	31.4	68.6
B.4	Attitudes towards environmental sustainability			
15	Instead of throwing away food wastes, it's better to make the them into compost	325	75.1	24.9
16	I like cultivating activities	325	66.8	33.2
Average			61.4	38.6

Table 2 provides an overview of students' attitudes toward local food consumption. Overall, the majority of students exhibit positive attitudes, with an average of 61.4% showing responses that support local food consumption. However, there are several aspects that still require attention, particularly regarding food diversification and environmental sustainability.

In terms of attitudes toward local food knowledge, 75.4% of students agree that they choose local food because it is fresher and of better quality. This reflects students' appreciation for the advantages of local food. However, 56.6% of students are still influenced by trends in their food choices, indicating that social factors significantly affect their decisions. Furthermore, 59.7% of students do not feel embarrassed to bring boiled cassava to school, but 40.3% still lack confidence in bringing local food. This highlights the need for further approaches to foster pride in consuming local food.

From the perspective of healthy food consumption, 72% of students agree that home-cooked meals are tastier and healthier than other options. Additionally, 67.4% of students prefer well-prepared food over fast food, demonstrating their awareness of the importance of healthy eating habits. However, on the indicator of food diversification, only 31.4% of students agree that they do not need to consume rice if they are already full from other foods. This indicates a high dependency on rice as a staple food, and food diversification has not yet been fully embraced by students.

Regarding environmental sustainability, 75.1% of students agree that it is better to convert food waste into compost rather than dispose of it, reflecting a fairly good level of awareness about waste management. Furthermore, 66.8% of students express enjoyment in gardening activities, while 33.2% are less interested in such activities. This suggests the need for more creative and engaging approaches to increase students' interest in activities th support environmental sustainability.

In conclusion, students generally have a positive attitude toward local food consumption, particularly in terms of knowledge and healthy food consumption. However, further educational efforts are necessary to enhance students' understanding of food diversification and the importance of environmental sustainability. Interventions through school programs and more interactive approaches can help strengthen these positive attitudes and support broader food sustainability goals.

Student Behavior in Consuming Local Food

Guttman scale questionnaire is chosen to examine student behaviour in local food consumption. The indicators used are 1) General behavior in consuming local food, 2) Behavior in consuming healthy food, 3) Implementation of food diversification, (4) Behavior in supporting food sustainability. The following information is the local food knowledge of students:

Table 3. Distribution of students' behavioral indicators in local food consumption

No.	Indicator	n	Yes (%)	No (%)
C.1	General behavior in local food consumption			
18	I eat a variety of local foods such as vegetables, nuts and fruit every day.	325	62.2	37.8
19	I sometimes consume boiled cassava/corn at home	325	68.3	31.7
20	It's better for me to bring lunch from home than snacks at school	325	56.3	43.7
C.2	Behavior in consuming healthy food			
21	I rarely consume instant noodles at school or home	325	43.4	56.6

22	I never consume junk food	325	59.4	40.6
C.3	Implementation of food diversification			
23	If I have consumed other foods, then I don't eat rice anymore	325	29.2	70.8
C.4	Behavior in supporting food sustainability			
24	If there is food waste, I make it into compost	325	61.8	38.2
25	I have a habit of cultivating plants at home	325	57.5	42.5
Average			54.8	45.2

Table 3 shows that 54.8% of students exhibit positive behavior toward local food consumption, while 45.2% of students display behaviors that are less supportive. On the indicator of general behavior in local food consumption, 62.2% of students consume a variety of local foods, such as vegetables, legumes, and fruits, on a daily basis. Additionally, 68.3% of students stated that they occasionally consume boiled cassava or corn at home, indicating that local foods remain a part of their diet. However, only 56.3% of students prefer bringing lunch from home over purchasing snacks at school, suggesting that some students still favor school snacks over homemade meals.

In terms of healthy food consumption behavior, 43.4% of students reported that they rarely consume instant noodles either at home or school, while the majority (56.6%) still frequently consume them. Furthermore, 59.4% of students stated that they never consume fast food, but 40.6% of students still consume such foods. These findings highlight the need for further efforts to promote healthy eating habits among students.

The indicator of food diversification implementation reveals that only 29.2% of students do not consume rice if they feel full from other foods, while 70.8% of students continue to eat rice even after consuming other meals. This indicates that food diversification has not been fully adopted by students, and there remains a high dependency on rice as a staple food. On the indicator of behavior supporting food sustainability, 61.8% of students agreed that food waste should be processed into compost, reflecting a relatively good level of awareness regarding waste management. Additionally, 57.5% of students have a habit of cultivating plants at home, although 42.5% of students do not engage in such activities. These findings suggest the need for more creative and engaging approaches to enhance students' participation in activities that support food sustainability.

Overall, students' behavior toward local food consumption has shown promising results, particularly in aspects of local food consumption and environmental sustainability. However, several areas still require improvement, such as reducing unhealthy food consumption, implementing food diversification, and encouraging more active involvement in activities supporting food sustainability. Educational efforts and school-based programs can serve as strategic steps to enhance students' behavior toward more sustainable local food consumption.

The Pearson Correlation Test Between Knowledge, Attitudes, and Behavior

After the data has been collected, the next step is to conduct data analysis using the Pearson correlation test. This test is used to determine whether there is a statistically significant relationship between students' knowledge of local food, their attitudes toward local food consumption, and their behavior in consuming local food. Additionally, it examines whether the relationship is positive, negative, or whether no relationship exists. The results of the Pearson correlation test are presented in Table 4.

Table 4. Pearson correlation test between knowledge, attitudes, and behavior of students toward local food consumption

Indikator		Knowledge	Attitudes	Behavior
Knowledge	Pearson Correlation	1	.112*	.032
	Sig. (2-tailed)		.044	.561
	N	325	325	325
Attitudes	Pearson Correlation	.112*	1	.091
	Sig. (2-tailed)	.044		.102
	N	325	325	325
Behavior	Pearson Correlation	.032	.091	1
	Sig. (2-tailed)	.561	.102	
	N	325	325	325

*. Correlation is significant at the 0.05 level (2-tailed).

Based on Table 4, the results of the Pearson correlation test indicate a significant relationship between students' knowledge of local food consumption and their attitudes toward local food consumption, with a correlation coefficient of 0.112 and a significance value of 0.044 ($p < 0.05$). Although significant, the strength of this relationship is very weak, suggesting that an increase in knowledge only has a small impact on shaping students' attitudes. Conversely, the relationship between students' knowledge and their behavior in consuming local food is not statistically significant, with a correlation coefficient of 0.032 and a significance value of 0.561 ($p > 0.05$). This indicates that students' level of knowledge does not directly influence their behavior in consuming local food.

Furthermore, the relationship between students' attitudes toward local food consumption and their behavior is also not statistically significant, with a correlation coefficient of 0.091 and a significance value of 0.102 ($p > 0.05$). This suggests that students' positive attitudes toward local food are not sufficient to encourage tangible behavior in consuming local food. Overall, these findings demonstrate that, while knowledge plays a role in influencing students' attitudes, it does not automatically translate into actual behavior.

Based on the findings above, it is illustrated that students' knowledge about local food is relatively good but has not been consistently internalized into attitudes and, even more so, into daily behavior. For example, students' knowledge of nutritional value and health benefits showed a very high prevalence of 89.2% and 86.5%, respectively. However, a decline was observed in the attitude and behavior indicators. In particular, regarding healthy food consumption, 56.6% of students reported consuming instant noodles at school or home, and 40.6% admitted to consuming fast food. This indicates that students still frequently consume instant noodles and fast food instead of homemade meals. Fast food contains 2,215 kcal with 52 grams of saturated fat (Dunford, Popkin and Ng 2022); excessive consumption of fast food may lead to diseases such as obesity, hypertension, and high cholesterol.

This condition reflects that instant noodles are a favorite snack among students. The reasons students prefer instant noodles are their savory taste, instant preparation, and the perception that instant noodles are a modern snack. However, consumption of instant noodles also does not support the local agricultural economy because instant noodles are made from wheat flour (Harianto, 2022). According to (Strizhevskaya, Simakova, Perkel, & Phedonnikov, 2020; Chailek, Thitichai, Praekunatham, Taweewigyakarn, & Chantian, 2023) instant

noodles contain high carbohydrates, fat and sodium and are low in fiber, low in vitamins and minerals. Excessive sodium consumption will have detrimental effects on health (Arcand, Blanco-Metzler, Aguilar, L'abbe, & Legetic, 2018) and can be considered a risk factor for autoimmune diseases such as multiple sclerosis (Haase, Wilck, Kleinewietfeld, Müller, & Linker, 2019) as well as the risk of developing cardiovascular disease (O'Donnell et al., 2020). In addition, excessive fat intake over a long period of time can result in obesity (Wang, Wang, Zhang, Popkin, & Du, 2020). Meanwhile, consuming low carbohydrates is effective in increasing weight loss (Chawla, Silva, Medeiros, Mekary, & Radenkovic, 2020). This means that consuming instant noodles in large quantities and over a long period of time can have a severe impact on body health (Strizhevskaya, Simakova, Perkel, & Phedonnikov, 2020; Niebla-Canelo et al., 2022). In fact, according to the Taiwanese Ministry of Health, instant noodles originating from Indonesia, especially Indomie special chicken flavor, contain carcinogenic substances that trigger the growth of cancer cells (CNN, 2023). Therefore, it is crucial to return to local food, which is undoubtedly healthier and safer. A surprising fact about instant noodle consumption was revealed in a study by Braden Kuo, a gastroenterologist, who conducted an experiment by inserting a micro camera into research subjects asked to consume instant noodles and homemade noodles alternately (DetikFood, 2020). The observations revealed that even after four hours, the instant noodles remained undigested and retained their original form. Another unexpected finding was how the stomach attempted to break down the instant noodles but failed. In contrast, homemade noodles were digestible within one to two hours due to the absence of a preservative called tertiary butyl hydroquinone (TBHQ), which is also used in perfume production. Unfortunately, prolonged consumption of TBHQ can weaken organs and increase the risk of tumors and cancer. Additionally, to maintain the structure of instant noodles when exposed to hot water, glycol is used, a substance commonly found in cigarettes. The packaging of instant noodles also contains harmful materials, such as bisphenol A (BPA), which mixes with the noodles when exposed to hot water and can disrupt body metabolism if consumed continuously.

Behavior concerning food diversification revealed a more surprising finding: even though students had consumed other foods, 70.8% believed these alternative foods could not be considered meals unless rice was also consumed. This assumption has a long historical context, as rice has been widely cultivated in the archipelago since the mid-13th century. Until the 19th century, rice had not yet achieved its status as the primary staple food for the majority of Indonesians (Cantwell-Chavez, 2023). However, since the Colonial Government sponsored the massive expansion of rice farming around the end of the 18th and 19th centuries, rice became a special dish, resulting in a food culture called rijsttafel. It refers to"...eten van de rijsmaaltjid een special tafel gebruikt" which means a special rice dish (Ido, 1948). Rijsttafel is always impressed with luxury and fame especially in the second and third decades of the 20th century in which rijsttafel became popular due to tourism sector (Rahman, 2016). This means that the consumption of rice as a staple food was part of the colonial government's policy. Since the beginning of Indonesian independence, Indonesia's first President, Sukarno, has promoted domestic agricultural production with food self-sufficiency and made rice an "indicator of prosperity, resilience and welfare" (Neilson & Wright, 2017). Government policy has appeared to favor monoculture, benefiting agribusiness oligarchies since the colonial period and even during Indonesia's early independence. The belief that one has not eaten unless rice is consumed became ingrained in Indonesian culture due to colonial-era efforts to establish rice as an invaluable staple

food while food diversification remained unfamiliar.

Additionally, in the table of food sustainability, it was found that students' behavior in food sustainability still needs improvement, with 38.2% not accustomed to transforming food waste into compost and 42.5% not engaged in gardening activities. From these three indicators, it is evident that students' abilities have declined. For example, the knowledge indicator showed a correct response rate of 70.2%, but a decline was observed in the attitude indicator, with 61.4% of students agreeing, while only 54.8% responded "yes" for daily behavior indicators. This indicates that, although knowledge and attitudes play a role, students' behavior is also influenced by various other complex factors, such as social environment (Becker & Kassouf, 2012; Wong, Ou, Zhang, & Zhang, 2022), economic status (Javaheri, 2007; McGrath & Elgar, 2015), culture (Nguyen, Le, Nguyen, & Tran, 2023; Tibenda, Jukes, & Sitabkhan, 2021), or the influence of media (Abdul-Aziz & Maigah, 2024; Guo, 2024). Figure 2 illustrates students' awareness of local food consumption as seen from the knowledge, attitude, and behavior indicators.

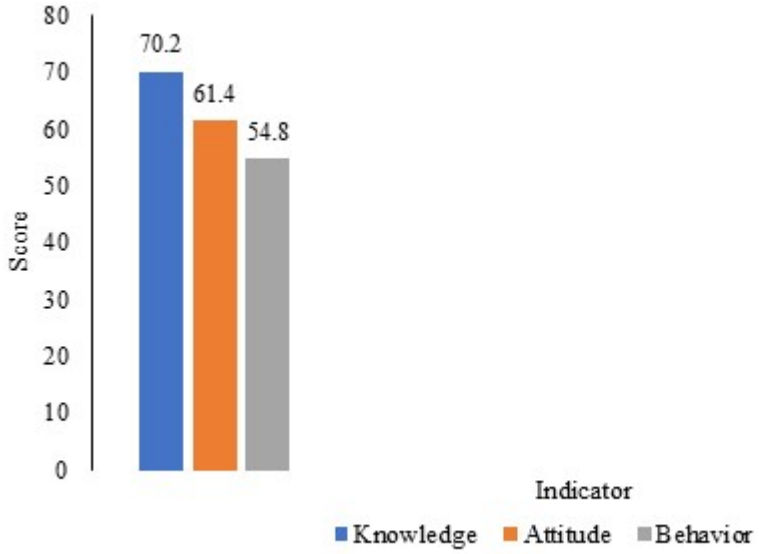

Figure. 2: Awareness of lokal food consumption among secondary school student

These three scores indicate inconsistency among students in responding to knowledge, attitude and behavior indicators, illustrating that high knowledge does not necessarily reflect high attitudes and behaviors. There are several reasons why awareness of local food consumption is essential. Firstly, by purchasing local foods, consumers can support the domestic economy as well as farmers, breeders and producers, thereby contributing to the circular economy within communities, creating job opportunities and fostering local economic prosperity. Additionally, consuming local foods offers environmental benefits by reducing food distribution distances to end consumers, which in turn lowers carbon emissions from transportation and helps protect the environment.

Furthermore, by consuming local foods, students can reduce excessive use of packaging materials and waste. From a health perspective, local foods are often fresher and healthier because long preservation and shipping processes are avoided and natural ingredients are utilized, which positively impacts nutritional quality and food safety. Local food consumption can encourage sustainable agricultural practices and maintain the

sustainability of natural resources. Local farmers tend to be more connected to their local ecosystems and understand how to manage land and resources wisely. Students can appreciate and preserve local culinary heritage, recognize the positive environmental impacts of choosing local foods, develop an awareness of the importance of food security and independence and learn how to grow and process local foods, thereby enhancing their practical skills. Ultimately, there is a need to return to healthier and safer local foods. Therefore, raising awareness about local food consumption is crucial by educating students about its benefits and how they can contribute. By raising awareness and advocating for local foods, communities can achieve environmental sustainability, local economic growth and improved food quality and safety, fostering sustainable and healthy individuals.

Based on the justification provided, this study emphasizes the knowledge of urban students on local food consumption in Indonesia and stresses the importance of appreciating and choosing locally-produced foods. The survey revealed that 70.2% of students correctly answered questions on the nutritional value, dietary diversity and sustainable environmental effects of local foods, indicating a fairly good understanding of these topics. However, there is still work to be done, particularly in promoting food variety and understanding the environmental impacts of food waste.

The majority of students choose local foods because they perceive them as high-quality and fresh, which is a positive trend in their attitudes towards local food consumption. However, behavioral inconsistencies remain, as frequent consumption of junk food and instant noodles persists. This suggests that, despite having positive attitudes and knowledge, students need to improve their daily routines to support sustainable and healthy local food use.

This study has significant implications for several Sustainable Development Goals (SDGs), particularly SDG 3 (Good Health and Well-being), SDG 4 (Quality Education) and SDG 12 (Responsible Consumption and Production). By promoting the consumption of nutritious local foods, this study supports SDG 3, which aims to ensure healthy lives and promote well-being for all ages. Integrating food sustainability education into the curriculum aligns with SDG 4, advocating for inclusive and equitable quality education and lifelong learning opportunities. Finally, encouraging responsible consumption and reducing food waste aligns with SDG 12, promoting sustainable practices in food production and consumption. This study calls for collaboration among the government, educational institutions and communities to enhance awareness and engagement in these initiatives, ultimately contributing to greater sustainability and well-being.

CONCLUSION

The conclusions of this study highlight significant disparities in the knowledge, attitudes, and practices of urban secondary school students, particularly in Serang City, Indonesia, regarding local food consumption. Despite a high percentage of correct responses on knowledge indicators (70.2%), which demonstrates a strong understanding of local food sustainability, this awareness does not fully translate into positive attitudes (61.4%) and behaviors (54.8%) in daily life. The results of the Pearson correlation test indicate a weak but statistically significant relationship between students' knowledge of local food consumption and their attitudes toward it, with a correlation coefficient of 0.112. This suggests that an increase in knowledge only has a minor impact on shaping students' attitudes. Conversely, the relationship between students' knowledge and their behavior in consuming local food was not statistically significant, with a correlation coefficient of 0.032, indicating that students' level of knowledge does not directly influence their behavior regarding local food

consumption. Furthermore, the relationship between students' attitudes toward local food consumption and their behavior was also not statistically significant, with a correlation coefficient of 0.091 and a significance value of 0.102. This implies that students' positive attitudes toward local food are insufficient to drive tangible behavior in local food consumption. These findings underscore the need for more practical and integrated food sustainability education, aligned with SDG 12 (Responsible Consumption and Production).

To address these issues, several strategies can be implemented. First, teachers should incorporate food sustainability themes into their curriculum more effectively. This can include project-based learning activities that focus on local food production and consumption. In addition, schools should implement policies to reduce the availability of unhealthy, processed foods on campus. Controlling junk food intake within the school environment can promote healthier eating habits among students, contributing to SDG 3 (Good Health and Well-being). Moreover, ensuring equal access to quality education supports SDG 4 (Quality Education), promoting better learning outcomes and awareness of sustainable practices.

In conclusion, while the study reveals that secondary school students in Serang City have a good theoretical understanding of local food sustainability, there is a clear need for more effective educational strategies to translate this knowledge into positive attitudes and behaviors. By integrating food sustainability themes into the curriculum, supporting local food consumption programs and fostering collaboration among stakeholders, educational institutions can help students adopt healthier and more sustainable lifestyles. This holistic approach not only benefits the students but also contributes to the broader goal of achieving food sustainability and security within the community. These efforts align with SDGs 3, 4 and 12. By implementing these recommendations, educators and policymakers can ensure that students are well-prepared to face the challenges of food sustainability in the future. Through continued research and evaluation, these strategies can be refined and adapted to meet the evolving needs of students and communities, paving the way for a more sustainable and resilient food system.

■ REFERENCES

Abdul-Aziz, Y., & Maigah, A. (2024). Influence of social media on social behaviour of youth in the Tamale Metropolis, Ghana. *Internasional Journal of Academic Research In Business & Social Sciences*. 14(2), 624-639 http://doi.org/10.6007/IJARBSS/v14-i2/20829

Afshin, A., Sur, P. J., Fay, K. A., Cornaby, L., Ferrara, G., Salama, J. S., Mullany, E. C., Abate, K. H., Abbafati, C., Abebe, Z., Afarideh, M., Aggarwal, A., Agrawal, S., Akinyemiju, T., Alahdab, F., Bacha, U., Bachman, V. F., Badali, H., Badawi, A., … Murray, C. J. L. (2019). Health effects of dietary risks in 195 countries, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017. *The Lancet*, *393*(10184), 1958–1972. https://doi.org/10.1016/S0140-6736(19)30041-8

Anderson, L. W., & Krathwohl, D. R. (2001). A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives. Longman. https://bit.ly/42HdB6g

Arcand, J., Blanco-Metzler, A., Aguilar, K. B., L'abbe, M. R., & Legetic, B. (2018). Sodium levels in packaged foods sold in 14 latin american and Caribbean countries: A food label analysis. *Nutrients*, *11*(2), 1–8. https://doi.org/10.3390/nu11020369

Ayelazuno, J. A., & Graham, E. (2022). It is still extractive imperialism in africa: ghana's oil rush, extractivist exploitation, and the

unpromising prospects of resources-led industrialization bt - the palgrave handbook of africa and the changing global order (S. O. Oloruntoba & T. Falola (eds.); pp. 345–366). Springer International Publishing. https://doi.org/10.1007/978-3-030-77481-3_17

Ayun, Q., Kurniawan, S., dan Saputro, W. A. (2020). *Perkembangan konversi lahan pertanian di bagian negara agraris*. *5*(2), 38–44. https://doi.org/10.31002/vigor.v5i2.3040

Becker, K. L., & Kassouf, A. L. (2012). Violência nas escolas: uma análise da relação entre o comportamento agressivo dos alunos e o ambiente escolar. *Anais Do XL Encontro Nacional de Economia*, *37*, 21. https://bit.ly/40XNDu1

Buani, D. C. P., & Nuraeni, N. (2023). Application of XGB classifier for obesity rate prediction. *Jurnal Riset Informatika*, *6*(1), 1–6. https://doi.org/10.34288/jri.v6i1.260

Cantwell-Chavez, D. (2023). Interlocal adaptations to climate in east and southeast Asia: sharing lessons of agriculture, disaster risk reduction, and resource management. In *International Affairs* (Vol. 99, Issue 3). https://doi.org/10.1093/ia/iiad074

Cassar, E. M. (2022). Hunger and fullness: How high-poverty urban students experience school food policy. *Urban Education*, *57*(8), 1387–1414. https://doi.org/10.1177/0042085918805147

Chailek, C., Thitichai, P., Praekunatham, H., Taweewigyakarn, P., & Chantian, T. (2023). Availability and price of low-sodium condiments and instant noodles in the Bangkok Metropolitan Region. *Preventing Chronic Disease*, *20*, 1–10. https://doi.org/10.5888/pcd20.220218

Chao, S. (2022). Gastrocolonialism: the intersections of race, food, and development in West Papua. *The International Journal of Human Rights*, *26*(5), 811–832. https://doi.org/10.1080/13642987.2021.1968378

Chawla, S., Silva, F. T., Medeiros, S. A., Mekary, R. A., & Radenkovic, D. (2020). The effect of low-fat and low-carbohydrate diets on weight loss and lipid levels: A systematic review and meta-analysis. *Nutrients*, *12*(12), 1–21. https://doi.org/10.3390/nu12123774

CNN, I. (2023). *Taiwan temukan zat pemicu kanker di mi instan Indonesia dan Malaysia.* https://bit.ly/3WMnRXl

Cornelissen, L. (2023). Neoliberal imperialism. *Politics*, 0(0). https://doi.org/10.1177/02633957231164035

Creswell, J. W., & David, C. V. (2018). Research design: Qualitative, quantitative, and mixed methods approaches. (5th ed.). SAGE Publications. bit.ly/4aNrnX9

Crocco, M. S. (2013). Sustainability and social studies: perfect together. Guest lecture for the University of Georgia College of Education, the coe lecture series: the sixth annual Mary Hepburn lectureship in social studies education. *Athens, GA*. bit.ly/40KSLQT

DetikFood. (2020). *Begini proses pencernaan mie instan dalam perut manusia.* https://bit.ly/3CDJims

Dunford, E. K., Popkin, B., & Ng, S. W. (2022). Junk food intake among adults in the United States. *The Journal of Nutrition*, *152*(2), 492–500. https://doi.org/10.1093/jn/nxab205

Dutta, D., & Dutta, A. R. (2023). Juxtaposing food security and sustainable development goals (sdgs) in North-East India: evidence and explanations bt - sustainable development goals in Northeast India: challenges and achievements. pp. 141–151). *Springer Nature Singapore*. https://doi.org/10.1007/978-981-19-6478-7_7

Economist Impact. (2024). Food sustainability.

The economist. Retrieved december 2024, from https://impact.economist.com/projects/foodsustainability/

Febriani, D., & Sudarti, T. (2019). Fast food as drivers for overweight and obesity among urban school children at Jakarta, Indonesia. *Jurnal Gizi Dan Pangan*, *14*(2), 99–106. https://doi.org/10.25182/jgp.2019.14.2.99-106

Ferranti, P. (2019). The united nations sustainable development goals. *Encyclopedia of Food Security and Sustainability*; pp. 6–8). Elsevier. https://doi.org/10.1016/B978-0-08-100596-5.22063-5

FAO., ECA., & AUC. (2021). Africa-Regional overview of food security and nutrition 2021: statistics and trends. Food and Agriculture Organization of the United Nations. https://doi.org/10.4060/cb7496en

Fresno-calleja, P. (2017). Fighting gastrocolonialism in indigenous pacific writing Indigenous Pacific Writing. https://doi.org/10.1080/1369801X.2017.1401938

García-Oliveira, P., Fraga-Corral, M., Pereira, A. G., Prieto, M. A., & Simal-Gandara, J. (2022). Retracted article: Solutions for the sustainability of the food production and consumption system. *Critical Reviews in Food Science* and *Nutrition*, *62*(7), 1765–1781. https://doi.org/10.1080/10408398.2020.1847028

Gigauri, I., Vasilev, V., & Mushkudiani, Z. (2022). In pursuit of sustainability: towards sustainable future through education. *International Journal of Innovative Technologies in Economy*, *1 (37)*. https://doi.org/10.31435/rsglobal_ijite/30032022/7798

Giles, D. B., & Stead, V. (2022). Big Data won't feed the world: global agribusiness, digital imperialism, and the contested promises of a new Green Revolution. *Dialectical Anthropology*, *46*(1), 37–53. https://doi.org/10.1007/s10624-021-09631-8

Goleman, D. (1999). What makes a leader. *IEEE Engineering Management Review*, *27*, 4–11. https://bit.ly/40XNM0x

Guo, Z. (2024). Research on the influence of social media and educational practices on youth learning behavior. *Interaction*, *6*(7), 6–11. https://doi.org/10.25236/IJNDE.2024.060702

Guttman, L. L. (2017). The basis for scalogram analysis. In *Scaling* (pp. 142–171). Routledge. https://doi.org/10.4324/9781315128948-16

Haase, S., Wilck, N., Kleinewietfeld, M., Müller, D. N., & Linker, R. A. (2019). Sodium chloride triggers Th17 mediated autoimmunity. *Journal of Neuroimmunology*, *329*, 9–13. https://doi.org/10.1016/j.jneuroim.2018.06.016

Harianto, R. A. D. K. H. & C. I. (2022). Pengembangan produk mi instan jagung madura dan singkong sebagai substitusi tepung terigu. https://ejournal.cilacapkab.go.id/index.php/winco/article/view/163

Higgins-Desbiolles, F. (2022). The ongoingness of imperialism: The problem of tourism dependency and the promise of radical equality. *Annals of Tourism Research*, *94*, 103382. https://doi.org/10.1016/j.annals.2022.103382

Ido, V. (1948). *Een Indische huisvrouw van 50 Jaar Geleden, De Huisvrouw in Indonesia*. *5*, 32.

Jamili, A. S. (2022). Youth and sago: consumption change of staple food in West Halmahera Regency, North Maluku. *Jurnal Agrosains: Karya Kreatif Dan Inovatif*, *7*(2), 68–80. https://doi.org/10.31102/agrosains.2022.7.2.68-80

Javaheri, F. (2007). *The study on affecting socio-economic status on university students' attitudes* and *behaviors*. https://www.sid.ir/paper/66746/en

Khan, Z., & Ali, A. (2023). Global food insecurity and its association with malnutrition. Emerging challenges in agriculture and food science. *Vol. 8*, *SE-Contents*, 2–19. https://doi.org/10.9734/bpi/mono/978-81-19217-36-6/CH1

Komalasari, K., & Saripudin, D. (2017). Pendidikan karakter: Konsep dan aplikasi living values education. *Bandung: Refika Aditama*. https://onesearch.id/Record/IOS2725.slims-4681

Lafuente-Lechuga, M., Cifuentes-Faura, J., & Faura-Martínez, Ú. (2023). Teaching sustainability in higher education by integrating mathematical concepts. *International Journal of Sustainability in Higher Education*, *25*(1), 62–77. https://doi.org/10.1108/IJSHE-07-2022-0221

Lewis, C. M. (2022). Capitalism, imperialism and the emergence of an industrialized global economy (pp. 127–155). Bristol University Press. https://doi.org/10.51952/9781529214826.ch006

McGrath, P. J., & Elgar, F. J. (2015). Behavioral problems, effects of socio-economic status on. https://doi.org/10.1016/B978-0-08-097086-8.23052-3

Mensi, A., & Udenigwe, C. C. (2021). Emerging and practical food innovations for achieving the Sustainable Development Goals (SDG) target 2.2. *Trends in Food Science & Technology*, *111*, 783–789. https://doi.org/https://doi.org/10.1016/j.tifs.2021.01.079

Montesclaros, J. M. L., & Teng, P. S. (2021). Agriculture and food security in Asia bt - climate change, disaster risks, and human security: asian experience and perspectives (J. M. Pulhin, M. Inoue, & R. Shaw (eds.); pp. 137–168). *Springer Singapore*. https://doi.org/10.1007/978-981-15-8852-5_7

Morawicki, R. O., & Díaz González, D. J. (2018). Food sustainability in the context of human behavior. *The Yale Journal of Biology* and *Medicine*, *91*(2), 191–196. https://pmc.ncbi.nlm.nih.gov/articles/PMC6020726/

Morin, A. (2011). Self awareness part 1: Definition, measures, effects, functions, and antecedents. *Social* and *Personality Psychology Compass*, *5*(10), 807–823. https://doi.org/10.1111/j.1751-9004.2011.00387.x

Musfira & Harina. (2019). *Studi alih fungsi lahan hutan sagu sebagai perumahan residence di Kabupaten Jayapura. Jurnal Planoearth*, *4*(2). https://doi.org/10.31764/jpe.v4i2.692

Mustafa, M. A., Mabhaudhi, T., Avvari, M. V, & Massawe, F. (2021). Chapter 2 - Transition toward sustainable food systems: a holistic pathway toward sustainable development (C. M. B. T.-F. S. and N. Galanakis (ed.); pp. 33–56). Academic Press. https://doi.org/10.1016/B978-0-12-820521-1.00002-2

Mylvaganam, S., Timmerberg, J., Halvorsen, H.-P., & Viumdal, H. (2021). Sustainability awareness through STEAM+. *Nordic Journal of STEM Education*, *5*(1). https://doi.org/10.5324/njsteme.v5i1.3974

Nabila, S., Haque, M. J., Morshed, M. M., & Bari, M. S. (2024). Exploring the relationship between knowledge of fast food and junk food consumption and sociodemographic characteristics among high school students in Bogura Town, Bangladesh. *Saudi J Med Pharm Sci*, *10*(6), 397–406. https://doi.org/10.36348/sjmps.2024.v10i06.011

Neeser, M., Natura, R., Jain, S., Taylor, J., & Lenglet, F. (2010). Sweden's pioneering role in education for sustainable development. *WM, McCandless, & R. Lambert, R.(Eds.), Tomorrow Today*, 89–90. https://bit.ly/42CovdD

Neilson, J., & Wright, J. (2017). The state and food security discourses of Indonesia: feeding the bangsa. *Geographical*

Research, *55*(2), 131–143. https://doi.org/10.1111/1745-5871.12210

Nguyen, H. T., Le, T. V., Nguyen, H. L., & Tran, T. T. C. (2023). The behavior of students with regard to school culture in high schools. *Academic Journal of Interdisciplinary Studies*, *12*(40), 267–276. https://doi.org/10.36941/ajis-2023-0113

Niebla-Canelo, D., Gutiérrez-Fernández, Á. J., Rubio-Armendáriz, C., Hardisson, A., González-Weller, D., & Paz-Montelongo, S. (2022). Toxic metals (al, cd, and pb) in instant soups: an assessment of dietary intake. *Foods*, *11*(23), 1–11. https://doi.org/10.3390/foods11233810

O'Donnell, M., Mente, A., Alderman, M. H., Brady, A. J. B., Diaz, R., Gupta, R., López-Jaramillo, P., Luft, F. C., Lüscher, T. F., Mancia, G., Mann, J. F. E., McCarron, D., McKee, M., Messerli, F. H., Moore, L. L., Narula, J., Oparil, S., Packer, M., Prabhakaran, D., … Yusuf, S. (2020). Salt and cardiovascular disease: Insufficient evidence to recommend low sodium intake. *European Heart Journal*, *41*(35), 3363–3373. https://doi.org/10.1093/eurheartj/ehaa586

Orago, N. W. (2018). Sustainability of food systems/ : The role of legal and policy frameworks. 16–41. https://doi.org/20.500.11825/691

Panjaitan, D. V, Ingot, S. R., Mardiansyah, A., & Christoffel, L. M. (2020). Analisis dampak export restriction komoditi pertanian terhadap indonesia. *Journal of Indonesian Agribusiness*, *8*(1), 1–16. https://doi.org/10.29244/jai.2020.8.1.1-16

Perez, C. S. (2013). *Facing Hawai»i»s Future*. https://bit.ly/4jMo5rm

Perkins, K. M., Kurtiº, T., & Velazquez, L. (2022). Progress toward the sustainable development goals. *International perspectives in psychology*, *11*(3), 197–205. https://doi.org/10.1027/2157-3891/a000043

Poore, J., & Nemecek, T. (2018). Reducing food's environmental impacts through producers and consumers. *Science*, *360*(6392), 987–992. https://doi.org/10.1126/science.aaq0216

Pradigdo, S. F., Nugraheni, S. A., & Putri, R. N. (2023). Lifestyle as a factor for overweight in adolescents. *Amerta nutrition*, *7*. https://doi.org/10.20473/amnt.v7i2SP.2023.232-237

Rahajeng, G. Y., & Khotimah, K. (2020). *Diversifikasi konsumsi pangan berbasis potensi lokal Kota Tarakan. Jurnal Borneo Saintek*, *3*(2), 61–72. https://doi.org/10.35334/borneo_saintek.v3i2.1670

Rahman, F. (2016). *Rijsttafel: Budaya kuliner di Indonesia masa kolonial 1870-1942*. Gramedia Pustaka Utama. https://bit.ly/4gu3Vj1

Resilience, B., Peace, F. O. R., & Security, F. (2017). *The state of food security* and *nutrition in the world*. https://bit.ly/4103eta

Sachs, J., Kroll, C., Lafortune, G., Fuller, G., & Woelm, F. (2022). Sustainable development report 2022. Cambridge University Press. https://doi.org/10.1017/9781009210058

Salsa, D. Y., Dinengsih, S., & Syamsiah, S. (2024). Analysis of factors associated with the incidence of obesity in Adolescents. *JKM (Jurnal Kebidanan Malahayati)*, *10*(4), 305–314. https://doi.org/10.33024/jkm.v10i4.14337

Schoo, L. A., van Zandvoort, M. J. E., Biessels, G. J., Kappelle, L. J., & Postma, A. (2013). Insight in cognition: self-awareness of performance across cognitive domains. *Applied Neuropsychology: Adult*, *20*(2), 95–102. https://doi.org/10.1080/09084282.2012.670144

Shuttleworth, J. (2015). Teaching the social issues

of a sustainable food supply. *The Social Studies*, *106*(4), 159–169. https://doi.org/10.1080/00377996.2015.1043602

Stanciu, A. C., & Condrea, E. (2023). Sustainability in higher education. *Proceedings of the 9th BASIQ International Conference on New Trends in Sustainable Business* and *Consumption, Constant, a, Romania*, 8–10. https://doi.org/10.24818/BASIQ/2023/09/035

Stewart, G., & Reinders, H. (2023). Metacognition and self-awareness: the impact of one language teacher's reflection about his instructional delivery and personality. *Second Language Teacher Education (SLTE)*, *2*(1). https://doi.org/10.1558/slte.23709

Strizhevskaya, V., Simakova, I., Perkel, R., & Phedonnikov, A. (2020). Technological and medical aspects of instant noodle safety. *E3S Web of Conferences*, *161*. https://doi.org/10.1051/e3sconf/202016101111

Sundawa, D., Fitriasari, S., & Iswandi, D. (2018). Sustainable development principles in the green constitution. *IOP Conference Series: Earth* and *Environmental Science*, *145*(1), 12122. https://doi.org/10.1088/1755-1315/145/1/012122

Supriatna, N., & Anang, S. W. (2019). *Prosa dari Praha: narasi historis masyarakat konsumen era kapitalisme global*.

Sutton, A. (2016). Measuring the effects of self-awareness: Construction of the self-awareness outcomes questionnaire. *Europe's Journal of Psychology*, *12*(4), 645. https://doi.org/10.5964/ejop.v12i4.1178

Thow, A. M., Ravuvu, A., Ofa, S. V., Andrew, N., Reeve, E., Tutuo, J., & Brewer, T. (2022). Food trade among Pacific Island countries and territories: implications for food security and nutrition. *Globalization* and *Health*, *18*(1), 1–15. https://doi.org/10.1186/s12992-022-00891-9

Tibenda, J., Jukes, M., & Sitabkhan, Y. (2021). Adapting pedagogy to cultural context. RTI Press. https://bit.ly/40ZOWIZ

Torrico, D. D., Nie, X., & Serventi, L. (2023). Food sustainability bt - sustainable food innovation (L. Serventi (ed.); pp. 1–11). Springer International Publishing. https://doi.org/10.1007/978-3-031-12358-0_1

UNESCO. (2005). Guidelines and recommendations for reorienting teacher education to address sustainability. https://unesdoc.unesco.org/ark:/48223/pf0000143370

Valentini, R., Sievenpiper, J. L., Antonelli, M., & Dembska, K. (2019). *Achieving the sustainable development goals through sustainable food systems*. Springer. https://doi.org/10.1007/978-3-030-23969-5

Wang, L., Wang, H., Zhang, B., Popkin, B. M., & Du, S. (2020). Elevated fat intake increases body weight and the risk of overweight and obesity among chinese adults: 1991-2015 Trends. *Nutrients. 12 (11): 3272*. https://doi.org/10.3390/nu12113272

Widodo, S., Katminingsih, Y., Sulistyono, B. A., & Handayani, A. D. W. I. (2023). Characteristics of creative mathematics teachers in posing contextual mathematics problems. *International Journal of Research* and *Review*, *10*(2), 41–48. https://doi.org/10.52403/ijrr.20230208

Willett, W., Rockström, J., Loken, B., Springmann, M., Lang, T., Vermeulen, S., Garnett, T., Tilman, D., & Declerck, F. (2019). The lancet commissions food in the anthropocene/ : the EAT – Lancet Commission on healthy diets from sustainable food systems. *The Lancet Commissions*, *393*, 447–92. https://doi.org/10.1016/S0140-6736(18)3788-4

Wong, M. Y. C., Ou, K., Zhang, C.-Q., & Zhang, R. (2022). Neighborhood built and social environment influences on lifestyle behaviors among college students in a high-density city: a photovoice study. *International Journal of Environmental Research* and *Public Health*, *19*(24), 16558. https://doi.org/10.3390/ijerph192416558

Yuniah, B., Feriandi, Y., & Yulianto, F. A. (2023). *Proporsi konsumsi junk food dan status gizi berlebih di mahasiswa kedokteran. Jurnal Riset Kedokteran*, 69–74. https://doi.org/10.29313/jrk.v3i2.2878

Zimmerman, E. B., Woolf, S. H., Blackburn, S. M., Kimmel, A. D., Barnes, A. J., & Bono, R. S. (2018). The case for considering education and health. *Urban Education*, *53*(6), 744–773. https://doi.org/10.1177/0042085916682572