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Analysis of Student's Awareness of Sustainable Diet in Reducing Carbon Footprint to Support Sustainable Development Goals (SDGs) 2030

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ABSTRACT

Students' awareness of sustainable diets or healthy eating patterns every day is still low. Diet is a healthy diet to meet the daily nutritional and calorie needs of each individual. The purpose of this study was to determine the awareness of students towards a sustainable diet in reducing the carbon footprint to support Sustainable Development Goals (SDGs) 2030. The research method used is quantitative descriptive method by distributing questionnaires using google form, questionnaires aimed at students. In this study it was found that students have a low understanding of the correlation of sustainable diets to reduce carbon footprints. The lack of awareness of students towards a sustainable diet leads to an increase in carbon footprint. In this research, it is necessary to increase the awareness of students towards a sustainable diet in reducing carbon footprints to support SDGs 2030.

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1. INTRODUCTION

Diet is a behavior that involves a regulated pattern of eating and drinking, where quantities are carefully calculated to achieve specific health goals. It includes efforts to limit the consumption of food and drink according to individual needs (Kelly *et al*., 2016). Therefore, dietary sources can come from a variety of foods and it is important to include balanced nutrition to support a healthy body (Setyawati & Setyowati, 2015). In this context, careful dietary management involves not only calculating the amount of food consumption, but also paying attention to the quality of nutrients obtained from the various types of food consumed. In the concept of a sustainable diet according to Scott (2018), it is an initiative that is implemented by involving the certification of agricultural products. The goal is to encourage companies to produce products that are environmentally friendly and healthy for humans. This approach provides an opportunity for individuals to expand the variety of their food consumption. This includes the consideration that food processing should have minimal adverse impact on the environment and still meet human nutritional needs (Suryana, 2014). In this context, a sustainable diet serves not only as an effort to maintain individual health, but also as a positive step in supporting environmental stewardship (Humaida *et al*., 2020). In addition, this approach encourages individuals to consume a variety of foods and utilize local food sources, creating a balance between environmental sustainability and human nutritional needs to support the 2030 SDGs (Riyadi *et al*., 2023).

Within the framework of the 2030 Sustainable Development Goals (SDGS), the concept of sustainable diets supports several points, especially Point 2: "Zero Hunger" and Point 12: "Responsible Consumption and Production". Under Point 2, which aims to achieve Zero Hunger, sustainable diets play an important role. This approach supports Point 2 by promoting a balanced diet and ensuring adequate food access for the entire population (Martony, 2019). By reducing food waste, introducing plant-based diets and considering sustainable food supply chains, sustainable diets make a significant contribution to addressing hunger. Sustainable diets support Point 12, which aims to achieve sustainable development, Indonesia affirms its commitment to ensure sustainable food consumption and production patterns (Ariani *et al*., 2021). This approach includes the implementation of a sustainable diet that supports Point 12, which is a responsible and sustainable consumption pattern. A sustainable diet is not only about choosing food produced in an environmentally friendly way, but also involves concrete actions such as reducing food waste and supporting sustainable agricultural practices. It can also help reduce the carbon footprint of food (Suroto, 2023).

The carbon footprint is an important indicator of the impact of humans on the environment, measured in terms of their daily activities (Dapas, 2015). In this context, the more intensive human activities are, the higher the carbon dioxide emissions generated as a direct result of these activities. In other words, carbon footprints reflect the extent to which humans influence climate change through their lifestyles and daily activities (Admaja *et al*., 2018). A carbon footprint, as defined, is a comprehensive measurement of carbon dioxide emissions that arise either directly or indirectly from human activities or the use of everyday products. In this sense, a carbon footprint includes all human contributions to increasing carbon dioxide concentrations in the atmosphere, accumulated from various daily activities and consumption patterns.

In a study conducted by Imaniar *et al*. (2022), it was discussed that the food system is one of the main contributors to the increase in global greenhouse gas (GHG-E) emissions, reaching 33% of total global GHG-E emissions. The importance of improving people's consumption patterns towards a sustainable diet is highly emphasized, as this not only has a positive impact

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on public health, but also supports environmental sustainability (Septianto *et al.*, 2020). Therefore, the development of low-carbon diets is considered a new approach that has great potential in addressing climate change in Indonesia. However, research conducted by Jay *et al*. (2019) discussed that understanding the relationship between diet and climate change through education needs to be done to the community. By providing education on how a sustainable diet can help reduce the impact of climate change, people will be more aware of the importance of choosing food wisely to support a sustainable environment. It can be concluded that from the research conducted by Imaniar *et al*. (2022) highlighted the important role of the food system as a major contributor to the increase in global greenhouse gas emissions (GHG-E) and other research by Jay *et al.* (2019) highlighted the need for education to the public regarding the relationship between diet and climate change.

In addressing the shortcomings of previous research, this study aims to explore students' awareness of sustainable diets as an effort to reduce carbon footprints, in accordance with the 2030 Sustainable Development Goals (SDGs). By focusing on students' understanding of the importance of sustainable diets, this research provides a new contribution in supporting the achievement of SDGs 2030. Through an in-depth analysis of students' mindsets, knowledge and attitudes towards sustainable diets, this research not only provides valuable insights, but also helps understand the role of students in supporting sustainable development goals.

2. METHODS

The research method used is quantitative descriptive analysis research method as illustrated in **Figure 1**. The population of this study were students (Students from Fakultas Pendidikan Teknologi dan Kejuruan, Universitas Pendidikan Indonesia). The sampling technique used is random sampling. Random sampling is a sampling process for each member that each member will be given the same opportunity to be selected as a sample. The data collection method used is by distributing questionnaires using google form (online) which are distributed via media (WhatsApp) and (Instagram). Respondents will be given 8 questions to explore information about how high the level of awareness of students towards sustainable diets in reducing carbon footprints to support SDGs 2030. Furthermore, the data collected can be analyzed so that it becomes the answer to the research question.

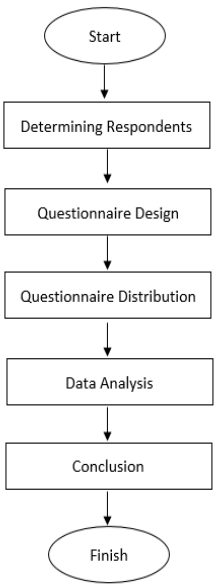

Figure 1. Troubleshooting flowchart.

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3. RESULTS AND DISCUSSION

3.1. Determining Respondents

The respondents selected were students from the Faculty of Technology and Vocational Education, Universitas Pendidikan Indonesia. In determining the selection of respondent samples, the random sampling method was used. Samples were selected randomly without regard to semester level, knowledge, and so on. So that the number of respondents in this study obtained was 46 students of the Faculty of Technology and Vocational Education, University of Education Indonesia.

3.2. Develop Questionnaire List

In developing a list of questions related to student awareness, the questionnaire was divided into four instruments, namely diet, sustainable diet, carbon footprint, and awareness of sustainable diet. Details of the list of questions that have been compiled as shown in **Table 1**.

Table 1. Questionnaire list.

No	Questionnaire list
	Personal Information
1	Study Program: a. Architecture Engineering Education b. Building Engineering Education c. Electrical Engineering Education d. Mechanical Engineering Education e. Family Welfare Education f. Culinary Education g. Fashion Education h. Agro-indsutrial Technology Education i. Logistic Engineering j. Indsutrial Automation and Robotics Engineering Education k. Electrical Engineering l. Architecture m. Civil Engineering n. Automotive Engineering Education
	Diet
1	Do you know about diet? a. Yes b. Have heard c. No
2	Are you on diet? a. Once b. Are doing c. No
	Diet Berkelanjutan
1	Do you know about sustainable diets? a. Yes b. Have heard c. No

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Table 1 (Continue). Questionnaire list.

No	Questionnaire list
	Personal Information
2	Choose the one that you think is the definition of a sustainable diet a. A sustainable diet is an approach to eating that considers environmental, ethical and personal health impacts. Includes environmentally friendly food choices, minimizing food waste, and other important aspects. b. A sustainable diet is a way of eating that prioritizes food that is produced sustainably, such as local vegetables, fruit and plant protein sources. This helps reduce our carbon footprint. c. A sustainable diet is an approach to eating that considers the ecological and ethical impact of the food consumed. d. A sustainable diet not only benefits the environment, but can also help improve an individual's health and well-being.
	Carbon footprint
1	Do you know about carbon footprint? a. Yes b. Have heard c. No
2	Did you know there is a correlation between a sustainable diet and a reduced carbon footprint? a. Yes b. Have heard c. No
	Awareness of Sustainable Diets
1	Do you think everyone should follow a sustainable diet? a. Yes you have to b. No need
2	Do you think a sustainable diet can reduce the carbon footprint and support the 2030 SDGs? a. Yes, very supportive b. Yes, quite supportive c. Quite supportive d. Does not supportive

3.3. Distributing Questionnaires

The distribution of questionnaires was carried out by distributing questionnaires to students of the Faculty of Technology and Vocational Education, Universitas Pendidikan Indonesia.

3.4. Data Analysis

We analyzed data based on the results of the question number one from students who are from Universitas Pendidikan Indonesia.

The respondents consisted of 63% students of Agroindustrial Technology Education Study Program, 13% students of Architectural Engineering Education Study Program, 2.2% student of Architecture Study Program, 4.3% students of Mechanical Engineering Education Study Program, 2.2% student of Automotive Engineering Education Study Program, 4.3% students of Logistics Engineering Study Program, 2.2% student of Building Engineering Education Study Program, 2.2% student of Electrical Engineering Education Study Program, 4.3% students of Electrical Engineering Study Program, and 2.2% student of Cosmetology Education Study Program.

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Based on the data, 90.30% of students know about diet. This indicates that knowledge of diet in students is in the high category. It can be interpreted that students know about diet.

Judging from the data acquisition, that as many as 39.13% students have been on a diet, and as many as 13.04% are on a diet. This figure is still below the number of FPTK students who have never done a diet at all, namely 47.83% students. This is quite alarming because there are still many students who have never been on a diet. Diet is a healthy diet so that each individual can meet their daily calorie needs every day not excessive and not deficient so that they have balanced energy (William *et al*., 2022).

Based on the questionnaire data received, 36.96% students know about sustainable diets and 41.30% students have only heard about sustainable diets. The remaining 21.47% students did not know at all about sustainable diets. This shows that the understanding of a sustainable diet in students is in the low category because most students have only heard of a sustainable diet. students have very low knowledge regarding sustainable diets, which are actually recognized as a dietary system that has a low impact and contributes to food security, nutrition, and health for future generations, as described by the Food and Agriculture Organization (FAO) (Donati *et al*., 2016).

The understanding of students regarding sustainable diets, as many as 63.04% students understand a sustainable diet is an approach to eating that considers environmental impacts, ethics, and personal health. Including the selection of environmentally friendly foods, minimization of food waste, and other important aspects. As many as 28.26% students understand a sustainable diet is a way of eating that prioritizes sustainably produced foods, such as local vegetables, fruits, and plant-based protein sources, this helps reduce our carbon footprint, and as many as 2.17% students understand a sustainable diet is an eating approach that considers the ecological and ethical impacts of the food consumed. While as many as 6.52% understand that a sustainable diet is a diet that not only benefits the environment, but can also help improve individual health and well-being.

Based on the data acquisition, it can be seen that as many as 39.13% of students have heard and as many as 30.43% of students know and do not know about carbon footprints. This indicates that knowledge of carbon footprints in students is in the high category because most students have heard and know about sustainable diets.

Based on the data acquisition, it can be seen that as many as 39.13% of students have heard and as many as 30.43% of students know and do not know about carbon footprints. This indicates that knowledge of carbon footprints in students is in the high category because most students have heard and know about sustainable diets.

Based on the data acquisition, it can be seen 56.52% of students do not know that a sustainable diet has a correlation with a decrease in carbon footprint. This indicates that knowledge of a sustainable diet is correlated with a decrease in the carbon footprint of students in the low category because most students have only heard and do not know about a sustainable diet.

Judging from the data acquisition, it can be seen 78.26% of students realize that a sustainable diet must be carried out by everyone. This indicates that students' awareness of sustainable diets is in the high category. It can be seen that students have realized the importance of a sustainable diet.

Based on the data, 41.30% of students support that a sustainable diet can reduce the carbon footprint to support SDGS 2030, 56.52% of students moderately support a sustainable diet can reduce the carbon footprint to support SDGS 2030 and 2.17% of students do not support a sustainable diet can reduce the carbon footprint to support SDGS 2030. Thus, it can

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be concluded that of the total students support a sustainable diet can reduce the carbon footprint that supports SDGS 2030.

4. CONCLUSION

From the results of the research and discussion, it can be concluded that 56.52% of students of the Faculty of Technology and Vocational Education have a low understanding of the correlation of sustainable diets in reducing carbon footprints, and 78.26% of students realize that sustainable diets must be carried out by everyone. However, only 41.30% of students think that a sustainable diet can reduce the carbon footprint to support SDGS 2030. The lack of awareness of students towards a sustainable diet can have an impact on increasing the carbon footprint. In this case, there needs to be activities or socialization carried out to help increase the understanding and awareness of students towards a sustainable diet in reducing the carbon footprint to support SDGs 2030.

5. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper was free of plagiarism.

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