Analysis of Food Consumption Patterns as a Step for Mapping Future Food Needs Based on the Potential of Local Food

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Muara Gembong Village, in Bekasi Regency, West Java is an area that has a variety of potential local food ingredients that can improve the welfare of the surrounding community. It is necessary to map the consumption and use of local food ingredients in the area so that it can be identified as the type of food that needs to be developed as a strategy to improve food security in Muara Gembong village. One way to identify this is by analysing the community's food consumption patterns. This study aims to analyse food consumption patterns as a step-in mapping future food needs based on local food potential in households in Muara Gembong village. The method used is descriptive quantitative with respondents in the form of household members consisting of father, mother, and children with a range of age from 17 years to 60 years. The data collection technique used was using a questionnaire distributed to 100 respondents. The results of this study stated that the types of foodstuffs with a high level of consumption were white rice, shallots, chilies, bananas, papaya, beef meatballs, chicken meatballs, and tilapia fish. The results of the mapping show that the food consumption patterns of the people in Muara Gembong village are still relatively less varied and centered on one type of food in each group, so it is necessary to use other food ingredients as an effort to diversify, especially local food that has the potential as food for the future.

1. Introduction

Government Regulation of the Republic of Indonesia (2015) concerning Food Security and Nutrition explains that food security is a condition in which the state is fulfilled until Based on food the availability of sufficient food, both in quantity and quality, is safe, diverse, nutritious, equitable and affordable and does not conflict with religion, belief, and community culture to be able to live a healthy, active and productive life in a sustainable manner (Pemerintah Republik Indonesia, 2015). In 2021, Ketaren noted that Indo-

nesia was placed second in the world as the Largest biological wealth in food produces such as Vegetables, Fruits, Herbs, and Spices (Ketaren, 2021). This wealth is also supported by the diversity of tribes that spread from Sabang to Merauke which opens 1,335 tribes (Ketaren, 2021). These two things create diversity in the use of food ingredients, processing methods, and presentation methods, to the eating habits of each region in Indonesia. Seeing the potential that Indonesia has based on the wealth and diversity of these food-

stuffs, Indonesia should have strong, self-reliant food security.

Food security is very important and strategic because food is a basic human need. Food security in an area can be measured by the availability of food, purchasing power, and the level of population consumption (Kementerian Pertanian Republik Indonesia, 2021).

Indonesia's potential and natural wealth as described previously is not directly proportional to food security in several regions. There are 66 districts that are included in the food insecurity category out of a total of 416 districts based on the results of the Food Security and Vulnerability Atlas (FSVA) analysis or the 2020 Food Security and Vulnerability Map. The mapping is carried out based on nine indicators covering three dimensions of food security, namely food availability, consumption food, and food affordability. Based on a survey by the Food Security Service (DKP) of Bekasi Regency in 2017, Muara Gembong District is included in one of seven villages in five sub-districts in Bekasi Regency which are classified as food insecure areas.

The condition of food security in Bekasi Regency is slowly improving. This can be seen from the Food Security Index (IKP) of Bekasi district in 2021 which scored 86.29 and was ranked 15th out of a total of 416 districts recorded (Food Security Agency, 2021). The Indonesian Food Security Index report on Bekasi District shows that food security has increased, but this value can certainly increase considering the potential of natural resources that exist in areas in Bekasi District. Muara Gembong District has abundant local food potential because its area is on the coast with areas of beaches, rivers, and open ponds (Saribanon et al, 2017). Therefore, it is necessary to determine a strategy to increase food security in accordance with the conditions and situations of the region and the local people.

The pattern of food consumption is the composition of the type, quantity, and frequency of food consumed by a person or group of people at a certain time interval (Baliwati et al, 2010). Food consumption patterns will be formed and influenced by the availability of food in an area as well as eating habits that are passed on from one generation to the next. Food consumption is one of the main drivers of environmental change because on the one hand food is a basic human need but on the other hand this need can pose a critical threat and impact on the environment (Notarnicola et al, 2017). The pattern of food consumption is also an illustration of the eating habits of the surrounding community and the types of commodities that are consumed the most. Food consumption patterns can also be used to determine the level of energy adequacy for individuals by analysing the frequency and amount of food each individual eats in one day. Based on this, the community's food consumption pattern can affect the quality and nutritional status of the surrounding community.

One of the solutions to tackling the environmental impacts caused by human food consumption patterns is to diversify the consumption of foodstuffs that have the potential as future food. Food of the future is food that has more nutrition for the body, and less negative impact on the environment. The introduction and habituation of the consumption of future types of food is important to do so that people can start to get used to consuming local food ingredients that have the potential to future food ingredients.

Mapping food consumption patterns in the Muara Gembong village community, especially in the family or household scope, is something that needs to be done so that there is data related to the type and frequency of consumption of certain foodstuffs. Based on these data, the frequency of consumption of local food-based future types of food can be verified. This mapping can also help reduce nutritional problems in an area connected to food availability, people's purchasing power, and the ability to gain access to nutritious food (Predi, 2013). This study aims to analyse food consumption patterns as a step for mapping future food needs, based on local food potential in households in Muara Gembong village.

2. Material and Methods

The method used in this research is a survey of food consumption patterns which will then be tabulated, and a future food mapping based on local food ingredients at home in Muara Gembong village will be carried out. The data collection technique used was a questionnaire distributed to 100 respondents who were residents of Muara Gembong village. This research was conducted in Pantai Mekar Village, Muara Gembong District, Bekasi Regency, West Java. The

subjects of this study were household members consisting of fathers, mothers, and children with an age range of 17 years to 60 years. The results of filling out the questionnaire are then processed and presented descriptively in the form of tables or diagrams to make it easier to see the food consumption patterns of the people in Muara Gembong village.

3. Result & Discussion

The mapping of the food consumption pattern of the Muara Gembong village community was carried out by grouping several types of food into seven groups namely, cereals and processed products thereof; tubers; vegetables; fruits; land animals and processed products; fowl, flying animals, and their processed products; as well as water animals. The following are the results of the analysis and mapping of food consumption patterns based on local food ingredients with the potential as future food.

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3.1 Cereals and Their Processed Products

White rice is a type of food from the cereals and their processed products with the highest consumption rate of 98%, while brown rice, black rice, and black glutinous rice are types of food with the lowest consumption rate of 0% with a frequency of more than seven times a week. In 2020 the household rice consumption rate for West Java province will reach 97.26 kg per capita per year (Ministry of Agriculture, 2021).

Rice is the staple food of the Indonesian people and is a type of cereal with a high level of consumption. As a source of carbohydrates and staple food, rice can be replaced with various other types of cereals or even root products such as cassava, taro, canna, and other types of tubers.

Table 1. Mapping Results of Cereal Consumption Patterns and Processed Products

Foodstuff	Never	Once a week	a week 2-3 times	a week 4-6 times	a week 7 times	a week > 7 times a week	Amount
White Rice	0	0	1	0	1	98	100
Brown rice	94	6	0	0	0	0	100
Black Rice	98	2	0	0	0	0	100
White Glutinous Rice	87	7	5	0	0	1	100
Black Glutinous Rice	89	8	3	0	0	0	100
Corn	78	7	9	5	1	0	100
Rice noodles	28	21	14	7	3	27	100
Kwetiau	52	16	14	6	1	11	100
Flour	22	13	21	10	5	29	100
Bread	30	16	11	14	5	24	100
Wet noodle	46	19	15	6	1	13	100
Dry noodle	0	15	14	5	1	11	100
Instant noodles	9	24	26	17	5	19	100
Soybeans	51	16	17	4	3	9	100
Peanuts	36	27	10	8	6	13	100
Mung beans	44	24	14	8	1	9	100

3.2 Tubers

For the tubers group, cassava is the food ingredient with the highest consumption rate of 11% and tapioca has the lowest consumption rate of 2% with a frequency of more than seven times a week. Cassava or also known as cassava is one type of tuber with characteristics that are close to wheat flour but have lower calories than wheat flour (Ariani et al, 2016). The Indonesian people themselves make cassava as a staple food as well as a raw material for making cakes and snacks with either savoury or sweet flavours. Cassava is one of the local food ingredients in the Bekasi district that has the potential to be developed to increase the value of PPH (Hendriwideta, 2018).

3.3 Vegetables

Types of vegetables with the highest consumption level were shallots and chilies with a percentage of 51%, while kluwih received the lowest consumption value of 0% with a frequency of more than seven times a week. Shallots and chilies are included in the group of vegetables that are used as cooking spices. Shallots are a type of root vegetable, while chilies are included in fruit vegetables. Shallots are used in three types of basic seasonings for Indonesian cuisine, namely white, red, and yellow seasonings. Chili is also a type of fruit vegetable that is widely consumed because it is commonly used as a spice and a complement to cooking. Shallots contain nutrients and active chemical compounds that have pharmacological effects so they are very beneficial for health (Aryanta, 2019). Therefore, Indonesian people in general can consume shallots and chilies every day, both for use in cooking spices and as a complement to dishes such as fried onions and chili sauce.

3.4 Fruits

Types of fruit with the highest consumption rate were bananas and papaya with a percentage of 15%, and cantaloupe had the lowest consumption rate with a percentage of 3% with a frequency of consumption of more than seven times a week. Bananas are also a local food ingredient that has the potential to increase PPH in the Bekasi district (Hendriwideta, 2018). A banana is a fruit that can be consumed directly or made into various preparations such as fried bananas, banana compote, banana cake, and so on. Papaya is a tropical fruit that is commonly consumed fresh both young (unripe) and ripe (ripe). Papaya contains a variety of nutrients such as pro-vitamin A, pro-vitamin C, B vitamins, lycopene, and dietary fibre (Kurnia, 2018). Papaya and banana are also known as table fruits, namely fruits that are consumed after the main meal.

3.5 Land Animals and Their Processed Products

Beef meatballs are a food ingredient in the group of land animals and their processed products with the highest consumption rate of 10%, while buffalo and smoked meat get the lowest score of 0% with a consumption frequency of more than seven times a week. Meatballs are processed meat products made from livestock meat with the addition of starch and spices, with or without the addition of other permitted food ingredients, round, or other shapes, and cooked. Meatballs are an alternative source of animal protein that is popular with the public (Indonesian National Standard, 2014)

Table 2. Results of Mapping Patterns of Consumption of Tubers

Foodstuff	Never	Once a week	a week 2-3 times	a week 4-6 times	a week 7 times	a week > 7 times a week	Amount
Sweet potato	26	36	14	10	6	8	100
Cassava	15	28	26	18	2	11	100
Potato	27	33	16	11	6	7	100
Taro	68	20	6	3	0	3	100
Tapioca	50	27	16	4	1	2	100

Table 3. Results of Mapping of Vegetable Consumption Patterns

Foodstuff	Never	Once a week	a week 2-3 times	a week 4-6 times	a week 7 times	a week > 7 times a week	Amount
Garlic	7	18	8	10	6	51	100
Onion	5	20	8	13	4	50	100
Carrot	58	15	7	8	3	9	100
Turnip	12	25	26	13	4	20	100
Celery	77	10	4	3	1	5	100
Chilli	22	26	15	11	7	18	100
Tomatoes	5	21	12	4	7	51	100
Cucumber	6	23	11	7	7	46	100
Round Green Eggplant	7	27	15	13	8	30	100
Round Purple Eggplant	28	35	14	7	6	10	100
Long Green Eggplant	36	29	21	6	1	7	100
Long Purple Eggplant	54	18	14	5	2	7	100
bitter gourd	36	24	20	8	4	8	100
Peppers	46	30	12	4	3	5	100
Pumpkin	85	6	3	3	2	1	100
Long beans	37	29	15	8	4	7	100
Young Jackfruit	22	33	21	7	5	12	100
Kluwih	67	17	6	2	2	6	100
Water spinach	85	6	4	2	3	0	100
Spinach	9	34	24	13	5	15	100
Mustard	10	36	22	14	4	14	100
Leek	12	40	16	13	4	15	100
Green Beans Leaves	14	33	24	8	9	12	100
Siamese Pumpkin Leaves	64	15	12	6	1	2	100
Cassava leaves	73	14	6	2	4	1	100
Papaya leaf	51	25	11	7	3	3	100
Cabbage	60	19	11	5	2	3	100
Cauliflower	21	35	21	8	3	12	100
Turi Flowers	47	24	16	8	3	2	100
Garlic	90	5	3	2	0	0	100

Table 4. Results of Mapping of Fruit Consumption Patterns

Foodstuff	Never	Once a week	a week 2-3 times	a week 4-6 times	a week 7 times	a week > 7 times a week	Amount
Mango	10	40	21	13	5	11	100
Mangosteen	34	32	13	13	1	7	100
rambutans	35	33	19	6	2	5	100
Hamlet	33	35	16	6	4	6	100
Breadfruit	52	30	10	2	2	4	100
Sapodilla	46	29	13	5	1	6	100
Guava	27	36	17	5	2	13	100
Star fruit	51	31	8	4	1	5	100
Jackfruit	51	22	12	9	1	5	100
Soursop	60	22	7	6	0	5	100
Orange	14	39	20	14	2	11	100
Snake fruit	32	36	13	7	2	10	100
Pineapple	42	29	12	8	1	8	100
Banana	19	30	23	11	2	15	100
Pawpaw	24	31	14	13	3	15	100
Melon	36	32	11	7	4	10	100
Watermelon	28	39	11	7	4	11	100
Cantaloupe	72	16	4	3	2	3	100
Timun Suri	53	23	12	2	3	7	100

Table 5. Results of Mapping Consumption Patterns of Land Animals and Their Processed Products

Foodstuff	Never	Once a week	a week 2-3 times	a week 4-6 times	a week 7 times	a week > 7 times a week	Amount
Cow	66	18	8	1	2	5	100
Goat	77	14	2	2	2	3	100
Buffalo	98	2	0	0	0	0	100
Beef sausage	61	17	12	4	2	4	100
Beef Meatballs	29	34	16	8	3	10	100
Smoked meat	98	2	0	0	0	0	100
cornet	88	0	9	0	1	2	100

3.6 Poultry, Flying Animals, and Their Processed Products

The types of foodstuffs in this category with the highest consumption rate were chicken meatballs (12%) and quail with the lowest score (0%) with a consumption frequency of more than seven times a week. Chicken meatballs are another variation of meatballs by using chicken as the main ingredient to produce meatball products at a more affordable price. The characteristics of chicken meatballs are almost like beef meatballs, including having a chewy texture due to fibre.

3.7 Aquatic Animals

The type of food in the aquatic animal group with the highest consumption value was tilapia fish with a percentage of 12%, while mackerel fish got the lowest percentage, namely 0% with a consumption frequency of more than seven times a week. Many people in Pantai Mekar village have professions as fish fishermen and also fishpond cultivation (Aziz, Wijayanto, & Heri, 2016). Commodities from ponds such as tilapia fish are generally consumed by families as side dishes, processed by being marinated with various spices and then fried. The abundance of tilapia fish in Pantai Mekar village is one of the reasons for the high consumption of this type of fish by the surrounding community.

4. Conclusion

The food consumption pattern of the community in the scope of households in Muara Gembong village is still classified as less varied because it still focuses on one type of food with a high level of consumption.

Some foodstuffs with high levels of consumption with a frequency of more than seven times a week are white rice, cassava, shallots, chilies, papaya, bananas, beef meatballs, chicken meatballs, and tilapia fish. Most of these food ingredients are not local food products that exist and are cultivated in the village of Muara Gembong. This causes the local food that is there is not utilized and consumed by the surrounding community. This food consumption pattern needs to be developed and made diverse so that local food ingredients that have potential as future food ingredients can be utilized from now on. The strategy of diversification and utilization of food in Muara Gembong village can be a strategy to strengthen regional food security so that the availability of food can be utilized to improve the health and nutrition quality of the community. This research is expected to be a first step in helping improve food security in the village of Muara Gembong so that potential food ingredients can be identified that can be utilized and developed as future food ingredients based on local food ingredients.

Table 6. Mapping Results of Poultry Consumption Patterns, Flying Animals, and Yields Processed

Foodstuff	Never	Once a week	a week 2-3 times	a week 4-6 times	a week 7 times	a week > 7 times a week	Amount
Chicken	4	28	38	16	3	11	100
Duck	52	23	12	4	3	6	100
Pigeon	98	1	1	0	0	0	100
Quail	99	0	1	0	0	0	100
Grouse	97	2	1	0	0	0	100
Chicken Nuggets	55	20	0	15	5	5	100
Chicken Meatballs	30	28	19	7	4	12	100

Table 7. Results of Mapping Patterns of Consumption of Aquatic Animals

Foodstuff	Never	Once a week	a week 2-3 times	a week 4-6 times	a week 7 times	a week > 7 times a week	Jumlah
Tilapia fish	22	24	25	10	7	12	100
Gurame	80	6	10	0	3	1	100
Pomfret	74	7	10	4	0	5	100
Catfish	67	11	13	6	0	3	100
Goldfish	63	17	10	6	1	3	100
Milkfish	16	17	31	20	6	10	100
Kedukang Fish	93	3	2	0	0	2	100
Nine fish	66	17	7	3	2	5	100
Snapper	79	14	6	0	0	1	100
Kurofish	77	9	9	1	0	4	100
Mackerel	88	8	2	2	0	0	100
Pompano	84	11	2	1	0	2	100
Shrimp	34	25	15	12	3	11	100
squid	55	22	11	3	2	7	100
Shell	59	22	10	3	3	3	100
Rebon	56	18	15	3	1	7	100
Fresh Anchovies	54	16	15	4	3	8	100
Salted Anchovies	39	27	14	7	3	10	100

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