



Local Fruits and Vegetables of Jember District That Can Increase Immunity during the Covid-19 Pandemic

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Abstract: *The Covid-19 pandemic is closely related to immunity, a biological protection system found in the human body. This system can ward off free radicals that will enter, so it is not easy to catch the disease. If this system works properly, then a person can avoid virus attacks. Consuming fruits and vegetables is the best immune boosting way that can be done. The importance of knowing local fruits and vegetables so that it can increase immunity. Make sure fruits and vegetables are always on the diet, so that the body is always in the best condition. This research examines the diversity of local fruits and vegetables in Jember District which can increase immunity. The research method uses exploratory survey, which aims to collect information with a qualitative approach. The research instrument consists of: observation sheets, interview guidelines and documentation. The survey area covers 31 districts in Jember District. The results of the study found 28 types of local fruit that can increase immunity, namely : avocado, sweet starfruit, wuluh starfruit, cantaloupe, red dragon fruit, guava, crystal guava, lime, semboro orange, kedondong, manalagi mango, gadung mango, pineapple, papaya, banana ambon, banana berlin, banana kepok, banana nangka, banana raja, soursop, big orange, ciplukan, passion fruit, pomegranate, mangosteen and apple melon. Also found 18 types of local vegetables that can increase immunity, namely: pumpkin, tomatoes, green spinach, red spinach, leeks, oyong, large chilies, rawit chilies, katu leaves, moringa leaves, papaya leaves, kenikir, cabbage, ferns, celery, and cauliflower. Of the 28 types of local fruit found, as much as 44.8% has been cultivated. From 18 types of local vegetables, which has been cultivated by 38.9%.*

Keywords: *local fruits and vegetables; Jember District; immune; Covid-19*

I. Introduction

The diversity of local fruits and vegetables is a rich biodiversity that is very important in life, because fruit and vegetables are one of the human food needs. Local fruits and vegetables contribute to the availability of food in the region through optimizing the use of local fruit and vegetable resources as a food provider (Komarayanti et al, 2017). Related to food needs that continue to increase, efforts are needed to increase the use of plant diversity to meet human needs (Pugalenthi et al, 2005).

Local fruits and vegetables are native fruits and vegetables that have been widely cultivated and consumed or introduced fruits and vegetables that have been developed for a long time and are known to the public in a certain area (Suryadi and Kusumana, 2004).

Fruits and vegetables in general are one of the commodities needed by humans to live healthy. Fruits and vegetables are a source of water, nutrition and vitamins, and is one of the largest sources of natural antioxidants in the world (Saleh, 2017).

The nutritional content as diverse as vitamin A, B, C, potassium, iron, protein and antioxidant compounds, indicating that the cultivation and consumption of vegetables may help in dealing with malnutrition in Indonesia (Becker, 2003; Madalla et al., 2013).

These fruits and vegetables are the best way to boost your immune system that we can do (Komarayanti et al., 2017). Whatever the type of fruit and vegetables, make sure it's always in the daily diet. So the immune system will always be in the best condition or situation.

The immune system is a protection system that is biologically present in the human body with the aim to be able to ward off free radicals that will attack so that the individual will not be susceptible to disease. Various kinds of infections that occur in humans today can be caused by some bacteria derived from the human body itself. Such infections can cause various diseases such as diarrhea and lower respiratory tract disease or pneumonia (Ramadhianto, 2019). If this system can or can work properly, then the person will avoid the virus attack. However, if this system is not working properly or is in a weak condition, then a person's immune system will be susceptible to disease. The thing that is feared if this system is weakened is that it can increase the risk of being attacked by Covid-19.

Jember District is one of the abundant fruit and vegetable producing cities in East Java Province, shows that the agricultural sector is a sector that has a fairly large role. Administratively, Jember District is divided into 31 sub-districts and information about fruits and vegetables that can increase immunity is not well explored and recorded. The effort to explore and recognize the potential of local fruit and vegetables in each region is very important. This is due to the entry of imported fruits and vegetables whose penetration reaches areas where local fruits can be pressed, changing consumption patterns of society and land use changes.

This study aims to obtain a database of information on local fruits and vegetables that can increase immunity in Covid-19 pandemic, which are traded in markets and fruit and vegetable sales centers in Jember District. This research is part of the first and second year research on development of multimedia-based encyclopedia of local fruits and vegetables in Jember as a learning resource for biology that supports food security.

II. Research Methods

The research method used exploratory survey with a qualitative approach. The research instrument consisted of observation sheets, interviews and documentation. Survey activities were carried out in July - August 2020.

2.1 Research Areas

- a. Jember District has an area of approximately 3293.34 km², with a coast length of approximately 170 km.
- b. Jember District is located at an altitude of 0-3300 meters above sea level (asl), with a height of Jember urban areas approximately 87 meters asl. Most of the territory is at an altitude of between 100 and 500 meters asl is 37.75%. Topographical conditions indicated by the slope or elevation, most of Jember District (36.60%) with 0 to 2% slope.
- c. Climate in Jember District is a tropical. Figures temperatures ranging from 23°C - 31°C

Location survey found in 31 districts in Jember (Jember Regency, 2018), namely: Subdistrict Kencong, Gumukmas, Puger, Wuluhan, Ambulu, Tempurejo, Silo, Mayang, Mumbulsari, Jenggawah, Ajung, Rambipuji, Balung, Umbulsari, Semboro, Jombang, Sumberbaru, Embankment, Bangsalsari, Panti, Sukorambi, Arjasa, Pakusari, Kalisat, Ledokombo, Sumberjambe, Sukowono, Jelbuk, Kaliwates, Summersari and Patrang (Figure 1), The study was conducted in the markets and centers of fruits and vegetables in each district. The respondents are the local fruit and vegetable traders. Data collected includes the

name of a plant, plant origin (aquaculture), morphology colors of fruits and vegetables and vegetable parts are sold. Plant growth is supported and influenced by several factors, namely nutrient ions or mineral salts which are absorbed by the leaves and carry out photosynthesis (Hasibuan, et al 2019). Fruits and vegetables are locally obtained and documented by the cameras and samples were taken for identification.



Figure 1. Map of Jember District (Jember District Government, 2018)

2.2 Identification of Plant Species

Local fruit and vegetable samples collected subsequently identified in the laboratory. Identification using book of determination: Flora of Java Volume I, II, III (Backer and Bakhuizen, 1968), A Practical Field Guide to Weeds of Rice in Asia (Caton et al, 2010), the Weed Identification (Naidu, 2012), The Institute for Functional Medicine, 2014 and Local Fruits and Vegetables in Jember District (Komarayanti et al, 2019).

III. Result and Discussion

3.1 Result

Local Fruits and Vegetables in Jember Regency That Can Increase Immunity during the Covid-19 Pandemic

The diversity of local fruits and vegetables in Jember District which can increase immunity, which found in markets and fruit centers as many as 28 types of local fruit and 18 types of local vegetables. The survey results of local fruits and vegetables as well as distribution in 31 districts in Jember are presented in Tables below:

Table 1. Local Fruits Found in 31 sub-districts in Jember Which Can Increase Immunity during the Covid-19 Pandemic

No	Type of Fruit	Species Name	Point of Distribution (sub-district)
1.	Avocado.	(<i>Persea americana</i>).	Gumukmas, Puger, Wuluhan, Ambulu, Silo, Mayang, Mumbulsari, Jenggawah, Rambipuji, Balung, Semboro, Sumberbaru, Tanggul, Panti, Arjasa, Pakusari, Kalisat, Ledokombo, Sumberjambe, Sukowono, Jelbuk, Summersari, dan Patrang.

2.	Black grapes.	(<i>Vitis vinifera</i>).	Ambulu, Rambipuji, Sumpersari, dan Patrang.
3.	Sweet starfruit.	(<i>Averrhoa carambola</i> L).	Kencong, Gumukmas, Puger, Wuluhan, Ambulu, Silo, Mayang, Mumbulsari, Jenggawah, Ajung, Rambipuji, Umbulsari, Semboro, Jombang, Sumberbaru, Tanggul, Panti, Arjasa, Pakusari, Kalisat, Sumberjambe, Sukowono, Jelbuk, Kaliwates, Sumpersari, dan Patrang.
4.	Wuluh starfruit.	(<i>Averrhoa bilimbi</i> L).	Ambulu, Balung, Tanggul dan Kaliwates.
5.	Cantaloupe	(<i>Cucumis melo</i>).	Ambulu, Balung, Tanggul, Sukowono, Kaliwates dan Patrang
6.	Red Dragon Fruit.	(<i>Hylocereus polyhizus</i>).	Ambulu, Balung, Tanggul dan Kaliwates.
7.	Guava	(<i>Psidium guajava</i> L).	Kencong, Gumukmas, Puger, Wuluhan, Ambulu, Silo, Mayang, Mumbulsari, Jenggawah, Rambipuji, Umbulsari, Semboro, Jombang, Sumberbaru, Tanggul, Panti, Sukorambi, Arjasa, Pakusari, Ledokombo, Sumberjambe, Jelbuk, Kaliwates, Sumpersari, dan Patrang.
8.	Crystal guava	(<i>Psidium guajava</i> L).	Ambulu, Tanggul, Kaliwates dan Balung.
9.	Lime	(<i>Citrus aurantifolia</i>).	Ambulu, Tanggul, Kaliwates dan Balung.
10.	Semboro orange	(<i>Citrus sp</i>).	Kencong, Gumukmas, Wuluhan, Ambulu dan Mayang,
11.	Kedondong.	(<i>Spondias dulcis</i>).	Ambulu, Tanggul, Kaliwates dan Balung.
12.	Mango Manalagi	(<i>Mangifera indica</i>).	Puger, Ambulu, Mayang, Rambipuji, Sukorambi, Pakusari, dan Patrang.
13.	Mango Gadung	(<i>Mangifera indica</i>).	Wuluhan, Silo, Mayang, Jenggawah, Ajung, Balung, Semboro, Tanggul, Bangsalsari, Panti, Arjasa, Pakusari, Ledokombo, Sumberjambe, Jelbuk, dan Patrang.
14.	Pineapple	(<i>Ananas comosus</i>).	Puger dan Rambipuji
15.	Thailand papaya	(<i>Carica papaya</i> L).	Gumukmas, Puger, Wuluhan, Ambulu, Tempurejo, Silo, Mayang, Mumbulsari, Jenggawah, Ajung, Rambipuji, Balung, Semboro, Sumberbaru, Tanggul, Bangsalsari, Panti, Sukorambi, Arjasa, Pakusari, Kalisat, Ledokombo, Sumberjambe, Sukowono, Jelbuk, Sumpersari, dan Patrang.
16.	California papaya	(<i>Carica papaya</i> L).	Gumukmas, Puger, Wuluhan, Ambulu, Tempurejo, Silo, Mayang, Mumbulsari, Jenggawah, Ajung, Rambipuji, Balung, Semboro, Sumberbaru, Tanggul, Bangsalsari, Panti, Sukorambi, Arjasa, Pakusari, Kalisat, Ledokombo, Sumberjambe, Sukowono, Jelbuk, Sumpersari, dan Patrang.
17.	Ambon banana	(<i>Musa Paradisiaca</i>).	Kencong, Gumukmas, Puger, Wuluhan, Ambulu, Tempurejo, Silo, Mayang, Mumbulsari, Jenggawah, Ajung, Rambipuji,

			Balung, Umbulsari, Semboro, Jombang, Sumberbaru, Tanggul, Bangsalsari, Panti, Sukorambi, Arjasa, Pakusari, Kalisat, Ledokombo, Sumberjambe, Sukowono, Jelbuk, Kaliwates, Summersari, dan Patrang.
18.	Barlin banana	(<i>Musa Paradisiaca</i>).	Kencong, Gumukmas, Puger, Wuluhan, Ambulu, Tempurejo, Silo, Mayang, Mumbulsari, Jenggawah, Ajung, Rambipuji, Balung, Umbulsari, Semboro, Jombang, Sumberbaru, Tanggul, Bangsalsari, Panti, Sukorambi, Arjasa, Pakusari, Kalisat, Ledokombo, Sumberjambe, Sukowono, Jelbuk, Kaliwates, Summersari, dan Patrang.
19.	Kepok banana	(<i>Musa acuminata</i>).	Kencong, Gumukmas, Puger, Wuluhan, Ambulu, Tempurejo, Silo, Mayang, Mumbulsari, Jenggawah, Ajung, Rambipuji, Balung, Umbulsari, Semboro, Jombang, Sumberbaru, Tanggul, Bangsalsari, Panti, Sukorambi, Arjasa, Pakusari, Kalisat, Ledokombo, Sumberjambe, Sukowono, Jelbuk, Kaliwates, Summersari, dan Patrang.
20.	Nangka banana	(<i>Musa sp</i> L).	Kencong, Gumukmas, Puger, Wuluhan, Ambulu, Tempurejo, Silo, Mayang, Mumbulsari, Jenggawah, Ajung, Rambipuji, Balung, Umbulsari, Semboro, Jombang, Sumberbaru, Tanggul, Bangsalsari, Panti, Sukorambi, Arjasa, Pakusari, Kalisat, Ledokombo, Sumberjambe, Sukowono, Jelbuk, Kaliwates, Summersari, dan Patrang.
21.	Raja banana	(<i>Musa sapientum</i>).	Kencong, Gumukmas, Puger, Wuluhan, Ambulu, Tempurejo, Silo, Mayang, Mumbulsari, Jenggawah, Ajung, Rambipuji, Balung, Umbulsari, Semboro, Jombang, Sumberbaru, Tanggul, Bangsalsari, Panti, Sukorambi, Arjasa, Pakusari, Kalisat, Ledokombo, Sumberjambe, Sukowono, Jelbuk, Kaliwates, Summersari, dan Patrang.
22.	Soursop	(<i>Annona muricata</i>).	Gumukmas, Puger, Ambulu, Silo, Mayang, Mumbulsari, Jenggawah, Ajung, Rambipuji, Semboro, Sumberbaru,
23.	Big orange	(<i>Vitis vinifera</i>).	Ambulu, Silo, Mayang, Jenggawah, Ajung, Semboro, Pakusari, dan Summersari.
24.	Ciplukan.	(<i>Physalis angulata</i> L).	Ambulu, Wuluhan dan Sukowono.
25.	Passion fruit	(<i>Passiflora edulis</i>).	Mayang, Jenggawah, dan Summersari.
26.	Pomegranate	(<i>Punica granatum</i> L).	Kencong, Ambulu, Kaliwates, Jenggawah, Ajung, Pakusari dan Summersari.
27.	Mangosteen	(<i>Garcinia mangostana</i> L).	Wuluhan, Silo, Mayang, Jenggawah, Ajung, Balung, Semboro, Tanggul, Bangsalsari, Panti, Arjasa, Pakusari, Ledokombo, Sumberjambe, Jelbuk, dan Patrang.
28.	Apple melon	(<i>Cucumis melo</i>).	Kencong, Ambulu, Rambipuji, Balung, Tanggul, Arjasa, Kaliwates, Summersari dan Patrang

Of the 28 types of local fruit that can increase immunity, 44.8% were found to be cultivated, namely Avocado, Grape, Starfruit, Guava, Semboro Orange, Big Orange, Mango, Mangosteen, Pineapple, Papaya, Banana, Passion Fruit, and Soursop.

Table 2. Local Vegetables Found in 31 sub-districts in Jember Which Can Increase Immunity During the Covid-19 Pandemic

No	Types of Vegetables	Point of Distribution (sub-district)
1.	Bean (<i>Phaseolus vulgaris</i> Linn)	Kencong, Ambulu, Balung, Umbulsari, Sukorambi.
2.	Big Chili (<i>Capsicum annum</i> L.)	Kencong, Gumuk Mas, Puger, Wuluhan, Ambulu, Tempurejo, Silo, Mayang, Mumbul Sari, Jenggawah, Ajung, Rambipuji, Umbul Sari, Semboro, Jombang, Sumberbaru, Bangsal Sari, Sukorambi, Ledokombo, Sumber Jambe, Sukowono, Patrang.
3.	Rawit Chili (<i>Capsicum frutescens</i> L)	Kencong, Gumuk Mas, Puger, Wuluhan, Ambulu, Tempurejo, Silo, Mayang, Mumbul Sari, Jenggawah, Ajung, Rambipuji, Balung, Umbul Sari, Semboro, Jombang, Sumberbaru, Tanggul, Panti, Sukorambi, Arjasa, Pakusari, Kalisat, Ledokombo, Sumber Jambe, Sukowono, Jelbuk, Sumpersari, Patrang.
4.	Pumpkin (<i>Cucurbita moschata</i> Duschesne)	Kaliwates, Kalisat, Jenggawah dan Tanggul.
5.	Oyong/gambas (<i>Luffa acutangula</i>)	Jenggawah, Tanggul, Kalisat dan Kaliwates.
6.	Tomato (<i>Solanum lycopersicum</i> L.)	Gumus Mas, Ambulu, Silo, Mayang, Jenggawah, Ajung, Rambipuji, Sumber Baru, Sukorambi, Kalisat, Ledokombo, Sumber Jambe
7.	Green Spinach (<i>Amaranthus spinosus</i>)	Panti, Sukorambi, Ledokombo, Kaliwates
8.	Red Spinach (<i>Amaranthus gangeticus</i> L.)	Panti, Sukorambi, Ledokombo, Kaliwates
9.	Spring onion (<i>Cleome rutidospermae</i>)	Wuluhan, Jenggawah, Jombang.
10.	Katu leaves (<i>Sauropus androgynus</i>)	Jenggawah, Tanggul dan Kaliwates.
11.	Moringa leaves (<i>Moringa oleifera</i> Lam.)	Kaliwates dan Bangsalsari.
12.	Papaya leaves (<i>Carica papaya</i> L.)	Kencong, Jenggawah, Tanggul, Kalisat dan Kaliwates.
13.	Basil (<i>Ocimum sanctum</i> L.)	Kaliwates, Kalisat, Jenggawah dan Tanggul.
14.	Kenikir (<i>Cosmos caudatus</i>)	Kaliwates, Kalisat, Jenggawah dan Tanggul.
15.	Cabbage (<i>Brassica oleraceae</i>)	Puger, Wuluhan, Ambulu, Jenggawah, Balung, Panti
16.	Fern (<i>Diplazium esculentum</i>)	Kaliwates, Kalisat, Jenggawah dan Tanggul.
17.	Celery (<i>Apium graveolens</i> L.)	Kaliwates, Kalisat, Jenggawah, Patrang, Jelbuk, Mumbulsari, Balung dan Tanggul.
18.	Cauliflower (<i>Brassica oleracea</i>)	Ambulu

From 18 types of local vegetables that can increase immunity, obtained as much as 38.9% which have been cultivated, namely: Spring onion (*Allium fistulosum* L), Cabbage (*Brassica oleraceae*), Cauliflower (*Brassica oleracea*), Big chili (*Capsicum annum* L.), Rawit chili (*Capsicum frutescens* L.), Tomato (*Solanum lycopersicum* L.) dan Spinach (*Amaranthus spinosus*).

Table 3. Local Fruits That Can Increase Immunity During Pandemic Times Covid-19 and Its Nutritions

No	Type of Fruits	Species Name	Nutrition
1.	Avocado.	<i>(Persea americana)</i> .	Calories 85,00 cal, protein 0,90 g, fat 6,50 g, carbohydrate 7,70 g, calcium (Ca) 10,00 mg, phosphor (P) 20,00 mg, iron (Fe) 0,90 mg, vitamin A 180,00 S.I., vitamin B1 0,05 mg, vitamin C 13,00 mg, water 84,30 mg, fiber 1,40 g, edible portion 61,00%
2.	Black grapes.	<i>(Vitis vinifera)</i> .	Energy, 75,00 kcal, protein 0,40 g. fat 0,36 g, carbohydrate 19,70 g, calcium 6,00 mg, phosphor 24,40 mg, fiber 1,7 g, iron 0,4 mg, vitamin A 68 RE, vitamin B1 0,06 mg, vitamin B2 0,02 mg, vitamin C 3 mg, dan niacin 0,2 mg.
3.	Sweet starfruit.	<i>(Averrhoa carambola L)</i> .	Calories 31 Kcal 1.5%, Sodium 2 mg 0%, Folatee 12 µg 3%, carbohydrate 6.73 g 5%, calium 133 mg 3%, Niacin 0.367 mg 2.25%, Protein 1.04 g 2%, Mineral, calcium 3 mg 0.3%, Pyridoxine 0.017 mg 1.5%, fat 0.33 g 1%, iron 0.08 mg 1%, Riboflavin 0.016 mg 1.25%, fiber 2.80 g 7%, Magnesium 10 mg 2%, Thiamin 0.014 mg 1%, phosphor 12 mg 2%, Vitamin A 61 IU 2%, Vitamin C 34.4 mg 57%, Vitamin E 0.15 mg 1%.
4.	Wuluh starfruit.	<i>(Averrhoa bilimbi L)</i> .	46 mg vitamin C per 100 gram. Fiber 4 gram and 40 cal.
5.	Cantaloupe	<i>(Cucumis melo)</i> .	100 gram cantaloupe : 12,69 mg magnesium, manganese 0,03 mg, 0,05 mg copper, 0,10 mg zinc; 0,003 mg cobalt, dan 0,005 mg chrome
6.	Red Dragon Fruit.	<i>(Hylocereus polyhizus)</i> .	60 kkal calories, 0,53 gram protein, 0,71 gram fiber, 11,5 gram carbohydrate, 134,5 mg calcium, 0,65 mg iron, 87 mg phosphor, 9,4 mg vitamin C, dan water 90%.
7.	Guava	<i>(Psidium guajava L)</i> .	Energy, 49,00 cal, protein 0,9 g. fat 0,30 g, carbohydrate 12,20 g, calcium 14,00 mg, phosphor 28 mg, fiber 5,6 g, iron 1,1 mg, vitamin A 4,00 RE, vitamin B1 0,5 mg, vitamin B2 0,04 mg, vitamin C 87,00 mg, dan niacin 1,10 mg.
8.	Crystal guava	<i>(Psidium guajava L)</i> .	Water 93 g, Calcium 29 mg, Manganese 0.029 mg, Energy 25 kcal, Iron, Fe 0.07 mg, Vitamin C, 22.3 mg, Energy 105 kj, Magnesium, 5 mg, Thiamin 0.02 mg, Protein 0.6 g, Phosphorus, P 8 mg, Riboflavin 0.03 mg, Total lipid 0.3 g, Potassium 123 mg, Niacin 0.8 mg, Ash 0.4 g, Zinc 0.06 mg, Vitamin A17 mcg, Carbohydrate 5.7 g.
9.	Lime	<i>(Citrus aurantifolia)</i> .	Energy, 52,00 cal, protein 1,10 g. fat 0,30 g, Carbohydrate 18,60 g, calcium 126,00 mg, phosphor 16 mg, fiber 0,2 g, iron 0,90 mg, vitamin A 5,00 RE, vitamin B1 0,07 mg, vitamin B2 0,09 mg, vitamin C 256,00 mg, and niacin 0,3 mg.
10.	Semboro orange	<i>(Citrus sp)</i> .	Vitamin / Vitamin B2, pantothenic acid / Vitamin B5. C, carbohydrates, potassium, folatee, calcium, thiamin / Vitamin B1, niacin or Vitamin B3, vitamin B6 / Pyridoxine, phosphorus, magnesium, copper, riboflavin

11.	Kedondong.	<i>(Spondias dulcis).</i>	Fiber in 100 grams of kedondong fruit = 0.83-3.60 mg, 30 mg of iron, 30-50 mg of vitamin C, 41 kcal of energy, 1 kcal of protein, 10.3 grams of carbohydrates, 15 mg of calcium, 22 mg of phosphorus, iron 3 mg, vitamin A 233 IU, vitamin B1 = 0.08 mg.
12.	Mango Manalagi	<i>(Mangifera indica).</i>	per 100 g (3.5 oz, Energy 272 kJ (65 kcal), Carbohydrates 17.00 g, Sugar 14.8 g, dietary fiber 1.8 g, Fat 0.27 g, Protein 0.51 g, Vitamin A equiv. 38 mg (4%), Beta-carotene 445 mg (4%), Thiamine (Vit. B1) 0.058 mg (4%), Riboflavin (Vit. B2) 0.057 mg (4%), Niacin (Vit. B3) 0.584 mg (4%), pantothenic acid (B5) 0.160 mg (3%), Vitamin B6 0.134 mg (10%), Folate (Vit. B9) 14 mg (4%), Vitamin C 27.7 mg (46%) , Calcium 10 mg (1%), Iron 0.13 mg (1%), Magnesium 9 mg (2%), Phosphorus 11 mg (2%), Potassium 156 mg (3%), Zinc 0.04 mg (0 %).
13.	Mango Gadung	<i>(Mangifera indica).</i>	1,5 mg vitamin E, fiber, vitamin A, B6, dan C.
14.	Pineapple	<i>(Ananas comosus).</i>	per 100 grams: energy: 52 cal, protein: 0.4 g, fat: 0.2 g, phosphorus: 11 mg, iron: 0.3 mg, vitamin A: 130 iu, fiber: 0.4 g, calcium : 16 mg, vitamin c: 24 mg, carbohydrates: 13.7 g, vitamin b1: 0.08 mg, water: 85.3 g. vitamins a and c, natural fiber, calcium, phosphorus, magnesium, iron, sodium, potassium, dextrose, sucrose, cystine, bromelain enzymes.
15.	Thailand papaya	<i>(Carica papaya L).</i>	Vitamin A (1,750 IU), Vitamin B (0.03 mg), Riboflavin (0.04 mg), Niacin (0.3 mg), Vitamin C (56 mg), Calcium (20 mg), Iron (0.3 mg), Phosphorus (16 mg), Potassium (470 mg), Fat (0.1 g), Carbohydrates (10 g), Protein (0.6 g), Calories (39)
16.	California papaya	<i>(Carica papaya L).</i>	Vitamin C 94 mg, vitamin E 17%, vitamin A, vitamin B complex, calcium and potassium.
17.	Ambon banana	<i>(Musa Paradisiaca).</i>	Energy, 99.00 cal, protein 1.2 g. Fat 0.20 g, carbohydrates 25.80 g, calcium 8.00 mg, phosphorus 28 mg, fiber 0.6 g, iron 0.8 mg, vitamin A 45 RE, vitamin B1 0.4 mg, vitamin B2 0, 4 mg, vitamin C 3 mg, and niacin 0.6 mg.
18.	Barlin banana	<i>(Musa Paradisiaca).</i>	Energy, 99.00 cal, protein 1.2 g. Fat 0.20 g, carbohydrates 25.80 g, calcium 8.00 mg, phosphorus 28 mg, fiber 0.6 g, iron 0.8 mg, vitamin A 45 RE, vitamin B1 0.4 mg, vitamin B2 0, 4 mg, vitamin C 3 mg, and niacin 0.6 mg.
19.	Kepok banana	<i>(Musa acuminata).</i>	Energy, 99.00 cal, protein 1.2 g. Fat 0.20 g, carbohydrates 25.80 g, calcium 8.00 mg, phosphorus 28 mg, fiber 0.6 g, iron 0.8 mg, vitamin A 45 RE, vitamin B1 0.4 mg, vitamin B2 0, 4 mg, vitamin C 3 mg, and niacin 0.6 mg.
20.	Nangka banana	<i>(Musa sp L).</i>	Energy, 99.00 cal, protein 1.2 g. Fat 0.20 g, carbohydrates 25.80 g, calcium 8.00 mg, phosphorus 28 mg, fiber 0.6 g, iron 0.8 mg, vitamin A 45 RE,

			vitamin B1 0.4 mg, vitamin B2 0, 4 mg, vitamin C 3 mg, and niacin 0.6 mg.
21.	Raja banana	(<i>Musa sapientum</i>).	Energy, 99.00 cal, protein 1.2 g. Fat 0.20 g, carbohydrates 25.80 g, calcium 8.00 mg, phosphorus 28 mg, fiber 0.6 g, iron 0.8 mg, vitamin A 45 RE, vitamin B1 0.4 mg, vitamin B2 0, 4 mg, vitamin C 3 mg, and niacin 0.6 mg.
22.	Soursop	(<i>Annona muricata</i>).	Energy, 65.00 cal, protein 1.00 g. Fat 0.30 g, carbohydrates 16.30 g, calcium 14.00 mg, phosphorus 27.40 mg, fiber 1.7 g, iron 0.4 mg, vitamin A 68 RE, vitamin B1 0.06 mg, vitamin B2 0.4 mg, vitamin C 20.00 mg, and niacin 0.70 mg.
23.	Big orange	(<i>Vitis vinifera</i>).	53 mg of vitamin C, vitamin B6, potassium, iron, magnesium, calcium and dietary fiber.
24.	Ciplukan.	(<i>Physalis angulata</i> L).	The content of chlorogenic acid, citric acid, fialin, malic acid, alkaloids, tannins, kriptoxantin, vitamin C, and sugar.
25.	Passion fruit	(<i>Passiflora edulis</i>).	Energy 97 Kcal 5%, carbohydrates 23.38 g 18%, protein 2.20 g 4%, total fat 0.70 g 3%, cholesterol 0 mg 0%, dietary fiber 10.40 g 27%, vitamins, folateees 14 mcg 3%, niacin 1,500 mg 9%, pyridoxine 8%, riboflavin 0.130 mg 10%, thiamin 0.00 mg 0%, vitamin A 1274 IU 43%, vitamin C 30 mg 50%, vitamin E 0.02 mcg <1 %, vitamin K 0.7 mg 0.5%, electrolytes, sodium 0 mg 0%, potassium 348 mg 7%, minerals, calcium 12 mg 1.2%, copper 0.086 mg 9.5%, iron 1.60 mg 20%, magnesium 29 mg 7%, phosphorus 68 mg 10%, selenium 0.6 mcg 1%, zinc 0.10 mcg 1%, phyto-nutrientsβ-carotene 743 mcg -, crypto-xanthin-β 41 mcg, lycopene 0 mcg.
26.	Pomegranate	(<i>Punica granatum</i> L).	Fiber, protein, vitamin C, vitamin K, folateee, potassium. Pomegranate juice is a good source of fructose, sucrose and glucose. Apart from that, pomegranate also contains some simple organic acids such as ascorbic acid, citric acid, fumaric acid, and malic acid. It contains trace amounts of all amino acids, particularly proline, methionine and valine. While the skin contains polyphenols.
27.	Mangosteen	(<i>Garcinia mangostana</i> L).	total carbohydrates 15.30 g = 5.1%, dietary fiber 2.7 g = 10.8%, vitamin B2 riboflavin = 0.6%, protein 0.20 g = 0.4%, vitamin C = 10.0%, phosphorus = 0.7%, vitamin B3 niacin = 0.5%, vitamin B5 acid pantothenic acid = 0.6%, vitamin b1 thiamin = 1.3, vitamin b6 = 2.5%, potassium = 3.3%, magnesium = 1.3%, calcium = 0.7%.
28.	Apple melon	(<i>Cucumis melo</i>).	100 grams contains: 14.8 grams of carbohydrates, 1.55 grams of protein, 0.5 grams of fat, 546.9 mg of potassium, 5706.5 IU of vitamin A (sufficient for 64 percent of daily vitamin A requirements), and 74.7 vitamin C mg (sufficient for 12 percent of daily vitamin C needs).

Table 4. Local Vegetables That Can Increase Immunity During Pandemic Times Covid-19 and Its Nutritions

No	Type of Vegetables	Nutrition
1.	Bean (<i>Phaseolus vulgaris</i> Linn)	100 grams: 35 calories, 3 grams fiber, 2 grams protein, 5 mg carbohydrates, 12 mg vitamin C, 43 micrograms vitamin K, 33 micrograms folate, 690 IU vitamin A.
2.	Big chili (<i>Capsicum annum</i> L.)	100 grams: Energy 31 kcal Protein 1.0 grams Fat 0.3 grams Carbohydrates 7.3 grams Calcium 29 grams Phosphorus 24 grams Iron 0.5 grams Vitamin A 470 mg Vitamin B1 0.05 mg Vitamin C 18 mg Water 90,9 grams.
3.	Rawit chili (<i>Capsicum frutescens</i> L)	100 grams: Energy 103 kcal Protein 4.7 grams Fat 2.4 grams Carbohydrates 19.9 grams Calcium 45 grams Phosphorus 85 grams Iron 2.5 grams Vitamin A 11.050 mg Vitamin B1 0.24 mg Vitamin C 70 mg Water 71,2 grams.
4.	Pumpkin (<i>Cucurbita moschata</i> Duschesne)	Energy 19 Kcal, Carbohydrates 4.51 g, Protein 0.82 g, Fiber 1.7 g, Vitamin C 7.7 mg, Vitamin E 0.12 mg, Vitamin K 4.1 µg, Calcium 17 mg, Iron 0.34 mg, Magnesium 12 mg, Phosphorus 18 mg, Zinc 0.74 mg.
5.	Oyong/gambas (<i>Luffa acutangula</i>)	per 100 grams: Energy 18 kcal, Protein 0.8 g, Fat 0.2 g, Carbohydrates 4.1 g, Calcium 19 mg, Phosphorus 33 mg, Iron 1 mg, Vitamin A 380 IU, Vitamin B1 0.03 mg, Vitamin C 8 mg.
6.	Tomato (<i>Solanum lycopersicum</i> L.)	Vitamins A, K, B1, B5, B3, B6, B7, C, folate, iron, potassium, magnesium, chromium, choline, zinc and phosphorus.
7.	Green Spinach (<i>Amaranthus spinosus</i>)	Vitamin C 80 mg, antioxidants, beta carotene, 3.5 grams protein, 6.5 grams carbohydrates, 265 mg calcium, 67 mg phosphorus, 3.9 mg iron, vitamin A 6,090 SI, vitamin B 0.08 mg, water 86.9 grams.
8.	Red Spinach (<i>Amaranthus gangeticus</i> L.)	100 grams: 41.2 Kcal of energy, 2.2 grams of protein, 0.8 grams of fat, 520 mg of calcium, 6.3 grams of carbohydrates, 2.2 grams of fiber, 62 mg of vitamin C, 7 mg of iron, protein, fat, carbohydrates, potassium, iron, amarantin, routine, purines and vitamins (A, B, C).
9.	Spring onion (<i>Cleome rutidospermae</i>)	Energy = 29 kcal, Protein = 1.8 g, Fat = 0.7 g, Carbohydrates = 5.2 gr, Calcium = 55 mg, Phosphorus = 39 mg, Iron = 7 mg, Vitamin B1 = 0.09 mg, Vitamin A = 1365 IU, Vitamin C = 37 mg.
10.	Katu leaves (<i>Sauropus androgynus</i>)	7% protein, 19% fiber, vitamin K, pro-vitamin A (beta-carotene), B, and C, calcium (2.8%), iron, potassium, phosphorus, and magnesium.
11.	Moringa leaves (<i>Moringa oleifera</i> Lam.)	Antioxidants, vitamins, minerals, essential and non-essential amino acids, anti-inflammatory,
12.	Papaya leaves (<i>Carica papaya</i> L.)	Vitamin B, A, C, D, E
13.	Basil (<i>Ocimum sanctum</i> L.)	100 grams: Energy: 22 Kcal, Fiber: 1.6 grams, Protein: 3.15 grams, Vitamin B6: 0.155 micrograms, Vitamin C: 18 milligrams, Vitamin E: 0.80 grams, Calcium: 177 milligrams, Iron: 3.17 milligrams,

	Phosphorus: 56 milligrams, Potassium: 295 milligrams, Zinc: 0.81 milligrams, Carbohydrates: 2.65 grams, Fat: 0.64 grams, Water: 92.06 grams, Folate: 68 micrograms.
14. Kenikir (<i>Cosmos caudatus</i>)	Anti-oxidants or polyphenolic flavonoids, saponins, fats, proteins, carbohydrates, minerals, magnesium, calcium, vitamin A, vitamin C, vitamin E, essential oils, tocopherols, terpenoids, antioxidants, quercetin compounds.
15. Cabbage (<i>Brassica oleraceae</i>)	Energy 103 kJ (25 kcal), Carbohydrates 5.8 g, Sugar 3.2 g, Fiber diet 2.5 g, Fat 0.1 g, Protein 1.28 g, Thiamine (Vit. B1) 0.061 mg (5%), Riboflavin (Vit B2) 0.040 mg (3%), Niacin (Vit. B3) 0.234 mg (2%), Pantothenic Acid (B5) 0.212 mg (4%), Vitamin B6 0.124 mg (10%), Folate (Vit. B9) 53 mg (13%), Vitamin C 36.6 mg (61%), Calcium 40 mg (4%), Iron 0.47 mg (4%), Magnesium 12 mg (3%), Phosphorus 26 mg (4%), Potassium 170 mg (4%), Zinc 0.18 mg (2%).
16. Fern (<i>Diplazium esculentum</i>)	Per 100 g: Energy 34 Kcal 1.7% Carbohydrates 5.54 g 4% Protein 4.55 g 8% Total Fat 0.40 g 2% Cholesterol 0 mg 0% Vitamin Niacin 4,980 mg 31% Riboflavin 0.210 mg 16% Thiamin 0.020 mg 1.5% Vitamin A 3617 IU 120.5% Vitamin C 26.6 mg 44% Sodium Electrolyte 1 mg <1% Potassium 370 mg 8% Calcium Minerals 32 mg 3% Copper 0.320 mg 35.5% Iron 1.31 mg 16% Magnesium 34 mg 8.5% Manganese 0.510 mg 22% Selenium 0.7 mcg 1% Zinc 0.83 mg 7.5%.
17. Celery (<i>Apium graveolens</i> L.)	apiin glycosides (flavone glycosides), isoquercetin, umbelliferone, mannite, inosite, asparagine, glutamine, choline, linamarose, pro vitamins A, vitamins C, and B, resin acids, palmitic, oleic, linoleic, and petroselenic, bergapten, seselin, isomperatorin, osthénol, and isopimpinelin.
18. Cauliflower (<i>Brassica oleracea</i>)	Glutathione, 22 calories and 1 g lean protein, 5 g carbohydrates, 1.5 g fiber, 2.5 g natural sugar, more than 90 percent water, 85% vitamin C, 20% vitamin A.

Research has found 28 types of local fruit and 18 types of local vegetables which can increase immunity during the Covid-19 pandemic. Documentation of the diversity of several local fruits that can increase immunity found in Jember district can be seen in Figure 2.



Figure 2. Local fruit that can increase immunity during the Covid-19 pandemic found in Jember district

The documentation of the diversity of local vegetables that can increase immunity found in Jember district can be seen in Figure 3.

 <p>Big chili (<i>Capsicum annum L</i>)</p>	 <p>Rawit chili (<i>Capsicum frutescens L</i>)</p>	 <p>Tomato (<i>Solanum lycopersicum L</i>)</p>
 <p>Moringa leaves (<i>Moringa oleifera Lam.</i>)</p>	 <p>Katu leaves (<i>Sauropus androgynus</i>)</p>	 <p>Papaya leaves (<i>Carica papaya L.</i>)</p>
 <p>Spinach (<i>Amaranthus spinosus</i>)</p>	 <p>Kenikir (<i>Cosmos caudatus</i>)</p>	 <p>Cabbage (<i>Brassica oleraceae</i>)</p>
 <p>Celery (<i>Apium graveolens L.</i>)</p>	 <p>Spring onion (<i>Allium fistulosum</i>)</p>	 <p>Cauliflower (<i>Brassica oleracea</i>)</p>

Figure 3. Local vegetables that can increase immunity during the Covid-19 pandemic found in Jember district

3.2 Discussion

The results of exploration of local fruit and vegetables that are traded in markets and fruit and vegetable centers in 31 sub-districts in Jember District, found 28 types of local fruit and 18 types of local vegetables that can boost immunity during the Covid-19 pandemic. These local fruits and vegetables have potential as a source of flora germplasm that can support the fulfillment of regional food needs and can increase immunity (Komarayanti et al, 2019). Therefore, local fruits and vegetables are one of the alternative sources of food in order to increase quality immunity.

Local fruits and vegetables are plants that are well known and cultivated by the community, but it has not been documented / there is no database on local fruits and vegetables that can increase immunity during the Covid-19 pandemic. Even though local fruit has a fresher taste with nutritional content in it. People still prefer imported fruit with its various advantages (Komarayanti et al, 2018). It is necessary to cultivate a love of local fruits and vegetables through education. Diversity based on local fruit and vegetables is an alternative that can improve community nutrition and can solve the problem of malnutrition and can increase immunity during the Covid-19 pandemic and support food security.

In this study, 28 types of local fruit and 18 types of local vegetables were found to increase immunity during the Covid-19 pandemic, which are spread across 31 districts in Jember District. There are 44.8% local types of fruit and 38.9% types of local vegetables that have been cultivated. There were 5 types of local fruit that can increase immunity during the Covid-19 pandemic, which are available in more than 20 sub-districts, namely avocado, star fruit, guava, papaya and banana. There are 3 types of local vegetables that can increase immunity during the Covid-19 pandemic, which are available in more than 12 sub-districts, namely large chilies, cayenne pepper and tomatoes. These findings indicate that some markets and fruit centers have a high diversity of local fruit and vegetables.

Research from 18 countries on 5 continents illustrates that the availability of fruit and vegetables in all regions is related to the consumption of the people (Miller et al., 2016). The colors of fruits and vegetables vary, such as blue-purple, red-green, white and yellow-orange. Each color indicates the presence of certain phytochemical compounds that are efficacious to prevent various diseases (Astawan, 2008). Each color contains different phytonutrients, so that optimal health can be achieved if the intake of fruits and vegetables of various colors meets the recommended portion.

Fruits and vegetables rich in phytonutrients have 64 times more antioxidants than animal foods (Amagram, 2014). The world's population who consume very few fruits and vegetables, both in terms of number and diversity, has the potential for low phytonutrient intake.

Phytonutrients in fruits consist of various colors, including red, green, yellow, orange, blue/purple, and white/brown, which function to determine health benefits, people are advised to consume fruit with a variety of colors every day (The Institute for Functional Medicine, 2014). According to Astawan (2008) people are advised to consume at least five groups of colored food items every day, namely red, white, blue or purple, yellow, and green. Each color indicates the presence of certain phytochemical compounds that are efficacious to prevent various diseases.

IV. Conclusion

The diversity of fruit found in Jember Regency will contribute to the availability of phytonutrients and can increase immunity during the Covid-19 pandemic for the people of Jember District. The availability of local fruit is stable for fruits that do not know the season. The availability of local vegetables is stable for cultivated vegetables.

The functions of the immune system include the following: (1) Defense System: is the main function of this immune system, namely as the body's defense system, both in diseases that can or can be transmitted or caused by viruses and bacteria, (2) Homeostatic balance: is an ideal balance in the body which has a function to be able to meet the needs of the body namely by interacting with all the systems contained in the body. So that immunity is useful to be able to maintain a homeostatic balance in order to work properly. (3) System Repair: The function of tissue repair is to be able to repair tissue by eliminating dead or damaged cell tissue in the body. Apart from that it is also in order to eliminate abnormal cells.

There are several ways to increase the body's immune system including: (1) Adequate rest. A number of medical experts then agreed that adequate and adequate rest is effective in being able to boost the immune system. The opposite happens if you don't have or have the right rest time, which will reduce the quality of the immune system, (2) Exercise regularly. In addition to adequate and proper rest, regular exercise is also claimed to be a powerful way to increase the body's immune system. No need for strenuous sports activities or activities, just walking leisurely in the morning or yoga alone can or can make the immune system experience an increase in quality, (3) Bask in the sun. The sun itself is the main source of vitamin D, which this vitamin has or has an important role to play in boosting the immune system, especially if the immune system is experiencing a decline, such as when you are sick, for example, (4) Consumption of Fruits and Vegetables. These fruits and vegetables are the best way to boost your immune system that you can or can do. Whatever types of fruit and vegetables, make sure they are always included in the daily diet. That way, the immune system will always be in the best condition or situation.

The making of a database of local fruits and vegetables in Jember District that can increase immunity during the Covid-19 pandemic is for the first time done through this research. The results of research that have found 28 types of local fruit and 18 types of local vegetables that can increase immunity during the Covid-19 pandemic, can contribute to the availability of foodstuffs in Jember District.

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