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Original Research

Formulation Functional Powder Drink Of Avocado (*Persea americana* Mill.) Seed And Star Anise (*Illicum verum* Hook.f.)

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ABSTRACT

Background: *Production of avocados in Central Java has increased every year, and products from seeds that have not been utilized optimally will be produced. Processing avocado seeds is very necessary so that they become foods that have a high selling value while maintaining the content of antioxidant compounds contained therein. One way to optimize is to make avocado seed powder that can be processed into a functional powder drink.*

Methods: *The method and the type of research conducted quantitatively using a descriptive design. Parameter tests include quality tests, flavonoid qualitative tests with color reaction tests, flavonoid quantitative tests, and antioxidant activity tests using a UV-Vis spectrophotometer.*

Results: *Quality tests show that the functional powder drink has a smooth texture, a whitish brown color, a distinctive smell, and a sweet taste. The pH was 6,599±0,038, 6,699±0,017, and 6,741±0,030. A qualitative test of flavonoids shows positive results, followed by a quantitative test of flavonoids obtained flavonoid levels of 12,044±0,009428%, 12,214±0,009428%, and 12,419±0,009428%. Antioxidant test results for functional drinks showed an* IC_{50} *value of 128,422 ± 0.0094 mg/L categorized as a moderate level of antioxidants.*

Conclusion: *The organoleptic test of functional powder drinks of avocado (Persea americana Mill.) seed and star anise (Illicum verum Hook f.) revealed a whitish chocolate color, typical spice smell, typical spice and sweet taste, and a fine powder texture.*

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INTRODUCTION

Health is important for all humans because, without good health, every human being will find it difficult to carry out their daily activities. Health Law No. 36 of 2009 provides a limit: health is a state of physical, mental, and social well-being that allows everyone to live socially and economically productive lives (Departemen Kesehatan RI,

2009). Every day, the simplest way to maintain health is to consume functional drinks that are good for health (Wardani, 2014).

Functional drinks are drinks that contain elements of nutrients or non-nutrients and, if consumed, can have a positive effect on body health (Musthikaningtyas & Tri, 2015). Novitasari (2020) stated that functional drinks can be made from various kinds of plants, one of the plants that can be processed into functional drinks is avocado seeds (*Persea americana* Mill.). Research by Afrianti (2010) proves that avocados (*Persea americana* Mill.) are rich in antioxidants and nutrients.

The content of antioxidants, fiber, and phenolic compounds in avocados is more concentrated in the seeds of the fruit than in the flesh. The production of avocados in Central Java has increased every year. With 44,522 tons produced in 2018 and an increase of 60,145 tons in 2019, products of seeds that have not been utilized optimally will be produced (Badan Pusat Statistik, 2019). Products of avocado seeds have bioactive compounds such as phenolic derivatives, namely flavonoids, polyphenols, and others, these compounds have antioxidant properties that are good for our bodies.

Antioxidants can control blood glucose levels, improving pancreatic function in producing insulin (Meiske et al., 2012). Avocado seeds have antioxidants with an IC_{50} value of 31.5 ppm (Azizah et al., 2014). Novitasari (2020) stated that avocado seeds have a slightly bitter taste and smell and can be combined with other ingredients as flavors and fragrances in beverage formulations.

Star anise (*Illicum verum* Hook.f.) contains essential oils (anethole 85–90 %), resins, fats, tannins, pectin, terpenes, limonene, estradiol, safrole, thymoquinone, flavonoids, and glucosides (Ali et al., 2010). Setyowati (2017), suggested that the essential oil content of the star anise, which has a distinctive aroma and a sweet taste, can be combined with other ingredients. Several studies explained that star anise has an antimicrobial, antifungal, anti-inflammatory, anti-allergic, and anticancer effect (Muchtadi et al., 2016). Star anise extract contains compounds that have the potential to be antioxidants, such as phenols and flavonoids. Star anise contains antioxidant activity with anIC_{50} value of 56.846 μg/mL (Dewajanthi et al., 2020).

Functional drinks tested based on physical quality include those that pass organoleptic, pH, and antioxidant activity tests (Rohmayanti et al., 2019). Indonesian National Standard number 01-4320-1996 explains the physical requirements of traditional powder drinks: color, smell, and taste are normal, typical of spices, and the type of spices (Badan Standarisasi Nasional, 1996). One of the components of functional drinks that have physiological functions for the body are antioxidants (Puspita et al., 2019). Measurement of antioxidant activity using the DPPH (2,2-diphenyl-1-picrylhydrazil) method is a simple method that uses a small number of samples in a short time (Hasnaeni & Aminah, 2019).

Based on the description above, the author wants to utilize avocado seed waste so it can be processed into beverage products with the addition of star anise as a flavor and fragrance, which is made into a functional powder drink that is efficacious as an antioxidant. As a result, the authors are intrigued by the study titled "Formulation Functional Drink of Avocado (Persea americana Mill.) Seed and Star Anise (Illicum verum Hook.f.)".

MATERIALS AND METHOD

The main raw materials used were the simplisia of avocado seeds (*Persea americana* Mill.), star anise (*Illicium verum* Hook.f.), and sucrose, which were obtained

from Yogyakarta. Quercetin, $AlCl_3$ 10%, DPPH (2.2-diphenyl-1-pikrilhydrazil) were obtained from Sigma (Sigma Aldrich GmbH, Sternheim, Germany). Acetic acid, Mg powder, HCl at 37%, and methanol p.a. were obtained from Merck, Darmstadt, Germany.

Whatmann 41 filter paper, aquades, pH 4, 7, and 10 buffers Analytical balance, 18-mesh sieve, blender, pH meters, beaker glasses, stirrer rods, thermometers, drip pipettes, test tubes, tube racks, vortexers, sudips, measuring cups, glass funnels, measuring pipettes, measuring pumpkins, kuvets, and UV-Vis spectrophotometers. This research was conducted in January–April 2021 at the Integrated Laboratory of Campus 3 Health Polytechnic of the Surakarta Ministry. This research is of the descriptive type with a quantitative descriptive design because it describes a sample objectively with data in the form of numbers or shaken data, and the variables used in this study are single variables.

This research includes the flouring process for making functional drink, physical quality analysis, including organoleptics and pH testing, qualitative and quantitative analysis of flavonoids, and antioxidant activity of functional drink made from avocado (*Persea americana* Mill.) seed waste, and star anise (*Illicum verum* Hook.f.). This research is of the descriptive type with a quantitative descriptive design because it describes or describes a sample objectively with data in the form of numbers or guessed data.

Functional Powder Drink of Avocado (*Persea americana* Mill.) Seed Waste and Star Anise (*Illicum verum* Hook.f.).

This study was carried out in three stages: the first was the production of functional beverage powder, the second was the testing of functional beverage powder, and the third was the processing and analysis of the data collected. Determination of Avocado (*Persea americana* Mill.) seed: the determination of avocado (*Persea americana*) seed was carried out in the Pharmacy Biology Laboratory, Islamic University of Indonesia; Manufacture of functional beverage powder. Extraction of avocado seeds and star anise refers to Anggoro modification (2018) which is the simplisia powder of avocado seeds and star anise are each infused with aquades (1:10) at a temperature of 90 ^{o}C for 15 minutes and strained, then evaporated until thick. The composition of functional beverage powders can be seen as follows.

Table 1. Functional Beverage Powder Composition

Composition	Formula		
	1	2	3
Avocado seeds	35%	40%	45%
Star Anise	35%	35%	35%
Sucrose	30%	25%	20%

The process of functional beverage powder refers to the modification of Rifkowaty et al., (2019), avocado seed extract and star anise mixed according to treatment, and sucrose added to the juice mixture. The mixture of sucrose and extract is heated over a steady, low heat while continuing to stir until crystals form. The resulting crystals are smoothed with a blender and sedated with an 18 mesh sieve to obtain functional beverage powder, which is then transported for further analysis.

Functional Beverage Powder Testing

Quality Test

Organoleptic test: Organoleptic testing is a means of testing using the human senses as the primary tool for measuring the power of reception to products that include smell, color, taste, and texture (Akmal, 2013).

pH test: Measured pH sample using pH meters that have been calibrated first using a pH buffer of 4, 7, and 10 then the sample of 8 grams is dissolved in 20 mL aquades, then dipped the pH meter electrode into the sample and awaited until the reading number becomes stable. The pH measurement is replicated three times and calculated on average (Musthikaningtyas & Tri, 2015).

Qualitative Test of Flavonoid

A total of 4 grams of the sample are dissolved in 40 mL of methanol p.a., then 10 mL are taken and put into a test tube. Added to the sample in the form of magnesium powder (2 mg) and given 3 drops of concentrated HCl. The sample is shuffled, and changes that occur are observed. Tests were conducted with three replications, and the formation of red, yellow, or orange in the solution showed the presence of flavonoids (Puspita et al., 2019).

Quantitative Test

Total Flavonoid Levels

The manufacture of a standard solution of 200 ppm quercetin is done by weighing as much as 10 mg of quercetin, dissolving it in methanol p.a. to taste, and adding 50 mL of takar squash in gojog until it is homogeneous (Azizah et al., 2014). Determination of the maximum wavelength of quercetin is done with a standard solution of 200 ppm quercetin, which is then made into a 100 ppm quercetin solution. A total of 1 mL of 100 ppm quercetin solution, 1 mL of 10% $AlCl_3$, and 8 mL of 5% acetic acid were added. The solution is incusted for 30 minutes, and absorbance is measured at wavelengths of 350–500 nm (Bakti et al., 2017).

The manufacture of the calibration curves will be done by making serial solution levels of 40, 60, 80, 100, and 120 ppm. A total of 1 mL of serial solution levels of each concentration are entered, and they react with 1 mL of $AlCl_3$ at 10% and 8 mL of acetic acid at 5%. After 30 minutes, the sample was silenced, and a series of absorption readings of levels were taken using UV-Vis spectrophotometry at a maximum wavelength (Sari & Ayuchecaria, 2017).

Determination of total flavonoid levels in functional beverage samples has been done by making a concentrated solution of 800 ppm, then spinning a vortex for 10 minutes at a speed of 3000 rpm. Then take much as 1 mL sample is inserted into a test tube and added 1 mL $AlCl_3$ 10% and 8 mL acetic acid 5%. Then the sample is incubated for 30 minutes, with absorbance measured at the maximum wavelength (Sari & Ayuchecaria, 2017).

Flavonoid levels are calculated using linear regression equations based on calibration curves resulting from UV-Vis spectrophotometer readings. Absorbance data obtained from measurements is entered into linear regression equations as y and x values representing raw solution concentrations. The linear regression equation is

expressed by the formula: y = bx + a, where y = absorbance, a = interception, x = concentration (ppm), and b = slope (slope).

The absorbance results of the sample measurement are entered into linear regression. Absorbance of the sample as y, so that the total flavonoid levels obtained are expressed as the mg amount equivalent of quercetin (QE) in each gram of the sample (Sari & Ayuchecaria, 2017) :

$$\% \text{ Total Flavonoids} = \frac{C \times V \times Fp}{m} \times 100\%$$

Information:
C = Concentration of quercetin (ppm)
V = Total sample volume (L)
Fp = Dilution factor
M = Sample weight (g)

Antioxidant Activity

Determination of maximum wave display DPPH is done by making a concentration of 50 ppm. The standard solution is then placed in a dark bottle. Baku meditated in a dark room for 30 minutes. The DPPH solution is determined by its maximum absorption wavelength using a UV-Vis spectrophotometer at a wavelength (λ) of 400–600 nm (Tahir et al., 2020).

The manufacture of quercetin solution as a comparison is done by making a concentration of 25 ppm. Then dilution is done to add methanol p.a. so that the solution is obtained with concentrations of 2, 4, 6, 8, and 10 ppm. Take 2 mL of 50 ppm DPPH solution added each series of 1 ml of quercetin solution. The solution is homogenized and incubated in a dark room for 30 minutes. The sample was measured for absorption with a UV-Vis spectrophotometer with the wavelength obtained (Tahir et al., 2020).

The determination of antioxidant activity in functional beverage samples is done by making a solution of concentration samples of 200, 400, 600, 800, and 1000 ppm. The sample solution is then vortexed for 10 minutes at a speed of 3000 rpm, then as much as 1 mL from each concentration is inserted into the test tube and added to 2 mL of DPPH solution at 50 ppm. A blanko solution is then made with 1 mL of methanol p.a. and 2 mL of DPPH solution at 50 ppm.

The vortex solution returns for 1 minute at a rate of 2000 rpm, then is incubated at lightproof indoor room temperature for 30 minutes. This solution is then measured in its absorbance at the maximum wavelength (Tahir et al., 2020).

$$\% \text{ Inhibition} = \frac{Standard\ absorbance - Sample\ Absorbance}{Standard\ absorbance} \times 100\%$$

IC_{50} value is a number that indicates the concentration of the test sample that provides immersion of 50% (able to inhibit or soak the oxidation process by 50%). The value of IC_{50} is determined by making a linear curve between the concentration of the test solution (x-axis) and % inhibition (y axis) so that the equation y = bx + a where y is % inhibition and x is the value of IC_{50} (Handayani et al., 2020).

$$IC_{50} = \frac{50-a}{b}$$

RESULTS

Determination of Avocado (*Persea americana* Mill.) seed

The result of the determination is obtained by the formula:
1b-2b-3b-4b-7b-9b-10b-11b-12b-13b-14b-16a-(class 10)
239b-243b-244a-245b-246b-247a-(Lauraceae)
1a-2a-13a-14a-(Persea americana Mill.)

Quality Test

Organoleptic Test Functional Powder Drink of Avocado (*Persea americana* Mill.) Seed and Star Anise (*Illicum verum* Hook f.)

Organoleptic tests are performed to determine the physical quality of functional powder drinks including color, smell, taste and texture. The results of organoleptic tests can be seen in table 2.

Table 2. Organoleptic Test Of Functional Powder Drink

Test Criteria	Result of Formula		
	1	2	3
Color	Whitish chocolate	Whitish chocolate	Whitish chocolate
Smell	Typical spices	Typical spices	Typical spices
Taste	Typical spice, sweet	Typical spice, sweet	Typical spice, sweet
Texture	Fine powder	Fine powder	Fine powder

Figure 1. Functional powder drink

The pH Test Functional Powder Drink of Avocado (*Persea americana* Mill.) Seed and Star Anise (*Illicum verum* Hook f.)

The pH test is done to determine the level of acidity or numbness in a functional powder drink. The results of the pH test can be seen in table 3.

Table 3. pH test in functional powder drink

Formula functional powder drink	Replication			Mean±SD	Category
	1	2	3		

Formula functional powder drink	Replication			Mean±SD	Category
	1	2	3		
1	6,569	6,679	6,769	6,599±0,038	Weak acid
2	6,653	6,697	6,699	6,699±0,017	Weak acid
3	6,574	6,721	6,756	6,741±0,030	Weak acid

Flavonoid Test Functional Powder Drink of Avocado (*Persea americana* Mill.) Seed and Star Anise (*Illicum verum* Hook f.)

Flavonoid tests are conducted to find out the presence of flavonoid content in samples of functional drinks that have the potential as antioxidants. Flavonoid tests are qualitative and quantitative flavonoid tests.

Qualitative Test of Flavonoids

Qualitative tests of flavonoids are conducted to determine the presence of flavonoids in functional powder drinks. The results of the flavonoid qualitative test can be seen in table 4.

Table 4. Flavonoid Qualitative Test

Sample	Color	Interpretation
Flavonoid standard	Red	+
Avocado seed powder	Red	+
Star anise powder	Red	+
Functional powder drink 1	Red	+
Functional powder drink 2	Red	+
Functional powder drink 3	Red	+

Total Flavonoid Quantitative Test

Quantitative tests of total flavonoids were conducted to determine the levels of flavonoids in functional powder drink The results of the total flavonoid quantitative test:

Table 5. The absorbance of quercetine

Concentration (ppm)	Absorbance
40	0,274
60	0,386
80	0,508
100	0,652
120	0,747

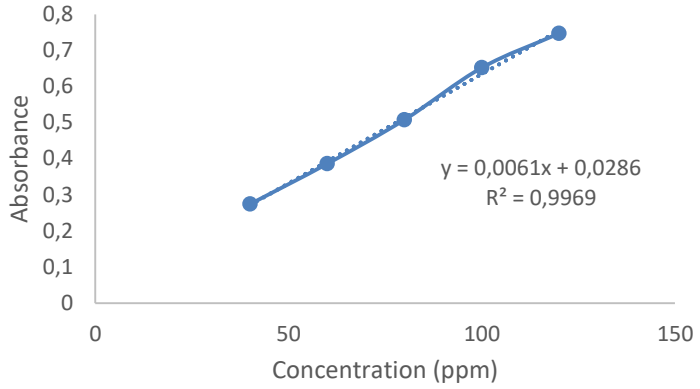

Figure 2. Calibration curve of quercetine

Table 6. The result of total flavonoid levels Functional Powder Drink of Avocado (*Persea americana* Mill.) Seed and Star Anise (*Illicum verum* Hook f.)

Formula	Replication	Absorbance	Concentration (ppm)	Total Flavonoid level (%)
F1	1	0,616	96,295	12,037
	2	0,617	96,459	12,057
	3	0,616	96,295	12,037
	Mean±SD	**0,616**	**96,349**	**12,044±0,009428**
F2	1	0,625	97,771	12,221
	2	0,625	97,771	12,221
	3	0,624	97,607	12,201
	Mean±SD	**0,625**	**97,716**	**12,214±0,009428**
F3	1	0,635	99,409	12,426
	2	0,634	99,246	12,406
	3	0,635	99,409	12,426
	Mean±SD	**0,635**	**99,355**	**12,419±0,009428**

Antioxidant Activity Test

The antioxidant activity test was conducted to determine the antioxidant properties in functional powder drink. The antioxidant activity test was carried out on functional powder drinks that had the highest total flavonoid content. The results of the antioxidant activity of functional drinks are as follows:

Table 7. Result of Antioxidant Activity of Formula 3

Concentration (ppm)	Absorbance				% Inhibition	IC_{50} (ppm)
	R1	R2	R3	Average		
200	0,379	0,366	0,356	0,367	53,009	
400	0,266	0,296	0,280	0,272	65,216	
600	0,188	0,180	0,194	0,187	76,014	128,422±0,0094
800	0,091	0,092	0,092	0,092	88,263	
1000	0,034	0,037	0,023	0,031	96,988	

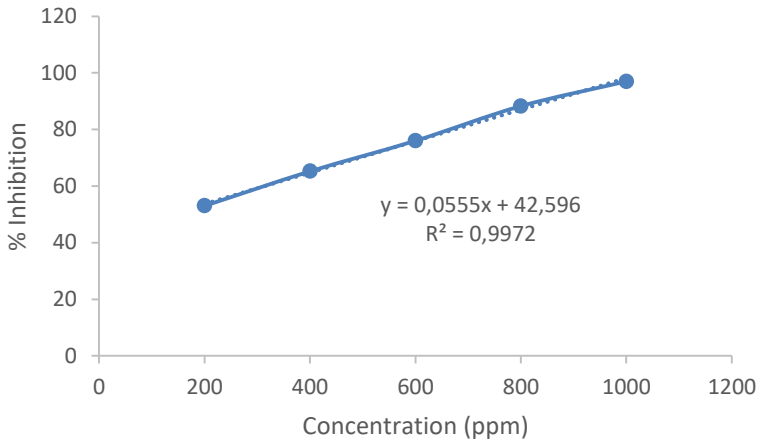

Figure 3. % inhibition curve of Formula 3

DISCUSSION

Determination of Avocado seeds (*Persea americana* Mill.)

The first step in this research is to determine the sample used, namely avocado seeds. This determination is carried out macroscopically at the Pharmacy Biology Laboratory of the Islamic University of Indonesia. The determination aims to ensure and prove that the identity of the sample used in this study is true avocado (*Persea americana* Mill.) seed.

The determination was made by adjusting the morphological condition of the plant using the key of determination contained in the Javanese flora (Backer, C.A., and Bakhuizen van den Brink, 1965). From the results of the determination formula, it can be ascertained that the plant is *Persea americana* Mill., commonly known as avocado.

Functional Powder Drink of Avocado (*Persea americana* Mill.) Seed and Star Anise (*Illicum verum* Hook f.)

The stage of making a functional powder drink begins with weighing the powders of avocado (*Persea americana* Mill.), sesame seed, and star anise (*Illicum verum* Hook f.). It is suggested that the infusion or extract of the sample be made by heating the material and aquadest solvent in a ratio of 1:10, then heated at 90 ^{o}C for 15 minutes using a water bath. The extract obtained is then blown up to half its initial volume, and the powder is made by mixing sucrose and stirring until it crystallizes.

Selection of the extraction ratio of 1:10 because this comparison is the best against flavonoid compounds (Waji, 2009). The addition of sucrose is intended as a sweetener and to form a crystallization process made into beverage powder to improve quality and facilitate storage so that its functional properties for health can be well maintained (Permadi et al., 2015). The crushed crystals were then sieved with an 18 mesh sieve because the degree of fineness produced was higher so that the powder dissolved in water more quickly, suggesting that the degree of fineness indicates the uniformity of the milling results or the distribution of coarse and fine fractions.

The finer the powder, the faster it will dissolve in water because the surface of the powder that is in direct contact with the solvent is getting wider, while the coarser the powder, the longer it will take to dissolve because the more cells the solvent has to penetrate (Rohmayanti et al., 2019).

Quality Test

Organoleptic and pH of Test Functional Powder Drink of Avocado (*Persea americana* Mill.) Seed and Star Anise (*Illicum verum* Hook f.)

The first test that was performed was an organoleptic test. Organoleptic tests were carried out to determine the physical quality of functional powder drinks, including color, smell, taste, and texture, with the results shown in table 2. The results obtained are in accordance with SNI 01-4320-1996 regarding the quality standard of traditional powder drinks, which explains that traditional powder drinks must have a normal color, smell, and taste typical of spices (Badan Standarisasi Nasional, 1996).

The pH test on functional powder drinks is performed using a pre-calibrated pH meter. Calibration is part of the maintenance of the tool and aims to ensure that the measurement results of the tool are acceptable and fall within the required validation range. Calibration of pH is carried out using a standard buffer solution reference material at acidic, alkaline, and neutral conditions (Nuryatini et al., 2016).

The pH test is a standard of acidity that determines the quality of a functional powder drink after being dissolved in water. The pH of the functional powder drink depends on the type and amount of raw materials added during the manufacturing process. The pH obtained ranged from 6.6 to 6.7 (Table 3). These results are in accordance with the research of Adhayanti I. and Tahir A. (2020), who found that the pH test results for powdered drinks must be acidic (pH 6–6.8) because it can affect the taste quality of the functional powder drink.

Test results from three formulas of functional powder drinks showed that these drinks had weak acidic properties due to the presence of flavonoid content in them. It is suggested that flavonoids are a group of polyphenols, so they have the chemical properties of phenol compounds that are acidic so they can dissolve in bases and have antioxidant properties (Arifin & Ibrahim, 2018).

Qualitative Test of Flavonoid on Avocado (*Persea americana* Mill.) Seed Powder, Star Anise (*Illicium verum* Hook f.) Powder, and Functional Powder Drink of Avocado (*Persea americana* Mill.) Seed and Star Anise (*Illicum verum* Hook f.)

A qualitative test was conducted to find out the presence of flavonoid compounds in the sample of avocado (*Persea americana* Mill.) seed powder, star anise (*Illicium verum* Hook f.) powder, and functional powder drinks, which is presented in Table 4. Qualitative test results of flavonoids on avocado (*Persea americana* Mill.) seed powder, star anise (*Illicium verum* Hook f.) powder, and functional powder drinks are proven by the formation of a red color in the solution. It is said to be positive if it contains flavonoids in accordance with the research of Rahayu et al., (2015), which states positive results if a red or orange solution is formed, indicating the presence of flavonoids.

Quantitative Test of Flavonoid on Functional Powder Drink of Avocado (*Persea americana* Mill.) Seed and Star Anise (*Illicum verum* Hook f.)

Total flavonoids are the total amount of secondary metabolite compounds derived from a plant. The total content of flavonoids is measured based on the presence of quercetin in plant extracts because quercetin is the most active substance in flavonoids, so quercetin represents other flavonoid compounds (Azizah et al., 2014). Quantitative tests of total flavonoids were conducted with a UV-Vis spectrophotometer at a

maximum wavelength of 418 nm. The wavelengths used for quantitative tests of flavonoids total between 350-500 nm (Bakti et al., 2017).

Long maximum waves are done to find out at what wavelength there is the maximum absorption value in the sample, so that the measurement results are accurate and minimize errors (Tahir et al., 2020). The solvent used is methanol p.a. because methanol is polar. Methanol is a liquid that easily enters the cell through the material's cell wall, so that the metabolites of the sunder contained in the cytoplasm will be dissolved in the solvent and the compound will be extracted perfectly.

Flavonoid compounds are polar compounds because they have a number of bound sugars that are bound, therefore, flavonoids are more likely to dissolve in polar solvents. According to the principle of polarization, a compound will dissolve in a solvent that has the same polarity (Suryani et al., 2016). Quantitative tests of total flavonoids were conducted to look for flavonoid levels in functional beverage samples measured quantitatively by the aluminum chloride method using a standard solution of quercetin.

Quantitative tests of total flavonoids were conducted with the addition of 1 mL of 10% $AlCl_3$ and 8 mL of acetic acid for every 1 mL of sample solution concentration to be tested. Azizah et al., (2014) suggested that the total flavonoid content was determined based on a colorimetric reaction, that is, after the sample was reacted with $AlCl_3$ in an acidic medium. The addition of $AlCl_3$ in the sample can form a complex between aluminum chloride and quercetin, resulting in a shift in wavelength towards visible (visible) and characterized by the solution producing a more yellow color. The function of adding acetic acid is to maintain wavelengths in visible areas.

Samples containing flavonoids will react with the $AlCl_3$ reagent to form a reaction complex between hydroxyl groups and neighboring ketones or with neighboring hydroxyl groups. Solution of $AlCl_3$ will react with ketone groups in C-4 and OH groups on C-3 or C-5 in flavon compounds or flavonols to form stable yellow complex compounds. Compounds used as standards in determining flavonoid levels are quercetin, because quercetin is a flavonoid flavonol group that has a keto group on C-4 atoms and also a hydroxyl group in neighboring C-3 and C-5 atoms (Sari & Ayuchecaria, 2017).

Based on the results of these measurements, the higher the concentration, the higher the absorbance. Linear regression equation obtained, i. e $y = 0.0061x+0.0286$. The average flavonoid total content of functional powder drink og avocado (*Persea americana* Mill.) seed and star anise (*Illicum verum* Hook f.) were 12,044±0,009428 %, 12,214±0,009428 %, and 12,419±0,009428 %, respectively, that can be seen in Table 6. Based on these data, the more addition of avocado (*Persea americana* Mill.) powder addedder, the higher the total flavonoid contents.

Antioxidant Activity Test Functional Powder Drink of Avocado (*Persea americana* Mill.) Seed and Star Anise (*Illicum verum* Hook f.)

Functional beverage samples have flavonoid content that has the potential to be used as antioxidants. The antioxidant activity of functional beverages is expressed as inhibitory concentration 50 (IC_{50}), which is defined as the concentration of antioxidant compounds needed to reduce free radical activity by 50%, where the smaller the IC_{50} value, the higher the antioxidant activity. Determination of antioxidant activity is done by the method of DPPH (2,2-diphenyl-1-picrylhydrazyl) by utilizing DPPH free radical compounds in polar solvents such as methanol to test antioxidant compounds in dampening free radicals (Sagar, B. K., & Singh, 2011).

The capture of DPPH free radicals by antioxidants will cause a reduction of DPPH compounds, causing the purple color to fade and the yellow diphenilpycrilhydrazine complex to form, which is non-radical (Izza et al., 2016).

Based on Table 7, the IC_{50} value of a functional powder drink with Formula 3 is 128,422 ppm. It showed that the antioxidant activity of functional powder drinks with Formula 3 is at a medium level because the antioxidant activity is between 101-250 ppm based on the classification of antioxidants (Sari & Ayuchecaria, 2017).

The medium-level antioxidant activity possessed is suspected because the compounds contained are flavonoids of the flavonoid class. Flavonols generally have medium antioxidant activity. Medium level antioxidant activity of flavonols compounds are generally caused by hydroxyl groups contained in the structure of the compound only a little.

So it is most likely to stabilize the structure of compounds if the loss of electrons from the hydrogen donor process does not occur. Another factor that affects antioxidant activity is the processing process, where antioxidants are easily oxidized and degraded by air and heat. Ingredients with the potential for antioxidant activity that are heated and directly exposed to air will have their chemical content damaged, reducing their antioxidant activity (Arung et al., 2011).

CONCLUSION

Based on this research, it can be concluded that the organoleptic test of functional powder drinks of avocado (*Persea americana* Mill.) seed and star anise (*Illicum verum* Hook f.) had a whitish chocolate color, typical spice smell, typical spice and sweet taste, and a fine powder texture. The average pH tests of functional powder drinks of avocado (*Persea americana* Mill.) seed and star anise (*Illicum verum* Hook f.) was 6,599±0,038, 6,699±0,017, and 6,741±0,030 respectively. Powder of avocado (*Persea americana* Mill.) seed, star anine (*Illicum verum* Hook f.), and functional powder drinks of avocado (*Persea americana* Mill.) seed and star anise (*Illicum verum* Hook f.) contain positive flavonoid compounds, the total flavonoid content of the functional powder drinks of avocado (*Persea americana* Mill.) and star anise (*Illicum verum* Hook f.) was 12,044±0,009428%, 12,214±0,009428%, and 12,419±0,009428% respectively.

The IC_{50} value of functional powder drinks of avocado (*Persea americana* Mill.) and star anise (*Illicum verum* Hook f.) with Formula 3 is 128,422 ppm, which is included in the medium level antioxidant.

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