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Test Acceptance and Antioxidant Content (Polyphenols) Grape jelly boba chia seed Formula as a Potential Beverage for Coronary Heart Disease

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ABSTRACT
In Indonesia, coronary heart disease is the most common cardiovascu-lar disease.This disease is caused by narrowing, blockage, or abnormali-ties in the coronary arteries, which carry blood to the heart muscle. An-tioxidants have been shown to have the ability to help fight various diseases. Grapes are rich in the polyphenol compound resveratrol, which has benefits in preventing colon cancer, prostate cancer, coro-nary heart disease and neurodegenerative diseases. This study aims to determine the acceptability and antioxidant activity levels of Grape Jelly Boba Chia Seed drink as a potential drink for coronary heart dis-ease. Organoleptic test treatment with the following formulation F1 (control) comparison between Brown sugar, Full Cream Milk, Tapioca Flour, Tea is (45:70:15:30) F2 comparison between Grape, skim milk, wheat flour, chia seeds are (100:50:7:3) F3 ratio between Grape, skim milk, wheat flour, chia seeds is (80:70:6:4). Grape Jelly Boba Chia Seed drink most preferred by the panelists was F2.The highest average antioxidant content in the Grape Jelly Boba Chia Seed drink formula was sample F2, which was 75.04%.For people with coronary heart dis-ease, you can consume 1 portion of Grape Jelly Boba Chia Seed drink, namely 100 ml per day to reduce cholesterol levels.

Keywords: Antioxidants,Polyphenols,Grape,Jelly,Boba,Chia Seed, Coronary Heart Disease

INTRODUCTION

Heart and blood vessel diseases collectively referred to as cardiovascular disease (CVD) include coronary heart disease, which is the leading cause of death in the nation of America to get both men and women. Coronary heart disease (CHD) is the most common type of cardiovascular disease (CVD) as all other types[1]. In accordance estimates of the global burden of CVD in low- and middle-income nations, especially the people of South Asia, it has for 75% of all deaths and 86.3% of deaths from disability-related delivers in such countries[2]. Worldwide, 1.28 billion adults in age to 30 and 79 believe to develop CAD, in the majority for the affecting (two thirds) living in low- and middle-income nations, according to the WHO[3]. According to epidemiologists, there will be on 1.56 billion adult cases of hypertension by 2025, that describes an increase of 60% on the totality of cases in the hypertensive population in 2000[4].

World Health Organization data shows non-communicable diseases (NCDs) cause approximately 39.5 million of the 56.4 million deaths in the world, or 70% of all deaths. Heart and blood vessel disease accounted for 17.7 million worldwide deaths, or 45% of the population. In Indonesia, heart and blood vessel disease (CHD), a circulatory system disease, is the majority of deaths, and causes 26.4% of all deaths, according to the Ministry of Health's 2019 report. The prevalence of deaths from cancer is only 6%, so this value is a fourth high. Put differently, (CHD) results in one on four deaths in Indonesia[5].

From information from Basic Health Research (Riskesdas) in 2018, the

prevalence of coronary heart disease (CHD) in Indonesia reached 1.5%. In East Java Province, the prevalence is slightly greater, namely 1.6%. Calculations based on estimates and indications show that the highest number of CHD sufferers is in East Java Province with 375,127 people, while West Papua Province has a very small number of sufferers, amounting to 6,690 people[6]. Modifiable risk factors such as diabetes, obesity, hypercholesterolemia, smoking, and hypertension are increasing rapid in correlation with changes in the state of the environment global[7] .Controlling cardiovascular disease risk factors, such dyslipidemia, which has very important modifiable risk factors, is one of the ways to lower morbidity and death. In order to prevent cardiovascular events, it helps to learn the link between lipids and the risk of coronary heart disease. The biggest cardiovascular cause of morbidity and death is dyslipidemia. The primary risk factor for it events is dyslipidemia[8].

Reducing consumption of foods that are high in fat and cholesterol can reduce the risk of developing heart disease and blood vessel problems. It is best to consume vegetables and fruit for people who suffer from coronary heart disease and other cardiovascular diseases. Compounds such as fiber and antioxidants found in vegetables and fruit function in reducing the risk of serious cardiovascular disease. Consuming fiber in particular can function in helping to reduce cholesterol levels, which in turn can reduce the risk of plaque buildup in blood vessels[9]. This step aims to reduce the number of people with high cholesterol levels, which can stimulate heart disease. It is recommended that increasing consumption of high-fiber foods, such as fruit and vegetables, as part of this strategy[10]. Other methods or efforts. This can be done by paying attention to consuming salt so that it does not exceed one teaspoon per day, reducing foods with high cholesterol content, especially for people with high LDL content. Avoid foods with a lot of sugar because they can increase the risk of diabetes, which is one of the main triggers for coronary heart disease[11].

Antioxidants have the ability to fight various diseases, such as degenerative diseases that are difficult to treat. One natural source of free radical inhibitors that has been proven to be efficient is seeds *divide* which is often found in Mexico and Guatemala, contains omega *3 ALA (Asam Alpha- linolenat)*, fiber, vitamins and minerals. The large antioxidant content provides many benefits, including the ability to reduce triglyceride and total cholesterol levels. Hence, seeds *divide* can help lower blood pressure and reduce the risk of cardiovascular disease[12]. Although still unknown to many people, the health benefits of chia seeds show that this natural food ingredient can provide beneficial benefits for heart health.

Grapes have compounds *polifenol resveratrol* which is efficient in preventing colon and prostate cancer, coronary heart disease, and degenerative neurological diseases[13]. Grapes contain phytochemical compounds that function as bioactive compounds, including polyphenols, anthocyanins, flavonoids, stilbenes, phenolic acids, proteins, fats, and vitamin C[14]. With its strong antioxidant activity, grapes inhibit cancer cell proliferation, suppress platelet aggregation and lower cholesterol[15]. *Flavonoid* can function in increasing the content of good cholesterol (HDL) as well as reducing levels triglycerides in blood. Anthocyanins, a type of flavonoid, have been clinically tested and proven to protect the system cardiovascular. Anthocyanin, with its unique mechanism of action, to the same extent as similar cholesterol-lowering drugs ciprofibrate, both can provide different health benefits for the body[16].

Jelly drink is a semi-solid drink made by cooking fruit juice with sugar. The consistency is similar to jelly, but not as stiff. The taste is delicious and natural, making jelly drinks more than just ordinary drinks; so it can be used as an option to

overcome hunger[17]. In recent years, boba drinks have become very popular among Indonesians. This phenomenon began in Taiwan in 1980, when the drink was named zhen zhu nai cha found. In Indonesian, this drink is known as pearl milk tea, or more commonly known as milk tea boba, boba milk tea, or bubble tea. Milk tea boba is a tea-based drink that is prepared by combining fruit flavors and/or milk, and added with chewy balls made from a combination of tapioca flour and brown sugar. These balls are often pronounced as boba", "bubble," or "pearl," and its chewy texture are the main characteristics of boba milk tea drinks. In recent years, boba drinks have achieved great popularity in Indonesia. Boba drinks continue to become popular among young and old people, with new outlets continuing to appear to meet demand[18].

Although famous, boba It is included in the type of sweet drinks that are high in sugar, which can contribute to higher levels of obesity, cardiovascular disease, diabetes mellitus, and higher uric acid levels[19]. Therefore, researchers are interested in the topic of Coronary Heart review because it is based on the results of information on prevalence which is still large, and is still a problem at the moment. Beverage growth boba shows that there is a need to create useful product innovations, including in the context of coronary heart disease which requires special attention by providing useful innovations through researched products. This product is a drink that is popular and trendy among all ages.

Not only contemporary but also drinks boba made by researchers has various benefits, so that people with coronary heart disease can always enjoy a drink that is delicious and beneficial for health. Here researchers make beverage products boba which is made from wheat flour and grape juice. In the product there is skim milk, jelly from grape juice, boba, as well as sauces made from grape juice using the method caramelized. It is also added to these drinks chia seed which is the treatment of the product sample.

RESEARCH METHOD

This type of research is experimental research because it involves giving certain treatments to research samples to evaluate the impact of the treatment given. The method of this research is True-experimental design. Testing on drinks Grape Jelly Boba carried out through 2 stages of test types, namely: Subjective test and objective test. Subjective tests were carried out by analyzing acceptability using organoleptic tests from 25 slightly trained panelists. The aspects assessed included color, aroma, texture and taste. The organoleptic test treatment contains 1 form of control formula and 2 forms of modified formula with the following formulation: F1 (control) comparison between Brown sugar, Milk Full Cream, Tapioca flour, Tea of (45:70:15:30), F2 ratio of Grape, milk skim, wheat flour, chia seeds of (100:50:7:3), F3 ratio between Grape, milk skim, wheat flour, chia seeds amounting to (80:70:6:4).

Meanwhile, objective tests are tests carried out in a laboratory by looking at the antioxidant (polyphenol) content in drinks Grape Jelly Boba Chia Seed. Data from organoleptic tests were tested using Kruskal Wallis to determine the differences in each product formulation made. If there is a difference, it will be continued with a group difference test using the Mann Whitney Test. Manufacture and organoleptic testing of beverage products grape Jelly boba Chia Seed carried out at the Nutrition Department Laboratory of the Health Polytechnic, Ministry of Health, Surabaya, Jalan Pucang Jajar Selatan No. 24B. And testing for antioxidant content was carried out at the Faculty of Agricultural Technology Building, Department of Agricultural Product Technology, Brawijaya University, Malang. This research was conducted for months September 2023 - June 2024.

RESULT AND DISCUSSION

Drink Grape Jelly Boba Chia Seed This is made in three formulations, namely one control formulation and two formulations with different chia seed addition ratios. This difference in formulation is used to see variations in product characteristics of each formulation.

Table 1. Characteristics of Beverage Formulations *Grape Jelly Boba Chia Seed* As a Potential Drink for Coronary Heart Disease

Indicator	Beverage Formulation *Grape Jelly Boba Chia Seed*		
	F1	**F2**	**F3**
Color	Chocolate	Dark red	Red
Aroma	Tea	Grapes special	Grapes special
Texture	Springy	A little chewy	A little chewy
Taste	sweet	Sweet and sour	Sweet and sour

Source: Primary Data, 2024

Figure 1. Organoleptic Test

Formulation F1 (control) has the most different color characteristics among the other formulations. The F1 formulation is characterized by a brown color, tea aroma, chewy texture and sweet taste. The F2 formulation has a characteristic dark red color, a typical grape aroma, a slightly chewy texture, and a taste that is a combination of sweet and slightly sour. And the F3 Formulation has a characteristic red color, a typical grape aroma, a slightly chewy texture, and a taste that is a combination of sweet and sour.

Table 2. Average of Drink Formulations *Grape Jelly Boba Chia Seed* As a Potential Drink for Coronary Heart Disease

Indicator	Beverage Formulation *Grape Jelly Boba Chia Seed*		
	F1 (Control)	**F2**	**F3**
Color	2.92	3.72	2.92
Aroma	4.08	3.6	4.00
Texture	3.04	3.44	3.76
Taste	3.6	3.84	3.36
Average	**3.41**	**3.65**	**3.51**

Source: Primary Data, 2024

Value score category: (1) Really dislike, (2) Dislike, (3) Usual, (4) Like, (5) Really like it

The general liking results are based on the average score value of the 4 indicators of Color, Aroma, Texture and Taste. The formula with the code F2 is obtained, which is the formula most liked by the panelists with an average score of 3.65, which is included in the like category. Based on each average indicator of color, aroma, texture and taste of the drink *Grape Jelly Boba Chia Seed*, The formula with code F2 also got the highest score on each indicator, namely the color indicator score was 3.72, including the like category, the score on the aroma indicator was 3.60, including the like category, the score on the texture indicator was 3.44, including the like category, and The score on the taste indicator is 3.84, including the liking category.

Table 3. Kruskal Wallis Test Results for Drink Formulations *Grape Jelly Boba Chia Seed* As a Potential Drink for Coronary Heart Disease

No	Indicator	Asymp. Sig
1	Color	0.001
2	Aroma	0.127
3	Texture	0.004
4	Taste	0.006

Source: Primary Data, 2024

Based on the table above, the results of the Kruskal-Wallis test show that there are significant differences in color, texture and taste between the three Grape Jelly Boba drink formulas, with a P value <0.05. However, there was no significant difference in aroma between the three

formulas, with a P value > 0.05.

Table 4. Test Results *Mann Whitney* Beverage Formulation *Grape Jelly Boba Chia Seed* As a Potential Drink for Coronary Heart Disease

No	Indicator	Asymp. Sig
1	Color	0.001
2	Aroma	0.127
3	Texture	0.004
4	Taste	0.006

Source: Primary Data, 2024

The results of the Mann-Whitney follow-up test show that in the color indicators there are differences between drinks *Grape Jelly Boba Chia Seed* formulation F1 with F2, and F1 with F3. In terms of texture indicators, there are differences between the textures of drinks *Grape Jelly Boba Chia Seed* formulation F1 with F2, and F1 with F3. Meanwhile, in terms of taste indicators, there are differences between the taste of drinks *Grape Jelly Boba Chia Seed* formulation of F1 with F2, F1 with F3, and between F2 and F3.

Table 5. Antioxidant Test Results and Repetitions for Sample 1 (Control) and Sample 2 (Modification)

CODE	ANTIOKSIDAN IC50 (µg/ml)
F1 Test 1	674.72
F1 Test 2	586.41
Average	**630.56**
F2 Test 1	78.11
F2 Test 2	71.98
Average	**75.04**

Source: Primary Data, 2024

From the table above, the antioxidant content results for the first sample (F1) in the first analysis test were 674.72 µg/ml, and for the second sample (F2) in the first analysis test it was 78.11 µg/ml. In the repeat test, the antioxidant content results for the first sample (F1) in the second analysis test were 586.41 µg/ml, while for the second sample (F2) in the second analysis test it was 71.98 µg/ml.

Characteristics of Grape Jelly Boba Chia Seed Drink Formulation

Color

Color assessment of beverage products *Grape Jelly Boba Chia Seed* is a subjective assessment given based on assessment by the sense of sight. Based on the organoleptic test, the highest average value on the color indicator is shown by code F2 with a score of 3.72 which means like it, while the lowest average value on the color indicator is shown by codes F1 and F3 with a score of 2.92 which means somewhat like it. This means the color of the drink *Grape Jelly Boba Chia Seed* The most popular thing is drinks *Grape Jelly Boba* with code F2.

Judging from these results, the panelists preferred drinks *Grape Jelly Boba Chia Seed* with dark red color. This color comes from grapes that have been fermented *caramelized* and more material was found in sample F2, namely 100 g.

Aroma

Aroma assessment in organoleptic tests is carried out using the sense of smell. Based on the organoleptic test results, the highest average score on the aroma indicator was shown by code F1 with a score of 4.08 which means like, while the lowest average score on the color indicator was shown by code F2 with a score of 3.60 with the same category, namely like. This means the aroma of the drink *Boba* the most preferred is F1 (Control formulation) .

From these results, the panelists preferred the aroma of drinks made from tea and palm sugar. This aroma arises because tea and palm sugar have a distinctive aroma that can calm and relax the body. Meanwhile Formula *Grape Jelly Boba Chia Seed* has a typical grape aroma which is not too strong because the researchers did not add food essence to the product.

Texture

Organoleptic research on texture indicators is carried out using the sense of taste. The texture of the F1 drink (control) is influenced by the ratio of tapioca flour to water used. Meanwhile, the texture of the

drink *Grape jelly Boba Chia Seed* Formulas 2 and 3 are influenced by the ratio of wheat flour, water and agar powder.

Based on the organoleptic test that has been carried out, the highest average score on the texture indicator is shown by code F3 with a score of 3.76 which means like, while the lowest average score on the texture indicator is shown by code F1 with a score of 3.04 with the same category, namely like.

Taste

Taste assessment is done using the sense of taste. Formulas 2 and 3 are made with the same sugar ratio, different from Formula 1 which uses *Brown Sugar*. The difference in taste in each formula is influenced by the use of ingredients such as F1 (control) using brown sugar, tea and milk *Full Cream*. Meanwhile, F2 and F3 use grapes, diabetasol sugar and skim milk.

Antioxidant Activity of Grape Jelly Boba Chia Seed Formulation

Antioxidants are substances that are important in protecting the body from damage caused by free radicals. They play a role in preventing disease in a natural way, protecting cells from damage caused by free radical oxidation. Antioxidants work by providing electrons to free radicals, stopping the chain of cell damage. In this way, they can neutralize free radicals so that they do not damage cells' DNA. Antioxidants have an important role in treating hypercholesterolemia by suppressing the oxidation of fatty acids and low density lipoprotein (LDL). Excessive oxidation of fatty acids can increase cholesterol in the blood. Thus, one strategy to reduce cholesterol production is to inhibit the activity of the HMG-CoA reductase enzyme[20].

The DPPH (1,1-diphenyl-2-picrylhydrazyl) method is often used to measure antioxidant activity because it is simple, easy, fast and sensitive. In this method, DPPH, a free radical compound, is used as an indicator. When antioxidant compounds react with DPPH, the color changes from purple to pale yellow or colorless. These changes can be measured using a spectrophotometer to evaluate the antioxidant activity of the compound. This method is generally used in antioxidant research on a variety of samples, from food to other natural products[21]. *DPPH (1,1-diphenyl-2-picrylhydrazyl)* is a stable free radical compound and is widely used as a reagent to measure the free radical scavenging capacity of a compound[22]. Specifically, the level of antioxidant power of a compound can be classified based on its IC50 value: very strong if the IC50 is less than 50 µg/ml, strong if the IC50 is between 50-100 µg/ml, medium if the IC50 is between 100-150 µg/ml, and weak if the IC50 is between 151-200 µg/ml[23-24].

Antioxidant activity test results in drinks *Grape Jelly Boba* using the DPPH method showed a significant difference in antioxidant activity between F1 samples (control) without additions *Chia Seed* with sample F2 which is a drink *Grape Jelly Boba Chia Seed* with the addition of 3 grams *Chia Seed*. The result was that the F2 sample had a higher average antioxidant activity, namely 75.04 µg/ml is included in the (Strong) category, compared to the F1 sample (control) the average antioxidant activity is 630.56 µg/ml falls into the (Weak) category. This difference is due to additions *Chia Seed* and the use of Grapes in drinks *Grape Jelly Boba* on product sample F2. In research conducted by Dina Elfrida Lorenza (2022), it was revealed that the IC50 value for antioxidant activity in red wine brands Orang Tua, Javan, and MC Donald was 127.21 respectively. µg /ml, 191,49 µg/ml, and 171.86 µg/ml. Meanwhile, for white wine, the respective IC50 value is 324.25 µg/ml, 385,91 µg/ml, and 329.73 µg/ml[25] .

Meanwhile, the average antioxidant activity possessed by the second Formula drink *Grape Jelly Boba* amounting to 75.04 µg/ml which can be concluded is that this figure is higher compared to the commercial drinks above and the results are in line with the use of the basic ingredients used in the Grape Jelly Boba drink, namely

Red Grape (*Vinifera L*). Thus the second Formula drink *Grape Jelly Boba* can be used as a functional drink as well as an alternative that contains antioxidants to lower cholesterol levels for people with coronary heart disease.

Food Cost

Food Cost on Beverage Formulation F2 *Grape Jelly Boba Chia Seed* needed to calculate the costs incurred in producing one portion of the menu.

Table 6. Calculation of Food Cost F2 Drink Formula

	Material Name	Net Weight (g)	Bruto (g)	Unit Price	Total Price
F2 ***Grape Jelly Boba Chia Seed***	Grapes	100	100	IDR 85.000	IDR 8.500
	Skim Milk	50	50	IDR 27.000 (/liter)	IDR 1.500
	Wheat flour	7	7	IDR 18.000	IDR 200
	Chia Seed	3	3	IDR 70.000	IDR 200
	Agar-Agar	7	3	IDR 4.500 (/sachet)	IDR 200
	Lime	50	2	IDR 2.000 (/buah)	IDR 200
	Glass Bottle Packaging	8	8	IDR 24.000	IDR 3.000
	Stickers/Label	54	54	IDR 12.000	IDR 700
	TOTAL				**IDR 14.500**

Source: Primary Data, 2024

The Food Cost calculation for the F2 Drink Formula was made to find out the production costs of making 1 portion. Where Formula F2 is recommended for sufferers of Coronary Heart Disease which is the favorite of 25 panelists and which has high levels of antioxidant activity. The total cost was Rp. 14,500. So that the budget spent is not too large, you can work around the packaging or replace the packaging used with plastic bottles.

CONCLUSION

Based on the research that has been carried out, several conclusions can be obtained as follows:

1. In this research, the drink formula *Grape Jelly Boba Chia Seed* Tested for antioxidant activity levels in the laboratory were F1 and F2, with the formulation:
   a. Formulation 1 (F1) comparison between *Brown sugar*, Milk *Full Cream*, Tapioca flour, tea amounting to 45:70:15:30 grams
   b. Formulation 2 (F2) comparison between Grape, milk *skim*, wheat flour, chia seeds 100:50:7:3 grams
2. Results *Uji Kruskal Wallis* shows that there are differences in the Color, Texture, Taste indicators, as well as no differences in the Aroma indicators.

After testing the levels of antioxidant activity in the laboratory, the results of the beverage formula were obtained *Grape Jelly Boba Chia seed* with code F2 had a higher average antioxidant activity of 75.04 µg/ml is included in the category (strong, compared with code F1 (control) with an average antioxidant activity of 630.56 µg/ml is included in the (Weak) category.

REFERENCES

1. Musa WZW, Bakar NA, Ahmad A, Naing N. Association between fatty

acids and coronary heart disease: a scoping review [Internet]. Med J Malaysia. e-mjm.org; 2022. Available from: https://www.e-mjm.org/2022/v77n1/coronary-heart-disease.pdf

2. Almas A, Hameed A, Sultan FAT. Knowledge of coronary artery disease (CAD) risk factors and coronary intervention among university students. J Pak Med Assoc. 2008;58(10):553–7.
3. World Health Organization. Ageing and health. 2021. https://www. who.int/news-room/fact-sheets/detail/ageing-and-health
4. Betcy G, Christina Johnson C, Christy Annie W, Christy P, Cincy J, Deepa Anna J, et al. Descriptive study to assess the knowledge on risk factors of Coronary Artery Disease (CAD). Clin J Nurs Care Pract. 2021;5(1):051–4.
5. Kemenkes, R. I. (2019). Hari Jantung Sedunia (HJS) Jantung Sehat, Tahun 2019 : Jantung Sehat SDM Unggul. *Kemenkes RI Jakarta*
6. Kemenkes RI. (2018). Hasil Riset Kesehatan D
7. Van Der Werf T. Pathophysiology of coronary heart disease. Tijdschr Soc Geneesk. 1977;55(24):103–6.
8. Parveen FS, Quamri MA, Ahmed K, Shahid A. Diagnostic criteria of dyslipidemia with lipid fractions & its association with the risk of coronary heart disease: A review. Int J Adv Biochem Res. 2022;6(2):159–64.
9. Pertiwi, A. Haniarti, & Usman. (2020). Hubungan Asupan Serat Dengan Kadar Kolesterol Pada Penderita Penyakit Jantung Koroner Rawat Jalan Di Rsud Andi Makkasau Kota Parepare. *Jurnal Ilmiah Manusia Dan Kesehatan*, https://doi.org/10.31850/makes.v3i1.285
10. Permatasari, O. & Muhlishoh, A. (2020). Pendidikan Kesehatan Tentang Asupan Diet Rendah Lemak Dan Kolesterol Di Wilayah Di Puskesmas Gambirsari Surakarta. . *Indonesian Journal of Community Empowerment (Ijce)*, 2(1).
11. Matsangidou, M. Liampas, A., Pittara, M, Pattichi, C. S., & Zis, P. (2021). Machine learning in pain medicine: an up-to-date systematic review. *Pain and Therapy*,, 1-18.
12. Trisnandi, R. A., Sundawa, A. P., & Trisnani, S. M. (2022). Pengaruh Ekstrak Biji Chia (Salvia Hispanica L) Terhadap Kadar IL-6. *Jurnal Penelitian Kesehatan Suara Forikes*, *13*(2), 27–3
13. Putra Prakasa, F. B. (2022). Desa Sumbermulyo dengan Potensi Pengembangan Anggur. *Jurnal Atma Inovasia*, *2*(4), 449–454. https://doi.org/10.24002/jai.v2i4.5220
14. Insanu, M., Karimah, H., Pramastya, H., & Fidrianny, I. (2021). Phytochemical Compounds and Pharmacological Activities of Vitis vinifera L.: An updated review. *Biointerface Research in Applied Chemistry*, 11(6), 13829-13849.
15. Profile SEE. A Functional Food : Grape Fruits DERLEME MAKALE A Functional Food : Grape Fruits Fonksiyonel Bir Gıda : Üzüm Meyveler i. 2024;(December 2023).
16. Kurniawaty, E., & Yusnita, A. R. (2016). Pengaruh Konsumsi Bluberi (Vaccinium cyanococcus) Terhadap Penurunan Oksidasi LDL sebagai Pengobatan untuk Penyakit Jantung Koroner Blueberries (Vaccinium cyanococcus) Consumption Effects on Decreasing LDL Oxidation as A Treatment for Coronary Heart D. *Jurnal Majoriti*, *5*(3), 6–10.
17. Wulan, R. I. S. (2019). *Analisa Kadar Siklamat Pada Berbagai Jenis Jelly Yang dijual di Pasar Kembang Surabaya* (Doctoral dissertation, Universitas Muhammadiyah Surabaya).

18. Veronica, M. T., & Ilmi, I. M. B. (2020). Minuman Kekinian Di Kalangan Mahasiswa Depok Dan Jakarta. *Indonesian Jurnal of Health Development*, *2*(2), 83–84.
19. Min, J.E., Green, D.B., & Kim, L. (2017). *Calories and Sugars in Boba Milk Tea: Implications for Obesity Risk in Asian Pacific Islanders. Food Science & Nutrition*. 5(1), pp. 38-45.
20. Yunarto, N., Aini, N., Oktoberia, I. S., Sulistyowati, I., & Kurniatri, A. A. (2019). Aktivitas antioksidan serta penghambatan HMG CoA dan lipase dari kombinasi ekstrak daun binahong-rimpang temu lawak. *Jurnal Kefarmasian Indonesia*, 89-96.
21. N. JULIZAN, "Validasi Penentuan Aktifitas Antioksidan Dengan Metode Dpph," Kandaga– Media Publ. Ilm. Jab. Fungsional Tenaga Kependidikan, vol. 1, no. 1, 2019, doi: 10.24198/kandaga.v1i1.21473.
22. Z. Theafelicia and S. N. Wulan, "Comparison of Various Methods for Testing Yanti et al., 2023; Indonesian Journal of Pharmaceutical Education (e-Journal); 3(3): 489-496 496 Antioxidant Activity (DPPH, ABTS, and FRAP) on Black Tea (Camellia sinensis) Zerlinda," J. Teknol. Pertan., vol. 24, no. 1, pp. 35–44, 2023
23 Fabiana Meijon Fadul, "Kandungan Beta karoten dan Aktivitas Penangkaan Radikal Bebas Terhadap DPPH (1,1-difenil 2-pikrilhidrazil) Ekstrak Buah Blewah (Cucumins melo var. Cantalupensis L) Secara Spektrofotometeri UVVisibel," vol. 14, no. 1, pp. 37–42, 2019.
24. Andriani D, Murtisiwi L. Uji Aktivitas Antioksidan Ekstrak Etanol 70% Bunga Telang (Clitoria ternatea L) dari Daerah Sleman dengan Metode DPPH. Pharmacon J Farm Indones. 2020;17(1):70–6.
25. Harianja, D. E. L. (2022). *Uji Aktivitas Antioksidan Minuman Anggur dengan Metode DPPH (1, 1-difenil-2-pikrilhidrazil)* (Doctoral dissertation, Universitas Sumatera Utara).