



The Effect Of Ginger Drinking On Cardiovascular Endurance In FIKK UNM Futsal Club Players

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Abstrac. This study aims to determine the effect of ginger drink on cardiovascular endurance in futsal club players Faculty of Sports Sciences Makassar State University (FIK UNM). Cardiovascular endurance is one of the important aspects that affect athlete performance, and ginger is known to have the potential to increase body capacity through antioxidant and anti-inflammatory properties. The research method used in this research is quasi-experiment with pre-test design and post-test Control Group Design. The sample consisted of 20 futsal players divided into two groups: control group (n =10) and treatment group given ginger drink (N =10). Cardiovascular endurance data were measured using standard methods before and after the intervention. The data analysis was done by independent sample t-test to determine the significant differences between the two groups. The results showed that the average cardiovascular endurance of the control group was 41,58 with a significance value of 0,038, while the average treatment group was 36,54 with a significance value of 0,041. The average difference in cardiovascular endurance between the two groups was 5,04, which showed significant differences.

Keyword Ginger drink, Cardiovascular Endurance, Futsal player.

1 Introduction

Cardiovascular resilience is affordability, heart, lung and Blood vessels to promote oxygen and malnutrition to cells to meet physical activity needs in a long time other commonly used terms are respiration-cardio-vascular, yakni resilience associated with breathing, heart, and blood circulation (Irvan & Asyhari, n.d.) The sense of resilience is reviewed from muscle work is muscle work ability or muscle group in a certain period of time, while the sense of resilience in the energy system is the work ability of the body organs in a certain period of time the term of endurance in the athletic world is known as the ability of the sportsman's body organ equipment to fight the fatigue during its resistance or physical work. If want to drive good lung vital capacity then we should also have cardiovascular endurance Which is good for holding as much oxygen as possible and distributing it to the body. When lung vital capacity and cardiovascular endurance have entered its peak and continue to force for physical activity it can

cause the onset of lactic acid in the muscles. When the accumulation of lactic acid in the body, oxygen is no longer able to be supplied to the muscles causing fatigue (APRILIANTO, n.d.).

Cardiovascular endurance can be achieved by doing sports involving large muscles with continuous rhythmic movement such as walking, running, swimming, cycling and so forth (Cium\uarneau et al., 2021) For endurance enhancement can also be obtained with a similar beverage extract and supplement drinks that contain certain vitamins and nutrients and pour me Ginger has a good content for endurance. This is widely trusted by sports coaches by giving supplement drinks to athletes during training, before physical activity or after physical activity. It is an interesting study to study. Cardiovascular endurance is one of the important components in physical fitness, especially for athletes involved in sports that require stamina and high body resistance such as futsal (Hartono et al., 2024). Good cardiovascular endurance can improve the body's ability to adapt to intense physical activity, reduce fatigue, and accelerate recovery after exercise. Therefore, futsal athletes need to maintain and improve their cardiovascular endurance in order to perform optimally in every game. One approach that can be used to increase cardiovascular endurance is to utilize natural ingredients, such as ginger. Ginger is known to have a variety of health benefits, including the ability to improve blood circulation, reduce inflammation, and boost metabolism. Some studies have shown that ginger can have a positive effect on heart and blood vessel health, which is directly related to cardiovascular function (Nopriani & Riadi, 2024).

Ginger drink has long been used in traditional medicine for a variety of health benefits, including in improving cardiovascular endurance. Ginger contains active compounds, such as gingerol and shogaol, which have anti-bacterial properties Inflammatory, antioxidant, and vasodilator, which potentially positively impact the health of the heart and circulatory system. According to (Amin et al., 2024) here are some benefits of ginger drink against cardiovascular endurance: 1. Ginger can help improve blood circulation by dilating blood vessels, which allows blood to flow more smoothly throughout the body. This increase in blood flow will support more efficient delivery of oxygen and nutrients to muscles and organs, which is crucial for body performance during physical activity, including in sports. 2. some studies suggest that ginger may help lower blood pressure, especially in individuals with hypertension. Ginger helps to dilate blood vessels and increase their elasticity, which serves to naturally lower blood pressure. Controlled blood pressure is essential in maintaining heart health and increasing cardiovascular endurance. 3. the compounds in ginger can increase the capacity of blood to carry oxygen, which in turn can increase stamina and endurance. It is beneficial for athletes, including futsal players, who require oxygen to generate energy in intense physical activity. 4. ginger acts as an antioxidant that protects the heart from damage due to free radicals. By fighting inflammation and oxidation in the body, ginger helps maintain heart function and prevents the risk of heart disease. A healthy heart condition will certainly support endurance in the face of heavy physical activity. 5. ginger has anticoagulant effect, which can prevent excess blood clotting. Uncontrolled blood clots may limit blood flow to vital organs, including the heart, and may increase the risk of cardiovascular disease. By consuming ginger drink, it can help maintain smooth blood flow in the body. With these benefits, ginger drinks can be an effective natural option for enhancing cardiovascular endurance. For athletes or individuals involved in sports that require the body to work hard for a long time, such as futsal, regular consumption of ginger can provide gains in improving physical performance and accelerate recovery after activity. With knowledge about the benefits of drinking ginger for

Cardiovascular improvement then researchers took samples on sports players Futsal. Futsal, as a sport that requires speed, agility, and endurance, requires special attention to

the physical aspects, especially cardiovascular endurance (Sekulic et al., 2021). Futsal players must have an efficient circulatory system to support physical activity that takes place in a fast tempo. Therefore, it is important to explore whether the provision of ginger-based drinks can affect the increase of cardiovascular endurance of futsal players, especially in the futsal club players of Faculty of Sports Sciences Makassar State University (FIK UNM). This study aimed to examine the effect of ginger drink on cardiovascular endurance in futsal players FIK UNM. The results of this study are expected to contribute to the knowledge about alternative physical performance improvement of futsal athletes through the consumption of natural materials that are easily accessible and effective.

2 Method

The method used in this research is an experiment with two-group pretest-posttest design (Pasaribu, 2020). Experimental research method is a method used to determine the effect of a particular treatment on other treatments under controlled conditions. This study was a pre-experimental study with a pretest and post test group design. The sample of this research is 10 male spear pelembar. The sample of this research is all of the students of the University of Makassar. At random, the samples were classified into 2 groups, 10 futsal club athletes FIK UNM and 10 students non-FIK UNM. The shape of the design in question is as shown in the picture below:

Table 1. Two-group pretest-posttest research design

Pretest	Treatment	Posttest
	X ₁	
O ₁	X ₂	O ₂

Source: (Susilawati, 2018)

This study uses the instrument test which is bleep test (also known as multi-stage fitness test or 20 meters shuttle run test). is a test used to measure cardiovascular capacity and aerobic endurance of a person (Atty et al., 2024). This test measures the extent to which a person's body can endure intense and progressive physical activity, as required in futsal sports. To measure the effect of ginger drink on cardiovascular endurance of futsal players at Futsal Club FIK UNM, bleep test can be used as an instrument to assess the increase of cardiovascular endurance after regular consumption of ginger drink. The following steps can be used in this study to perform bleep test (Duhe et al., 2024):

1. Preparation Before Test
 - a. Subject preparation: make sure futsal players are in good shape and ready for physical tests. Make sure they are not in a state of fatigue or have health problems that can inhibit the test.
 - b. Environmental conditions: prepare field or long enough area, at least 20 meters, which will be used in the test.
 - c. Required tools: a audio recording bleep test (which contains beeps that get faster as time passes). Tape measure for marking distance of 20 meters. Stopwatch to monitor time if needed.

2. Measurement before giving jahe drink (pre-test). Early bleep test: before giving intervention (ginger drink), do bleep test to measure the player's initial cardiovascular endurance. The player will run back and forth between two points as far as 20 meters according to the rhythm of the beep.
3. intervention administration (ginger drink)
 - a. Ginger drink consumption plan: determine the pattern of consumption of ginger drink to be given. For example, players will consume ginger drinks one hour before training or futsal games in the period Specific time (e.g. 2 weeks, 4 weeks, or according to research design).
 - b. Ginger drink quantity: determine the consistent amount to consume, for example 150-200 ml per day.
 - c. Consumption schedule: determine the time of consumption of ginger drinks (e.g. every morning or before exercise).
4. Implementation of bleep test after giving ginger drink (post-test). Repeat bleep test: After the ginger drink feeding period is completed, re-perform the same bleep test on the player. Players will again conduct tests to assess their improved cardiovascular endurance after consumption of ginger drink.

3 Result

In Table 2 this will explain the results of data processing in SPSS test with descriptive analysis test that aims to see the picture of the initial data or the description of the data in the test.

Table 2. Descriptive test of the influence of ginger drink on cardiovascular endurance in futsal club FIK UNM

Variabel	N	Minimum	Maximum	Sum	Mean	Std. Deviation
Ginger Drink Pre-test	10	31.40	47.40	392.80	39.2800	5.43503
Post test Drink Ginger	10	34.30	51.10	415.80	41.5800	6.01938
Free pre-test	10	31.40	41.20	360.50	36.0500	3.63234

In this study, there are two types of tests measured, namely tests related to ginger consumption and freedom-related tests (which may refer to other variables, such as physical or mental freedom). The data obtained are divided into two periods Measurements, namely pre test (before intervention) and post test (after intervention). In this research is described as follows:

1. Control Group
 - a. Pre test ginger drink: the value of pre test ginger drink showed varying results with minimum value of 31.40 and maximum 47.40. The total sum of the Pre test value is 392.80, with an average (mean) of 39.28. The variation of the values recorded

is quite large, with standard deviation of 5.44, showed a significant difference in individual response to ginger drink at the beginning of the measurement.

- b. Post test drink ginger: after the intervention, that is, consumption of ginger, post test value showed a slight increase. The minimum value was recorded at 34.30, and the maximum value reached 51.10. The total summation of the post test value was 415.80, with an average of 41.58. The average of these values is higher than that of pre-test, indicating a positive effect of intervention. However, variations between individuals (standard deviation of 6.02) were slightly greater than those of pre tests, which may indicate greater response differences after ginger consumption.
2. Free group
- a. Pre free test: Before the intervention, the value of the free test showed a variation with a minimum value of 31.40 and a maximum of 41.20, with a total sum value of 360.50. The average for pre free test was 36.05, with standard deviation of 3.63, which showed moderate variation between participants.
 - b. Post free test: after the intervention, the value of post free test slightly increased, with a minimum value of 31.50 and a maximum of 41.70. The total sum of free post test score is 365.40, with an average of 36.54, Higher than with Pre test. The average increase is relatively small, but it shows positive changes. Variation among individuals in post free test was slightly greater, with standard deviation of 3.83, which showed that although the average increased, differences between participants varied more after intervention.

In this table 3 will explain the results of the data in the SPSS test with the test (K-SZ) the objective is to see the data distributed normally or not with the provision of $P > 0.05$ as follows:

Table 3. Normality test effect of ginger drink on cardiovascular endurance in futsal club players FIK UNM

Variabel	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
PRETEST	.159	20	.200*	.932	20	.171
POSTETS	.189	20	.059	.939	20	.231

In this study, the data were analyzed using two different statistical tests, Kolmogorov-Smirnov and Shapiro-Wilk. Both of these tests are used to determine whether the data obtained follows normal distribution.

1. Pretes

Kolmogorov-Smirnov test: statistical value obtained was 0.159 with a significance value (sig) of 0.200. A greater significance value of this 0.05 indicates that pretes data is not significantly different from normal distribution. Therefore, it can be concluded that the pretes data were normally distributed and Shapiro-Wilk test: the statistical value obtain

ed was 0.932 with significance value (sig) of 0.171. A significance value greater than 0.05 also indicates that pretes data are distributed normally.

2. Posts

Kolmogorov-Smirnov test: statistical value obtained was 0.189 with a significance value (sig) of 0.059. Although this significance value is slightly lower than that of the pretes test, this value is still greater than 0.05, which means that the postes data is not significantly different from the normal distribution. Therefore, the Post data is distributed normally and Shapiro-Wilk test: the statistical value obtained is 0.939 with a significance value (sig) of 0.231. Same as in the Kolmogorov-Smirnov test, a significance value greater than 0.05 indicates that the postes data are distributed normally.

The results of this study showed that the effect of ginger drink on cardiovascular endurance in futsal club player FIK UNM obtained was normal distribution. Next in Table 4 will explain if the data in SPSS test with variance homogeneity test above shows that the data has a different diversity is not significant with the provision of $P > 0,05$ as follows:

Table 4. Homogeneity Test effect of ginger drink on cardiovascular endurance in futsal club FIK UNM

Test of Homogeneity of Variances				
Levene Statistic	df1	df2	Sig.	
1.328	1	18	.264	

Based on the output table "test of homogeneity of variations" above is known significance value (sig.) the variables of homogeneity test result of the influence of ginger drink on cardiovascular endurance in futsal club players FIK UNM control group and free Group is 0,264. Because of it. $0,264 > 0,05$, then as the basis of decision making in the test of homogeneity above, it can be concluded that the variance of ginger drink data on cardiovascular endurance in Club players Futsal FIK UNM control group and free group is equal or homogeneous.

The data of this research are analyzed using Descriptive Qualitative Method. The data used in this research is Descriptive Qualitative method. This test helps to determine whether there are statistically significant differences between the average of the two groups, from the results of the data as follows:

Table 5. Independent sample T test the effect of ginger drink on cardiovascular endurance in futsal club players FIK UNM

Test	N	Mean	Std. Deviation	Std. Error Mean	
Variabel	Control group	10	41.5800	6.01938	1.90349
	Free group	10	36.5400	3.82744	1.21034

Based on the output table "group Statistics" above is known the number of learning outcomes data for the control group is as many as 10 athletes, while for the free group is as many as 10 athletes. The average value of futsal athlete FIK UNM mean for control group is

41.5800, while for free group is 36.5400. Thus, it can be concluded that there are differences in the average effect of ginger drink on cardiovascular endurance in futsal club FIK UNM players. Further to prove whether the difference means significant (real) or not then we need to interpret the output as follows.

Table 6. Independent sample T test the effect of ginger drink on cardiovascular endurance in futsal club players FIK UNM

Variabel	N	Mean	Sig.
Control group	10	41.5800	.038
Free group	10	36.5400	.041
Difference		5.04000	

Independent sample t-test was performed to compare the average between control group and free group. Here are the results of the analysis:

1. Control group N/number of samples of 10 athletes had an average of 41,58 and significance value for the control group was 0,038, since the significance value of the control group is below the threshold $\alpha=0,05$ \ $\alpha=0,05$ $\alpha=0,05$, it can be concluded that there is a significant difference between the average of control group.
2. Free group N/total sample of 10 athletes had an average of 36,54, for an average of free group was 0,041, and since the significance value of the free group is below the $\alpha=0,05$ \ $\alpha=0,05$ $\alpha=0,05$ threshold, it can be concluded that there is a significant difference between the average of the free group.
3. Conclusion data of control group and free group with average control has an average of 41,58, free group has an average of 36,54, so that have an average difference between the two groups is 5,04.

4 Discussion

This study aimed to determine the effect of ginger drink on cardiovascular endurance in futsal club players of Faculty of Sports Sciences (FIK) Makassar State University (UNM). Cardiovascular endurance is an important component in athlete performance, especially in futsal sports that require high stamina and optimal physical performance. The results showed that there were significant differences in cardiovascular endurance between the group who consumed ginger drink (free group) and the control group. The group given ginger drink had an average cardiovascular endurance value of 41,58, while the control group had an average of 36,54. The average difference of 5,04 showed improved endurance in the group receiving treatment. The significance value of the statistical test was 0,038 for the control group and 0,041 for the free group. Since $P < 0,05$ $P < 0,05$ $P < 0,05$, this difference is considered statistically significant, meaning that the administration of ginger drinks has a positive effect on cardiovascular endurance.

Ginger is a type of spice that became one of the export commodities traded in the form of fresh ginger, dried ginger process (dried or Pikel), essential oil or oleoresin. There are three main types of ginger in Indonesia, namely Red Ginger, elephant ginger (rhino ginger), and small white ginger (ginger syringe). These three types are based on the shape, size, and color of ginger (Nopriani & Riadi, 2024). Ginger can be used as a drink, and in Indonesia ginger drink is a type of drink that is quite popular in the community. Ginger drink is a drink made from the

juice of ginger rhizomes cooked and added sugar. Ginger drink *bandrek* (sarconsisting) is generally made from red ginger and sugar by adding several types of spices, so it has a spicy, sweet, and distinctive spice aroma. Red Ginger has a more pungent taste and has a higher content of essential oils than elephant ginger and an emporet. Red Ginger is commonly used as a refreshing drink and source of essential oils (Amin et al., 2024). Ginger drinks are generally consumed in a warm state, so the presentation requires a container that must continue to remain hot. Ginger is one of the spices that have been widely known by the public. Ginger (*Zingiber officinale*) is known to contain bioactive compounds such as gingerols and shogaol which have antioxidant and anti-inflammatory properties. Both of these compounds are thought to help improve cardiovascular function through: increasing blood flow by dilating blood vessels. Reducing

Possible inflammation due to heavy physical exertion. Decreases oxidative stress, thus accelerating recovery after intensive training (cahyani astiningtias, 2023). In addition to being a flavor-producing in a variety of products, jahe is also known to have nourishment heals various kinds of diseases such as anigina, cough, diarrhea so it is good for body endurance. Some bioactive components in jahe ekastrak among others (6)-gingerol, (6)-shogaol, diarilheptanoid and curcumin have antioxidant activity that exceeds tocopherol (Wulandari & Syahrul, 2022). In crop taxonomy, jahe emporet has oil content atsiri around 1,5%-3,5% and 2,58%,3,90 %. This jahe is widely used as spices, food silvers, drinks and medicinal raw materials. Mahluk li ved closely with his ability to perform physical activity well to protect themselves and meet the needs of life. Physical activity according to (Bompa & Buzzichelli, 2019) is all kinds of body movements produced by skeletal muscles that require energy production. In addition to the main components in the production of energy, physical activity is also impaired in the balance of energy and body composition.

Performing daily activities person requires the condition of the body in a state of fitness. Some of the ways that a person does to get fitness, such as adjusting a diet, taking adequate breaks and doing sports activities regularly and regularly. Endurance is the body's ability to work for long periods without experiencing fatigue which means after completing a job. Endurance is generally defined as fatigue fatigue and recovery ability immediately after experiencing fatigue (Ilyas et al., 2024). High durability dapat mempertahankan penemilan over a relatively long period of time continuously. Thue endurance contributes to improving and increasing presasi Dan limiting fatigue Tingkat. Cardiorespiratory endurance associated with blood circulation and breathing. Cardiorespiratory endurance is the ability of the heart, lungs, blood vessels to supply oxygen to the cells so as to meet the need to prolong physical activity. A person who has good cardiorespiratory endurance will not easily experience fatigue after doing activities. Cardiorespiratory endurance can be measured through VO₂max levels are achieved, so if VO₂max levels are high then physical fitness is also good.

The difference in individual VO₂max usually influenced by three things, namely internal respiration, air transport cardiovascular system, and external respiration. These three factors according to the theory of rentice and Bucher who said that the difference means between individuals is lowered by the work of three systems in the body namely (Deliceo\uglu et al., 2024): external respiration (lung function), air transport cardiovascular system such as heart, blood vessels, and blood, internal respiration (The use of oxygen by body cells for energy production) ginger drink can be used as a natural intervention that is easy to apply to increase cardiovascular endurance in futsal athletes. This is important considering futsal is a sport that

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