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## CHOLESTEROL LEVELS BEFORE AND AFTER CONSUMING SAUSAGE

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### ABSTRACT

*Cholesterol is a component of fat forming yellow and in the form of wax which is produced by the liver. One of the foods that can increase cholesterol levels is meat sausage. These food ingredients, if consumed in excess amounts, will increase fat levels in the body, which in turn will increase total cholesterol levels in the blood (hypercholesterolemia). In this millennial era, many foods are produced fast using raw materials from processed meat, one of which is sausage. Sausage is one of the foods that are high in fat, so there will be an increase in fat levels in the body when a person consumes 50 grams of sausage (half a portion).*

*Methods: This research uses analytic / inferential research, namely pre-experiment. There were 20 subjects used. The average (mean) blood cholesterol level before consuming sausage was 203.51 mg / dL and the mean (mean) blood cholesterol level after consuming sausage was 207.67 mg / dL. Furthermore, the results obtained after statistical testing using the paired T-Test, namely p value = 0.056, meaning that there was no significant difference in cholesterol levels before and 2 hours after consuming sausages. In this study it can be concluded that there is no significant difference in cholesterol levels before and 2 hours after consuming 75 grams of sausage (1 serving).*

**Keywords:** Cholesterol Levels; Sausage

### PENDAHULUAN

Cholesterol is a yellow, waxy fat-forming component produced by the liver. It is also a complex fat component needed by the body. This component is possibly be gained from various foods, namely beef, pork, goat, chicken, fish, poultry, chicken eggs, chicken intestines, pigeons, quail eggs, duck eggs, meat sausages, tripe, gizzard, lung, liver, beef meatball, cow lard, cow milk, freshwater fish, crab, shrimp, clams, eel, and squid. When these foods are consumed excessively, they will increase fat levels in the body, which eventually can elevate total cholesterol levels in the blood (hypercholesterolemia). (Shafira, Ngaisyah, & Yuningrum, 2020)

Hypercholesterolemia can be classified based on the cause, namely primary and secondary hypercholesterolemia. Primary

hypercholesterolemia is mainly caused by genetic factors, age, and sex. Meanwhile, secondary hypercholesterolemia is triggered by saturated fat diet habits, lack of physical activity, obesity, and nephrotic syndrome. (Rusnoto & Firman Setyono, 2018)

The high cholesterol levels caused several diseases such as atherosclerosis (narrowing of blood vessels), coronary heart disease, stroke, and high blood pressure. The ideal level of total blood cholesterol is <200 mg/dl. If it is more than 200mg/dl, the risk of heart disease will increase. In 2007, Basic Health Research Data (BHRD) reported that the 45–54-year age group is at high risk of suffering a heart attack or stroke. (Central Bureau of Statistics, 2018) (“Central Obesity and Total Blood Cholesterol Levels,” 2013)

The prevalence of hypercholesterolemia in Indonesia at the age range of 25-65 years is 1.5%, while the prevalence of high blood cholesterol levels is 200-249 mg/dl is 11.2%. The high level of cholesterol in the human body is influenced by several factors, namely physical activity, nutritional intake, fat intake, carbohydrates, protein, fiber, and cholesterol intake in food. (Health Ministry of Indonesian Republic, 2018)

A study conducted by Sari et al (2014) revealed that there was a significant relationship between fat intake and LDL cholesterol levels. A person whose fat intake covers 25% of total energy has a 1.5 times greater risk of suffering hypercholesterolemia compared to those whose fat intake is < 25% of total energy. (Sari, Prihartini, & Brantas, 2014)

Blood cholesterol levels are influenced by various factors including food consumption and physical activity. Davison (2012) states that fat, carbohydrate, and protein intake affected cholesterol levels. Furthermore, Mahan and Escott-Stump (2008) assert that fiber intake, cholesterol intake from food, and physical activity also influence blood cholesterol levels. (Davison & Kaplan, 2012)

Risk factors related to total cholesterol levels are divided into modifiable risk factors and non-modifiable risk factors. Non-modifiable risk factors consist of age, gender, and genetics. Modifiable risk factors comprise diet, nutritional status, and food intake such as fiber, total fat, and physical activity. (NIH, 2020)

In this millennial era, many foods are instantly produced by using raw materials from processed meat, one of which is sausage. Sausage is a kind of food with high fat. It potentially increases fat levels in the body when it is consumed in the amount of 50 grams. (RI, 2014)

Consuming 50 grams of sausage can increase fat levels in the body and most people recently consume more than 50 grams of sausage. Therefore, the researchers are interested in investigating the cholesterol

levels in the blood before and 2 hours after consuming 75 grams of meat sausage

## **METHOD**

This type of analytical/interferential research employed a pre-experimental design. The sample data were taken at the Clinical Laboratory of Musi Charitas Catholic University, Palembang. Afterward, the data were examined at the Central Health Laboratory (CHL). This research was conducted from January to April 2021. The populations of this research were students of the Faculty of Health Sciences of Musi Charitas Catholic University, Palembang. 20 students who met the inclusion and exclusion criteria were involved as the samples of this research. The accidental sampling technique was used to select the samples. CHOD-PAP enzymatic colorimetric method was employed to examine the cholesterol level and statistical software was used to analyze the data

## **RESULT AND DISCUSSION**

The subjects of this were 20 students of the Faculty of Health Sciences at Musi Charitas Catholic University. The students met the inclusion and exclusion criteria and were voluntarily to be the research subjects. In the beginning, the students' cholesterol levels were checked after fasting for 12 hours. Then, they were asked to eat sausage. After 2 hours, their cholesterol levels were rechecked to see the cholesterol levels after eating sausage. The cholesterol level check was conducted at Central Health Laboratory.

The results of the blood cholesterol level check revealed that the average cholesterol level before consuming sausage was 203.51 mg/dl. Meanwhile, the average cholesterol level 2 hours after consuming sausage was 207.67 mg/dl.

The data of the cholesterol levels were then analyzed by using a statistical test, namely the Paired T-Test which is described in the following table.

**Table 1 Paired T-Test**

Variable	N	Mean	P Value
Before	20	203.51	0.056
After	20	207.67	

In table 1, the result of the paired t-test showed that the p-value = 0.056. This result inferred that there was no significant difference in cholesterol levels between before and 2 hours after consuming sausage.

Excessive or increasing cholesterol levels (hypercholesterolemia) are potentially caused by excessive fat intake. The excessive fat intake is probably obtained from various foods. Consuming excessive amounts of sausage, more than 50 grams per day, will definitely increase cholesterol levels. This study investigated the cholesterol levels in the blood before and after consuming 75 grams of sausage. The subjects are 20 students of the Medical Laboratory Technology Study Program, Faculty of Health Sciences, Musi Charitas Catholic University who met the inclusion and exclusion criteria.

The results of this study showed that the average blood cholesterol level before consuming sausage was 203.51 mg/dl and the average blood cholesterol level after consuming sausage was 207.67 mg/dl. Furthermore, the results of the t-test revealed the p-value = 0.056. These results implied that there was no significant difference in cholesterol levels between before and 2 hours after consuming sausage.

There was no significant difference in cholesterol levels between before and 2 hours after consuming sausages because 75 grams (1 piece) of sausage contains 170 calories, 9 grams of fat, 15 grams of carbohydrates, 6 grams of protein, and cholesterol in sausages is 71 mg/100 grams. The Health Minister Regulation No. 30, 2013 states that the recommended amount of fat level is 67 grams/day and cholesterol level is <300 mg/day.

Based on the data of statistical test results, it was found that there was no effect between before and 2 hours after consuming sausage. The reason was the amount of the 75 grams of sausage did not exceed the amount of fat and cholesterol limit required by the body or it was not more than the consumption limit that has been set by the Health Minister Regulation. Therefore, it did not affect the total cholesterol levels in the body. However, the data results showed that the mean value of cholesterol levels before sausage consumption was 203.51 mg/dl, and the mean value of 2 hours after sausage consumption was 207.67 mg/dl. These results indicated that there was an increase in mean value before and after sausage consumption. In addition, the 75 grams of sausage consumption (1 piece) per day statistically showed cholesterol level increase but it was not significantly different. In other words, consuming sausage can increase cholesterol levels especially when consuming more than 2 sausages per day or taking 1 sausage with another food that also contains other cholesterol. (Bagiastra & Yuliartini Griadhi, 2019)

This study result is in line with Fitri's research result (2019) which revealed that there was no relationship between fat intake, cholesterol, and nutritional status with cholesterol levels in hypercholesterolemic outpatient at RSUD Dr. Moewardi Surakarta. The amount of food with cholesterol that can be consuming is <300 mg/day and it is not recommended to consume more than it. Consuming food with higher cholesterol levels will increase the cholesterol level in the blood, cause flakes in blood vessels and trigger coronary heart disease. If the consumption of food with cholesterol is <300 mg/day, there will be no significant increase in cholesterol levels. (Fitri, 2019)

Research conducted by Yoeantafara's (2017) revealed that in the variable of the high-fat diet, there was no relationship between a high-fat diet and total cholesterol levels when it was balanced with high fiber intake. Therefore, consuming foods with high-fat or

high cholesterol must be balanced with high fiber intake to avoid the increase of cholesterol levels in the body. (Yoeantafara & Martini, 2017)

## CONCLUSION

In conclusion, this research revealed that there was no significant difference in cholesterol levels between before and the 2 hours after consuming 75 grams of sausages (1 serving). Future research can examine the lipid profile.

## THANK-YOU NOTE

The researcher would like to thank Dr. Antonius Singgih Setiawan, S.E., M.Sc. as the Chancellor of the Musi Charitas Catholic University (UKMC), Maria Nuraeni, SKM., M.Kes, as the Dekan of the UKMC Health Sciences Faculty, Pra Dian Mariadi, as the Head. UKMC Medical Laboratory Technology (TLM) Study Program, Yulia Dewi Rahmawati, student of Medical Laboratory Technology IV Department of Health Sciences UKMC.

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