

# The effectiveness of banana consumption on blood pressure, liver function, and lipid function in construction workers



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Received: 2023-04-06  
Accepted: 2023-05-29  
Published: 2023-06-21

## ABSTRACT

**Introduction:** Food consumption has a substantial impact on the physical condition of work for unskilled individuals like construction workers because their activity demands a lot of energy. Consumption of bananas can increase energy, so it is hoped that the results of this study can be used as a consideration to maintain the health of construction workers so that they are kept in good condition. The aim of the study was to determine the effectiveness of bananas on blood pressure, liver function, and lipid function.

**Methods:** This is an experimental study with samples taken from the total population of 15 employees. The blood pressure, liver function, and lipid function measurements in construction workers were made before and after consuming bananas. The analysis of the data in this study was conducted by a paired t test.

**Results:** Based on the data analysis, the result showed that there was no significant difference in blood pressure and liver function measurements between the workers before and after consuming bananas ( $p > 0.05$ ). Meanwhile, the results showed that there was a significant difference in lipid function measurements between the workers before and after consuming bananas ( $p < 0.05$ ).

**Conclusion:** The effectiveness of banana consumption can be seen in the examination of lipid function. However, there is no effect on the blood pressure or liver function of the workers.

**Keywords:** bananas, blood pressure, lipid function, liver function.

**Cite This Article:** Santoso, A.P.R., Wulandari, D.D., Firdaus., Kardina, R.N., Nabil, A.J., Pamungkas, D.K.Y., Zain, S.S., Rohima, M. 2023. The effectiveness of banana consumption on blood pressure, liver function, and lipid function in construction workers. *Bali Medical Journal* 12(2): 1945-1947. DOI: 10.15562/bmj.v12i2.4316

## INTRODUCTION

Construction workers are one the types of workers who require more physical ability while working. In general, construction work includes stone, excavation, iron, and steel porters. If these jobs are combined, it can cause high levels of fatigue and a risk of health problems.<sup>1</sup> Construction workers generally have unhealthy habits such as smoking and coffee consumption, which can cause hypertension,<sup>2</sup> a diet high in carbohydrates and saturated fat that causes increased triglycerides and cholesterol,<sup>3</sup> and are exposed to free radicals such as excessive lead, which will interfere with liver function.<sup>4</sup>

Bananas are easy to find in Indonesia at affordable prices and have many health benefits. Bananas contain magnesium, calcium, flavonoids, potassium, and high

levels of fiber.<sup>5</sup> High potassium levels in bananas are able to regulate heart rate and body fluid balance so that they can help lower blood pressure.<sup>6</sup> Bananas have potential as antioxidants against free radicals such as lead exposure, which can interfere with liver function. Antioxidants function to neutralize and accelerate the degradation of free radical compounds to prevent damage to macromolecular components.<sup>7</sup> According to research, giving bananas can reduce serum triglyceride levels by 40.4%,<sup>8</sup> and according to research, consuming bananas can reduce blood cholesterol levels because bananas contain flavonoid compounds and fiber, which function to reduce excess cholesterol in the liver and digestive tract so that blood cholesterol levels are reduced.<sup>9</sup>

Thus, this study aims to determine the effectiveness of bananas on blood pressure, liver function, as measured by changes in levels of alanine aminotransferase (ALT) and aspartate aminotransferase (AST), as well as lipid function (triglycerides and cholesterol) in construction workers who were treated with bananas for two weeks.

## METHODS

### Study Design and sampling

This is an experimental study with samples taken using the total sampling technique. The population used is construction workers at PT Driyorejo Kencana Permai as many as 15 people. This study was conducted at PT Driyorejo Kencana Permai and the Laboratory of the Faculty of Health, Nahdlatul Ulama University, Surabaya.

## Materials

The tools used are tension, tourniquet, tube, syringe, and photometer, while the materials used are alcohol cotton, serum glutamic oxaloacetic transaminase (SGOT) reagent kit, serum glutamic pyruvic transaminase (SGPT) reagent kit, triglycerides reagent kit, and cholesterol reagent kit.

## Data collection

Samples were checked for blood pressure. Blood was taken to measure levels of SGOT, SGPT, triglycerides, and total cholesterol. Then, the construction workers were given bananas three times a day, in the morning, afternoon, and evening, for two weeks. After two weeks, the patient's blood was taken again for blood pressure checks, and blood collection was continued for examination after treatment for levels of SGOT, SGPT, triglycerides, and total cholesterol.

## Data analysis

The data obtained were blood pressure, liver function (SGOT and SGPT), and lipid function (triglyceride and cholesterol levels), which were then analyzed in each test with a paired t test. The result is considered significant if  $p$ -value  $< 0.05$

## RESULTS

### Blood pressure

The results of blood pressure tests carried out before taking blood and after giving banana consumption treatment. Based on the results, it was determined that  $p = 0.374$ .  $P$ -value was greater than 0.05, which means that there was no difference between before and after the consumption of bananas on the blood pressure of the workers (Table 1).

### Liver function

Based on the results, Table 2 shows the results of the examination of the levels of SGOT and SGPT to determine the effect of giving bananas on liver function. The  $p$ -value of SGOT obtained are 0.070 and SGPT are 0.710, indicating that  $p > 0.05$ , which means there is no difference between before and after consuming bananas on liver function.

**Table 1.** The analysis using paired t test of blood pressure before and after consuming bananas

		Mean	p-value
Blood pressure	Before	118.67	0.374
	After	116	

**Table 2.** The analysis using paired t test of liver function levels before and after consuming bananas

Liver Function		Mean	p-value
SGOT	Before	24.18	0.070
	After	19.68	
SGPT	Before	23.93	0.710
	After	22.91	

**Table 3.** The analysis using paired t test of lipid function before and after consuming bananas

Lipid function		Mean	p-value
Triglycerides	Before	197.42	0.004
	After	137.41	
Total Cholesterol	Before	192.52	$< 0.001$
	After	144.233	

### Lipid function

The examination of lipid function is conducted by measuring the levels of triglycerides and total cholesterol. Based on the results, Table 3 shows the results of the triglyceride and total cholesterol examinations to determine the effect of giving bananas on lipid function. The  $p$ -value of triglycerides is 0.004 and total cholesterol is  $< 0.001$ , indicating that  $p < 0.05$ , which means there is a significant difference in the triglyceride and total cholesterol levels of the workers before and after consuming bananas.

## DISCUSSION

Based on the result of this study, there was no difference found in blood pressure and levels of liver function (SGOT and SGPT) in workers before and after consuming bananas within the time frame given. Meanwhile, the levels of lipid function (triglycerides and total cholesterol) of the workers showed a significant difference before and after consuming bananas. In the previous study conducted by Mosa and Khalil (2015), the effect of banana supplements showed significant results, but the differences in results might be due to the use of different samples and research objects.<sup>10</sup>

A previous study by Khusuma et al. (2018) that evaluated the Ambon bananas effect on patients with hypertension,

showed a result of  $p < 0.001$  which indicated that there was a significant effect of giving Ambon bananas to reduce hypertension.<sup>5</sup> Another study by Mustofa et al. (2021) regarding the effects of Ambon bananas consumption on blood pressure in the elderly showed significant results for lowering blood pressure in the elderly with hypertension.<sup>11</sup> The difference between the results of the current study and previous studies occurred because of the different types of bananas used and the sample used, which was not a specific sample for hypertension.

Based on the research results of Edenta et al. (2017) regarding the effect of banana peel extract on kidney and liver levels, there was a significant effect on liver levels.<sup>12</sup> In contrast to the research conducted in this study, this happened because of the differences in the samples used and the objects used, but based on the average results, there was a small decrease. Based on research conducted by Leelarungyub et al. (2017) regarding the effect of banana consumption on lipid profiles, it was found that bananas had an effect on lipid profiles.<sup>13</sup> The results obtained are the same as those carried out in this study, namely that bananas have an effect on lipid levels. The limitation in this study is that the population is still limited, so it does not represent the entire population. This study has also not been able to control for confounding variables.

## CONCLUSION

There was no difference in the blood pressure and liver function (SGOT and SGPT examinations) between before and after consumption of bananas, while lipid function (examination of triglycerides and total cholesterol) showed a significant difference between before and after consumption of bananas. Further studies are needed to evaluate the potential effect of bananas in a larger population with controlled cofounding variables. In future studies, specific samples, especially those suffering from the same disease, can be selected.

## ACKNOWLEDGMENT

Acknowledgments to Nahdlatul Ulama University Surabaya for supporting the research to be completed in the form of funds and the use of laboratories as research facilities, and to PT Driyorejo Kencana, which provides the construction workers used as samples.

## FUNDING

Thanks to Nahdlatul Ulama University Surabaya for the funding provided for this study.

## ETHICAL APPROVAL

Ethical approval has been granted by Nahdlatul Ulama University Surabaya.

## CONFLICT OF INTEREST

There is no conflict of interest between all authors.

## AUTHOR CONTRIBUTIONS

Each author has the same task in carrying out this study.

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