

# The Impact of Banana Consumption on Bangladeshi Rickshaw Pullers' Assessing Cholesterol, Liver and Blood Pressure Functions

Iftear Kazim Rafi<sup>1</sup>, Annesha Sanyal<sup>1</sup>, Majedul Hoque<sup>1\*</sup> 

<sup>1</sup>Department of Pharmacy, Jahangirnagar University, Dhaka, Bangladesh

**Abstract: Background:** The physical demands of labor, such as those performed by rickshaw puller, have a significant influence on food intake. It is hoped that the findings of this study may be utilized as a consideration to maintain the health of rickshaw puller so that they are kept in excellent physical condition. Eating bananas can enhance energy. The study's objective was to find out how well bananas affected cholesterol, liver, and blood pressure functions. **Method:** Samples for this experimental investigation were gathered from the entire population of 40 people. Before and after eating bananas, their' blood pressure, liver function, and lipid function were measured. In this study, a paired t test was used to analyze the data. **Findings:** According to the data analysis, there was no discernible variation in the rickshaw pullers' blood pressure and liver function readings before and after consuming bananas ( $p > 0.05$ ). The findings revealed that there was significant discrepancy in the workers' measurements of lipid function before and after consuming bananas ( $p < 0.05$ ).

## RESEARCH PAPER

### \*Corresponding Author:

Majedul Hoque

Department of Pharmacy,  
Jahangirnagar University, Dhaka,  
Bangladesh

### How to cite this paper:

Iftear Kazim Rafi *et al* (2023).

The Impact of Banana  
Consumption on Bangladeshi  
Rickshaw Pullers' Assessing  
Cholesterol, Liver and Blood  
Pressure Functions. *Middle East  
Res J Biological Sci*, 3(2): 24-28.

### Article History:

| Submit: 02.09.2023 |

| Accepted: 06.10.2023 |

| Published: 12.10.2023 |

**Keywords:** Banana, rickshaw puller, liver, lipid, Bangladesh.

**Copyright © 2023 The Author(s):** This is an open-access article distributed under the terms of the Creative Commons Attribution **4.0 International License (CC BY-NC 4.0)** which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use provided the original author and source are credited.

## 1. INTRODUCTION

Fruits are a crucial component of human's healthy diet. Fruits are a secondary source of essential nutrients. Compared to grains, several fruits have substantially higher nutritional potentials. Bananas are among the most popular and significant fruits. Bananas have a tremendous nutritional potential and are one of the oldest plants that have been domesticated. One fruit whose entire portion has the potential to be nutritious is the banana. Each component of this plant has nutritional and therapeutic value [1]. Calcium, phosphorus, and nitrogen are all essential for maintaining healthy tissues, and bananas assist the body retain these minerals. Adding bananas to your diet is an excellent idea. Calories in bananas are often low. Approximately 116 kilocalories are contained in 100 grams of banana. According to study, eating two bananas can provide you enough energy to work out for 90 minutes [1]. These have less protein than other foods (foods high in protein, including cereals). A typical banana has about 1.2 g of protein, or 2% of the daily recommended intake [2]. In the body, proteins serve a variety of purposes. A significant source of potassium is the banana. The most important nutrients for a human diet are carbohydrates, vitamins, and minerals, all of which are abundant in bananas. These are among the significant tropical fruits sold on the global

market [3]. Bananas extract have considerable amounts of both macro- and micronutrients from the soil. The nutritional profile of bananas is improved by the application of fertilizers, ideally inorganic ones combined with organic manures [4].

High potassium content in banana can help decrease blood pressure by regulating the heart rate and fluid balance in the body [5]. Bananas have the potential to protect the liver from free radicals like lead exposure by working as antioxidants. To stop harm to macromolecular components, antioxidants work to neutralize and hasten the breakdown of free radical molecules [6]. According to research, eating bananas can lower serum triglyceride levels by 40.4% [7], and eating bananas can lower blood cholesterol levels because they contain flavonoid compounds and fiber that work to lower excess cholesterol in the liver and digestive system and lower blood cholesterol levels [8]. Bananas contain a lot of moisture. A normal-sized banana has 88 g of water in it [9]. A typical 100g "Cooking Banana" of the species *Musa paradisiaca*, known by its scientific name, weighs about 65g and contains about 65g of moisture (water) [10]. Therefore, the purpose of this study is to evaluate the effects of banana consumption on blood pressure, liver function (as determined by changes in

ALT and AST levels), and lipid function (triglycerides and cholesterol) in rickshaw puller who consumed bananas for two weeks.

## 2. Medicinal Importance of Banana

Due to their high vitamin C content, bananas are a very effective antioxidant. In addition to helping the body manufacture collagen and mend wounds, vitamin C also plays critical roles in the body's repair and growth of

tissues, maintenance of bone and tooth health, and repair of bodily tissues. But perhaps most critically, vitamin C fights free radicals. Some of the crucial functions of vitamin C in the human body include antioxidant action, aiding or stimulating specific enzymes, activating hormones, collagen manufacturing, leukocyte phagocytosis, hydroxylation of proline, and nitrosamine synthesis. Above all else, vitamin C is crucial to a person's body's normal operation [11].



**Figure 1: Health benefits of Banana on different human organ**  
(Source: pinterest)

Vitamin A is another significant antioxidant that aids in eye function; a diet low in Vitamin A has been linked to both night blindness and compromised eye health [12]. Additionally, bananas are a good source of vitamin B complex, which is essential for many bodily processes. Important ones include producing antibodies, promoting good neuron function, and maintaining a normal blood sugar level. B vitamins are essential for many bodily processes. The proper functioning of the gastrointestinal tract, muscles, brain, liver, and nervous system are just a few of the critical processes that Vitamin B complex supports. Vitamin B complex can be found in bananas at a reasonable price and with great consistency [13]. Bananas are an excellent source of potassium and are highly advised for patients with hypertension. Potassium is essential for maintaining the proper balance of water and minerals in the human body as well as for controlling blood pressure [14]. Another excellent source of copper is bananas. Copper is a very

important nutrient for all living things since it is a redox active metal. This metal has a significant impact on numerous disorders, including diabetes, cardiovascular disease, and others [15]. Bananas have a lot of fiber. The presence of fiber aids in maintaining a healthy digestive tract and regular bowel motions. Digestion proceeds more quickly when there is more fiber present [16]. Bananas' magnesium content has been found to be effective against cancer [17].

## 3. METHODS & STUDY DESIGN

This is an experimental study with samples taken using the total sampling technique. The population used is rickshaw puller as many as 40 people. This study was conducted at Savar, Bangladesh and the Laboratory of Wazed Miah research institute, Jahangirnagar University during august 2023.



**Figure 2: Study area near Dhaka city**

### 3.1 Equipment used

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

### 3.2 Data collection

The blood pressure of the samples was measured. Triglyceride, total cholesterol, SGOT, and SGPT levels were assessed using blood samples. Then, for the following two weeks, bananas were provided to the rickshaw puller three times per day—in the morning, midday, and nighttime. Blood was drawn from the patient again for blood pressure checks after two weeks, and blood was continued for analysis of the patient's

levels of SGOT, SGPT, triglycerides, and total cholesterol after therapy.

### 3.3 Statistical analysis

The data collected included blood pressure, liver function (SGOT and SGPT), and lipid function (triglyceride and cholesterol levels). For each test, a paired t test and SPSS 23.0 version were used to evaluate the data. If the p-value is less than 0.05, the result is regarded as significant.

### 3.4 Ethical Consideration

This study was carried out in accordance with the required research ethics. Prior to the start of the participants' involvement in the study, the participants' agreement for participation was also sought.

## 4. RESULTS

**Table 1: The comparison of blood pressure readings before and after eating bananas using paired t tests**

Variable	Time interval	Mean	P value
Blood pressure (mmHg)	Before	121.4	0.422
	After	120.1	

**Table 2: The examination of liver function levels before and after eating bananas using paired t tests**

Liver function	Time interval	Mean	P value
SGOT	Before	22.67	0.108
	After	19.80	
SGPT	Before	23.75	0.256
	After	23.23	

**Table 3: The examination of lipid function before and after eating bananas using paired t tests**

Lipid function	Time interval	Mean	P value
Triglycerides	Before	214.6	<0.05
	After	140.87	
Total cholesterol	Before	178.57	<0.05
	After	124.35	

(Table 1) shows that results of blood pressure measurements performed before taking blood and after eating bananas. The findings led to the conclusion that p

= 0.422. P-value was higher than 0.05, indicating that there was no difference in the workers' blood pressure before or after consuming bananas.

Based on the findings, (Table 2) displays the outcomes of the investigation into the levels of SGOT and SGPT to ascertain the impact of banana consumption on liver function. The p-values for the SGOT and SGPT tests were 0.108 and 0.256, respectively, showing that  $p > 0.05$ , which suggests that there is no significant difference in liver function before and after eating bananas.

According to the findings, (Table 3) displays the outcomes of the triglyceride and total cholesterol examinations to ascertain the impact of giving bananas on lipid function. The p-value of triglycerides is less than 0.05 and total cholesterol is less than 0.05, indicating that  $p < 0.05$ , which means there is a significant difference in the triglyceride and total cholesterol levels.

## 5. DISCUSSION

According to the findings of this study, there was no variation in the pullers' blood pressure or levels of liver function (SGOT and SGPT) before and after eating bananas within the allotted time period. Before and after the workers had bananas, there was a considerable variation in their levels of lipid function (triglycerides and total cholesterol).

The effects of banana supplements were found to be substantial in a prior study by Mosa and Khalil (2015), however different results may have been obtained due to the use of various samples and research objectives [18]. Another study by Mustofa *et al.*, (2021) on the impact of eating Ambon bananas on blood pressure in the elderly produced statistically significant findings for decreasing blood pressure in the elderly with hypertension [19]. According to Edenta *et al.*, (2017)'s findings, there was a substantial impact on liver levels of banana peel extract on both kidney and liver levels [20]. 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 [21]. The results showed that bananas have an impact on lipid levels, which is consistent with the findings of this study.

## LIMITATIONS

This study's population is still small, thus it does not accurately represent the overall population. Additionally, it was hard for this study to account for confounding factors.

## 6. CONCLUSION

While lipid function (examination of triglycerides and total cholesterol) showed a significant difference between before and after consumption of bananas, blood pressure and liver function (SGOT and SGPT examinations) did not differ between the two times. Additional research is required to assess the possible impact of bananas in a broader population. The preservation and processing of banana flesh and non-

flesh portions results in a variety of products. There is a lot of variety in these things. The most well-known banana products are banana powder, banana flour, banana chips, banana biscuits, banana sauce, banana jam, banana juice, and banana pulp. In order to discover new potential uses for bananas that are supported by science, we need continue to explore this fruit.

## COMPLIANCE WITH ETHICAL STANDARDS

**Disclosure of Conflict of Interest:** There is no conflict of interest regarding this paper.

**Author Contribution:** All author contributed significantly to design and development of this work.

## Acknowledgement

Thanks must be given to Jahangirnagar University for supporting the finished research.

## REFERENCES

1. Kumar, K. S., Bhowmik, D., Duraivel, S., & Umadevi, M. (2012). Traditional and medicinal uses of banana. *Journal of pharmacognosy and phytochemistry*, 1(3), 51-63.
2. Mateljan, G. (2007). *The World's Healthiest Foods: Essential Guide for the Healthiest Way of Eating*; Seattle, WA: GMF Publishing.
3. Shankar, G., Jeevitha, P., & Shadeesh, L. (2017). Nutritional Analysis of Musa Acuminata. *Research & Reviews: Journal of Food and Dairy Technology*, 5(4), 27-29.
4. Thangaselvabai, T., & Suresh, S. (2009). Banana nutrition—A review. *Agricultural Reviews*, 30(1), 24-31.
5. Tina, L., Ulfianti, R., & Yunawati, I. (2019). Pengaruh pemberian pisang ambon (musa acuminata colla) terhadap tekanan darah penderita hipertensi di atas 45 tahun di Puskesmas Wawotobi Tahun 2017. *Majalah Kesehatan*, 6(2), 106-112.
6. Prasetyawan, P. A., Suarsana, I. N., & Kendran, A. A. S. (2021). Kadar Alanin Aminotransferase, Aspartat Aminotransferase dan Gambaran Histologi Hati Tikus Putih yang diberikan Ekstrak Kulit Pisang Kepok dan Latihan Intensif. *Bul Vet Udayana*, 13(1), 93-98. doi: 10.24843/bulvet.2021.v13.i01.p14
7. Rusdiana, A. S. (2015). Pengaruh Pemberian Pisang Kepok (Musa Paradisiaca Forma Typical) Terhadap Kadar Triglicerida Tikus Sprague Dawley Pra Sindrom Metabolik. *J Nutr Coll*, 4(2), 585-592.
8. Prameswari, D. C. (2021). Konsumsi Pisang dalam Menurunkan Kadar Kolesterol Darah. *Jurnal Penelitian Perawat Profesional*, 3(3), 511-518. Available from: <http://jurnal.globalhealthsciencegroup.com/index.php/JPPP%0AKONSUMSI>
9. Willie, T., & Ong, M. (2018). 10 Benefits of Eating a Banana. <http://www.pchrd.dost.gov.ph/index.php/news/library-health-news/4617-10-benefits-of-eating-a-banana> (accessed Sep 8, 2018).



10. Food Composition Databases Show Foods—Plantains, Yellow, Raw. <https://ndb.nal.usda.gov/ndb/foods/show/09277>
11. Clemens, Z. (2013). Vitamin C and disease: insights from the evolutionary perspective. *Journal of Evolution and Health: A joint publication of the Ancestral Health Society and the Society for Evolutionary Medicine and Health*, 1(1), 1-22. DOI: 10.15310/2334-3591.1030
12. Englberger, L., Darnton-Hill, I., Coyne, T., Fitzgerald, M. H., & Marks, G. C. (2003). Carotenoid-rich bananas: a potential food source for alleviating vitamin A deficiency. *Food and Nutrition Bulletin*, 24(4), 303-318. DOI: 10.1177/156482650302400401
13. Kaur, A. (2015). Biological Functions of Vitamin B complex and effects on human health in both excess and deficiency levels. *PharmaTutor*, 3(11), 40-47.
14. Moyad, M. A. (2011). Heart health= urologic health and heart unhealthy= urologic unhealthy: rapid review of lifestyle changes and dietary supplements. *Urologic Clinics*, 38(3), 359-367. DOI: 10.1016/j.ucl.2011.05.004
15. Uriu-Adams, J. Y., & Keen, C. L. (2005). Copper, Oxidative Stress, and Human Health. *Mol Aspects Med*, 26(4-5), 268-298. DOI: 10.1016/j.ma::m.2005.07.015
16. Stewart, N. (2014). The Health Benefits of Dietary Fiber Consumption of Adults in the United States. In Graduate Research Papers; University of Northern Iowa: Cedar Falls, pp 1-40.
17. Zhang, W. J., Zhang, X. Y., & Xia, Y. K. (2008). An overview and prospect on banana processing technologies in China. *Food science and technology: new research*. Nova Science Publishers, New York, 393-406.
18. Mosa, Z. M., & Khalil, A. F. (2015). The effect of banana peels supplemented diet on acute liver failure rats. *Annals of Agricultural Sciences*, 60(2), 373-379. doi: 10.1016/j.aos.2015.11.003
19. Mustofa, F. L., Ulfa, A. M., Putri, N., & Husna, I. (2021). Pengaruh Konsumsi Buah Pisang Ambon (Musa Paradisiaca) Terhadap Tekanan Darah Pada Lansia Dengan Hipertensi Di Wilayah Kerja Puskesmas Kibang Budi Jaya Kecamatan Lambu Kibang Kabupaten Tulang Bawang Barat. *J Med Malahayati*, 5(1), 53-8.
20. Edenta, C., Okoduwa, S. I., & Okpe, O. (2017). Effects of aqueous extract of three cultivars of banana (Musa acuminata) fruit peel on kidney and liver function indices in wistar rats. *Medicines*, 4(4), 77. doi:10.3390/medicines4040077
21. Leelarungrayub, J., Parameyong, A., Eungpinichpong, W., & Klaphajone, J. (2017). Effects of Banana (Linn) Consumption for Physical Strength, Metabolic Response, Oxidative Stress, Lipid Profiles, and Interleukin-23 in Healthy Men: A Preliminary Study. *The Open Sports Sciences Journal*, 10(1), 151-159. doi:10.2174/1875399X01710010151