

# THE EFFECT OF CONSUMING *FEIJOA* *REDUCES* THE GLUCOSE LEVELS IN BLOOD

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To quote this article:

Godínez, J., Montañó, L. y Pérez, P. (2018) El consumo de feijoa sellowiana reduce los niveles de glucosa en sangre. *Espacio I+D Innovación más Desarrollo*, 7(17) 22-29. Recuperado de: [http://www.espacioimasd.unach.mx/articulos/vol.7/num17/pdf/02\\_Feijoa.pdf](http://www.espacioimasd.unach.mx/articulos/vol.7/num17/pdf/02_Feijoa.pdf)

— Abstract —

In this work we show that the effect of consuming Feijoa reduces the glucose levels in blood on wistar rats. For the experimental part, we prepare these rats constrain them to consume sugar in liquid solution. Normally, the glucose level in blood for these rats is around  $85 \pm 5$  mg/dL. After consuming this liquid solution during three weeks their glucose level raised to 150 mg/dL. Later, for other three weeks they were constrained to consume feijoa juice. Every week of consuming this juice we controled the glucose levels in blood finding it was reduced to 80 mg/dL by the third week, and even less, to  $65 \pm 4$  mg/dL. These results show that drinking feijoa juice helps to reduce the glucose level in blood.

### Keywords

*Feijoa, glucose; wistar rats.*

The feijoa is scientifically known as *Acca sellowiana*, it is a fruit native from the tropical and subtropical zones of South America, particularly in some areas of Brazil. It is also commercially available in some European countries whose suppliers are New Zealand, Israel and France. On the other hand, in the American continent it is usually cultivated in Uruguay, Colombia, the United States, Argentina and Mexico, as well as Brazil. This fruit is similar to guava, it has a spherical shape with a length of 5 to 8 centimeters and an approximate weight of 30gr. This fruit is matured in autumn (see figure 1) (Giuseppe Y Corrado, 2004).

**Image 1.** Ripe Feijoa.



To date, not all the components of this fruit are known. However, Shaw and colleagues showed that in the peel of the feijoa, there is a substance called pectin, which, when consumed, helps control blood pressure; this brings benefits for those patients who suffer from hypertension (increase in blood pressure). It has also been reported that pectin helps lower blood cholesterol levels (Shaw, Allen and Yates, 1990).

The feijoa pulp has been used in rejuvenating creams helping to delay the appearance of wrinkles and, applied to the hair, helps to keep it hydrated. On the other hand, the feijoa contains high levels of chlorophyll in its shell which, together with the amino acid arginine present in the pulp, stimulates the growth of the children who consume it. It is also high in vitamin C, making it an excellent natural anti-flu (Motohashi, Kawase, Shirataki, 2000, Vuotto *et al.*, 2000, Bontempo *et al.*, 2007, Nakashima, 2001).

In those people who have trouble sleeping, the consumption of feijoa juice helps them to stabilize the normal sleep cycle. In addition, it helps to improve mood, reduce fatigue, reduce irritability and can help prevent depression (Motohashi, Kawase and Shirataki, 2000, Vuotto *et al.*, 2000, Bontempo *et al.*, 2007; Nakashima, 2001).

**Image 2.** Feijoa pulp with high nutritional benefits.



For all the reported benefits that the feijoa presents in the nutritional status of the human being along with the little information that is available about its effects on patients suffering from diabetes mellitus (high blood sugar levels) in our laboratory, we decided to investigate as a main target if the feijoa juice helps reduce blood glucose levels.

## METHODS

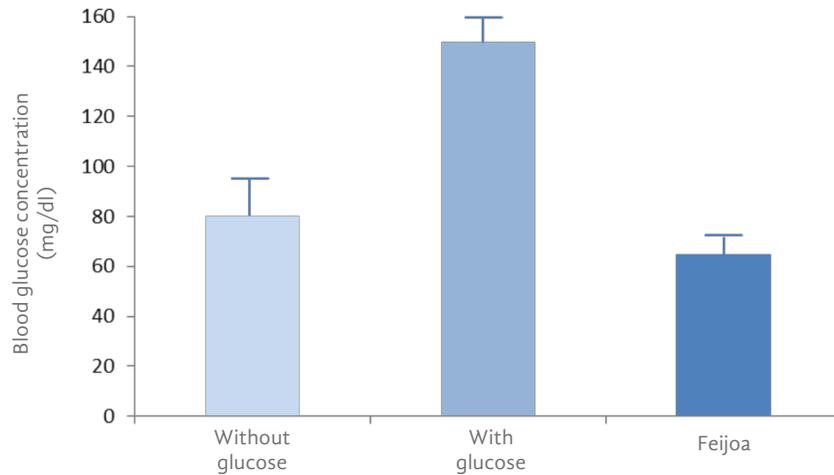
The present study is of experimental type with a longitudinal temporal frequency. Wistar rats were used, which were treated to raise their blood glucose levels by consuming a solution with high glucose content daily for three weeks. Under normal conditions, the rats had glucose levels between 80 to 90 mg/dL, this will serve as a control. In our experimental phase, we used four rats that raised their glucose level in the three weeks to 150 mg/dL. These rats, once removing the food to increase their blood glucose level, were subsequently given the feijoa juice for three weeks.

## RESULTS

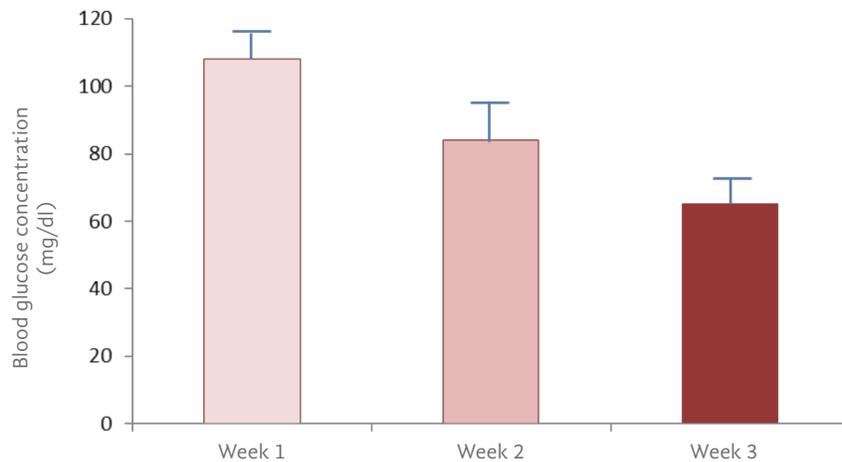
The blood glucose levels of the rats that consumed the solution with high glucose content were monitored week by week. Before starting the glucose solution they had blood glucose levels of  $85 \pm 5$  mg/dL and as the weeks progressed the blood glucose levels increased until reaching an average

concentration of 150mg/dL. Subsequently, by removing the solution with high glucose content, the rats were given feijoa juice for 3 weeks and their blood glucose levels were being evaluated. These results can be seen in image 3. It was observed how it was decreasing every week, until the last week where glucose levels were  $65 \pm 4$  mg/dL, that is, at normal levels (see Image 4).

**Image 3.** Feijoa reduces blood glucose levels in rats with high glucose levels.



**Image 4.** Temporary course of blood glucose reduction in Wistar rats with high glucose levels that consumed Feijoa for three weeks.



## DISCUSSION AND CONCLUSIONS

The feijoa is a fruit with many health benefits. The potent antimicrobial and antifungal activity has been reported, for example the Vuotto team and collaborators demonstrated that Feijoa has helped to reduce the *Helicobacter pylori* levels, bacteria responsible for gastrointestinal diseases (Vuotto *et al.*, 2000). The Bontempo team and collaborators in 2007 showed that Feijoa extract has anti-carcinogenic properties. More recent studies report the nephroprotective effect produced by the feijoa extract (Karami *et al.*, 2014). However, no information has been found on the effect of feijoa on blood glucose levels, which is why our team was interested in this topic. This work is the first to demonstrate that the daily consumption of feijoa juice helps reduce the blood glucose levels of Wistar rats. With these favorable results, our plan is, in the near future, to generate diabetic rats and see if the daily consumption of feijoa juice (during a month) helps to reduce blood glucose levels that are usually elevated. It is also desired to know which chemical component of the feijoa is responsible for the hypoglycaemic effect (decrease in blood glucose).

In our country we have a great variety of fruits and vegetables of which we do not know about their existence and we still do not know the great nutritional benefits they can provide us. We have heard many times in different media that *Diabetes Mellitus* is the main disease that affects the Mexican population and that some of the complications of this disease is kidney failure (decreased kidney function). In an investigation, the team Karami and collaborators showed the nephroprotective effect produced by the feijoa; therefore, the consumption of this fruit could help diabetic patients. The contribution that our team is making is to show data that prove the benefits that feijoa can have in reducing blood glucose levels in the Mexican diabetic population.

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