



# Bioproducts of Amazonian Fruits for the Prevention and Alternative Treatment of Noncommunicable Diseases- A Mini Review

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## Abstract

The Amazon biome offers fruits with an exceptional content of bioactive compounds in their chemical composition, including essential fatty acids, tocopherols, carotenoids, ascorbic acid and phenolic compounds, which strengthen the endogenous system by reducing oxidative and inflammatory stress. The technological development of products based on Amazonian fruits stands out as they boost antioxidant and anti-inflammatory content, bioavailability and health safety, characterizing bioproducts with functional property claims as alternative sources in the prevention and treatment of non-communicable diseases. In this context, this brief literature review aims to raise awareness of the use of Amazonian bioproducts to improve the quality of life of the population suffering from non-communicable diseases, especially obesity and its comorbidities, which are of great importance to global public health and which have been increasing in prevalence in all countries, especially middle-income countries and some low-income countries. It is also technologically viable, low-cost and has great potential for the food and pharmaceutical industries, strengthening the bioeconomy.

**Keywords:** Amazon Fruits; Bioproducts; Bioactive Compounds; Noncommunicable Diseases; Bioeconomy

## Obesity and Global Health

The prevalence of obesity has increased epidemically, as highlighted in the World Obesity Atlas 2023 [1], with significant socio-economic impacts. By 2035, more than half of the world's population will be over the weight considered healthy, representing a major public health problem in the world.

## High BMI and the Risk of Noncommunicable Diseases in Children and Adults

The growing prevalence of overweight and obese adults is verified by statistical projections over the years, as shown below Table 1.

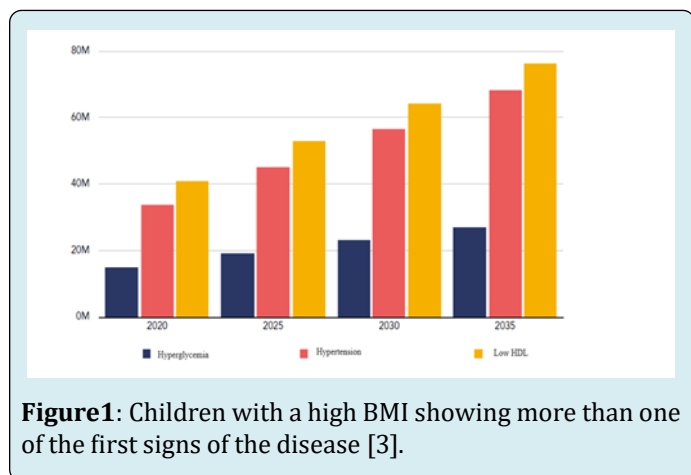
	2020	2025	2030	2035
<b>Overweight</b>	1.39 billion	1.52 billion	1.65 billion	1.77 billion
<b>Obesity</b>	0.81 billion	1.01 billion	1.25 billion	1.53 billion
Proportion of overweight or obesity adults worldwide	42%	46%	50%	54%

**Table 1:** Global estimate (2020) and projected number of adults (2025-2035) bearing high body mass index (BMI  $\geq$  25 kg/m<sup>2</sup>).

World Obesity Federation 2023.



According to the World Atlas of Obesity [2], projections for 2035, assuming there are no effective interventions to reduce overweight and obesity, has been undertaken up to then indicate nearly 27 million children will have hyperglycemia, 68 million from high blood pressure and 76 million from low levels HDL cholesterol, on account of their high BMI (Figure 1). Their majority be dwelling in middle-income countries and in most cases, under undetected or untreated conditions.



**Figure 1:** Children with a high BMI showing more than one of the first signs of the disease [3].

### Projected Increase in Global Overweight and Obesity and its Impacts

Based on data trends projected since 2000, the ineffectiveness of the interventions is evident and reveals the number of children and young people bearing the early signs of noncommunicable diseases (NCDs) which are attributable to overweight and obesity, in addition to the increase on the prevalence of adults affected by high BMI. Out of the 41 million annual deaths attributed to NCDs, 5 million are propelled by high BMI ( $\geq 25 \text{ kg/m}^2$ ) and, as based on current trends, by 2035, more than 750 million children (aged in between 5 and 19) will have to live overweighted and obese, as measured by their body mass index [2].

According to the study on Global Burden of Disease [3], recent estimates indicate that more than 56 million people die every year and 2.5 billion years of healthy life are lost due to disease or injury or other causes of ill health or decrease on adult life years (DALYs). Of these, around 41 million adult deaths and 1.6 billion DALYs are caused by chronic non-communicable diseases (NCDs). Two-thirds of these NCDs deaths and 40% of NCDs DALYs are caused by just four conditions: cancer (neoplasms), coronary heart disease, stroke and diabetes. Each of these conditions is associated with and accelerated by overweight and obesity.

The above-mentioned study also provides estimates, on the proportion of these deaths and DALYs, for which risk

factors are known including the risk factor of high body mass index (BMI  $\geq 25 \text{ kg/m}^2$ ). As shown in Table 2, the latter is responsible for between 5% and 42% of adult deaths and the four main NCDs, for 5% to 52% of DALYs.

	Total number of deaths in 2019	Deaths due to high BMI
All causes of disease	50.3	5.0 (10%)
NCDs	41	5.0 (12%)
<b>The following NCDs</b>		
Diabetic mellitus (Type 2)	1.47	0.62 (42%)
Coronary disease	9.1	1.7 (19%)
Cancer	9.9	0.46 (5%)
Cerebrovascular disease	6.5	1.1 (17%)

**Table 2:** Adult deaths attributable to high BMI (million). IHME, 2024.

It is worth mentioning that Brazil is one of the 25 countries, which were selected by the WHO Acceleration Plan, to ensure the commitment to implement the Recommendations for the Prevention and Management of Obesity through Life, ranking 5<sup>th</sup> for adults (55%) and 4<sup>th</sup> for children (30%) among the Latin American countries holding high prevalence of overweight and obesity [2].

### Emerging Healthy Alternatives to Curb the Impact of NCDs

Due to the notorious ineffectiveness of conservative treatment, the Amazon fruit-based bioproducts technological development, has shown to be effective on the prevention and alternative treatment of obesity and its comorbidities without imparting any side effects, as one may observe in allopathic or invasive treatments [4-6]. It can also serve both as a strategy for adherence to a low-cost alternative treatment that yields both substantial reduction and improvement in anthropometric and biochemical parameters along with, a better quality of life [7-12].

Figure 2, highlights the Amazon fruits' high bioactive compounds and antioxidants levels, their hypolipidemic and anti-inflammatory effects, which are important for the treatment of overweight and obesity and their comorbidities [13,14]. Whether in the form of extracts, drinks, oils or in the preparation of nutritional bars, since added valued-bioproducts increase their macro and micronutrients, bioactive compounds and antioxidants content, in addition to avoiding waste, due to keeping fresh for a long time,

being available throughout the off-season, enabling access to geographically distant locations, surpassing the unfeasibility of cultivation and, facilitating their distribution and standardization in suitable quantities for human consumption [15-17].



**Figure 2A:** Endopleura uchi, **B:** Myrciaria dubia (H.B.K.) McVaugh, **C:** Paullinia cupana, **D:** Euterpe precatoria Mart, **E:** Castanha-de-cutia tree.

Hence, food technology contributes to palatability, digestibility, nutritional value and bioavailability, by implementing long lasting sanitary quality, through emerging food processing technologies [18]. Moreover, the development of new Amazon biodiversity-derived bioproducts and technological applications aims to add value to raw materials and become an alternative for the region's sustainable socioeconomic development, opening great prospects for trade in the food and pharmaceutical industries [19-22].

As a matter of fact, overweight and obesity, is a major global challenge to be faced, however, strategies have been established by the World Health Organization and approved by all governments in 2013, to reduce their harm by 2030. The World Health World Obesity Atlas 2022 [23] has projected global obesity to have probably been doubled over this period. It should be remembered that the individual's

environment modulates their lifestyle and is considered one of the main causes of obesity [24].

The impact of overweight and obesity on the poorest communities not only increased vulnerability, in terms of health, but economic and social crises as well, with an economic impact of 2.4% of global GDP in 2020, estimated to rise to 4.32 trillion dollars by 2035 [2].

## Conclusion

Bioproducts based on Amazonian fruits are promising for the emerging therapy of obesity with antioxidant and anti-inflammatory effects, aiming for greater reach and impact, associated with psychological support, nutritional therapy and exercise, for the implementation of effective public health policies applied to food and health, in high, middle or low income countries and in all populations.

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## Conflicts of Interest

The author declares no conflicts of interest.

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