

## Anthocyanins and Obesity: A Framework of Situation

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Several researches has reported that diets rich in anthocyanins can prevent metabolic diseases. Obesity is caused by a long-term difference in energy intake and expenditure (i.e. positive energy balance), which leads to a rise in body mass and the accumulation of subcutaneous and visceral fat. Despite the fact that obesity is a risk factor for a variety of diseases, numerous human studies have found that visceral fat, or fat in the viscera, is the fat that is most closely associated to a variety of health problems [1,2]. Insulin resistance (IR) has been associated to a number of metabolic issues, including insulin resistance, non-insulin-dependent diabetes, hypertension, and dyslipidemia. Moreover, the pathophysiology of IR in obesity, as well as the processes that cause it, remain unexplained [3]. Under normal physiological settings, the insulin and glucagon levels of glucose in equilibrium are within a small range. It was assumed that it had been managed. The perception of the presence of a more complicated multihormonal system has shifted in recent years. The metabolism of glucose and lipids are also implicated. Adipokines (leptin, adiponectin, visfatin, resistin, and adipisin) secreted from adipose tissue, as well as GLP-1, ghrelin, and glucose-dependent insulinotropic polypeptide (GIP) secreted from the intestinal tract, all play a role [4].

Anthocyanins are color-rich food components that are beneficial to human health. They are particularly abundant in fruits and vegetables with vibrant hues. Flavonoid pigments, which range in color from orange to blue and violet, are the most common [5]. Anthocyanins protect against a variety of diseases and slow the advancement of those diseases through a variety of ways. They're chemical compounds that can react with a wide range of other chemicals. It has been discovered to play a role in a variety of intricate metabolic interactions in the human body. Inhibiting -glucosidase, lipase, and -amylase enzymes, reducing glucose levels, modulating insulin secretion, and preventing insulin resistance are all benefits of anthocyanins [6]. They are chemical compounds that prevent neurological and cardiovascular disorders and have anticancer, antitumor, anti-atherosclerotic, anti-inflammatory, anti-microbial, and anti-obesity effects on human health [7-9]. Anthocyanins fight obesity by regulating adipocytokine release and lipid metabolism in adipose tissue and lowering blood leptin levels [10-15].

Blood orange, pomegranate, mulberry, aronia, berries (blackberry, blackcurrant, cranberry, strawberry, raspberry, and so on), vegetables such as red cabbage, purple potatoes, purple carrot, purple cauliflower, and red radish, legumes such as black bean, and cereals such as black rice are some of the most well-known anthocyanin-rich plant foods. Five anti-obesity treatments are attributed to anthocyanins, which are found in colored fruits and vegetables. Lipid absorption inhibition, higher energy expenditure, lipid mechanism regulation, food intake management, and gut microbiota regulation are some of these activities. Anthocyanins had a substantial impact on reducing/regulating insulin resistance and fasting insulin levels in medical nutrition treatment. Many researchers have adequately explained anthocyanins' anti-inflammatory properties.

It may be inferred that the anthocyanin source of a fruit or vegetable (juice, extract, or powdered form) has varied impacts on fat storage in the body. Different findings on weight gain have been observed with different fruit and vegetable forms when considering the product type of fruit and vegetable as a source of anthocyanin.

### Disclosure Statement

The author declare that there are no conflicts of interest.

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