



Nutrition Trends and Insights:

An Analysis in Mango Nutrition Attributes Within the Context of Current Trends

The National Mango Board (NMB)'s mission is to increase consumption of fresh mangos in the U.S. through innovative research and promotional activities, while fostering a thriving industry. The NMB has focused their efforts on consumer barriers and utilizing consumer research as tools to help impulse the mango industry.

Allison Beadle, nutritionist and registered dietician for Salt and Company, conducted a Nutrition Trends and Insights study to examine the predominant nutrition attributes of mangos within the context of current consumer and research trends, generating insights to help form the NMB's nutrition research strategy. The goal is for the NMB to better understand the compounds found in mangos and how they impact different conditions in the human body. This research helps the NMB's marketing efforts, enhance communication opportunities and develop the nutrition brand image of mangos.

Salt and Company determined the predominant nutrition attributes of fresh mangos by examining the existing nutrition data and selecting those attributes with the greatest concentration in fresh mangos. These attributes include: vitamin C, beta carotene (vitamin A), folate, fiber, vitamin B6. After determining these attributes, Salt and Company gathered consumer trends data from a variety of sources including third party consumer research as well as news and keyword search analysis. Furthermore, Salt and Company identified research trends relating to these attributes by gathering input from other nutrition experts and reviewing existing published research (non-mango specific). The project yielded recommendations for the NMB to consider future research to generate nutrition opportunities that will support on-trend marketing messages. The following are the overall findings of this research.

Key Findings

Food and Health: What's Trending with Consumers?

Overall, consumers are expecting their food choices to protect them from chronic diseases or specific conditions. Recent data indicates that more than nine out of ten consumers have given at least "a little" thought to the healthfulness of their foods and beverages, and half of consumers have given "a lot." Based on research conducted, the following conditions are trending highest in terms of their influence on consumer food choices:

- **Heart Health:** Consumers are looking to lower their cholesterol and blood pressure, as well as other heart related conditions such as circulation, stroke, and plaque formation.
- **Weight Management/Blood Sugar:** Consumers also have concerns regarding weight management and diabetes, since these two conditions are closely linked with each other. Controlling blood sugar and insulin levels are also an important part of both weight and diabetes management.
- **Digestive Health:** Consumers are also particularly interested in digestive health, and other conditions such as obesity, inflammation, and immune function.

- **Aging:** Aging is also an emerging concern in health conditions, maintaining energy levels, mental activity, bone health, eye health, and cancer.
- **Satiety:** it is becoming important for consumers to eat foods that increase the feelings of fullness and help prevent hunger and overeating.
- **Skin Health:** There is a growing interest amongst consumers in relation to diet and skin health extending to beauty and skincare product innovation.

Mango Nutrition: What is Trending with Consumers?

This research focused on the main attributes that are found in the flesh of mangos in concentrations deemed to be of significance to human health. These attributes were found to be most significant with consumers during our research. 40% of consumers say that they are “making a strong effort” to get more vitamin C, 34% report the same for B vitamins, and 24% for vitamin A. At the same time, 53% of consumers are seeking more fiber, and beta carotene and polyphenols are trending high in consumer health opportunities. The following nutrition attributes of fresh mangos are the focal points of this report: vitamin C, beta carotene/vitamin A, folate, fiber, vitamin B6, and polyphenols.

- **Vitamin C:** One cup of fresh mango contains 60 mg of vitamin C, which equals to 100% of the Daily Value. Vitamin C is an antioxidant that aids the human body in several functions including supporting healthy cognitive functions, and wound healing. It is also required to produce collagen, a protein that plays a critical role in the structure of our bodies. In addition, vitamin C plays an important role in immune functions.
- **Beta Carotene/Vitamin A:** One cup of fresh mango contains 1785 IU of vitamin A, which equals 35% of the Daily Value. Beta Carotene is an antioxidant pigment that the body converts to vitamin A. Vitamin A is important for vision health and also plays an important role in immune function, reproductive health, bone growth, and maintaining healthy skin.
- **Folate:** One cup of fresh mango contains 71 ug of folate, which equals 20% of the Daily Value. Folate is a vitamin B that helps the body make red blood cells, supports healthy cardiovascular functions, and is important for women during pregnancy.
- **Fiber:** One cup of fresh mango contains 3 g of fiber, which equals to 12% of the Daily Value. Fiber helps the body with digestive functions, control constipation, slow the absorption of sugar into the bloodstream and can increase the feeling of satiety after eating.
- **Vitamin B6:** One cup of fresh mango contains .2 mg of vitamin B6, which equals to 10% of the Daily Value. Vitamin B6 helps the body with immune functions, and also plays an important role in cognitive development. In addition, vitamin B6 helps the body maintain normal blood sugar levels.
- **Polyphenols:** One cup of fresh mango contains 236-1395 mg/kg GAE (Gallic Acid Equivalent); no Daily Value has been established for GAE. Polyphenols have various antioxidant and anti-inflammatory properties.

Consumers are very interested in the relationship between diet and health as evidenced by the volume of consumer media coverage touting the potential health benefits of various food, nutrients, etc.

Mango Nutrition: What is Trending in Health Research?

Salt and Company conducted a review of research studies pertaining to predominant nutrition attributes and health benefits that have been published in peer-reviewed scientific journals over the last five years. With this (not mango-specific) research, we have gathered insights and perspective on the volume of published research as well as trends within this research.

Salt and Company found that although the predominant mango nutrients are well-established in terms of their functions within the human body, as nutrition research evolves; science and research continue to uncover potential benefits of these nutrients (polyphenols continue to be studied and research is inconclusive as to whether they are beneficial compounds).

Based on Salt and Company's review, new research regarding the predominant nutrition attributes is focusing on the following areas:

- **Vitamin C**
 - Circulatory benefits
 - Role in glucose metabolism
 - Bone health
 - Immune support
- **Beta Carotene/Vitamin A**
 - Relationship to cancer
 - Potential for cardiovascular protection
- **Folate**
 - Cancer protection
 - Cognitive health
 - Cardiovascular benefits
- **Fiber**
 - Cancer protection
 - Obesity protection
 - Cardiovascular benefits
 - Prebiotic fibers and gut health/microbiome effects
 - Inflammation
 - Immune health
- **Vitamin B6**
 - Colorectal cancer survival
 - Association with depressive symptoms in elderly
 - Protection against active disease in Lupus patients
 - Cardiovascular disease protection
- **Polyphenols**
 - Relationship between polyphenol and fiber digestion/metabolism
 - Effect on gut microbiome
 - Immune function
 - Absorption and metabolism of polyphenols
 - Gene interactions of polyphenols
 - Neuroprotective effects
 - Cardioprotective effects
 - Skin protection

Looking Ahead

Based on the review of consumers and research trends, there are great opportunities for the NMB to further develop mango's nutrition research that will help support marketing messages. Recommendations were made to the NMB to further studies in the following areas:

- Composition, bioavailability, and mechanistic studies
 - Fiber
 - Polyphenols
- Mango health impact studies
 - Digestive health
 - Inflammatory response
 - Heart health
 - Weight management/blood sugar
 - Aging
 - Satiety
 - Skin health
- Special population studies
 - Children and adolescents
 - Pregnancy
 - Athletes

In conclusion, research shows that it is important to consider areas of health impact that have not been explored in regards to mango consumption.