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Nutritive Value and Health Benefits of Whiteleg Shrimp (*Litopenaeus vannamei*)

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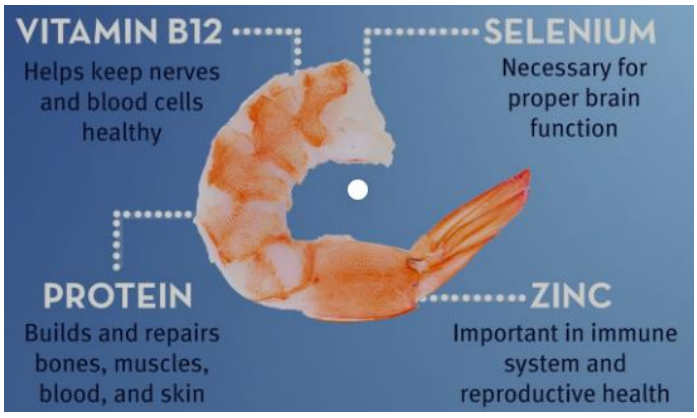
SUMMARY

The most widely cultivated shrimp in Latin America and Southeast Asia, making up more than 90% of all shrimp production, is the whiteleg shrimp (*Litopenaeus vannamei*, originally *Penaeus vannamei*). This is also known as Pacific white shrimp or King Prawn. This decapod crustacean is indigenous to Eastern Pacific Coast of Central and South America from Tumbes, Peru in the south to Mexico in the north. Since the 1970s, it has been widely distributed around the world, but notably since 2000 as it has risen as the primary species of cultured shrimp in Asia. With 1.24 million ha of brackish water area and 8,118 km of coastline, India is the second-largest producer of shrimp in the world, with Andhra Pradesh having the most vannamei farms. The state of Andhra Pradesh, which is located on the nation's southern coast, has 175,000 ha of brackish water and 974 km of shoreline.

INTRODUCTION

The Government of India (GoI) decided to start shrimp farming after conducting research on brackish water fish farming in the late 1970s. In the early 1990s, *Penaeus monodon* culture grew rapidly as a result of the financial benefits of shrimp farming. An outbreak of White Spot Syndrome Virus (WSSV) occurred in 1994 due to lack of growing culture systems and cultivation practices. Freshwater shrimp, or *Macrobrachium rosenbergii* ("scampi"), was introduced in 1999 as a replacement for *P. monodon*. The 1990s is a well-known "virus disease period" in shrimp farming. Freshwater prawn farming in the state was severely affected by a severe disease outbreak in 2001-2002. After this phenomena a new species of shrimp, *Litopenaeus vannamei* which was disease resistance, ability to withstand high stocking density, low salinity, and tolerance of high temperatures, as well as its rapid growth rate suggested as a possible replacement species. The National Bureau of Fish Genetics and Resources (NBFGR) and the Central Institute of Brackishwater Aquaculture (CIBA) together conducted a risk analysis to determine whether the introduction of this new species was feasible. In 2009, the Coastal Aquaculture Authority (CAA) approved vannamei culture through the import of specific pathogen free (SPF) brood stock and stringent regulatory guidelines. The introduction of vannamei was done in response to ongoing pressure from producers and traders. At the request of the Ministry of Agriculture, the Rajiv Gandhi Center for Aquaculture (RGCA) established the Aquatic Quarantine Facility (AQF) of *L. vannamei*, a state-of-the-art facility located in Chennai, Tamil Nadu. This vannamei broodstock was imported to India to reduce the risk of negative effects from the introduction of this exotic shrimp.

Health benefits



Nutritive value and health benefits

- Shrimp is a low-calorie, high-protein food that is also rich in calcium, a variety of extractable chemicals, and other essential nutrients for human health (Abdullah et al., 2009).

- Polyunsaturated fatty acids predominate in the shrimp lipid (essential fatty acids). Peoples can benefit from them in terms of their health, including improved brain and retinal development (Conner et al., 1992).
- Shrimps' bodies include a variety of inorganic substances that support a variety of essential physiological processes.
- Certain elements, such copper, zinc, manganese, iron, and chromium, which are present in shrimp at acceptable quantities and have useful biological functions, are particularly beneficial to human health (Abdullah et al., 2009).

Table 1. Proximate and mineral composition of flesh of *L. vannamei*

A. Proximate composition	
Crude protein	35.69±0.5%
Crude carbohydrate	3.20±0.3%
Crude lipid	19.00±0.6%
Moisture	76.20±0.5%
Ash	1.20±0.6%
B. Mineral composition	
Calcium	154.5 mg/g
Magnesium	13.41 mg/g
Sodium	67.70 mg/g
Potassium	56.70 mg/g
Phosphorus	6.98 mg/g
Manganese	0.89 mg/g
Iron	4.54 mg/g
Copper	In trace
Chromium	In trace

Source: Gunalan *et al.*, 2013

CONCLUSION

The shrimp *Penaeus vannamei* has large amounts of protein, vitamins, and minerals. When included in a regular diet, the shrimp maintain a high nutritional content while displaying heightened antioxidant activity, which is advantageous for enhancing nutrition and health. This article may be help in the areas of pharmaceutical and food manufacturing like: shrimp product preservation and cooking process techniques to meet consumer nutritional needs and contribute to the development of new functional products with therapeutic nutritional properties that include shrimp meat in their composition, used in therapeutic nutrition to treat chronic diseases and malnutrition diseases, and extract some bioactive compounds from shrimp meat (vitamins, minerals, fatty acids, and amino acids) for uses in the pharmaceutical industries.

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