

FUNCTIONAL FOOD PRODUCTS FROM SEAWEEDS

Seaweed enriched Pasta

Pasta was prepared with dried *Ulva* powder (a green seaweed) as an ingredient to improve its functional and nutritional qualities. Seaweed enriched pasta was prepared with Samolina, egg white and dried seaweed powder and pasta dough was made into far-falle shape pasta. Pasta was dried at 75°C for 3h in a hot air oven.



Pasta fortified with seaweed showed higher protein and fibre content. Addition of 5% dried *Ulva* powder improved textural properties of pasta and pasta with 2.5 & 5% dried seaweed powder had better sensory acceptability. Dried *Ulva* powder can be considered as potential ingredient for developing healthy pasta. The product can be produced by food/fish processors and can be marketed in retail market, restaurants and retails food kiosks.

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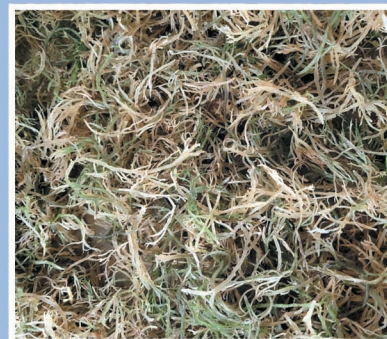
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Functional food products from seaweed

Seaweeds, also known as macro algae, are heterogeneous plants that live in salt water, either in marine or brackish water environments, and grow abundantly on rocky solid substrates in waters up to 180 m depth. Seaweeds are a rich source of macro elements (Na, Ca, K, Mg, S, Cl and P) and micro elements (I, Zn, Cu, Se, Ni, Co, B and Mn) and contain plenty of iodine which has important role in preventing goiter disease in humans.

They are also rich in protein, fibre and vitamins, especially vitamin K and folic acid. The dietary fibre content of edible seaweeds ranges from 33% to 62% of dry mass which is much higher as compared to dietary fibre content found in higher plants. Seaweeds are a good source of both water-soluble vitamins such as B1, B2, B12 and C and fat-soluble vitamin such as Vitamin A and Vitamin E.

Though seaweeds are rich in nutrients, it is generally not preferred in India for human consumption. But recently, there has been a growing interest to develop seaweed-based food products and the seaweed as functional food ingredients create potential business opportunity to promote the diversification of exiting utilization of seaweed. Diversifying the utilization of seaweed, ICAR-CIFT, Visakhapatnam Research Centre has developed varieties of value added food products enriched with seaweed nutrients, such as seaweed dietary fibre-dietary supplements, dietary fibre fortified-fish sausages, seaweed-enriched noodles and pasta.

Seaweed Dietary fibre

Gracilaria edulis is a species of red seaweed grows abundantly in both East and West Coast of India. ICAR-CIFT had optimized the technology for dietary fibre extraction from seaweed.

Dietary fibre helps in reducing coronary heart related diseases, diabetes incidence, gut neoplasia and prevention of constipation as well as in reducing the risk of colon cancer. Dietary fibre from seaweed is a promising functional food ingredient with wide application in the food industry.



Seaweed dietary fibre fortified fish sausage

Sausages prepared from fish meat/red meat are available commercially, but these products lack in dietary fibre. Dietary fibre helps in reducing coronary heart related diseases, diabetes incidence, gut neoplasia and prevention of constipation as well as in reducing the risk of colon cancer.



A new product namely seaweed dietary fibre fortified fish sausage was developed by ICAR-CIFT. Seaweed dietary fibre fortified fish sausage was prepared following the standard protocol with a standard formulation of fish surimi, salt, sugar, poly phosphate, guar gum, corn starch, sunflower oil and seaweed dietary fibre. Incorporation of seaweed dietary fibre to fish sausage can enrich the product with dietary fibre and improves the quality and textural properties. The product has shelf life of 63 days at $2\pm 0.5^\circ\text{C}$. The product can be produced by food/fish processors and can be marketed in retail market, restaurants and retail food kiosks.

Seaweed enriched fish noodles



Ulva reticulata, a species of green seaweed grows abundantly in both East and West Coast of India. Noodles are prepared using wheat flour, corn flour, tapioca starch, salt, edible green seaweed (*Ulva reticulata*) puree and fish (*Pangasianodon hypophthalmus*) mince.

Incorporation of green seaweed puree and fish mince increased the protein, crude fibre content and also enhanced flavour of the noodles. *U. reticulata* and pangasius fish mince can be considered as potential ingredients for developing healthy noodles products. The product can be produced by food/fish processors and can be marketed in retail market, restaurants and retail food kiosks.