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A Review on Fish Composition

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Abstract:

Fish has important nutrient beneficial to human health. The taste of fish and nutritional value has made it important food source, hence consumed all over the world which in turn increase economy. The principle nutrients of fish are lipid, protein and water. Along with this there are minerals, vitamins and carbohydrate present in fish which has several benefits on health. In this review important nutrient and it's health benefit is accumulated from various sources and summarized.

Introduction:

Fish is a vital source of food for people. The FAO estimates that about one billion people world-wide rely on fish as their primary source of animal protein. Consumption of food fish is increasing, having risen from 40 million tonnes in 1970 to 86 million tonnes in 1998 (FAO, 2000). Although fish is considered as a crucial source of protein, it also contains other significant nutrients that are beneficial to human health. Because of its high nutritional content, fish in small amounts is also sufficient for filling out the nutrient index. The fish has medicinal potential that has significant benefits on human health. It not only improves human health but also guards against numerous health issues. (Li et al., 2020). This point includes a significant literature review of the fish component. Hence it gives a pressure on fish industry to grow fish to fulfill market demand in turn demand of aquaculture raise globally.

Fish nutrients

Fish is high in nutrients, including micro and macronutrients. Proteins, lipids, and a very small quantity of carbohydrates make up the macronutrients. Micronutrients such as vitamins and minerals are also crucial components. (Balami et al., 2019)The significance of several nutrients and water found in fish is further explained here.

Lipids:

Lipids and their constituent fatty acids are, along with proteins, the major organic constituents of fish, with carbohydrates being quantitatively much less prominent in fish. Even though fat is found in all of the tissues in fish, there are places where it is present in exceptionally high amounts, creating depots of fat. Muscles, head tissue, milt, liver, skeletal tissue, subcutaneous connective tissue, and viscera are among places where fish depot fat can be found. However, heart has the lowest level of fat content and the brain has the most. The amount of fat in fish impacts its quality and, consequently, its value (S. K. Gupta & Gupta, 2006).

Moreover, the fatty acids of fish lipids are rich in long chain, highly unsaturated fatty acids (HUFA) that have particularly important roles in animal nutrition (Tocher, 2003) . Wet tissue in the liver has 3.56 to 39.55% total lipids, and meat only contains 0.007 to 0.80 percent. There are up to 25 different fatty acids in marine fish oil; among the saturated fatty acids, myristic, palmitic, and stearic acid are the most prevalent, with lauric and pentadecanoic acid acting as minor components (Ahmed, 1995) . Fish flesh contains omega-3, it helps to reduce extra cholesterol level. Moderate amount of omega – 3 is beneficial for human health like The omega-3 PUFAs tend to lower plasma cholesterol, VLDL plus LDL, and triglycerides (Connor & Connor, 1997; GIBSON, 1988; VON et al., 1978) The preponderance of evidence shows that the consumption of fish or fish oil containing omega-3 polyunsaturated fatty acids reduces the risk of coronary heart disease and it reduces the incidence of stroke (Sidhu, 2003). Consumption of omega-3 PUFAs has caused a mild decrease in systolic and diastolicblood pressures in humans with mild hypertension (Bonna, 1990; Connor & Connor, 1997; Deckere, 1998; Stone, 1996; Takahata et al., 1998; Toft et al., 1995). Fish oil intake has been associated with a low incidence of diabetes mellitus (Malasanos & Stacpoole, 1991; Rustan et al., 1997). Omega-3 PUFAs appear to reduce blood pressure and plasma triglycerides, which appear to improve several metabolic symptoms of insulin resistance in humans. (Berry, 1997). Omega-3 PUFAs may have specific health benefits for pregnant women. These fatty acids may also be important for optimal prenatal and postnatal development (Burdge, 1998). Fish oil–derived n–3 PUFA therapy has clinically important muscle anabolic and physical performance–enhancing effects in older adults (Smith et al., 2015).Omega-3 PUFAs may retard the progression of prostate cancer (Karmali et al., 1987; Rose, 1997). Fish has anti-inflammatory qualities and is linked to a lower risk of cardiovascular disease due to omega-3 polyunsaturated fatty acids (PUFAs). The two key ones are docosahexaenoic acid

(DHA) and eicosapentaenoic acid (EPA). They thin the blood, which decreases the risk of clot formation, by reducing the level of platelet aggregation in the blood.(Gormley, 2012)

Protein:

The high saturated fat found in fatty meat products is minimal in fish, making them excellent sources of protein. Furthermore, unlike other animal products, fish fat is made up of PUFA, which are good for human health (Stone, 1996) . The major functions of fish protein are to strengthen and repair muscular tissue, boost immunity, and enhance blood quality (Balami et al., 2019). Since fish farming has been a source of protein for people for almost 4,000 years, particularly in Asia, fish is an excellent food for humans since it provides all 10 essential amino acids at a desirable concentration. Lysine and methionine is found to be most abundant (S. K. Gupta & Gupta, 2006; Kundam et al., 2018). Protein content in fish muscle ranges from 15–25%. Myogen and myo-albumin are found intracellularly, while albumin is primarily found in the sarcoplasm interstitial fluid. Fish also have myosin, actin, actomyosin, and tropomyosin, which are contractile proteins. Most stroma proteins are collagen and stroma, which are present in connective tissue, cell membrane, and myocommate(S. K. Gupta & Gupta, 2006) . Fish muscles are rich in amino acids, particularly glutamic acid, proline, taurine, glycine, alanine, and arginine, among the water-soluble components. Taurine, an amino acid that has been shown to be involved in several aspects of mammalian development, is an important source of conditionally necessary amino acids and is found in fish. Instead of the carboxylic acid moiety, the molecule has a sulfonic acid group, one of the most prevalent free amino acids in many tissues, including skeletal and cardiac muscle and the brain. This group is not integrated into proteins (Kadam & Prabhasankar, 2010; Kundam et al., 2018).

Dietary protein is required for three key functions. maintenance includes the repair of tissue damage, the replenishment of tissues that have been used up, and growth or the creation of new, extra proteins. The pattern of the amino acids in dietary protein, the amount consumed, the amount of calories in the food, and the animal's physiological condition all have a significant impact on how well it is utilised.(Cowey & Sargent, 1972) The body easily digests and absorbs fish proteins. Taurine has a potential role in lowering blood pressure, enhancing cardiovascular system, and lowering blood cholesterol levels. Fish is a good source of taurine, which is beneficial for cardiovascular health (Gormley, 2012; Kundam et al., 2018). Anti-hypertensive peptides (ACE inhibitors) are present in fish and fish extracts, which lower blood pressure and prevent atherosclerosis (Gormley, 2012).

Vitamins:

Vitamins A, D, and E are plentiful in marine fish oils. Fish liver oils provide the highest concentration of vitamin A. Vitamins A and D are abundant in cod liver oil and halibut (Kadam & Prabhasankar, 2010; Kundam et al., 2018). The vitamin E found in fish liver oils acts as a protection against the oxidation of vitamin A. Marine fish are good source of vitamin B_1 and B_2 and D .(S. K. Gupta & Gupta, 2006)

Carbohydrate

Fish flesh contains negligible amount of carbohydrates and glycogen which is present only in liver. Glycogen is present in living fish and is rapidly converted to lactic acid after death of fish (S. Gupta, 2010; S. K. Gupta & Gupta, 2006).

Minerals

Fish may obtain inorganic atoms from sea or river water, therefore they are rich in essential minerals and trace elements. When compared to foods from the land, seafood contains more of these vital elements. These minerals constitute around 1-2% of flesh (S. Gupta, 2010). Fish is therefore one of the most important sources of calcium (Ca). It is possible to classify the calcium, copper, selenium, zinc, and magnesium found in fish as bioactive substances (Kundam et al., 2018). In addition to these minerals, fish muscles also include copper, manganese, strontium, zinc, aluminium, barium, molybdenum, cobalt, chromium, silver, mercury, lithium, silicon, radium, bromine, fluorine, and iodine. Some species include cadmium and gold. Iodine level in fresh fish muscle is between 130 and 5130 μg/kg, whereas copper content ranges from 1.4 to 4.1 mg/kg.(S. K. Gupta & Gupta, 2006)

Water:

Water content is not same in all fish. Water content of fish varies inversely to the amount of fat present in fish. It can be from 55-83%. Fish like Bombay Duck have more content of water while oily fish have less concentration.

Conclusion:

Due to busy life style it's important for one to have healthy diet to sustain with challenges and to get an appropriate source of healthy protein source with rich omega 3 lipid in that. The good quality and quantity of essential nutrient makes fish as a staple food which is healthy for all human. Although the benefits of fish crucial nutrients are not utilized by vegetarian population. The fish in daily diet even in small quantity can be a key source of protein. Hence the consumption of fish is increasing day by day. The increase in fish consumption will increase economy also mode of employments.

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