



## Policy Brief No. 3, October 2013

# THE ROLE OF FISH AND SEAFOOD IN FOOD AND NUTRITION SECURITY IN THE CARIBBEAN

## Executive Summary

Fish and seafood are important components of the diet of the Caribbean population. However, in the Caribbean region most of the traditional commercially important fish species and species groups are reported to be either fully developed or over-exploited. Despite efforts to increase production of fish and seafood, the region is still a major importer of the commonly consumed fish and seafood. These foods represent healthier options to consume with respect to protein content and other health benefits throughout the life course. The benefits of fish and seafood include reduction in cardiovascular diseases through the regulation of blood clotting and vessel constriction thus reducing the risk of heart disease and may prolong life after a heart attack. Fish and seafood consumption lowers blood triglycerides (fats); may improve heart function and reduce damage from heart disease; can lower blood pressure; and may improve symptoms of inflammatory diseases, arthritis and psoriasis. The omega-3 fatty acids may also reduce the incidence of depression and postpartum depression in pregnant women. Some fish and seafood may reduce the risk of Alzheimer's Disease and cognitive decline in the elderly. In babies it contributes to vision development and nerve growth in the retina. These benefits augur well for the drive to combat obesity and the related conditions of diabetes, hypertension, heart diseases and some forms of cancer (lifestyle diseases), which are reaching epidemic proportions in the region. Adolescents and young children are also at risk since childhood obesity is also on the rise with overweight and obesity ranging from 25%-30%. Changing the pattern of consumption from high cholesterol saturated fatty animal sources of protein to fish and seafood can contribute positively to a reduction in these lifestyle diseases.

For these shifts in consumption to occur, there needs to be:

- Increased availability and accessibility to fish and seafood
- Policies, systems and regulations to ensure sustainability and proper management of the resources (avoid overfishing)
- Greater support by governments for the strengthening of the Fisheries sector
- Public education with respect to the choice of fish and seafood to minimize the consumption of contaminated fish. Consumers should avoid large fish species that are high up in the food chain since those are more prone to toxin accumulation

## Statement of the Problem

Food and nutrition security exists when the household has access to food needed for a healthy life for all members and is not at risk of losing such access. It embraces all sectors, is multidimensional and embodies: food availability; food accessibility; food utilization; and stability. In 2004 fish provided more than 2.6 billion people globally with at least 20 % of their average per capita animal protein intake (FAO 2006). The FAO report also highlights that fish protein as a share of total world animal protein supplies increased from 14.9% in 1992 to 16.0% in 1996 but then declined to 15.5% in 2003. Global fish consumption was 16.5kg per capita in 2013 with China accounting for most of it. In the Caribbean Region, fish and other seafood constitute a traditional element of the diet of most Caribbean people. Fish and fish products account for an average of 9.9% of the total share of dietary protein. Grenada, Guyana, Barbados, Suriname and St. Lucia have the highest share of the dietary consumption while St. Vincent and the Grenadines, Trinidad and Tobago, Jamaica and Belize have the lowest (CRFM Administrative Report, 2009). Production has fallen over the years despite increasing demands for fish and seafood by both consumers and the Tourism industry. The ocean environment relevant to CARICOM Member States includes the Caribbean Sea and the central Atlantic Region off the coasts of Latin America, from Suriname to Trinidad and Tobago. Despite substantial levels of agricultural support in almost all CARICOM member states over the past 40 years, the fisheries industry has shown only marginal economic activity. The fisheries sector in the Caribbean provides employment for many in the rural communities in addition to enhancing food security and export earnings. It is an important contributor to GDP. The data indicate that, on average, the fisheries sector contributed from as low as 0.13% in Trinidad and Tobago to a high of 6.85% in Guyana. It is also an important foreign exchange earner.

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There are several threats to availability of fish and seafood for food and challenges to continued access. Thus, although markets for processed fish products exist, the potential for penetrating them through aquaculture remains a challenging enterprise. Some other challenges include: population growth; limited productivity of coastal fisheries; climate change; and overexploitation of certain species such as tuna (Secretariat of the Pacific Community, 2008). The consumption of fish and seafoods has changed among indigenous populations of the Caribbean due, in part, to increased incomes and the development of the tourist industry. The consumption of imported frozen and smoked fish is increasing, particularly in the richer countries.

## The Contextual Environment

According to Heileman (2007) the living marine resources in the Caribbean Sea include queen conch, spiny lobster, crabs, molluscs, and penaeid shrimps together with a range of fish species associated with an arrange of habitats (reefs, muddy bottom species, small and medium sized coastal pelagic species, large migratory pelagic species, and deep slope snapper and groupers) to turtles and marine mammals. Fish is preferred in a fresh whole form, although salted dried fish is well accepted in some islands. Processed forms are bought in larger quantities due to greater availability and sometimes cheaper prices. Fish imports into the region comprise a wide range of species and product forms, mostly dried, smoked, salt-dried, gutted, iced, and canned. The use of imported salted fish forms a major part of the local diets of the region. Complex economic factors combined with traditional eating habits continue to affect the pattern of fish consumption. Crustaceans are scarce and seldom consumed locally. They have become a valuable export commodity in most islands, particularly spiny lobsters. Freshwater prawns are consumed by the local population in some territories, although at present they are all being channeled to the local tourist trade due to their high value. Molluscs are not a traditional part of the diet, with the exception of stromboid queen conch and the mangrove oyster which are consumed mainly in Cuba and Jamaica. The region is experiencing a nutrition transition reflected in a shift in diets away from indigenous staples (cereals and starchy roots, fruits and tubers), locally grown fruits, vegetables, legumes, and limited foods from animals, to diets that are more varied and energy-dense, consisting of foods that are more processed (including processed beverages), more from animals, more added sugars, high in fats/oils and sodium, and often more alcohol. This shift in diets is ultimately reflected in the increasing prevalence of overweight and obesity, a main risk factor for non-communicable



diseases (NCDs), such as diabetes, hypertension, stroke, heart diseases and some forms of cancers. These NCDs are the main public health problems in the region.

Seafood is a powerhouse food! It fuels our bodies with important vitamins and minerals that help keep us in the best possible health throughout the life course. Seafood contains about 20% of the high quality proteins of red meat and poultry. It is also low in fat and most of the fat it has is polyunsaturated. Because many diets now specify polyunsaturated fat, rather than saturated fat, fish and seafood make excellent meat substitutes. Some fish, such as salmon, mackerel and catfish, are relatively high in fat. However, the fat is primarily unsaturated. Seafood contain high levels of nutrients that are not commonly found in other foods and have a low proportion of the saturated fats. Fish and seafood are important sources for vital nutrients such as proteins, vitamin D, vitamin B12, phosphorus, potassium, zinc, selenium and iodine. Canned fish with edible bones, such as salmon or sardines, are also rich in calcium. These polyunsaturated and long-chain fatty acids (omega 3 fatty acids: eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA)) are key building blocks in the cell membranes of fish, shellfish and marine mammals.

Many varieties of seafood are also low in sodium and cholesterol. Fish is also a good source of "B" Vitamins: B<sub>6</sub>, B<sub>12</sub>, biotin and niacin. Vitamin A is found mainly in fish liver oils, but some high fat fish are good sources of Vitamin A. Fatty fish and cod liver oil are the most important sources of long-chain polyunsaturated omega-3 fatty acids and vitamin D, and is favorable with respect to both cardiovascular diseases and foetal development. The cholesterol content of most fish is similar to red meat and poultry, about 20 mg per ounce. Some shellfish contain more cholesterol than red meat. But the fat is mainly polyunsaturated.

Fish and seafood provide a range of health benefits. A growing body of evidence indicates that omega -3 fatty acids help maintain cardiovascular health by playing a role in the regulation of blood clotting and vessel constriction thus reducing the risk of heart disease and may prolong life after a heart attack. Fish and seafood consumption lowers blood triglycerides (fats); may improve heart function and reduce damage from heart disease; can lower blood pressure; and may improve symptoms of inflammatory diseases, arthritis and psoriasis. The omega-3 fatty acids may also reduce the incidence of depression and postpartum depression in pregnant women. Some fish and seafood may reduce the risk of Alzheimer's Disease and cognitive decline in the elderly. In babies it contributes to vision development and nerve growth in the retina.

Fish and seafood are an important part of the diet because they provide minerals, vitamins, proteins, and fatty acids. However, pollution in our waterways results in the contamination of fish populations. The main seafood groups can be divided into larger predator fish such as sharks, tuna, marlin, swordfish, mackerel, and salmon; and smaller forage fish like herring, sardines anchovies. These smaller fish feed on plankton and can accumulate toxins but it is the larger predator fish that accumulates the toxins to a higher degree.

Common contaminants include mercury, often in the form of methylmercury, a highly toxic organic compound of mercury, and polychlorinated biphenyls (PCBs) — compounds linked to neurological disorders and other health effects. Species of fish that are high on the food chain, such as shark, swordfish, king mackerel, albacore tuna, and tilefish contain higher concentrations of mercury than others. This is because mercury is stored in the muscle tissues of fish, and when a predatory fish eats another fish, it assumes the entire body burden of mercury in

the consumed fish. Since fish are less efficient at depurating than accumulating methylmercury, fish-tissue concentrations increase over time. Thus species that are high on the food chain such as marlin, tuna, shark, swordfish, king mackerel, tilefish (Gulf of Mexico), northern pike, and lake trout amass body burdens of mercury that can be ten times higher than the species they consume. This process is called biomagnification. The presence of mercury in fish can be a health issue, particularly for women who are or may become pregnant, nursing mothers, and young children. It is important for this sector of the population to learn about healthy fish consumption. Species with characteristically low levels of mercury include shrimp, tilapia, salmon, pollock, and catfish (FDA March 2004). The FDA characterizes shrimp, catfish, pollock, salmon, sardines, and canned light tuna as low-mercury seafood. A study published in 2008 found that mercury distribution in tuna meat is inversely related to the lipid content, suggesting that the lipid concentration within edible tuna tissues has a diluting effect on mercury content. These findings suggest that choosing to consume a type of tuna that has a higher natural fat content may help reduce the amount of mercury intake, compared to consuming tuna with a low fat content. Also, many of the fish chosen for *sushi* contain high levels of mercury. According to the FDA, the risk from mercury by eating fish and shellfish is not a health concern for most people. However, certain seafood might contain levels of mercury that may cause harm to an unborn baby (and especially its brain development and nervous system). Research suggests that selenium content in fish is protective against the toxic effects of methylmercury content. Fish with higher ratios of selenium to methylmercury (Se:Hg) are better to eat since the selenium binds to the methylmercury allowing it to pass through the body un-absorbed.

Ciguatera poisoning is another concern to the safety of fish consumption. However, it is more prevalent in the larger carnivorous fish, such as barracuda and grouper caused by consumption of reef fish contaminated with ciguatoxin, which originates with certain dinoflagellates (ie, algae) associated with coral reef systems. Contaminated fish have no specific odor, color, or taste, making identification of potential contamination extremely difficult.

## Recommended Policy Actions

- Policies to stimulate an increase in domestic production of fish and seafood should be developed and implemented
- Policies to avoid overfishing to sustain viable stock should be developed
- Enhance institutional capabilities, the legal and regulatory environment, and responsible fishing culture to reduce and prevent illegal, unregulated fishing activities in the CRFM member States
- Facilitate the development of aquaculture in the CRFM Member States
- Strengthen capabilities of CRFM Member countries in the formulation of policies and plans of action
- Develop mechanisms for the management of shared resources and the reduction of fisherfolk vulnerability to disasters
- Support the development of a Regional Information System and Policy Network
- Promote the expansion of pelagic fisheries and other unutilized resources
- Assess the CRFM Member States situation with respect to requirements for global trade
- Enhance capacity of all participants (including Fishers' Organizations) in the fishing industry for effective participatory management and to ensure sustainability
- Add value as a means of sustainability of products and the farming sector
- Diversify the supply of fish by strengthening aquaculture for fresh water fish such as tilapia
- Increase production or importation of fish and seafood with high selenium/mercury ratios such as: striped marlin; yellow-fin tuna; mahi-mahi; skipjack tuna; spearfish and wahoo.
- Conduct population-wide campaigns to educate consumers about the nutritional benefits of fish and seafood, and ways to prevent allergic reactions from shellfish, which are among the more common food allergens, to increase consumption of a variety fish and seafood products;
- Policies are required to minimize demand for and consumption of the larger fish varieties that are higher up the food chain as much as possible to minimize consumption of fish with high methylmercury content



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## CNFO

The Caribbean Network of Fisherfolk Organisations (CNFO) is a non-profit regional network operating in the CARICOM countries. Its mission is to "Improve the quality of life for fisherfolk and develop a sustainable and profitable fishing industry through networking, advocacy, representation and capacity building.

## CRFM

The CRFM is an inter-governmental organisation whose mission is to "Promote and facilitate the responsible utilisation of the region's fisheries and other aquatic resources for the economic and social benefits of the current and future population of the region". The CRFM consists of three bodies – the Ministerial Council, the Caribbean Fisheries Forum and the CRFM Secretariat.

CRFM members are Anguilla, Antigua and Barbuda, The Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Trinidad and Tobago and the Turks and Caicos Islands.

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