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Nile Perch (*Lates niloticus*): The Promising White Meat of the World

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Abstract

Nile perch (*Lates niloticus*) is the largest freshwater fish in the world and maximum weight and length so far reported was 200 kg and 2 meter respectively. This fish is native to Africa particularly east and West African water bodies of major rivers and lakes including Nile in Uganda, Turkana, Chamo and Abaya lakes and rivers in Ethiopia. The fish zones especially in Lake Victoria countries are well developed as industry level and exported in the international market (EU, US, Australia, Japan, Israel and other countries). But if it was not well handled and processed Nile perch is highly susceptible to microorganisms' especially food safety and hygiene issues including coli form bacteria loads, parasites, and others. The global distribution, high demand in the global fish market, high quantity of white meat/flesh with no bone make the fish wanted fish in the world. So improving research especially in the processing, postharvest loss reduction, value addition, fishing gears, aquaculture production of this species and accustoming of the of Nile perch eggs for human food should be investigated for better utilization of the species. Hence this paper gives some important scenery about Nile perch for better development of the resources.

Keywords: Africa; Nile perch/*Lates niloticus*; White meat; Food safety; Hygiene

Introduction

Nile perch in scientific name *Lates niloticus* is the largest and biggest freshwater fish in the world (mature weight range upto 200 kg and 2 meters in length) and most of the time this fish is caught before they can grow up to this size [1] and native to Africa i.e. a large extent in central, western and eastern zone of Africa water bodies widely in rivers and Lakes), throughout the region of Ethiopia, Nile river (after Murchison fall on the White Nile), as well as the Congo, Niger, Volga, Senegal rivers and Lakes Chad and Turkana [2,3]. But now days this fish is introduced in many countries throughout the world including USA [4]. This fish is a predator and exists and nourishes all the way through the water column, key pull as a food fish are its great quantity, easy of grasp with a diversity of artisanal and developed method, its large size and very edible bone free white meat [4]. According to Schofield, [5] Nile perch has big importance from market dimension and many making for the fish community in east Africa especially for lake victory basin where the fishery industry has brought transformation [4]. Age at first maturity for Nile perch is roughly three years and can stay up to 16 years, with each individual capable of spawning many times and giving many fry/fingerlings [6]. This species also breeds throughout the year and length at first maturity i.e. L50 in female Nile perch is 50-80 centimeter and can give up to 16 million eggs at a time [6]. The objective of this paper is to share and increases awareness of the science followers and to initiate/show the new looks for researchers about this species i.e. Nile perch fish.

Nile Perch Origin and Distribution

Nile perch is native to Africa especially Nile river (after Murchison fall on the White Nile), as well as the Congo, Niger, Volga, Senegal rivers and Lakes Chad and Turkana [2,3]. More precisely Nile perch is native, current available and distributed in the following African countries; Benin, Burkinafaso, Cameron, Central Africa republic, Chad, Congo, Congo Democratic republic, Cot devoir, Egypt, Ethiopia, Ghana, Guinea Bissau, Kenya, Liberia, Mali, Mauritania, Morocco, Niger, Nigeria, Senegal, Sierraleone, Sudan, Tanzania, Togo and Uganda, this species is native/endemic and currently available in their natural bodies [7,2,3], whereas outside Africa this fish is transported and introduced in North America/USA and Central America Cuba. Nile perch can live both in brackish (inland saline areas) and freshwaters bodies such as lakes, rivers, reservoirs and irrigation channels as a main habitat for this fish species. Also, this fish is artificially cultured in manmade water bodies from natural waters bodies for aquaculture and fisheries purpose, where adults inhabit deep water, while juveniles are found in shallow water [2,3].

Opportunities

According to Sigbjorn Tvetera et al. [8], three billion people world-wide depend and consume fish and other sea foods as a major protein source. In line with this sea food is one of the highly traded food item in the world and based on the Food and Agriculture Origination of the United Nation both supply and demand are increased year to year particularly production from the aquaculture sector and also sea food and fish rice increased in the past five years for example The world fish production and sea food products are expected to increase by 2.3 percent in 2017 and that of the aquaculture sector was considered as the world's primary source of sea food sources including fish, whereas the largest take away from the food outlook is that 5.9 percent in 2017 over 2016 for FAOs fish price [9]. Fish is a major protein sourced food of human beings and has very big role for food and nutrition security in many countries of the world especially those which live near the water bodies and those whose livelihood is totally depend on the fishery industry talks very well about the role of the sector to their families and security [8,10,11]. This fish is rich in omega-3 and the Nile perch skin is rich in zinc, iron, calcium, lipids and protein and can be processed as gutted, filleted, smoked, canned, chilled, frozen, salted, dried, powdered or canned [12,13]; for example, 100 germ of Nile perch meat has 93 percent calories, 1.8 germs, cholesterol 54.5 mille germs,

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sodium 32.89 mille germ, protein 19.1 germ and Omega-3, 710 mille germ [14]. And also eggs and egg made foods are one of the major supplies of proteins, fats and micronutrients that play key function in fundamental diet, in line with this fish eggs are one of the common egg for human consumptions especially in developed countries and these are comes in a variety of sizes, shapes and colors in the international market. For example fish eggs comes from sturgeon particularly from the Caspian Sea and Ural-River are known in their unique and high-quality fish eggs. Also the following fish species like salmon, lumpfish and white fish are also known in the world market for their eggs for human consumption. Because fish egg is rich in omega-3 fatty acids and vitamins B-12 that are good for regular brain task, development and heart health and also fish eggs are rich in vitamin A, D and K which have advantages for usual reproduction, sight, better skin health and improves human being immune function, bone strength, blood clot and avoid too much blooding but excessive feeding of this fish egg has cholesterol side effect [15,16]. The fishing activity is a key job and work for the water community and engaged fishermen/girls in the world, where it provides food, job/employment, and source of income/daily cash as well as for supporting social and cultural values in developing countries. In line with this fish and other aquatic products are the most marketed food commodities in the global trade and these products accounts about 10 percent of the overall agriculture exports in the global market and 1 percent of the world goods trade and worth US Dollar of 102 billion; in 2012 almost, 37 percent of the total fisheries products was exported in various forms [12].

Challenges and Possible Measures

Nile perch /*Lates niloticus*/ has excellent white carcass meat with no tinny bones for cooking and eating due to this the flesh is widely accepted by many peoples in the world including US, European peoples to Asian peoples but the Nile perch fish is highly susceptible to microorganisms' especially food safety and hygiene issues including coliform bacteria loads, parasites, and others. For example a study on the imported fresh fish fleet and super chilled fish lake Victory to Germany and Netherlands market had showed low level of bacterial contamination of super chilled fish samples and high total viable counts as well as naturally present bacterial pathogens such as Aeromonas species, Pseudomonas species were identified in the fresh fleeted/ carcass of the fish [17].

Food hygiene and safety is a technical order in the modern science and scientific community that indicates and give attention for the whole vale chain of the food starting from the production, handling, processing and storage that avoid the incidence of the food related infection. If appropriate methods are not used in proper way in the food production, handling, processing then several food related illness will result in human health including life loss as a result of negligence. Food hygiene, safety and quality issues are key issues in the world fish trade and market stage. The strict policy setting in the major fish importing nations of the developed countries that take in 80% of the global fish exports put the food safety priority over price as the key determinant of the market access [18]. Over 77 percent the fish exports come from developing countries which have limited infrastructure in the fish processing and packaging including cold chain facilities which are important for safety procedures demanded by importing countries [12]. For example In Lake Victory most of the fish processing industries (Tanzania, Kenya and Uganda) meet the standards of design and construction ordered in the European Union hygiene directive 91/493/ EEC, the fish are washed as well sorted, the fish are then filleted by hand, gutter and skinned and trimmed [18,19]. In any fishery industry food safety is very important because fish are especially sensitive to pathogenic contamination, improper processing, poor packaging and other related post-processing handling and storage. In fish countries the failure to use adequate quality and safety measures implies to the loss at different stages of fish handling and selling. In addition to the above fish post-harvest loss is also an issue in many countries i.e. which includes physical loss including discard of fish offal and meat from bad handling and preservation, economic loss during spoilage or due to lock of technology or finance for reprocessing of fish and nutritional loss when fish is unsafe for consumption [18]. Another challenging problems of Nile perch is ecological impact due to the food web and feeding nature of the fish i.e. this fish is a predator fish that eats all fish that have smaller size and other aquatic animals and plants inside the water ecosystem for example after the introduction of this fish in Lake Victoria most of the endemic cichlid species type are reduced, by now above three hundred native species have been determined for loss/ death and this also has impact on the downstream water bodies and related ecosystems and may impact the lake/river and/ or other water bodies community in their social wellbeing of the different countries sharing the resource [20,21,7].

Conclusion and Recommendations

Nile perch has an excellent bone free white flesh/meat with rich of protein and vitamins including omega-3 which is vital for human food, nutrition and wellbeing development especially now a days where the world population hits above 7 billion in number and needs more pretentious animal origin foods including fish, hence Nile perch is the right answer due to the wide global distribution, high edible white meat without bone, good fish for aquaculture development, one mature fish provides many millions of eggs, good and promising price in the global fish market including Asia, Europe, Middle east and USA. Finally the reviewer recommends much should be done on research part; such as, processing, postharvest loss reduction, safety and hygienic issues, value addition and accustoming of the of Nile perch eggs for human food should be researched out including the nutritional content and side effects.

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