

FISH PRODUCTS IN THE 21ST CENTURY FOR ECONOMIC AND HEALTH DEVELOPMENT

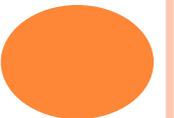
By:

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INTRODUCTION:

- No one knows how many species of animals exist on Earth.
- In fact, some 10,000 species of animals are discovered each year,
- with over one and a half million species already described.
- Projections for the total number of species on Earth range from
- 2 million to 50 million



INTRODUCTION (NUMBER OF ANIMAL SPECIES):

- Amphibians: 6,199
- Birds: 9,956
- Fish: 30,000
- Mammals: 5,416
- Reptiles: 8,240
- Subtotal: 59,811

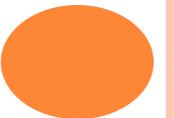


- ## FISHERIES IN NIGERIA.
- Estimated total contribution of fisheries to the Nigerian economy: N126.417 billion gross output
 - with a capitalization of N78.530 billion.
 - In addition, the total aquaculture investment and capital contribution in the country are put at N7 billion and N20 billion respectively.
 - Artisanal Fisheries, that is Small scale fisheries, provides more than
 - 82 percent of the domestic fish supply, giving livelihoods to one million fishermen and up to
 - 5.8 million fisher folk in the secondary sector.



FISHERIES IN NIGERIA:

- Aquaculture is an economically viable, private enterprise in Nigeria,
- with some 2,642 fish farms inventoried and counting.
- 85,000 MT of fish are produced in fish farms in Nigeria,
- making the country the largest aquaculture producer in Africa,
- but this production is negligible when compared to projected yields estimated at two million tons.



HISTORICAL AND CULTURAL VALUE OF FISH:

- Freshwater fishes have been significant in inspiring art, literature and society in many countries for centuries:
- The earliest written records of koi carp, were first described in a Chinese book written during the Western Chin Dynasty, around 265-316 A.D.
- A novel written in the 1930s titled “A Riot of Goldfish” tells of the impossible love of a breeder’s son for the daughter of a wealthy patron.
- As his love grows into an obsession, he attempts to create a goldfish that will capture and reflect her beauty.



HISTORICAL AND CULTURAL VALUE OF FISH:

- Freshwater fish also have a part to play in the cultures of the different ethnic groups in Singapore.
- Some Malays believe that the climbing perch (*Anabas testudineus*) has the supernatural power of warding off or warning against the presence of evil spirits in the house.
- Salmon figure prominently in Celtic tales, and are primarily associated with wisdom and prophecy.
- They often inhabited the sacred wells, feeding on the fruits (often, hazelnuts) of the tree of life.



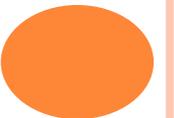
HISTORICAL AND CULTURAL VALUE OF FISH:

- Fish have been the subject of works of art for at least 14,000 years and appeared in primitive art from many cultures.
- In the twentieth century, fish were painted by many modern artists.
- Fish-keeping for pleasure began with the Sumerians more than 4,000 years ago and it is still a major hobby today, worldwide.



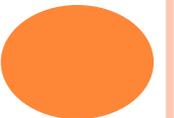
HISTORICAL AND CULTURAL VALUE OF FISH:

- According to the World Association of Zoos and Aquariums (WAZA),
- more than 700 million people visit zoos worldwide,
- most of which have aquariums,
- and 200 million people visit aquariums globally each year.
- Beijing Aquarium alone accounts for 17.3 million visitors.



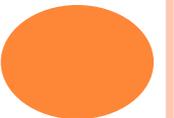
ECONOMIC AND NUTRITIONAL VALUE:

- **Freshwater fisheries:**
- Fishing is the largest extractive use of wildlife in the world.
- In 2010, the annual capture, combining both wild capture and aquaculture, was 149 million tonnes.
- About 94% of all freshwater fisheries occur in developing countries.
- They provide food and a livelihood for millions of the world's poorest people, and also
- contribute to the overall economic wellbeing by means of export commodity trade, tourism and recreation.



ECONOMIC AND NUTRITIONAL VALUE:

- In the Mekong River basin alone, some 55.3 million people depend on freshwater fish for nutrition and livelihoods,
- with an estimated average fish consumption of 56.6 kg/person/year (Baran *et al.*, 2007).
- It is estimated that freshwater fishes make up more than 6% of the world's annual animal protein supplies for humans.



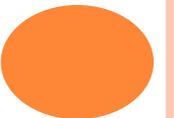
ECONOMIC AND NUTRITIONAL VALUE:

- In Bangladesh, Indonesia and the Philippines freshwater fishes comprise 50% of animal protein intake,
- while in Thailand and Vietnam its share is 40%.
- It is the major and often the only source of animal protein for low income families.



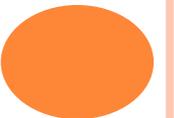
ECONOMIC AND NUTRITIONAL VALUE:

- Recreational fishing accounts for at least 4% of the world's fish catch. It has an overall value of US\$116 billion a year.
- Of the 29,966,920 tonnes produced by freshwater aquaculture in 2005, fishes represented 96% of the total,
- whereas crustaceans, molluscs, amphibians and all other animals combined only represented the remainder 4%, with 1,308,547 tonnes.



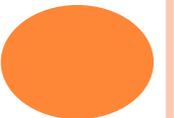
ECONOMIC AND NUTRITIONAL VALUE:

- Aquarium keeping is a US\$15-\$30 billion international industry.
- With over 4,000 freshwater fish species,
- these dominate the trade, accounting for 80%-90% of the estimated 350 million fishes traded annually.
- The worldwide trade in ornamental fishes has an export value of about US\$186 million,
- a substantial proportion of which is from developing countries.



THE VALUE OF THE GLOBAL SEAFOOD INDUSTRY:

- The export value of world trade in fish was US\$148 billion in 2014.**
- For developing countries fishery net-export value is higher than that of rice, coffee, sugar and tea combined.**
- 12% of the world's population rely on fisheries and aquaculture for their livelihoods.**
- In 2014, 54% of seafood exports came from developing countries.**
- Fish exports are a valuable source of foreign exchange for many developing countries, which export more than they import.**



VALUES OF FISH:

- Ecosystem-services value:
- Regulating food web dynamics and nutrient balances
- Regulating carbon flux
- Regulating sediment processes
- Fish as active links between ecosystems



VALUES OF FISH:

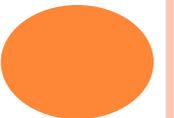
- Fish as bioindicators

Scientific value:

- Fish as surrogates and research models

Fish as early warning signals

- Fish in biotechnology



FISH IN MEDICINE:

- Fish are used in management to mitigate vector borne diseases like schistosomiasis and malaria.
- Due to bioaccumulation, predatory species have also been used as sentinels for the presence of toxic chemicals in waterways.
- Because of their fecundity, small size, and economical maintenance and use, fish models are becoming well established in many laboratories.



FISH IN MEDICINE:

- Aquatic medicine:
- The first record of aquatic medicine is nearly 5000 years old.
- The tax records generated in China in the year 2953 BCE, during the rule of Emperor Fu Hsi, are proof that the empire was levying fish-derived medicine.
- Circa 400 BCE Hippocrates noticed the antibiotic effects of certain sponges, which he recommended to dress soldiers' wounds with.
- In 41 CE, Scribonius Largus, personal doctor of Emperor Claudius, recommended the discharges of electric fish (*Torpedo nobiliana*) to cure migraines and headaches.



FISH IN MEDICINE:

- Dioscorides noted in his *Materia Medica*, around 65 CE, the benefits of applying brown algae for treating inflammation.
- Some years later, Galen also described medicinal uses of algae, noting that the mucilage surrounding the thallus had remarkable properties to dress wounds.
- Pliny “the elder” also plunged into marine medicine in 77 CE when he suggested stingray spines to alleviate toothaches.



FISH IN MEDICINE:

- The contribution of Chinese scholars to this topic is outstanding. Two salient books on the topic are Shen Nung Pen Ts'ao Ching (神農本草經) or The Divine Farmer's Materia Medica *circa* 200 CE, and the Chinese Materia Medica published *circa* 618 CE.
- As far as mentioning the Middle East,
- Lev-Yadun (2004) offers a comprehensive listing of animal-derived medicines used in Levant from 600 CE into 1700 CE,
- in which mollusks, fish and corals are included.



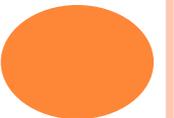
FISH IN MEDICINE:

- Pacific islanders and
- peoples of coastal places in Africa
- also incorporate marine organisms in their pharmacopoeias.
- Every coastal society we know of has developed a marine pharmacopoeia.
- After all, some 80% of the chemical diversity of the world lies in the oceans.



HEALTH BENEFITS OF FISH:

- Fish is among the healthiest foods on the planet. It is loaded with important nutrients, such as protein and vitamin D.
- Fish is also the world's best source of omega-3 fatty acids, which are very important for the body and brain.
- 1. Fish is high in important nutrients that most people don't get enough of.
- This includes high-quality protein, iodine and various vitamins and minerals.



HEALTH BENEFITS OF FISH:

- Fatty fish are also much higher in omega-3 fatty acids. These fatty acids are crucial for the body and brain to function optimally, and are strongly linked to reduced risk of many diseases
- 2. Fish may lower the risk of heart attacks and strokes.
- Heart attacks and strokes are the two most common causes of premature death in the world.
- Fish is generally considered to be among the best foods you can eat for a healthy heart.



HEALTH BENEFITS OF FISH:

- 3. Fish contains nutrients that are crucial during development.
- Omega-3 fatty acids are absolutely essential for growth and development.
- The omega-3 fatty acid docosahexaenoic acid (DHA) is especially important, because it accumulates in the developing brain and eye.
- For this reason, it is often recommended that expecting and nursing mothers make sure to eat enough omega-3 fatty acids.



HEALTH BENEFITS OF FISH:

- However, there is one caveat with recommending fish to expecting mothers.
- Some fish is high in mercury, which ironically is linked to brain developmental *problems*.
- For this reason, pregnant women should only eat fish that are low in the food chain (salmon, sardines, trout, etc.), and no more than 12 ounces (340 grams) per week.
- Pregnant women should also avoid raw and uncooked fish (including sushi), because it may contain microorganisms that can harm the fetus.



HEALTH BENEFITS OF FISH:

- 4. Fish may increase grey matter in the brain and protect it from age-related deterioration.
- One of the consequences of ageing is that brain function often deteriorates (referred to as age-related cognitive decline).
- This is normal in many cases, but then there are also serious neurodegenerative diseases like Alzheimer's disease.
- Interestingly, many observational studies have shown that people who eat more fish have slower rates of cognitive decline.



HEALTH BENEFITS OF FISH:

- One mechanism could be related to grey matter in the brain.
- Grey matter is the major functional tissue in your brain, containing the neurons that process information, store memories and make you human.
- Studies have shown that people who eat fish every week have more grey matter in the centers of the brain that regulate emotion and memory.



HEALTH BENEFITS OF FISH:

- 5. Fish may help prevent and treat depression, making you a happier person.
- Depression is a serious and incredibly common mental disorder. It is
- characterized by low mood, sadness, decreased energy and loss of interest in life and activities.
- Although it isn't talked about nearly as much as heart disease or obesity, depression is currently one of the world's **biggest** health problems.



HEALTH BENEFITS OF FISH:

- Studies have found that people who eat fish regularly are much less likely to become depressed.
- Controlled trials have also found that omega-3 fatty acids are beneficial against depression, and significantly increase the effectiveness of antidepressant medications.
- What this means is that fish can quite literally make one a happier person and improve your quality of life.
- Fish and omega-3 fatty acids may also help with other mental disorders, such as bipolar disorder.



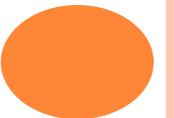
HEALTH BENEFITS OF FISH:

- 6. Fish is The Only Good Dietary Source of Vitamin D
- Vitamin D has received a lot of mainstream attention in recent years.
- This important vitamin actually functions like a steroid hormone in the body, and a whopping 41.6% of the US population is deficient in it. Fish and fish products are the best dietary sources of vitamin D, by far.
- Some fish oils, such as cod liver oil, are also very high in vitamin D, providing more than 200% of the recommended intake in a single tablespoon.
- Fatty fish is an excellent source of vitamin D, an important nutrient that over 40% of people may be deficient in.



HEALTH BENEFITS OF FISH:

- 7. Fish Consumption is linked to reduced risk of autoimmune diseases, including type 1 diabetes
- Autoimmune disease occurs when the immune system mistakenly attacks and destroys healthy body tissues.
- A key example is type 1 diabetes, which involves the immune system attacking the insulin-producing cells in the pancreas.
- Several studies have found that omega-3 or fish oil consumption is linked to reduced risk of type 1 diabetes in children, as well as a form of autoimmune diabetes in adults.



HEALTH BENEFITS OF FISH:

- The results are preliminary, but researchers believe that this may be caused by the omega-3 fatty acids and vitamin D in fish and fish oils.
- Some believe that fish consumption may also lower the risk of
- rheumatoid arthritis and multiple sclerosis, but the current evidence is weak at best.
- Eating fish has been linked to reduced risk of type 1 diabetes and several other autoimmune diseases.



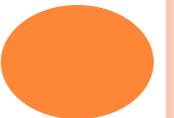
HEALTH BENEFITS OF FISH:

- 8. Fish may help prevent asthma in children
- Rates of asthma have increased dramatically over the past few decades.
- Studies show that regular fish consumption is linked to a 24% lower risk of asthma in children, but no significant effect has been found in adults.
- 9. Fish may protect vision in old age
- A disease called macular degeneration is a leading cause of vision impairment and blindness, and mostly affects older individuals.
- People who eat more fish have a much lower risk of developing macular degeneration, a leading cause of vision impairment and blindness.



HEALTH BENEFITS OF FISH:

- 10. Fish may improve sleep quality
- Sleep disorders have become incredibly common worldwide.
- There are many different reasons for this (such as increased exposure to blue light), but some researchers believe that vitamin D deficiency can also play a role.
- There is preliminary evidence that eating fatty fish like salmon may lead to improved sleep.



HEALTH BENEFITS OF FISH:

- 11. Gynecomastia: Gynecomastia is a condition that affects men, in which the breast tissues become swelled and take on a fuller look that can be embarrassing for many.
- It occurs as a result of **irregular levels of hormones** in the body during puberty.
- Gynecomastia can affect one or both breasts and may also have uneven development.
- The condition may require medical attention if it is accompanied by pain, swelling and discharge from one or both the nipples.



HEALTH BENEFITS OF FISH:

- This can happen due to a variety of reasons including puberty, age, hypogonadism,
- low testosterone (male hormone), hyperthyroidism, chemotherapy,
- radiation treatment, chronic liver disease, exposure to pollutants,
- kidney failure, use of marijuana,
- excess alcohol consumption, malnutrition, and side effects of certain medications.
- Being overweight can also add to the problem.



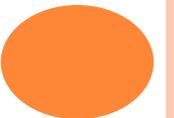
HEALTH BENEFITS OF FISH:

- Fish Oil: omega-3 fatty acids are beneficial for men with gynecomastia because they help in the production of testosterone.
- In addition, these fatty acids help reduce estrogen levels, which is one of the reasons behind the growth of male breasts.
- Take fish oil supplements and especially omega-3 supplements.
- Eat cold-water fish like salmon, tuna and mackerel that are rich in omega-3 fatty acids.



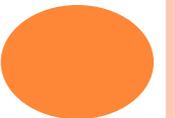
EMERGING APPLICATIONS OF FISH:

- Pharmaceuticals
- Fish fertilizer
- Fish leather
- Fish Eggs: Superior Vitamin D Boost



FISH FACTS:

- Most fish **can't swim in reverse?** The ones that can are usually of the eel family.
- Most fish reproduce by **laying eggs**, some sharks, however, give birth to pups!
- **Fish can drown.** Although they live in water fish still need oxygen to breathe, if there is no oxygen a fish will drown.
- Goldfish can live up to **30 years!**
- The oldest fishhook found is around **42,000** years old



FISH FACTS:

- The Sailfish is the fastest swimming fish. It is a saltwater fish and it can swim up to an estimated **60 mph (96 kph)**.
 - The **slowest fish** is again a saltwater fish – the **sea horse!** Seahorses also mate for life and the male carries the baby.
 - Many fish have taste buds **all over their body!**
 - Sharks are the **only fish to have eyelids**; the majority of fish don't have them and therefore sleep with their eyes open.
- 

FISH FACTS:

- Fish were the **first vertebrates** with bony skeletons to appear on Earth.
- Fish **do not have vocal chords**; instead they use parts of their body in order to make sound and communicate.
- Many species of fish **change sex** at least once during their lifetime.



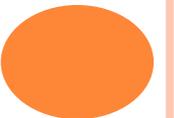
FISH FACTS:

- Some fish can **migrate between fresh water and the sea**; fish will usually do this to spawn if they can.
- Fish are **cold blooded** animals.
- Fish move by **creating a wave motion** that actually moves the entire length of their body;
- this is so that they can swim, smoothly through the water.



FISH FACTS:

- **Fishes Use Problem Solving and Invent Tools:** New discoveries show that fishes are capable of complex mental calculus,
- reshaping man's ideas about animal intelligence underwater
- Fishes have long been dismissed as dullards,
- but new observations and studies are proving this assumption wrong.

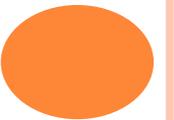


FISH FACTS:

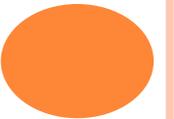
- One species of wrasse, for instance, has been filmed engaging in a marine version of tool use.
- Archerfish, which capture prey with precisely calibrated jets of water, are showing how fishes can learn complex skills—
- and that they can mentally place themselves in the position of a fellow fish.



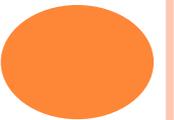
WEIRD FISHES: LONGNOSE



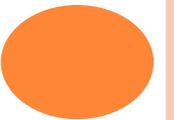
FLYING SQUID:



PURPLE SEA PEN



SHEEPSHEAD FISH



SCORPION FISH

