Fish in the First 1,000 Days

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What are the First 1,000 Days?



Scaling Up Nutrition (SUN) Framework and Roadmap: 1,000 Days Global Effort

Early risers: Burkino Faso, Guatemala, Laos, Malawi, Mali, Nepal, Niger, Peru, Senegal, Tanzania, Uganda, Zambia



SUN: 1,000 Days

- Feed the Future, Global Health Initiative (USAID)
- CGIAR: CRPs, in particular CRP 4: Agriculture for Improved Nutrition and Health, also CRP1.3 and 3.7
- SPRING: Strengthening partnerships, results and innovations in nutrition globally (USAID)
- Bill and Melinda Gates Foundation Grand Challenges Explorations Round 7: Explore Nutrition for Healthy Growth of Infants and Young Children
- Grand Challenges Canada: Saving Brains
 "The waste of human capital is enormous. Imagine a world where children reach their full potential. That is the world of the Saving Brains initiative is aiming to create."

Fat in the Critical Thousand Days Ensuring Adequacy of Essential Dietary Fats for Mothers and Children in Low and Middle Income Countries

Meeting in Washington D. C., April 2011



SUN: 1,000 Days

Global, National and Individual Development



Brain Development and Cognitive Capacity (1,000 Days)



Essential Dietary Fats

Fish (small marine) and Fish Products



Kasenga Market, DRC





Dried Small Fish, Prawn and Shrimp





Fish is a Rich Source of Essential Fats

- Lake Malawi:
- •Dried usipe contains 1,700 mg docosahexaenoic acid (DHA) per 100 g, comparable to salmon
- •DHA in the breast milk of women ~0.7% of fatty acids, about twice the global average
- Lake Kitangiri, Tanzania (cradle of civilization): •Fish and breast milk of women with high concentrations of essential fats



Factors Affecting Fat Content and Composition in Fish Species

Marine fish

Cold water - - Warm water

Freshwater fish Cold water - - Warm water

Within Species: Adult - - Juvenile

Breeding: (in relation to cold / warm season) Before breeding season – more fat (coincides with fish harvesting season)

Feeding: Carnivore - - Omnivore - - Herbivore Additional feeds Fish meal and fish oil Other feed ingredients – rice bran, oil cake, slaughter house waste, pig/chicken manure

Water quality Good water quality – more feed (phyto- and zooplankton)



Fat Content of Common Bangladeshi Freshwater and Marine Fish Species

Freshwater species	g fat/100 g raw, whole fish
Small indigenous	
Puti	2.5
Taki	0.5
Chikra	
Mola	4.5
Chanda	2
Chapila	4.5
Kaski	

Marine species	g fat/ 100 g raw,
	whole lish
Anchovy	5 - 8
Herring	5 - 10
Small shrimp	
Jew fish	2 - 3
Bombay duck	0.5 - 1
Dried Shrimp	

Freshwater species	a fot/100 a row
i resirwater species	giavito giaw,
	whole fish
Carps	
Indigenous	
Rui	1.5
Catla	2.5
Mrigal	1
Non indigenous	
Silver carp	2
Common carp	3
Other cultured fish	
Tilapia (muscle)	0.6-2.2
Pangas	11
Common migratory fish	
Hilsa	19
Prawn	
Small prawn, dried	8.5
Small prawn, raw	1



Essential Fats in Selected Fish Species

Species	LA	ALA	AA	EPA	DHA	Total n-6	Total n-3	n-6/n-3
	C18:2n-6	C18:3n-3	C20:4n-6	C20:5n-3	C22:6n-3	PUFA	PUFA	
Marine warm water								
Thai sardine	1.2	0.5	2.7	6.11	9.7	3.9	16.3	1:4
Freshwater warm water								
Farmed silver carp	4.3	7.0	3.3	6.6	2.0	7.6	15.6	1:2
Farmed Nile tilapia	9.0	0.8	1.5	0.8	9.0	10.5	10.6	1:1
Dried small fish from Rift Valley lakes								
Chisense	3.4	3.8	3.8	6.9	8.5	7.5	22.5	1:3
Kapenta	1.7	1.9	2.4	6.6	7.4	4.3	17.9	1:4
Kapenta	2.8	2.8	4.3	7.5	11.4	7.4	24.8	1:4
Kenya, Lake Victoria small fish								
Omena	1.8	2.0	2.5	7.1	10.2	7.0	21.7	1:3
Cambodian small freshwater fish								
Trey sloeuk russey	3.8	3.6	2.4	1.7	2.7	8.5	2.7	3:1
Laos								
Fermented fish	15.1-16.5	2.2-4.6	1.8-3.1	1.8	1.2-2.5	15.8-18.5	3.4-7.1	5:1-3:1
Other aquatic animals (OAA)								
Small apple snail	7.2	3.2	13.6	2.0	2.2	20.8	6.0	4:1
Freshwater crab	15.2	4.9	7.2	2.4		22.4	7.3	3:1
Chinese edible frog	9.2	2.3	10.8	1.7	3.5	20	8.6	2:1

g fatty acid/100 g total fatty acids

Adapted from Michaelsen et al. (2011), Nurhasan et al. (2010), Roos (2010), Steiner-Asiedu et al. (1993)

Contribution of a Fish Meal to Essential Fats Intake

		Fish/	Fat					
	Fish species	meal	from fish	LA mg	ALA mg	AA mg	EPA mg	DHA mg
		g	g					
Child								
Some African countries	Dried kapenta In a porridge	10	1	28	28	43	75	114
Cambodia	Trey slouek russey Rice and sour soup	25	3	114	108	72	51	81
Woman	Rice and fish curry							
Bangladesh	Mixed small fish	25	1	78	23	7	13	26
	Silver carp Common carp	25	1	79	29	86	88	65
	Hilsa	25	5 PUFA 50 %				n-3 = 50	
Cambodia	Trey sloeuk russey Rice and sour soup	50	6	228	216	144	102	162

Fish in Complementary Foods



- Alleviating childhood malnutrition by improved utilization of traditional foods
- Effectiveness studies of complementary foods in children 6-24 m
- •Cambodia: dried and powdered rice, dried powdered fish (2 small species: rich in iron and zinc and essential fats), spider
- •Kenya: maize, small fish omena, termite



SUN: 1,000 Days

Recommendations from the Washington D. C. Meeting:

The **agricultural sector** has an important role to play to increase the availability of foods containing omega-3 fatty acids:

- •Increase access to fish with omega-3 fatty acids
- Improve omega-3 content of fish feeds and expand access to farmers
- How will The WorldFish Center embrace this Missed Opportunity?



Increased Fish Production is Not Sufficient

- Increased Use of Small Marine Fish for Human Consumption present use: fish meal and fish oil
- Improvement in Post-harvest Processes drying, smoking, fermentation, storage, marketing, cooking
- Reduction of Spoilage and Wastage



Thank you





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