

Fish consumption among women and pre-school children in Cambodia

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In 2014, the Inland Fisheries Research and Development Institute of the Cambodian Ministry of Agriculture, Forestry and Fisheries undertook a study of the consumption of fish and other aquatic animals by women and pre-school children. The study, supported by Oregon State University through the University of Connecticut under the AquaFish Innovation Lab programme, covered 300 women and 343 children in three provinces – Stung Treng and Prey Veng on the Mekong River and Kampong Thom on the Tonle Sap Lake. Interviews over two weeks in June estimated food intake over the previous 24 hours. Evaluations of energy, macronutrients and micronutrients were made using the ASEAN Food Composition Table. To determine nutritional adequacy, nutrient intake was compared with the Recommended Dietary Allowances for Southeast Asia.

The women surveyed consumed 43 species of fish and other aquatic animals. The children, aged from 6 months to 5 years, consumed 38 species. The most popular was mud carp known as *trey riel* (*Henicorhynchus* sp.), accounting for more than a fifth of consumption by both women and children. Striped snakehead or *trey ros* (*Channa striata*) came next (13% of consumption by women and 18% by children). The third and fourth most commonly consumed species were Mekong silver barb or *trey chhpin* (*Barbonymus gonionotus*) and the bagrid catfish *trey kanhchus* (*Mystus* sp.).

Women's daily fish consumption averaged 145 grams, or 17% of total food intake. Among animal food sources (including meat, poultry and eggs), fish and other aquatic animals such as freshwater snails, prawns and crabs accounted for 80% of protein, 70% of energy and 54% of fat. For

micronutrients, the proportions were 88% for Vitamin A, 83% for calcium, 75% for iron and 45% for zinc from fish and other aquatic animals?

Children's fish consumption averaged 53 grams a day, or 11% of total food intake. Among animal foods, fish and other aquatic animals accounted for 78% of protein, 72% of energy and 60% of fat. For micronutrients, the proportions were 93% for calcium, 57% for iron, 56% for Vitamin A and 44% for zinc from fish and other aquatic animals. When compared to a Philippine survey in 2008, the study indicated that fish consumption among the Cambodian children was almost 50% higher than that for Philippine children (see table below).

Average daily calorific intake was 1,976 kcal for the Cambodian women (compared with 2,196 kcal in a Vietnamese study in 2013) with contributions of 71% from carbohydrates (65% in Viet Nam), 13% from protein (15% in Viet Nam) and 16% from fat (20% in Viet Nam). Calorific intake for children averaged 845 kcal a day with 68% from carbohydrates, 15% from protein and 17% from fat. For both women and children, the proportion of protein was desirable. But the proportion of fat in their diets was far lower than desirable.

'When compared to the Philippine survey of 2008, higher proportions of Cambodian women and children were meeting recommendations for energy and protein'

Only half the Cambodian women and less than a third of the children were meeting their recommended daily intake of energy. But almost

Food consumption by pre-schoolers

Average daily food consumption and selected main foods consumed by pre-school children in Cambodia and the Philippines

	All Foods	Cereals	Fish	Milk	Vegetables
Cambodia	489 grams	257 grams	53 grams	45 grams	21 grams
Philippines	492 grams	148 grams	36 grams	188 grams	16 grams

Daily energy and nutrient intake

Proportion of women and pre-school children in Cambodia and the Philippines who meet 100% of their recommended energy intake and 80% of their recommended intake of protein, iron and Vitamin A

	Women		Children	
	Cambodia	Philippines	Cambodia	Philippines
Energy (meeting 100% of intake)	50.0 %	17.9 %	29.6 %	17.8 %
Protein (meeting 80% of intake)	71.0 %	50.1 %	53.4 %	48.3 %
Iron (meeting 80% of intake)	10.7 %	12.3 %	24.1 %	25.2 %
Vitamin A (meeting 80% of intake)	28.0 %	16.0 %	18.6 %	26.0 %

three-quarters of the women and more than half of the children were meeting 80% of their daily protein needs. When compared to the Philippine survey of 2008, higher proportions of Cambodian women and children were meeting recommendations for energy and protein (see table above). For micronutrients, only 11% of women and 24% of the children in Cambodia met 80% of the recommended intake for iron, only 36% of women and 8% of children met 80% of their daily zinc needs, only 24% of both women and children met 80% of their calcium needs and only 28% of women and 19% of children met 80% of the recommended intake of Vitamin A.

As part of the study, the Industrial Laboratory Centre of Cambodia analysed fresh and processed fish and other aquatic animals commonly eaten by Cambodians. The analyses showed high levels of protein, calcium, iron and phosphorous (see table below), indicating that fish and other aquatic animals eaten by the rural poor are safe to consume.

The study concluded that low intakes of iron, zinc, calcium and Vitamin A put Cambodian women and children at risk of micronutrient deficiencies. It recommended:

(a) a programme using fish to combat micronutrient

deficiencies in women and children in rural areas, focussing on iron, zinc and Vitamin A;

- (b) research into improved processing of fish and other aquatic animals caught in open waters, lakes and rice fields including better methods of handling and preservation;
- (c) research into species, parts of fish and other aquatic animals (such as eyes, head, skin and meat) and processed fish products that are rich in micronutrients such as iron, zinc, calcium, Vitamin B complex and Vitamin A with the aim of incorporating these species into cultural practices
- (d) a nutritional education programme in partnership with partners such as the Cambodian Red Cross in consultation with the National Maternal and Child Health Centre and the National Nutrition Program on commonly consumed nutrient-dense species for women and mothers with additional focus on hygiene and sanitation.

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Nutrients of fish and other aquatic animals

Analysis by the Industrial Laboratory Centre of Cambodia of 16 freshwater animal species (13 fishes, 1 snail, 1 prawn and 1 crab) randomly collected from markets in Phnom Penh, Kampong Chhnang, Kandal and Takeo. Processed fish refers to smoked mud carps known as *trey riel* (*Henicorhynchus* sp.) and dried snakeheads known as *trey ros* (*Channa* sp.).

Macronutrients	Fresh		Processed	
	Min (%)	Max (%)	Min (%)	Max (%)
Protein	10.11	16.81	37.38	38.52
Fat	0.99	4.25	6.01	24.65
Micronutrients	Min (mg/100g)	Max (mg/100g)	Min (mg/100g)	Max (mg/100g)
Calcium	15	123.9	19.1	83.3
Phosphorous	0.57	3.98	1.15	2.06
Iron	0.26	0.83	0.3	0.38