

Country	Date	Location	Source	Population	Processing type	Primary species	Source	Avg. portion, g	Study portion relative to our analysis
Kenya	2014	Mfangano Island	Fiorella et al. 2018	WRA	Dried dagaa and cichlids, and fresh or fried tilapia and Nile perch	<i>Rastrineobola argentea</i> , <i>Cichlidae</i>	FW	85	207%
Kenya	2014	Mfangano Island	Fiorella et al. 2018	Child (<24 months)	Dried dagaa and cichlids, and fresh or fried tilapia and Nile perch	<i>Rastrineobola argentea</i> , <i>Cichlidae</i>	FW	-	-
Malawi	2018-2019	Mangochi District	Werner et al. 2024	Child (6-15 months)	Small fish (not identified)	<i>Engraulicypris sardella</i>	FW	3.35	37%
Uganda	2018	Eastern Uganda	Lydia O'Meara	WRA (NPNL)	Sun-dried fish	<i>Rastrineobola argentea</i>	FW	12.75	31%
Uganda	2018	Eastern Uganda	Lydia O'Meara	Child (12-23 mo)	Sun-dried fish	<i>Rastrineobola argentea</i>	FW	2	22%
Uganda	2018	Eastern Uganda	Kimere et al. 2022	Child (12-23 months)	Small fish with bones	<i>Rastrineobola argentea</i>	FW	2	22%
Uganda & Tanzania	-	Northwestern Tanzania and Central Uganda	Ekesa et al. 2019	Child (12-59 months)	Dried or fried	<i>Rastrineobola argentea</i>	FW	15	167%
Zambia	-	Lusaka	Marinda et al. 2018	Household	Fresh, dried, smoked, salted fish.	<i>Claris theodora</i> , <i>Rastrineobola argentea</i> , <i>Limnothrissa miodan</i> , <i>Stolothrissa miodon</i>	FW	-	-
Ghana	2022	Four coastal regions	Janananda et al. 2023	Child (18-59 months)	40 small fish species, primarily fried (43%) or smoked (38%)	<i>Sardinella aurita</i> , <i>Engraulis encrasicolus</i> , <i>Scomber colias</i>	M	29.5	328%
Ghana	-	National	Hasselberg et al. 2022	Child (6-23 months)	-	-	M	17	189%
Senegal	-	Dakar	Anderson et al. 2010	Adult Men (20-62 years)	No processing indicated.	<i>Epinephelus aeneus</i> , <i>Sardinella sp.</i>	M	33.17	81%
Tanzania	2015	Central Tanzania	Raymond et al. 2017	Child (6-23 months)	Whole fish, dried or smoked	Sardine and tilapia	-	-	-
Tanzania	2008-09	Rufiji river floodplain	Moreau & Garaway 2018	Household	Fresh and sundried	<i>Oreochromis urolepsis</i> , <i>Citharinus congicus</i> , <i>Synodontis rukwaensis</i> , <i>Rastrineobola argentea</i> , <i>Hilsa kelee</i>	FW & M	86.3	-
Kenya	2021	Southern Kenyan coast	Odoli et al. 2021	-	Dried sardine (<i>Sardinella gibbosa</i>)	<i>Sardinella gibbosa</i>	M	-	-
Ghana	2023	Greater Accra, Volta, Central, and Western regions	Agyei-Mensah et al. 2023	Household	Dried, smoked, or fried	<i>Sardinella</i> , <i>Engraulis encrasicolus</i>	M	-	-

Table S1 | Species composition and portion size of dried fish consumption from studies conducted across East and West Africa. WRA = women of reproductive age. Table is ordered by the ‘Source’ column, indicating fish sourced from freshwater (FW, green) or marine (M, blue) ecosystems

Country	Survey Name	Total population	Population year	N households	Avg. household size	Dried fish categories	% households consuming fish			
							Fish	Processed fish	Smoked	Dried
Cote D'Ivoire	Enquête Harmonisée sur le Conditions de Vie des Ménages 2018-2019	28,873,034	2023	12,774	2.6	Poisson fumé mangni, Autres Poissons fumés	87%	59%	100%	-
Malawi	Fourth Integrated Household Survey 2016-2017	20,931,751	2023	12,447	3.7	Dried fish (small, medium, large), Smoked fish (small, medium, large)	73%	63%	32%	82%
Nigeria	General Household Survey Wave 4 2018-2019	223,804,632	2023	4,976	5.2	Fish - smoked, Fish - dried	71%	42%	41%	67%
Senegal	Enquête Harmonisée sur le Conditions de Vie des Ménages 2018-2019	17,763,163	2023	7,101	9.3	Poisson fumé Kethiakh (sardinelle), Autre Poisson fumé (Con fumé, yaboye ou obo fumé, ...), Poisson séché	91%	67%	69%	73%
Tanzania	National Panel Survey 2014-2015, Wave 4	67,438,106	2023	3,352	5.3	Dried/salted fish and seafood	75%	29%	-	-
Uganda	National Panel Survey 2010-2011	48,582,334	2023	2,657	7.1	Dry/Smoked fish	36%	24%	-	-
		407,393,020		43,307						

Table S2 | The number of households surveyed in LSMS, with dried fish categories and % household consuming each type, by country. Total population estimates from data.worldbank.org. Some households consumed both smoked and dried, meaning combined processed proportions may exceed 100%.

Covariate	Definition	Link with fish consumption	Data source
Proximity to inland waterbody	Distance from household to nearest large inland waterbody, km	Households nearer to inland fish production sources are likely to have greater physical access to fish and at lower prices, thus associated with higher fish consumption	Lehner & Doll (2004), South (2017)
Proximity to marine coastline	Distance from household to nearest marine coastline, km	Households nearer to marine fish production sources are likely to have greater physical access to fish and at lower prices, thus associated with higher fish consumption	Lehner & Doll (2004), South (2017)
Proximity to urban centres	Travel time from household to nearest urban centre via surface transport (based on 2015 data)	Urban centres likely to have greater availability of fish products, through trade routes, and lower fish prices, thus associated with higher fish consumption	Weiss et al. (2018)
Wealth	Total expenditure on items in the past 3 months (square root and scaled to Purchasing Power Parity)	Dried fish are more affordable than fresh fish and so may be consumed more by poorer households	LSMS, World Bank (2024)
Household size	Number of people in household	Larger households consume more foods and thus may be more likely to have consumed fish in the past 7 days	LSMS
Household cluster	Nested intercept of household cluster (defined by country survey)	Non-independence of diet surveys from neighbouring households	LSMS
Household country	Country intercept	Country-level prevalence of fish consumption	LSMS

Table S3 | Explanatory covariates used in LSMS models of dried and fresh fish consumption.

	Calcium, mg	Iron, mg	Zinc, mg	Selenium, µg	Iodine, µg	Vitamin B12, µg	Vitamin A, µg	Vitamin D, µg	Omega-3 (EPA + DHA), g	Cadmium, µg	Lead, mg/kg	Mercury, µg
Children 0.5-5 years	450	7.5	4.1	20	110	0.8	250	5	0.7	0.32	0.05	0.02
Women 15-49 years	1150	30.1	11.4	55	150	2.4	650	5	1.1	1.625	0.05	0.104
Guideline	RNI	RNI	PRI	RDA	RDA	RNI	PRI	RNI	AI	PTMI	Maximum regulatory limit	TWI
Source	WHO & FAO (2004)	WHO & FAO (2004)	EFSA (2017)	IOM (2000)	IOM (2001)	WHO & FAO (2004)	EFSA (2017)	WHO & FAO (2004)	FAO & WHO (2010)	JECFA (2010)	EC (2014)	JECFA (2006)

Table S4 | Nutrient reference values and contaminant limits. Values are the per capita recommended intakes per day (for nutrients), or healthy limits per day, week, or month (for contaminants), for young children and non-pregnant, adult women. Iron requirements assume 10% bioavailability (i.e. diets with moderate phytate concentrations and some meat/fish). Zinc requirements assume an estimated phytate intake level of 900 mg/day (i.e. a semi-unrefined diet). Cadmium and mercury tolerable intakes were estimated for a child of 12.8 kg and adult woman of 65 kg. RNI = Recommended Nutrient Intake, PRI = Population Reference Intake, RDA = Recommended Dietary Allowance, AI = Adequate Intake, PTMI = Provisional Tolerable Monthly Intake, TWI = Tolerable Weekly Intake.

Supplementary References

Table S1

- Y. O. Agyei-Mensah, *et al.*, The processing, preparation, and cooking practices of small fish among poor Ghanaian households: An exploratory qualitative study. *Marit. Stud.* **22**, 15 (2023).
- C. A. Anderson, *et al.*, Dietary intake of Senegalese adults. *Nutr. J.* **9**, 7 (2010).
- B. Ekesa, D. Nabuuma, G. Kennedy, Content of Iron and Vitamin A in Common Foods Given to Children 12–59 Months Old from North Western Tanzania and Central Uganda. *Nutrients* **11** (2019).
- K. J. Fiorella, E. M. Milner, E. Bukusi, L. C. Fernald, Quantity and species of fish consumed shape breast-milk fatty acid concentrations around Lake Victoria, Kenya. *Public Health Nutr.* **21**, 777–784 (2018).
- A. E. Hasselberg, *et al.*, Nutrient and contaminant exposure from smoked European anchovy (*Engraulis encrasicolus*): Implications for children’s health in Ghana. *Food Control* **134**, 108650 (2022).
- B. Janananda, *et al.*, A cross-sectional study on the nutritional status, dietary diversity, and small fish consumption patterns in coastal fishing communities of Ghana. *Marit. Stud.* **22**, 35 (2023).
- N. C. Kimere, *et al.*, A food-based approach could improve dietary adequacy for 12–23-month-old Eastern Ugandan children. *Matern. Child Nutr.* **18**, e13311 (2022).
- P. A. Marinda, S. Genschick, C. Khayeka-Wandabwa, R. Kiwanuka-Lubinda, S. H. Thilsted, Dietary diversity determinants and contribution of fish to maternal and under-five nutritional status in Zambia. *PLoS One* **13**, e0204009 (2018).
- M.-A. Moreau, C. J. Garaway, “Fish Rescue us from Hunger”: the Contribution of Aquatic Resources to Household Food Security on the Rufiji River Floodplain, Tanzania, East Africa. *Hum. Ecol.* **46**, 831–848 (2018).
- O. C. Odoli, S. Kolbrun, M. O.-O. Peter, A. Sigurjon, Marketing potential of improved dried sardine (*Sardinella gibossa*) and capelin (*Mallotus villosus*) in the Southern Kenyan coast. *Afr. J. Food Sci.* **15**, 162–168 (2021).
- J. Raymond, M. Agaba, C. Mollay, J. W. Rose, N. Kassim, Analysis of nutritional adequacy of local foods for meeting dietary requirements of children aged 6–23 months in rural central Tanzania. *Arch. Public Health* **75**, 60 (2017).
- E. R. Werner, *et al.*, Associations of fish and meat intake with iron and anaemia in Malawian children. *Matern. Child Nutr.* e13622 (2024).

Table S3

B. Lehner, P. Döll, Development and validation of a global database of lakes, reservoirs and wetlands. *J. Hydrol.* 296, 1–22 (2004).

A. South, Rnaturalearth: world map data from natural earth. *R package version 0.1.0* **898**, 79–88 (2017).

D. J. Weiss, *et al.*, A global map of travel time to cities to assess inequalities in accessibility in 2015. *Nature* **553**, 333–336 (2018).

World Bank, World Development Indicators database. Deposited 2024.

Table S4

WHO & FAO. Vitamin and mineral requirements in human nutrition. Report of a Joint FAO/WHO Expert Consultation. (2004).

European Food Safety Authority (EFSA). Dietary Reference Values for nutrients Summary report. EFSA Supporting Publications. 14(12) (2017).

Institute of Medicine. Dietary Reference Intakes for vitamin C, vitamin E, selenium and carotenoids. Washington DC: National Academies Press. (2000).

Institute of Medicine (US) Panel on Micronutrients. Dietary Reference Intakes for Vitamin A, Vitamin K, Arsenic, Boron, Chromium, Copper, Iodine, Iron, Manganese, Molybdenum, Nickel, Silicon, Vanadium, and Zinc. Washington, DC: National Academies Press. (2001).

FAO & WHO. Fats and fatty acids in human nutrition. Proceedings of the Joint FAO/WHO Expert Consultation. November 10-14, 2008. Geneva, Switzerland. In *Annals of nutrition & metabolism*. **55**, 1–3 (2010).

Joint FAO/WHO Expert Committee on Food Additives (JECFA). Proceedings of the 73rd Joint FAO/WHO Expert Committee on Food Additives (JECFA) Meeting—Food Additives and Contaminants, Geneva, Switzerland. (2010).

Commission Regulation (EU). No 488/2014 of 12 May 2014 amending Regulation (EC) No 1881/2006 as regard maximum levels of cadmium in foodstuffs, Text with EEA relevance. *Off. J. Eur. Comm. L.* **138**, 75–79 (2014).

Joint FAO/WHO Expert Committee on Food Additives (JECFA). Proceedings of the Evaluation of Certain Food Additives and Contaminants: Sixty-Seventh Report of the Joint FAO/WHO Expert Committee on Food Additives, Rome, Italy. (2006).