



Food and Agriculture Organization  
of the United Nations



# FISH IN HOME-GROWN SCHOOL FEEDING

## ANGOLA, HONDURAS AND PERU

Fish is rich in essential micronutrients such as iron and zinc, vitamin A, important fatty acids and high-quality protein. It makes an important and often relatively affordable contribution to animal protein intake in many developing countries. In addition, the harvesting of fish and post-harvest activities generate income for fisherfolk. Fishing activities are an important source of nutrient-rich food and employment for communities in areas near coastal and inland waters in many developing countries.

Although fishing activities provide a significant contribution to livelihoods in many countries in Latin America, fish consumption in the region is low (Food and Agriculture Organization of the United Nations [FAO], 2017). This is particularly true for Honduras, where annual per capita fish consumption is very low compared with the global average (3.3 kg per capita in Honduras vs a global average of 20.3 kg per capita). Meanwhile, annual fish consumption in Peru exceeds that of all red meats combined (23.9 kg per capita, accounting for 26.5 percent of total animal protein intake) (FAO, 2017). Intake levels are, however, not distributed evenly throughout the country.

Across the Atlantic from Latin America, fishing activities off the west coast of Africa contribute greatly to employment and gross domestic product (GDP). In Angola, where small-scale pelagic fisheries are a major source of livelihoods and food for coastal communities, fishing contributes nearly 5 percent to overall GDP (FAO, 2018). Fish consumption in Angola is close to the global average (18.6 kg per capita) and accounts for 29 percent of the total consumption of animal protein (FAO, 2020).

Issues of food insecurity and malnutrition affect all three countries. Stunting, an indicator for chronic malnutrition, affects nearly one third of children in Honduras, and 38 percent of children in Angola; stunting rates in rural and inland areas are even higher (The Borgen Project, n.d.; Global Nutrition Report, 2018). While Peru has seen successes in the reduction of its national stunting rate, higher rates of stunting is seen in rural areas of the Amazon (World Food Programme [WFP], 2020). In addition, many children do not take in enough iron. A recent study in Peru has demonstrated the positive results in terms of children's school performance of iron supplementation

(Chong *et al.*, 2016). However, the costs of supplementation programmes are high; this demonstrates that there is a need to strengthen the capacity of food systems to meet micronutrient needs, and especially those of children.

Faced with the challenges of fighting hunger, food insecurity and malnutrition and reaching Sustainable Development Goal 2 (Zero Hunger), the Governments of Angola, Honduras and Peru have adopted policies and programmes to guarantee food security and nutrition, with special attention being paid to children. To help the countries reach these goals, the Food and Agriculture Organization of the United Nations (FAO) is helping them develop national strategies to diversify school feeding programmes and improve the nutrient adequacy of meals provided to schoolchildren. In 2019, FAO implemented a project to develop strategies to include fish in school meals in the three countries.

## HOME-GROWN SCHOOL FEEDING

School feeding programmes normally pursue educational, social protection or nutrition goals, or a combination of these. When school feeding programmes are combined with the purchasing of safe, diversified and nutritious foods from local food producers, they are called home-grown school feeding (HGFSF) programmes. Even if only a percentage of the food is purchased locally from smallholder farmers, a programme can be considered “home-grown” if procurement is designed to support local food markets. The HGFSF approach plays an important role in shaping healthy eating habits by offering nutritious, local foods. When coupled with food and nutrition education, HGFSF can impact the dietary choices of future generations. In addition, HGFSF programmes are considered to contribute to the continuum of development by building on health and nutrition interventions during the first 1 000 days of children’s lives (FAO and WFP, 2018).

## BENEFITS FOR PRODUCERS AND CONSUMERS

The strategic procurement of locally produced food under HGFSF programmes creates a structured demand for products from local farmers and small-scale fishers. In addition, HGFSF programmes build synergies with complementary interventions to enable local farmers to participate in school feeding markets. This can boost local food production, create business opportunities for rural smallholder producers and processors who may be marginalized (including women, youth and members of traditional or indigenous communities), and contribute to communities’ socio-economic development. HGFSF programmes can also increase the value of traditional foods, which are nutritious but often overlooked (FAO and WFP, 2018).

Linking schools with foods produced locally by small-scale farmers and fishers requires a set of policies, adequate legislation and an enabling environment. Examples of the factors that influence HGFSF programmes include trade and agriculture/fishery laws, education

policies, food safety legislation and standards, social protection laws, human rights legislation, nutrition standards and health legislation, and the regulatory framework for public procurement. To be successful, these programmes must ensure that solutions are demand-driven while also considering the supply for HGFSF products; they may need to ensure that additional support is provided to farmers and fishers, to enable them to increase their production to match demand. From the perspective of consumers, HGFSF has a huge potential to bring together the school community, children, families and local producers to promote healthier and more sustainable food practices and work together to ensure healthy diets for all (FAO, 2019).

## THE CASE FOR FISH: ANGOLA, HONDURAS AND PERU

School meals are increasingly seen as a unique opportunity to improve food and nutrition security in many countries suffering from malnutrition. Against this background, FAO has supported the three target countries in the development of national policies and strategies that incorporate fish into national school feeding programmes, encouraging them to include small-scale fishers and aquaculture producers in their public procurement scheme for HGFSF programmes. Acceptability trials were conducted in all three target countries. All fish products were checked by the food safety authorities in each country prior to these acceptability trials.

Various types of fish products were used to prepare meals for schoolchildren, including fish soup, fish pie and fish croquettes. The students were asked to grade each product on a scale of 1 to 5, with 1 being not acceptable and 5 being highly acceptable.

**In Honduras**, three different meals including tilapia (either as breaded fillet or in soup) were tested for acceptability in three schools in the department of Santa Barbara. It was concluded that fish is an acceptable food item in the two forms that were tested, based on a 100 percent acceptance rate of the menus among schoolchildren.

**In Peru**, women’s groups received assistance from Sumaq (a social responsibility project financed by the private sector) to standardize fish products, considering the nutritional potential of anchovies and the lack of cold chains. Salted anchovies in vacuum-sealed bags were found to have a shelf life of 12 months. Acceptability trials for this food were conducted in primary schools by FAO and the Peruvian national school food programme “Qali Warma”; it was found that meals including salted and pressed anchovies had an acceptance rate of 77 to 88 percent.

**In Angola**, mackerel (carapau) is the most popular fish in many areas, as it is often more affordable than other types of fish. The project tested three different preparation methods (fish soup, fish pie and fish croquettes) that use fish powder processed from dried whole, cleaned mackerel. All three fish products were found to be highly acceptable to schoolchildren.



©INFOPESCA/N. Avdalov



©INFOPESCA/N. Avdalov

There are many barriers to overcome before fish becomes a natural part of school meals in many countries of the world. Fish is generally known to be a healthy food but is rarely included in menus for school meals. The case studies in Angola, Honduras and Peru sought to identify the reasons for the inclusion or exclusion of fish in school meal programmes in the three countries, to develop and test strategies to ensure the inclusion of fish in school meals that are adapted to each country's reality. Barriers to the inclusion of fish in school menus are the high cost and the perishability of fish products, the belief that children do not like fish, and the lack of political will to include nutritious foods such as fish in school meals. The initial activities of the project therefore focused on developing low-cost fish products with a long shelf life and high nutritional values, and testing the acceptability of school meals including these products among schoolchildren.

One of the fish products tested for school feeding was the Peruvian anchoveta, a fish that is used primarily for animal feed purposes but is highly nutritious and affordable. A menu including grated and canned whole anchoveta (eviscerated) was tested, with close to 100 percent of the children reporting that they liked the dish very much. Salted and semi-dried anchoveta, a product that was already being produced by small, local processing units driven by women, were also found to be highly acceptable among schoolchildren.

Alternative fish products that were also found to have a high acceptability among schoolchildren were powdered

fish (made from whole dried fish and included as an ingredient in local dishes) and a soup prepared with the heads and bones of tilapia (instead of serving only fillets). Using heads and bones reduces loss and waste as it allows two thirds of the fish to be used, rather than the one third used previously; this means that more children can be fed with the same amount of fish.

These pilot tests demonstrate the high acceptability among children of fish products that are cheap and highly nutritious and can easily be stored. Based on these initial successes regarding the acceptability of fish products, the tested products will be analysed further for their nutrient content.

Together with the development of fish products for school feeding programmes, the project also developed a guide for children to explain why eating fish is good for us and how fish can be included in diets. This guide is being disseminated in target schools to raise awareness among children and their families about the importance of the inclusion of fish in school meals and healthy diets.

The study found that in all three selected countries, fish is available as a raw material. However, the fisheries sector's focus is often on exports, to generate foreign currency revenue. One of the major barriers to the inclusion of fish in school meals identified by the study is the high cost of fish procured from large-scale producers. An alternative would be to buy fish from small-scale fishers; however, the legal and bureaucratic aspects of public procurement systems, as well as food safety standards, may

work against this. In addition, small-scale fishers may not have the production capacity necessary to supply a consistent amount of good-quality fish. Another barrier identified in the study is the lack of cold chains (with ice or basic equipment such as refrigerators) that are required to keep fish fresh.



©FAO/Katia Iversen



©FAO/John Kamwambi

## RECOMMENDATIONS FOR THE INCLUSION OF FISH IN HOME-GROWN SCHOOL FEEDING

The project developed strategies to include fish in HGSF programmes in the three countries, considering the supply and demand constraints for local fish products identified in each country. Many of the suggested actions were similar for all countries. A recurrent theme was the importance of promoting the consumption of fish through food education. Such education should not focus exclusively on schoolchildren, but be directed towards parents, teachers, cooks, politicians, and fish producers and processors as well. Another recurrent important area of work identified by the project was the development and testing of low-cost fish products with a long shelf life. Improved collaboration between government institutions working in the fields of education, health and fisheries was also identified as an important factor determining the success of efforts to include fish in school meals. As important as providing nutritious meals to schoolchildren is ensuring that those meals are safe to eat.

The strategies to enhance the supply and demand of fish products developed for each of the three countries included in the study provide an important tool to convince governments – in those countries and beyond – to strengthen their school meal programmes and include fish in the menus. Collaboration with international organizations and agencies will be important to promote this idea and provide the knowledge and funding necessary for capacity building.

Based on the lessons learned during the implementation of the project in Angola, Honduras and Peru, the following recommendations can be formulated for follow-up in those three countries and for the integration of fish in school feeding programmes in general:

**Set up a multisectoral committee to develop policies and strategies to incorporate fish into school feeding.** Engage national and local authorities from various ministerial departments (health, nutrition, education, fisheries) in the development of policies and strategies to effectively incorporate fish and fish products in school meals.

**Use a multi-stakeholder participatory approach to develop acceptable and affordable fish products using available resources and raise awareness.** Involve parents, schools, local fishers and fishing organizations, fish processors and processing organizations, and community members in the development of fish products for school feeding. Through this platform, raise communities' awareness of the importance of fish and fish products for nutrition – for children as well as for the entire family.

**Understand capacity needs and build the capacity of small-scale fisherfolk (active in both capture fisheries and aquaculture) to produce safe, acceptable and affordable fish products for school feeding programmes.** Small-scale fisherfolk, fish processors and processing organizations may need capacity building in areas of organizational strengthening, food safety, fish handling, fish processing and value addition. In addition, they may need assistance with access to raw materials or small-scale infrastructure; their finance and business management skills may also need strengthening.

**Invest in the development of a toolbox of strategies and tools for the introduction of fish in school menus, to replicate the project's success in other countries.** Based on the lessons learned in this project and other past projects aimed at integrating fish into school feeding programmes, identify and document successful strategies and methods to introduce fish into school feeding programmes. Test these tools for the replication of the success of this project in other countries and produce a toolbox or handbook for integrating fish into school feeding that is adaptable to various country contexts.

## REFERENCES

- Bundy, D.A.P., de Silva, N., Horton, S., Jamison D.T. & Patton, G.C., eds. 2017. *Disease Control Priorities, Third Edition: Volume 8. Child and Adolescent Health and Development*. Washington DC, World Bank. <http://hdl.handle.net/10986/28876>
- Chong, A., Cohen, I., Field, E., Nakasone, E. & Torero, M. 2016. Iron deficiency and schooling attainment in Peru. *American Economic Journal: Applied Economics*, 8(4): 222–255. <https://doi.org/10.1257/app.20140494>
- FAO. 2017. *Regional review on status and trends in aquaculture development in Latin America and the Caribbean – 2015*. FAO Fisheries and Aquaculture Circular 1135/3. Rome. 49 pp. [www.fao.org/3/a-i6867e.pdf](http://www.fao.org/3/a-i6867e.pdf)
- FAO. 2019. *FAO school food and nutrition framework*. Rome. 36 pp. [www.fao.org/3/ca4091en/ca4091en.pdf](http://www.fao.org/3/ca4091en/ca4091en.pdf)
- FAO. 2020. *The state of world fisheries and aquaculture. Sustainability in action*. Rome. 244 pp. [www.fao.org/documents/card/en/c/ca9229en](http://www.fao.org/documents/card/en/c/ca9229en)
- FAO & WFP. 2018. *Home-Grown School Feeding Resource Framework. Technical Document*. Rome. 170 pp. [www.fao.org/3/ca0957en/CA0957EN.pdf](http://www.fao.org/3/ca0957en/CA0957EN.pdf)
- Global Nutrition Report**. 2018. Country nutrition profiles. Angola. In: *Resources* [online]. N.p. [Cited 10 April 2020]. <https://globalnutritionreport.org/resources/nutrition-profiles/africa/middle-africa/angola/>
- The Borgen Project**. N.d. Malnutrition in Honduras. In: *Issues* [online]. Seattle, USA. [Cited 31 March 2017]. <https://borgenproject.org/tag/malnutrition-in-honduras/>
- WFP. 2013. *State of school feeding worldwide 2013*. Rome. [www.wfp.org/publications/state-school-feeding-worldwide-2013](http://www.wfp.org/publications/state-school-feeding-worldwide-2013)
- WFP. 2020. Peru. In: *Where we work* [online]. Rome. [Cited 25 April 2020]. [www.wfp.org/countries/peru](http://www.wfp.org/countries/peru)

### CONTACT:

Andrea Polo Galante  
[mlvc@fao.org](mailto:mlvc@fao.org)

Food and Nutrition Division

Molly Ahern  
[fi-inquiries@fao.org](mailto:fi-inquiries@fao.org)

Fisheries Division

Jogeir Toppe  
[fi-inquiries@fao.org](mailto:fi-inquiries@fao.org)

Subregional Office for Mesoamerica

Food and Agriculture Organization of the United Nations (FAO), Rome, Italy



Some rights reserved. This work is available under a [CC BY-NC-SA 3.0 IGO](https://creativecommons.org/licenses/by-nc-sa/3.0/) licence