Revitalizing Tradition: Empowering Women and Strengthening Child Nutrition Through Mbala Pinda in the Republic of the Congo

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In 2019, during the early months of the COVID-19 pandemic, the World Food Programme (WFP) launched an initiative in the Republic of the Congo to strengthen the local food system and improve child nutrition by incorporating mbala pinda, a traditional snack made from peanuts and cassava, into school nutrition programs. A key focus of the project was empowering women farmers and small-scale mbala pinda producers by providing training in food safety, hygiene, and proper use of equipment, enabling them to scale up production. The WFP provided cash to schools, enabling them to purchase mbala pinda directly. This approach not only supplied over 4000 students with a nutritious, culturally familiar snack but also created a reliable market for women food producers, fostering economic empowerment and sustainability.

Food Science in Action:

- ✓ Product Development
- ✓ Food Processing
- ✓ Nutrition
- ✓ Food Safety

Introduction

In 2019, the United Nations World Food Programme (WFP) launched a project in the Republic of the Congo to boost the production of mbala pinda, a traditional snack made from cassava and peanuts. The Republic of the Congo, located just west of its much larger neighbor, the Democratic Republic of the Congo (DRC) has been a focus area for the WFP. This initiative aimed to enhance nutrition for schoolchildren while strengthening local food systems by relying on traditional regional crops and community-based production.

At the time, the Republic of the Congo faced significant challenges related to food access. Because 70 percent of the country's food came from imports, COVID-19 pandemic-related market closures and supply chain disruptions caused food prices to rise sharply in Brazzaville, the capital (Figure 1).[1] Farmers, especially women, who make up 60 percent of the local agricultural workforce, were hit hard by this.[2,3] The WFP prioritized the Bouenza department, or district, of the Republic of the Congo due to its existing food insecurity and economic vulnerability. This predominantly agricultural area, including the districts of Loudima, Madingou, and Mfouati, faced worsening conditions as pandemic-related restrictions disrupted food supply chains, limited market access, and sharply reduced household incomes. The WFP aimed to provide immediate relief while also supporting long-term food security through agricultural and sustainability-focused programs. This response was part of a broader strategy to safeguard food systems and promote resilience in rural communities. A primary initiative linked local mbala pinda production to school feeding programs using cash-based transfers giving farmers a steady market and students regular meals. The targeted nutrition interventions focused on schools, because malnutrition was a significant issue among children in the area.[1,4]

By relying on locally sourced ingredients such as cassava and peanuts, the program not only promoted agricultural sustainability but also honored the cultural significance of mbala pinda, a traditional food deeply rooted in the community's legacy of resilience.

Botanical and Agricultural Aspects of Cassava and Peanuts

Cassava (*Manihot esculenta*), introduced to Africa by Portuguese traders in the 16th century, is a staple crop in the Republic of the Congo. Its resilience to drought, resistance to pests, and ability to grow in poor soils make it a critical food source. Because cassava is inexpensive to grow, it is well-suited to smallholder farmers. It can be processed into a variety of products, including flour, starch, and tapioca that contribute to local economies and diversify the diet. Nutritionally, cassava is a starchy, low-fat root that provides energy and small amounts of vitamin C. While it plays a key role in addressing food insecurity, it lacks protein and essential micronutrients, so it is best consumed alongside more nutrient-dense foods to support a balanced diet. Importantly, raw cassava contains cyanogenic glycosides, which must be removed through adequate processing to prevent toxicity.[7]

Peanuts (*Arachis hypogaea*), native to South America, were introduced to Central Africa and have since become a cornerstone of Congolese agriculture and cuisine. They thrive in warm climates and help improve soil health through nitrogen fixation. Peanuts are rich in plant-based protein, monounsaturated fats, and key nutrients such as vitamin E, magnesium, and folate. Their high protein content makes peanuts an ideal complement to cassava's low protein profile. Peanuts are used extensively in Congolese cooking, from roasted snacks to sauces, and they offer economic benefits for smallholder farmers – strengthening both food security and agricultural livelihoods.

Figure 1. *Republic of the Congo location in map of Africa.*
Source: Republic of the Congo country profile. BBC NEWS, 11 April 2023. https://www.bbc.com/news/world-africa-14121191

Historical Background: A Legacy of Resilience, Nutrition, and Cultural Pride

Mbala pinda is deeply rooted in the country's culinary heritage and it reflects the agricultural traditions of the region, where peanuts and cassava have been cultivated for generations. The name itself, *"mbala pinda,"* highlights its key ingredients: *mbala,* which refers to cassava, and *pinda,* which means peanuts. Mbala pinda is a staple at family gatherings and celebrations, as well as a popular convenient snack sold at street food stalls and traditional markets. It showcases the ingenuity of Congolese cuisine in turning local ingredients into flavorful, sustainable food.

Mbala pinda has long been valued for its portability and convenience. Its significance is closely linked to the region's history, particularly during the construction of the Congo-Ocean Railway in the early 20th century under French colonial rule. The railway, linking Brazzaville to Pointe-Noire, was built under extreme conditions, with inadequate food supplies and harsh working environments.[5] During this challenging period, women from local communities played a crucial role in supporting the workers. They frequently prepared and delivered meals to those laboring on the railway, and mbala pinda was a popular and practical food choice. The dish, dense in both nutrition and energy, was well suited to provide sustenance for the physically demanding tasks the workers endured.[6] For many women, preparing mbala pinda for the railway workers was a means to provide essential nourishment while maintaining connections to their cultural traditions. In some cases, it was also a way to earn money or exchange goods.

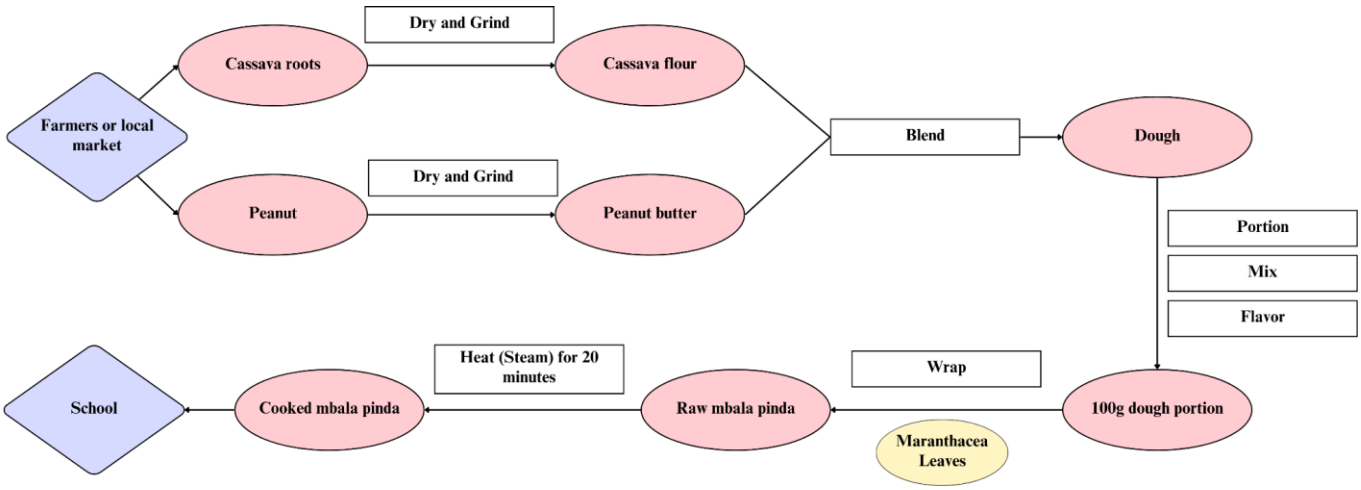

Figure 2. *Diagram of the preparation of mbala pinda.*

How Mbala Pinda Is Prepared

For mbala pinda preparation details, see ***Supplement I: Preserving Safety and Tradition: Summary of WFP Guide to Mbala Pinda Preparation*** *and Figure 2.*

Mbala pinda is traditionally made by mixing roughly equal parts cassava flour and ground peanuts. Sometimes salt is added, or it's flavored with red pepper or dried fish. The mixture is pressed or shaped into portions about the length of a granola bar, but much thicker and rounder. They are then wrapped in leaves and steamed for around 30 minutes (Figure 3).

The choice of wrapping leaves is just as important as the ingredients themselves. Traditionally, mbala pinda is wrapped in large, flexible leaves from the *Marantochloa purpurea* plant (Figure 4). This plant, part of the Maranthaceae family, grows naturally in tropical Africa, including the Republic of the Congo. These leaves are highly valued in local cooking because they hold moisture well and resist tearing, with no need for plastic or other synthetic packaging.

The nutrition content of the bars was estimated using the nutritional profiles of cassava and peanuts, the primary ingredients in mbala pinda (Table 1).

Figure 3. *Mbala pinda bars with red string indicating these are chili-infused (left). Steaming a new batch of mbala pinda (right). Photo courtesy of WFP/Alice Rahmoun.*

Figure 4. *Maranthacea leaves as biodegradable wrappers. Source: https://www.fondazioneslowfood.com/en/ark-of-taste-slow-food/maranthacea-leaves/*

Response

To address the threat of food insecurity in the Republic of the Congo, the WFP took a leading role in upscaling mbala pinda production to provide nutritious meals for school children. With its deep experience in emergency response, strong logistics capacity, and established presence in the region, the WFP was well positioned to take on this effort. The WFP received essential backing from international donors, which allowed them to launch the Mbala Pinda program.

One influential collaborator was the Sodexo Stop Hunger Foundation, an independent U.S. charity dedicated to fighting global hunger and food insecurity, with a special focus on the health and welfare of children. The foundation funds various hunger relief and agricultural sustainability initiatives across Africa to create lasting solutions to hunger through community engagement, empowerment, and strategic partnerships.[9]

Tailored Food, a Canadian-based organization, also contributed significantly to the Mbala Pinda initiative. The non-profit focuses on creating affordable, scalable food products that are culturally appropriate, climate-resilient, and nutrient-dense. Even before the COVID-19 pandemic they had completed research and the design for mbala pinda production. Executive Director Taylor Quinn conducted anthropological research to understand local dietary habits and cultural preferences. This fieldwork helped ensure the product would be accepted by the community. Recognizing the potential of the traditional cassava-peanut snack, Quinn led the process of adapting it for commercial production, working to preserve its historical and cultural integrity while meeting modern standards for nutrition and food safety.[10-12]

Jean-Martin Bauer, Director of the Food Security and Nutrition Analysis Service at the WFP, emphasized that every initiative must include a food safety perspective. As he explained, "We need a food safety lens on any project," as food safety represents "another dimension of food security".[13] This approach was put into action when the WFP rolled out Tailored Food's safety model in June 2020, training 160 women across 16 cooperatives on hygiene, equipment, and production management. Mbala pinda is traditionally made outdoors and can be prone to contamination. To address this challenge and to keep production consistent, the WFP created a *Guide pratique de la sécurité sanitaire des aliments dans la production du Mbala Pinda* (*Practical Guide to Food Safety in the Production of Mbala Pinda*) for the producers (Figure 5).[14] The guide laid out important hygiene steps, making it easier for cooperatives to standardize their practices and promote safe food production.

Table 1. *Mbala pinda approximate nutrient content. Ingredients: Cassava flour (50%), ground peanuts (50%). Serving size: 50g.*

Nutrient	Amount (% Daily Value)
Calories	211 kcal
Total Fat	14.9 g (19%)
Saturated Fat	2.0 g (10%)
Cholesterol	0 mg (0%)
Sodium	1 mg (0%)
Total Carbohydrate	14.1 g (5%)
Dietary Fiber	3.2 g (11%)
Total Sugars	1.3 g
Protein	6.1 g (12%)
Calcium	18 mg (1%)
Iron	0.9 mg (5%)
Potassium	287 mg (6%)
Magnesium	64 mg (15%)

Based on USDA FoodData Central values and standard Daily Values (DVs) based on a 2,000-calorie diet.[8]

Figure 5. *Practical Guide to Food Safety in the Production of Mbala Pinda, released in June 2020 by WFP.*
Source: https://www.wfp.org/publications

This approach emphasized adaptation over replacement, building on what communities were already doing rather than imposing outside systems. As Taylor Quinn emphasized, "The reality is not that evolutionary sanitation principles were provided, we simply leveraged the traditional food safety protocols."[15]

How Food Science Was Used

The Mbala Pinda production challenge was addressed through a practical application of food science across multiple disciplines. Nutrition science confirmed that the snack, made from cassava flour and ground peanuts, provided essential protein and micronutrients suitable for school-aged children. Ingredient science guided the selection of locally available components, enhancing both the nutritional profile and community ownership of the product. Food processing and hygiene were improved through targeted training, ensuring safe preparation practices, while the introduction of mechanical grinders by the WFP replaced traditional, labor-intensive methods with more efficient production. Overall, product development principles were applied to create a snack that was culturally appropriate, appealing to children, and easy to distribute through school feeding programs.

The WFP placed a high priority on ensuring clean, sanitary processing environments in all participating communities. Hygiene protocols were co-developed with local stakeholders and included routine training and on-site inspections to verify compliance with internationally recognized food safety practices.

Risk management for traditional crops addressed key hazards such as cyanogenic compounds in cassava, which could cause cyanide poisoning if not processed correctly. To reduce these risks, the WFP and its partners promoted practices like soaking, fermenting, and drying cassava. Training and monitoring ensured these methods were properly followed.[16] Peanuts face contamination risks, particularly from aflatoxin-producing molds such as *Aspergillus flavus*, which are common in warm and humid environments. To address this, women producers were trained to hand-sort peanuts, discard damaged or moldy nuts, and to thoroughly sun-dry them.

Results

In October 2020, mbala pinda became a key part of WFP school feeding programs, replacing imported maize meal with this locally sourced alternative. At the beginning of the academic year, around 3,400 school children benefited from these nutritious snacks. This change not only enhanced child nutrition but also created a stable market for women producers. Schools used WFP vouchers to purchase mbala pinda directly from women's groups.[17]

By April 2021, the program had expanded to reach 4,884 students across the districts of Madingou, Loudima, and Mfouati in the Bouenza Department. Regular deliveries ensured that students received an energy-rich snack during school hours, improving their nutritional intake.[18] A WFP report from October 2022 stated that support continued through cash-based transfers to 16 schools in Bouenza Department. This direct funding enabled the schools to buy 33,202 mbala

pinda bars—boosting local economies and maintaining students' access to nutritious food.[19]

Sustaining Impact Through Direct Support to Schools

The success of this initiative highlights the powerful intersection of food security, economic empowerment, and education. By investing in local food production, WFP not only improved school nutrition but also created a sustainable market for women producers. WFP support for this program was designed to be a short-term response to the immediate challenges posed by the COVID-19 pandemic and not intended as an open-ended program. However, its impact has evolved over time. For example, the WFP "Seeds for Tomorrow" project, launched in September 2023, continues to support local agriculture and school feeding programs, indicating the program's integration into broader, long-term strategies in the Republic of the Congo.[20]

Lessons Learned

- The Mbala Pinda initiative emphasized both the opportunities and the challenges that come with elevating a traditional food into a large-scale solution for school nutrition programs. It showed that traditional food knowledge and modern food science can complement one another if challenges around safety, consistency, and sustainability are fully recognized.
- Strategic partnerships were essential in this process, with the WFP supplying the logistical capacity and infrastructure required for large-scale production and distribution. Tailored Food bridged cultural and consumer gaps by researching traditional practices and preferences. Local women's cooperatives ensured authenticity, providing both the knowledge and labor that kept the product rooted in community tradition.
- A key challenge was balancing cultural acceptance while meeting school children's nutritional needs. Mbala pinda was familiar in Congolese households, which helped with its adoption in school feeding programs. Nutrition science showed that cassava offered energy but little protein, while peanuts filled that gap. Blending the two created a snack that honored heritage and met nutrition goals for school-aged children.
- Perhaps the biggest hurdle lay in food safety and processing. Traditional preparation outdoors left mbala pinda vulnerable to various types of contamination. Scaling up production required training and refining practices into more consistent and safe processing techniques. However, as Taylor Quinn explained, "The reality is not that evolutionary sanitation principles were provided, we simply leveraged the traditional food safety protocols."[21] Ultimately, the key to scaling mbala pinda meant taking the way it had always been prepared and enhancing those traditions with procedures that made the food safe to share more widely.

Next Steps

The Mbala Pinda project is about more than just one product. It is a model for how traditional food wisdom and modern technology can be combined to create sustainable food systems that directly address nutrition vulnerability. Looking ahead, the next steps could include applying this model to other culturally rooted foods, expanding into other regions, formalizing food safety training, and strengthening women's cooperatives with financial and business support.

Expanding mbala pinda production into other food-insecure areas within the Republic of the Congo and reaching neighboring countries with similar crops and cultural traditions, can strengthen food security where it's needed most. To maintain safe and consistent production, the WFP Guide pratique could be transformed into a formal curriculum that can be widely taught.

Women's cooperatives could be supported to commercialize mbala pinda products beyond school feeding programs. Formalizing these cooperatives may also increase their access to microfinance, grants, and partnerships independent of external aid. Public–private partnerships, especially with mission-driven companies like Tailored Foods, can provide the necessary resources to scale production and distribution to boost child nutrition and support

women's economic empowerment. Equally important is preserving the rich cultural heritage of mbala pinda. Documenting its oral histories and traditional preparation methods will honor its place in Congolese identity.

By integrating these approaches, the WFP mbala pinda model may continue to provide a fundamental blueprint to address current food system challenges and to further scale the approach without losing sight of proven practices from the past.

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Supplement I: Preserving Safety and Tradition: Summary of WFP Guide to Mbala Pinda Preparation

Based on the Guide pratique de la sécurité sanitaire des aliments dans la production du Mbala Pinda (WFP, September 2, 2020)[14]

Application of Food Science

- Careful ingredient selection and cleaning reduce contamination risks from the start.
- Roasting peanuts improves safety and flavor.
- Thorough sanitation follows traditional practices while incorporating modern food safety practices.
- Steaming acts as a critical control point to eliminate pathogens.
- Proper cooling and storage prevent spoilage and maintain product quality.

Preparation

Hygiene and Safety Practices

- Wash hands thoroughly with soap and clean water before hsandling any ingredients or equipment.
- Select equipment that is easy to clean and sanitize before and after each use.
- Always use safe water—collect from treated wells. May filter and boil before use.

Ingredient Selection and Preparation

- Use good-quality, locally sourced cassava flour and peanuts.
- Wash peanuts thoroughly to remove dirt and debris.
- Roast peanuts until they are golden-brown with a distinct roasted aroma.
- Grind roasted peanuts into a smooth paste; clean equipment before and after processing.
- Sift cassava flour to remove lumps; keep it dry and covered.

Mixing and Forming

- Combine cassava flour and peanut paste in approximately equal parts in a clean container.
- Add salt and optional flavorings (e.g., red pepper, dried fish).
- Knead the mixture by hand until smooth and well blended.
- Divide dough into about 100 gram portions, shaping into bars or balls. Use clean hands or gloves to maintain hygiene.

Wrapping and Steaming

- Wrap each bar securely in clean maranta or banana leaves on sanitized surfaces.
- Set up steaming equipment: use a large pot with a tight lid, place a perforated tray above water level.
- Arrange wrapped bars in a single layer, spaced apart on the tray.
- Steam bars over boiling water for 30 minutes, maintaining consistent heat.

Cooling, Packaging, and Storage

- Remove steamed bars carefully with clean tongs or gloved hands.
- Cool bars in a clean, shaded, well-ventilated area to prevent condensation and bacterial growth.
- Package cooled bars in clean containers or bundles.
- Store in a cool, dry place away from direct sunlight, insects, and moisture.
- Consume within 5–7 days for optimal quality and safety.

Ongoing Hygiene and Quality Control

- Maintain handwashing, equipment sanitation, and clean work environments throughout all steps.
- Monitor stored bars daily for spoilage signs such as mold, sour smell, sliminess, or leaf breakdown—discard if detected.
- Check that bars are firm with intact leaf wrapping and no pooling of water inside wraps.