



Healthy guts and income for women: promoting fermented foods in low-resource areas

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Fermented foods have long been revered for their health promoting properties, from their anti-inflammatory metabolites to the potential of deterring infectious diseases. Cultures around the world have relied on the healing power of these gut-fortifying foods, making them an integral part of their traditional diets.

Women in rural areas are often tasked with the time-consuming process of producing fermented foods. Supporting the efforts of rural women to adapt or modify producing traditional fermented foods in ways that are aligned with their culture and well-being has the potential to bolster their entrepreneurial skills while uplifting the importance of cultural foods.

Thus, there is great potential to leverage the production and sale of fermented foods to promote healthier communities and empowered entrepreneurship in low resource areas, specifically in rural Africa. This article will explore the cultural implications of supporting such efforts, discuss the assets and barriers to implementation, and highlight instances where fermented foods programs have yielded cascading benefits.

Fermented foods are good for the body and for the culture

Health benefits of fermented foods have been readily documented, from their ability to [reduce inflammation](#) [1], their [anti-pathogenic](#) [2] capacity, or the ability to make [nutrients more bioavailable](#) [3] in the gut. For example, the fermentation process breaks down phytates, compounds that bind important minerals like zinc, calcium, or iron in cereal foods, making those minerals more available for absorption in the gut. Additionally, the acidic environment and other metabolites, like ethanol and hydrogen peroxide, from the fermentation process have antimicrobial properties. These biochemical attributes of fermented foods make them a natural source of gut health.

While the media has only recently begun to promote the power of fermented foods, these types of foods have been a mainstay in traditional meals and various cultures for thousands of years. Globally, kimchi in Korea, miso and soy sauce in Japan, and yogurt in the Netherlands [have high rates of consumption](#) [4], making their production a worldwide access point.

In Zambia, fermented cereal beverages like *munkoyo* and *chibwantu*, along with the fermented milk product *mabisi*, are traditionally used as quick, [high-energy foods](#) [5] and for [enhancing gastrointestinal health](#) [6] within local communities. Each indigenous tribe or community has unique preferences for the types of

fermented foods they consume and distinct preparation methods. In rural areas of Zambia, where maize and other carbohydrate-rich staples dominate diets, fermentation practices could play a crucial role in enhancing nutritional value of common diets through culturally rooted methods. Promoting the use of traditional foods can enhance health by focusing on culturally accepted options that encourage [food sovereignty](#) [7], especially in rural African areas where raw materials are readily available and production processes are ingrained into society. These traditional products often have known benefits in their societies, such as relying on *munkoyo* to prevent diarrhea in Zambia. Therefore, enhancing their production of fermented foods to improve health would build upon previously established belief in the healing capacity of these foods rather than having to build trust in the power of a newly introduced health phenomenon. This approach also helps preserve traditional practices and showcases the valuable knowledge held by many rural women.

Strong guts open doors for women

[The low start-up costs and low barriers](#) [8] to entry make fermentation programs a potential avenue for addressing food insecurity and to generating income in low resource areas. The general spontaneous [fermentation process](#) [9] requires a starter culture that introduces lactic acid bacteria that will break down the carbohydrate sources, incubation at a viable temperature for the bacteria for an extended period of time, and stirring or sieving the concoction before consumption, but the process can vary by food or culture. The fermentation process can be managed by low labor costs and can be integrated into household work, with most of the costs being raw materials and equipment as discussed later. [Given that women hold the knowledge of fermentation processes and are often responsible for producing traditional foods](#) [10], fermented food programs have a unique opportunity to harness and cultivate their entrepreneurial potential.

The process of producing fermented foods requires understanding of how to manipulate the raw materials and starter cultures, proper packaging and storage conditions, and sale of the traditional foods. These are marketable skills that many rural women have practiced for generations and therefore can be amplified to generate income for themselves and their families. For example, after training women on the production of probiotics and fermented foods, [women in rural East African populations like Kenya, Tanzania, and Uganda were able to create sustainable income and make strides towards gender equality](#)

[11]. This “pro-poor business model” works to reduce the vulnerability of poor entrepreneurs by stressing the importance of local production and distribution and gives women the resources and support to take agency in their communities and own lives.

“ The pro-poor model enabled her to transition from poverty and a thatched single room dwelling to owning 20 dairy cows, employing 27 staff, sending her four children to better schools, owning a new concrete home with iron roof, and producing up to 200 L of probiotic yogurt per day.

– Description of *Winnie Busingye’s new found success*, founder of *Kiboga Ikamiro Women’s Group PU in Uganda*

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Fermented foods provide a feasible model for women, particularly rural women, to capitalize on their cultural knowledge and promote health of their community members.

Box 1: Potential skills and benefits fermentation programs can afford women as outlined by the [FAO](#) [8]



- Income production
- Bookkeeping and transactional skills
- Independence in producing the food
- Confidence in teaching fermentation processes and selling
- Networking skills amongst consumers and vendors
- Increased education and training in a specific subject
- Teamwork with other producers and vendors
- Supply management and distribution

Assets, challenges, and potential strategies to implementing a fermented foods program

By building on the cultural importance and the skills it affords women, a fermented foods program may be a viable model for promoting health in communities that have the raw materials and fermenting equipment available. This is where local NGOs, non-profits, or government initiatives can support their communities’ investments in healthy lifestyles.

In terms of assets, programs can develop and grow out of existing cultural knowledge, the long shelf life, and the capacity of fermented foods to promote [sustainable food chains](#) [12]. A successful program will work in concert with, instead of in opposition to, the local knowledge about fermentation benefits and processes. By assessing the traditional cultural knowledge of community members (an example questionnaire can be found in [Appendix 1](#)), the program can build upon the community's foundational knowledge. As fermentation was originally a mechanism of food preservation, fermented products inherently have a longer shelf-life and reduces food waste by reducing the pH of the environment which inhibits many pathogens such as *Listeria* and *Salmonella*.

However, promoting new foods systems does not come without its challenges. Despite the low cost of production, access to raw materials like cereals, dairy, starter cultures, fermenting equipment (such as [plastic bins or calabashes for mabisi](#) [9]), and optimized production processes may be at a premium. Additionally, the costs of transporting and storing products, as well as bringing them to profitable markets may limit the capacity of small-scale fermentation producers. Once in the markets, sellers may not have the capacity to properly market the health benefits of the fermented foods, limiting the reach of their product. [Upscaling of traditional fermented foods to build value chains and to promote women entrepreneurship](#) [12] by the IFAD provides a comprehensive overview of the benefits and challenges to women when upscaling fermented foods production chains. Additionally, the use of starter cultures raises question about the introduction of potentially pathogenic bacteria. While studies have shown that the traditional fermentation methods are effective in [reducing pathogens to an acceptable level](#) [14], frequent safety inspections of the products should be conducted to ensure microbiological safety.

To establish a system that empowers community members, programs can encourage collaboration between local stakeholders and women entrepreneurs, facilitating sustainable access to sales markets. Partnering with local farmers can help secure raw materials while enabling experimentation with efficient production methods to optimize the supply chain. The culinary aspects of these foods are also important, positioning them as a healthy and desirable food for all, rather than a "product for the poor." Investing in women's ability to evaluating market responses to product taste and quality, and advertise with these ideas in mind, can guide strategic recommendations.

Overall, supporting initiatives to train women in processing fermented foods, scaling their production, and navigating markets can significantly contribute to

the success of such grassroots health promotion efforts.

Community success with fermentation

Global initiatives have acknowledged the importance of integrating culturally important foods into the healthy diets of their communities.

- In response to the COVID-19 pandemic and the threat to food security in Sub-Saharan Africa and South Asia, the Bill and Melinda Gates Foundation put forth a challenge to investigate how the [production of traditionally fermented foods can benefit maternal nutrition](#) [15]. Based on research in Ghana that Soymilk-Burkina can be a source nutritional success for maternal women, Dr. Oduro-Yeboah put forth an [inception workshop to recruit stakeholders](#) [16] in their efforts to reduce harvest losses and simultaneously promote traditional knowledge to combat malnutrition. Dr. Oduro-Yeboah hopes that “integrating tradition and technology would help change perceptions, and encourage more people to accept the dishes” and that fermentation will “help in preventing post-harvest losses of millet and create demand for soya beans.”

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– Dr. Oduro-Yeboah

- In Zambia, studies by the Wageningen University in collaboration with the University of Zambia have demonstrated the role of fermented foods in creating value food chains in rural areas, [promoting a sustainable source of nutritious food and women empowerment](#) [17] when producing *munkoyo* and *mabisi*.

While highlighted studies have demonstrated the potential of fermented foods in sub-Saharan Africa, the support for similar programs are promising in low-resource areas globally. Because of the cultural impact that many of these dishes have and the wealth of knowledge traditional production practices bring, a fermented foods program as an area for investment and exploration is viable in a variety of different communities. These success stories and the ever-

increasing focus on traditional foods establishes a foundation for promoting female driven initiatives that promote fermented foods.

Want more resources for empowering women in rural areas? Check out these resources:

Case studies of the success of fermented food programs | [Fermented Food for Life: Stories of Inspiration, Struggle, and Success](#)

Benefits of fermented foods and probiotics in low-resource areas | [Locally sourced probiotics, the next opportunity for developing countries?](#), [Fermented foods, their microbiome and its potential in boosting human health](#)

Promoting Women's Entrepreneurship | [International Labour Organization Women's Entrepreneurship Development](#), [World Bank Group Female Entrepreneurship](#)

Potential funding sources for similar projects | [Good Food Institute](#), [USDA Community Food Projects Competitive Grant Program](#), [African Women's Entrepreneurship Program](#)

Questions to assess local fermented food diet patterns | [Appendix 1](#)

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