



Applying advancements in food technology to utilize locally grown turkey berry in Ghana to combat iron-deficiency anemia

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Left: Processing turkey berry at Achiever Foods. Right: Founder Millicent A. Adoboe.
(Photo courtesy of Achiever Foods)

To combat widespread anemia in high-risk populations throughout Ghana, Achiever Foods is offering product lines of juices, powders, and teas that use *Abedru* (or turkey berry). This native and sustainable crop is an excellent source of iron and is shown to improve cases of iron-deficiency anemia. Tackling post-harvest losses and bitter notes from the crop, Co-Founder and Deputy CEO Millicent Agidipo Adoboe, a trained food scientist, is using her knowledge to make turkey berry an effective iron-enrichment ingredient.

Food Science in Action:

- ✓ Food Technology
- ✓ Food Engineering
- ✓ Food Processing
- ✓ Product Development
- ✓ Sensory Science
- ✓ Nutrition
- ✓ Sustainability

Introduction

It is well established that anemia, defined as a lack of healthy red blood cells required to deliver oxygen to the body's tissues, is a major public health crisis in Ghana that disproportionately affects women of reproductive age and children. Anemia in pregnancy increases the risk of

preterm delivery, low birth weight, and maternal and child mortality. Although there are several risk factors associated with the disease, more than half of all cases are caused by iron deficiency in the diet.^{1, 2, 3} For this reason, diet fortification can be a main strategy in the mitigation of anemia prevalence.

Food scientist Millicent Agidipo Adoboe (Millicent) experienced the deleterious effects of iron deficiency anemia herself when she was a young woman growing up in Ghana. During a lengthy and life-threatening hospital stay a nurse suggested seeking out a local crop called turkey berry (Figure 1). As soon as she was stable enough to go home, Millicent began incorporating turkey berry into her diet. Upon doing so, her health took a dramatic turn for the better. She attributes the turkey berry to saving her life. Since that time, Millicent has been on a mission to incorporate turkey berry into the diets of vulnerable populations within Ghana. She co-founded Achiever Foods⁴ in 2018.



Figure 1. Turkey Berry (*Abedru*) grows natively in Ghana
(Source: <https://www.healthline.com/nutrition/turkey-berry>)

Project Overview

Turkey berry, known locally in Ghana as *Abedru*, is touted for its high iron content, making it well-suited as an intervention ingredient in the diet. Studies have shown effectiveness in using turkey berry-fortified foods to reverse anemia and the risk factors associated with it.^{5,6} However, it remains largely an underutilized crop.

Due to high moisture content averaging 81- 84%, post-harvest losses when growing cultivated turkey berries are common.⁷ Farmers in Ghana typically do not have the drying and preservation techniques needed to make cultivating turkey berry a sound choice. Achiever Foods partnered with these farmers to implement a proprietary large-scale drying process quickly after harvest to extend the shelf life of the crop and reduce loss (Figure 2). The end result is a shelf-stable, dried and milled product with a moisture level of <8%. Third-party analysis confirms that the dried turkey berry produced by Achiever Foods is a source of iron as it provides over 15% of the Nutrient Reference Value (NRV) per 100g (Table 1)⁸.

By way of vertical integration, the dried turkey berry is then utilized as an ingredient for finished products. Using her technical training including a certification in Hazard Analysis Critical Control Point, Millicent has created three different product lines totaling 19 unique products comprising teas, juices, and powders. Being known as bitter and tart tasting, the product lines were designed to incorporate turkey berry in a way that is highly palatable. Starting with 100% turkey berry powder

and creating formulas with ingredients that would mask or alter the taste of turkey berry was vital. The powders, for instance, come in six different flavors ranging from cocoa to turmeric, offering versatility to how it can be used. The company recommends adding to ready-prepared meals such as: porridges, smoothies, yoghurts, and cereal foods. It can also be added to soups and stews just before simmering for seasoning. Taste testing panels were used to validate the products' acceptance. "Now it's up to us to educate the consumer that these products are worth trying," Millicent reflects.

It is the handling and drying innovation that have allowed the company to establish mutually beneficial partnerships with local farmers. The company provides the seeds, training, tools, and suitable clothing to the farmers. It takes three to six months to cultivate the turkey berry and harvesting of the crops is done every two weeks throughout the network to maintain consistent supply year-round.

Successes

The marketing strategy at Achiever Foods has always been to target their known consumer-mothers and women of reproductive age. That is why Millicent went back to where it all began, to the nurses in local hospitals. Through awareness and promotional activities in hospitals, now the nurses, midwives, and dietitians throughout Ghana can recommend a product line that is

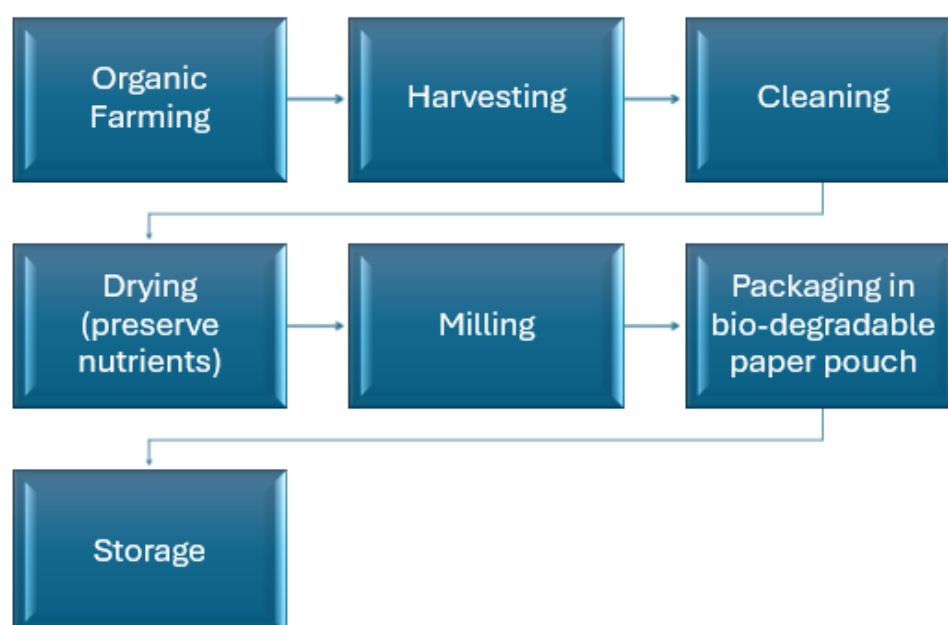


Figure 2. Steps in processing Abedru or turkey berry (Source: Achiever Foods).

convenient, long-lasting, and nutritious. Further, the products can be found in many pharmacies, health food stores, and grocery stores. The company also offers business-to-consumer (B2C) purchasing on social media platforms worldwide. Achiever Foods currently exports to the USA, UK, Kenya and South Africa with a legal presence in Virginia, USA.

This project is an example of creating a sustainable solution that benefits local, at-risk communities. Often described as both adaptable

and resilient, this perennial crop regenerates the soil when its leaves fall and serves as ground cover and enrichment.

The creation of Achiever Foods and subsequent innovation in using turkey berry has impacted the lives of dozens of farmers in the area who can now benefit from this indigenous plant. In just five years, they have created 16 new jobs and work with over 100 farmers, giving preference to rural female farmers in the area to help improve gender equality. “We believe strongly in gender equality and women empowerment. We have seen that the money female farmers earn goes right back into our schools, thus strengthening our community,” Millicent observed.

Since creation, 20,000 tonnes of berries have been used in production. Over 100,000 products have been made and sold. In 2020, Millicent was honored with an Impact Award by Generation Africa for impacting and improving the nutrition of over 400 pregnant women in her home country and across the globe. She also has embarked on an entrepreneurship program, The Achieving Consultant, to empower women and youth in her community and has positively impacted the lives of over 2,000 people so far.⁹

Table 1. Third-party nutritional analysis of processed and dried turkey berry (Source: Achiever Foods).

Nutritional value of dried turkey berry (per 100 g)	
Energy	379.43 kcal
Protein	13.86 g
Carbohydrate	58.52 g
Total fat	8.99 g
Iron	39.13 mg
Vitamin C	6.79 mg

Looking Ahead

Achiever Foods is currently raising funds to expand its reach throughout Ghana. The funds will be used to upgrade equipment that will improve packaging as well as the purchase of a company van for national distribution. The van will also be used to organize community social responsibility programs to reach and educate pregnant women suffering from iron deficiency anemia throughout Ghana. For more information on Achiever Foods visit <https://achieverfoods.net>.

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