

**VOLUNTEER REPORT FORMAT**

*To be submitted to CRS at the end of volunteer assignment and shared with the Host*

**1.1 Assignment information**

- a) Volunteer Name: Jennifer L. Allen, PhD
- b) Host Organization: Stawi Foods & Fruits Ltd.
- c) Assignment: Development of New Nutritious Products for Stawi Foods & Fruit Company
- d) Dates of Assignment: August 28-Sept 12th
- e) Number of days worked 14 days

**1.2.1 Objective 1: Conduct Training of Quality & Food Safety Production**

- a) The first objective was to provide a refresher training course for the employees at Stawi Foods. This training was developed to reinforce the learnings from the previous volunteer. We covered both Hazardous Analysis Critical Control Points (HACCP) and Good Manufacturing Procedures (GMP). Through the trainings employees were able to gain information on the importance of hygiene at work and methods of cross-contamination. We discussed better hygiene practices and how to make the product safer during processing.
- b) It is expected that with this the employees will have seen relevant information pertaining to food quality & safety in production that following GMPs will become a habit and ensure the safety of the product.
- c) It is recommended that this training be repeated on an annual basis to ensure employees understand the importance of producing safe quality product.

**1.2.2 Objective 2 Review Processing Procedures & Provide Recommendations**

- A) For objective 2, I conducted a walk-through of the processing facility on multiple days to observe the processing, packaging, and handling of the product. I took notes for each step of the process and noted safety, quality, and efficiency concerns that should be address at some level. Though many of the recommendation of efficiency may require a significant investment, some are minor and took it upon myself to address, others may be accomplished with so general effort from the management team. It should also be noted that the current processing facility is not well suited for production of food for human consumption. The primary factor of this concern is that the facility's general/all-purpose areas are exposed to the outside atmosphere. This increases the exposure of the product to elements such as birds, rodents, and insects. Not only is cross contamination an issue for the product, but also the final product also becomes susceptible to humidity changes of the atmosphere which may also affect the shelf life of the product.

To begin, with a general efficiency guideline, in a processing facility the flow of production should be streamlined and flow in order of processing. Therefore, the flow should be from Raw Materials → Processing → Packaging → Finished Goods. This will help to reduce the risk of cross-contamination of the finished goods with that of the raw product, likewise reduce traffic confusion and therefore make the process faster.

### **General necessities for the processing facility:**

1. **Provide Employees with Proper PPE** (personal protection equipment), **daily**:
  - a. Clean Smocks or uniforms
  - b. Hairnets and beard nets
  - c. Gloves (preferably colored-allows the employee to easily see rips and tears and if the glove breaks into the product)- Protects the final product from contamination
  - d. Googles, or other eye protection gear- protect employees from dust and debris that may be in the air
  - e. Breathing Masks- Prevent contamination and protect employees breathing pathways
  - f. Earplugs- Noise from the mills are detrimental to hearing over time
2. **Hand Washing Facilities**
  - a. If hot water is not made accessible, then employees should have access to:
    - i. Soap: preferably a liquid anti-microbial soap
    - ii. Hand sanitizer-for use after the employees wash their hands when
  - b. Hand washing station should be free and clear of debris, if used for other washing purposes, the area should be cleared prior to hours of production.
3. **Record Keeping System**
  - a. An adequate system of the chain of custody is necessary for the production of the final product.
  - b. Documentation is also needed for the processing parameters, batching, formulation, and cleaning and sanitizing procedures. These documents will help ensure the checks and balances are met for the processing and understand any processing mistakes that may occur. Also they will help in training future employees if necessary.

**Unit 1 Finished Goods Storage:** It is recommended that there be enclosed rodent traps placed within the unit to remove the hazard of contamination from the finished product.

### **Unit 2 Raw Material Storage:**

- a. Clear Labeling of all the proper storage areas of the grains. (Printed these to be laminated)
- b. Clear a walking path for employees to gather grains safely. This area needs to be larger, it would be beneficial to be able to receive ingredients and allow a **First In, First Out** system of usage. This ensures the grain is not kept in storage too long if there is a delay in processing.
- c. This room should be swept daily if possible. If there is minimal grains in storage, this area should be mopped with a cleaning agent before a new shipment arrives. This will keep down the occurrence of rodents and insects, which can increase the risk of contamination.

- d. Transporting the grains in sacks to the roasting room uses a dolly (hand truck). Process could be more efficient using a manual expandable accordion style conveyor (see photo). Multiple units would be necessary to reach the roasting room perhaps but measurements would be necessary.



Expandable accordion conveyor, found on [www.Alibaba.com](http://www.Alibaba.com). The dimensions needed at this facility would need to be measured for appropriate size.

**Unit 3 Toilet Facilities:** The toilet area has a faucet located just outside the room. There should be proper signage of hand washing protocols located within the enclosure. This reminds employees of the importance of hand washing (these signs were provided and should be laminated to reduce need for replacement. There should be a proper cleaning schedule of this area on a daily basis at minimum. Likewise, it is idea that there is a foot bath (shoe sanitization) system located in this area, especially considering the construction of the facility. Foot traffic in and out of this area can transfer germs from the bathroom into the processing areas.

#### Unit 4 Roasting Room:

- a. Currently there are too many roasters in the room. This space is not effective. Remove idle units and place in storage or repair where necessary.
- b. A more efficient method of processing would be to designate specific roasters to individual grains, this would allow for less susceptibility for cross-contamination, the opportunity to clean units at the end of the processing day and dry for the next day. It can also increase capacity of the roasting.
- c. Timers are needed in the roasting room, this will allow for uniform processing across all of the batches.
- d. Roasted grain should **not** be placed back into the sacks used for raw grains. Essentially the roasting step is your only kill step, therefore grains should be handled in the most sensitive manor following this step.
  - i. Keep roasted grain off of the ground at all times
  - ii. Use different sacks for roasted grains or collect roasted grain in a clean container; the current sack allows for its torn pieces to potentially contaminate the product.
- e. The addition of the grains from the sacks to the roasters involves strenuous lifting and repetitive bending by the workers to load the roaster, which could cause back injuries. An alternative method of addition is necessary; this could speed up the loading of the

bags. (Just an example, at higher capacity warehouse production-  
<https://www.youtube.com/watch?v=NsEoWGMEb5M>)

A more feasible option is found here: <http://www.liftingsafety.co.uk/product/genie-load-lifter-828.html>. This unit can move up and down to heights necessary to easily load the roasters in half the time.



- f. Having a removable accordion conveyor (shown earlier) into the room and out of the room to the milling room would increase efficiency, decrease stress on the employee, and keep the product off of the ground post-milling (currently after milling the sacks are filled with the roasted grains and pulled across the floor and ground into the milling room).

#### Unit 5 Milling Room:

- a. Each of the grains should be stored in color coded (labeled) bins to reduce the confusion of what product is in the container after milling.
- b. Bins/Totes should be washed at minimum daily after production each day.
- c. All PPE needs to be worn in these areas post roasting to ensure the safety of the product.
- d. Area need to be more organized for efficiency.
- e. Packaging for the product should be kept in a clean safe area. The packaging should never be left outside and exposed to the atmosphere. This allows for dust, debris, and potentially insects to enter the package that is delivered to the consumer.
- f. Also it was noted the appearance of “cobwebs” in the product by consumers. After visiting the milling area, it is likely that the material is due to the milling of the grains, and may be strands of fibrous and/or protein. This may be limited in the final product by milling into containers that may have a screen mesh over the opening to limit its introduction into the final product.

B) It is expected that with modification in the current process as suggested, Stawi can achieve a safer product and gain some efficiencies in the production process. This will allow increased product production within the current schedule.

#### 1.2.3 Objective 3 Review Potential for New Product Production

- A) There is currently a gap in the market for a new nutritious small meal biscuit product. Currently, the biscuits in the market are high sugar and appear to be more of a dessert product. Likewise there is a market for a product that may be fortified with vitamins and minerals that is high in fiber and

provides energy longer through the day. The concept that was tested at Baby Banda with consumers attempted to determine the market for such a product, price point, and additional need for formulation work on the samples shown. Stawi has a unique opportunity to capitalize on this market if they position the product properly. Based on consumer feedback, they enjoyed that the product was not too sweet and was all natural and made with Whole Grains. Likewise, with the product being fortified with vitamins and minerals it gives an added bonus for the product.

Stawi however does not have the capacity in the current facility to produce such a product. It was suggested to reach out to a co-manufacturer, utilize an existing bakery, or rent a home to produce the ready to eat product. The equipment necessary to produce such products would include a large scale dough blender. One of the larger brands utilized in the US is Hobart. <http://www.hobartcorp.com/products/food-prep/mixers/> . They supply both larger “pilot-scale” and floor stand mixers capable of making 200lb batches. The capacity is something to be determined as the company plans for commercial production. Also, large ovens will be necessary for production. Capacity would need to produce 200+ biscuits at a given time ([http://www.webstaurantstore.com/14181/commercial-convection-ovens.html?show\\_all&vendor=Vulcan&gclid=CNzr6NXRIs8CFZKCaQoduk0ANg](http://www.webstaurantstore.com/14181/commercial-convection-ovens.html?show_all&vendor=Vulcan&gclid=CNzr6NXRIs8CFZKCaQoduk0ANg)). These ovens are only pictorial suggestions. To produce quantities for industrial use, much larger ovens may be necessary. As previously mentioned a local bakery may have this capability so renting the space may be a better option.

- B) It is expected with a new product that there would be some financial hurdles that would need to be addressed to produce such a product, considering the business currently produces a product that is prepared for further processing. The formulation could be modified to become a dry mix that the end consumer would further prepare. All dry ingredients could be properly blended and combined and allow the consumer to bake, but that may change the market.
- C) I would recommend holding off on further product development of a ready to eat biscuit until capital investments have been discussed and a decision is made on the direction of any new products. The company should first become well established within in the current product category, i.e porridge/ dry blends. So using the formulation to offer a dry premix biscuit is a suggestion until the capital is achieved. The formula would have all dry ingredients including a milk powder and dry spices and flavors. Consumer may then add Egg, Oil and water and bake.

#### **1.2.3 Objective 4 Conduct Training on Product Development Process**

- a) Product development training was given in a general sense of the process and in regards to the “benchtop” level of formulation work for the product. I discussed the Stage-Gate Process in regards to the product development process. We discussed the importance of developing a business case, sensory testing, and consumer opinions. Once the product is developed additional testing for quality and safety are of importance as well.
- b) This training gives the company a broad sense of what is necessary to develop a new food product. Likewise, the training of preparation of a formula and noting observations in cook and sensorial attributes were discussed with Miriam (an employee at Stawi).

- c) Further product development work may be conducted based on the trainings provided once a decision is made on the direction of the company.

### 1.2.3 Objective 5 Develop a New Nutritious Product

- a) In developing a new product, it was decided that a ready-to-eat biscuit would be the target product. A formula using made with 2 versions, one utilizing red sorghum and one using white sorghum. The flavor profile for each was very distinctive therefore we decided to try them both with consumers. The formulation will be provided in separate notes. It was advised that the formula be put into percentages to make it easier for formulation batching of higher and lower levels. Consumer testing determined that there was still some work necessary to reach an ideal texture as most consumers thought the texture was only mildly acceptable, however majority enjoyed the taste and the biscuit overall.
- b) It is expected that this product development on the ready to eat biscuit provides the host will a starting ground to work with on the formulation of ready to eat biscuit or dry blend for further baking by the consumer.
- c) Further work is necessary on this product however as previously stated the ready to eat product may require more capital investment for Stawi to begin immediately.

### 1.3 Action Plan

Recommendation	Specific Action	Responsible person	By when
1. Assign an individual to be the safety/ quality Ambassador	Person will be in charge of GMP signage, PPE for employees and be the enforcer of regulations	Eric	
2. Properly document process runs, batching, and COC (chain of custody)	Use spreadsheet provided for batching and formulation, make additional forms for processing	Eric	
3. Establish a proper cleaning and sanitation schedule	Schedule a minimum of a once a week cleaning and sanitization schedule.	Eric	
4. Continue product development work on Ready to Eat breakfast snacks	Identify a fully functional bakery or kitchen to utilize for product development work, as well as for potential scale-up	Eric	
5.			
6.			

### 1.4 Number of people Assisted

- a) Through formal training =5
- b) Through direct technical assistance (Do not double count)= 2



- c) Out of these above, number of host staffs=6  
d) Training/assistance by field

Category	Total	Males	Females
Members/ owners	1	1	0
Employees	6	1	5
Clients/ Suppliers			
Family Members			
Total	7	2	5

#### 1.5 Gender

- a) I did not notice any definitive gender roles during my stay. There were mostly females working at the production site and within the sales and marketing team.
- b) I think within the host, there have been many opportunities for women. And it seems as though the work of the women is valued as they seem to have a big impact on the workings of the production facility.

#### 1.6 Value of volunteer contribution in \$

- a. I spent roughly 10 hours preparing for this assignment before heading over
- b. The materials used included handouts and PowerPoint presentations.

#### 1.7 Value of hosts' contribution in \$ (Please consult the host as well)

- a) Meals
- b) Transportation
- c) Lodging
- d) Translation
- e) Other (Specify)

#### 1.8 Host Profile Data:

The host Profile Data provided was correct.

#### 1.9 Recommendations for CRS:

For assignments that will be based on the food industry, it would be helpful to provide the volunteer with information on the food industry of that particular country. This will help in the preparation of recommendations that the company could meet based on their own country standards.

Additionally, for assignments based on the food industry, a more general technical training may be prepared for the companies. This could allow for volunteers to reach a larger audience within the short period of time. General trainings may be had for product development, GMP, HACCP, and Quality & Safety concerns.





1.10 Press Release

**FOR IMMEDIATE RELEASE**

**VOLUNTEER CONTACT:**

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**East St. Louis Area Volunteer Travels to Kenya to Share Skills with Local Farmers**

**Farmer to Farmer program promotes economic growth and agricultural development in East Africa**

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**East St. Louis Area Volunteer Travels to Kenya to Share Skills with Local Farmers**

**Farmer to Farmer program promotes economic growth and Agricultural development in East Africa**

**Jennifer L. Allen** a graduate research assistant from **East St. Louis, IL** travelled to **Nairobi, Kenya** for **18 days** to share her technical skills and expertise with local farmers. Jennifer's assignment is part of Catholic Relief Services' Farmer-to-Farmer (FTF) program that promotes economic growth, food security, and agricultural development in East Africa.

**"This experience offered through CRS Farmer-to-Farmer program has been by far one of the greatest experiences of my life! I've had an interest in applying my skills and knowledge in food science to benefit those in lesser developed countries and this program gave me just that opportunity. I feel that the benefits gained were mutual for both myself and the company that worked alongside. The transfer of knowledge is a beautiful thing and for me, very invigorating. I learned so much about the country, its food industry and its people. I hope to be able to experience it on this level again someday providing even more benefit," said Jennifer.**

Funded by the U.S. Agency for International Development (USAID), the five-year program matches the technical assistance of U.S. farmers, agribusinesses, cooperatives, and universities to





help farmers in developing countries improve agricultural productivity, access new markets, and increase their incomes.

**In Kenya, Jennifer worked with Stawi Foods & Fruit Company in Product Development & Food Quality/Safety training and giving technical assistance to production employees and the company owner to enable them to continue to produce safe product and grow their business through new product introduction. A total of 7 beneficiaries within the small producer were reached. However the impact of producing safe, quality, nutritious products may be reach the entire population of Nairobi.**

Jennifer Allen's volunteer assignment is one of nearly 500 assignments that focus on agriculture, food security and nutrition in Ethiopia, Tanzania, Kenya and Uganda. This is the first time CRS has been involved in the 28-year-old Farmer-to-Farmer Program funded by the U.S. government.

CRS is partnering with five U.S. institutions to tap into the rich diversity of the U.S. agriculture community: the National Catholic Rural Life Conference, Foods Resource Bank, National Association of Agricultural Educators, American Agri-Women, and the University of Illinois' College of Agricultural, Consumer and Environmental Sciences.

The U.S. volunteers will travel to East Africa for anywhere from one to six weeks, their expenses covered by USAID.

"One thing we are certain of is that this program will be beneficial not just to the farmers in East Africa, but also to the volunteers from America," said Bruce White, CRS' director for the program. "It's going to make the world a little bit smaller for everyone involved."

For more information, visit [farmertofarmer.crs.org](http://farmertofarmer.crs.org)

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*Catholic Relief Services is the official international humanitarian agency of the Catholic community in the United States. The agency alleviates suffering and provides assistance to people in need in nearly 100 countries, without regard to race, religion or nationality. For more information, please visit [crs.org](http://crs.org) or [crsespanol.org](http://crsespanol.org).*