Sun-dried tomato processing in Nubaria

Background

Food losses and waste along the tomato value chain are a serious issue and a major problem in Egypt. Tomatoes are a staple horticulture crop in Egypt, however, more than half of the tomatoes produced are found to be fully spoiled, or exhibit quality loss and damage by the time they reach consumers. Based on recommendations from a market assessment and food loss study in 2017 for the tomato value chain in Egypt, sun-dried tomato processing was identified as a simple, low-cost and effective method to reduce loss and waste in tomatoes by transforming them into a longer shelf-life product, creating value addition, supporting agribusiness through primary processing in the rural area, and exploring different marketing channels for tomato growers.

Advantages of sun-dried tomato processing:

- Reduce tomato losses in Nubaria during seasons that have over production and low prices (sun-dried tomatoes can be stored for 2 years);
- Increase the value of the tomatoes (at least 25 to 30%);
- Reduce price fluctuation in tomatoes (during the peak of production season we can dry the tomatoes to balance between the demand and supply);
- Create job opportunities especially for youth and women (each 1 ton of sun-dried tomatoes provides 40 to 45 labor days);
- Reduce the cost of transportation (90%);
- Gain experience with the drying process and expand the business into similar crops (ex. pepper or eggplants);
- Build the experience of the cooperative in managing a processing activity, contracting with buyers and potentially exporting their products.

Through the project GCP/RNE/004/ITA: food loss and waste reduction and value chain development for food security in Egypt and Tunisia, implemented by the Food and Agriculture Organization of the United Nations (FAO) in collaboration with the Ministry of Agriculture and Land Reclamation (MALR) and funded by Italian Agency for Development Cooperation, a pilot sun-dried tomato processing unit was established in village 15, Bangar El Sokar, Nubaria.

The local marketing cooperative for fruits and vegetables was selected to manage the unit in collaboration with local MALR authorities and FAO.
The project model for sun-dried tomato processing

The diagram below shows the activities and actions of different value chain stakeholders in the sun-dried tomato processing unit in Nubaria. At the end of the GCP/RNE/004/ITA project, the Cooperative and similar entities can continue to replicate the project interventions and contribute to the production process for sustainability.

Entry points for project stakeholders in sun-dried tomato model value chain
Sun-dried tomato process and operations

Sun-dried tomatoes are ripe tomatoes that lose most of their water content through drying under the sun over 4-10 days. Tomatoes are cut into halves and treated with sulfur dioxide or salt to keep their quality, then laid out under the sun to dry. After drying, the tomatoes preserve their nutritional value; they are high in lycopene, antioxidants, and vitamin C.

Two techniques for sun-dried tomato processing were established in the Nubaria model

Ground drying on plastic cover

This method is lower cost, and higher output since 70-80% of the total ground area is used for drying. The main disadvantages are, need for more control over biological and chemical contamination and lower efficiency of labor work.

Raisin drying on tables

Long tables of plastic netting on iron supports were built to dry tomatoes in a position raised above the ground surface. This system is more costly (as compared to plastic cover) and only about 50% of the total ground area can be used, but it has less risk of contamination and can yield higher a better quality product.

Sun-dried tomato process flow-chart

1. Receiving raw material
   - Fresh tomato inspection to decide if it is suitable or not.

2. Washing and cleaning
   - Use clean water and change it frequently.

3. Cutting into halves
   - Cut the tomatoes into two equal halves through vertical axis.

4. Applying salt / SO2
   - Using dry salt #2 or Meta Bi sulfate sodium or potassium (granules).

5. Collection - primary sorting
   - Sorting dried product to reduce the time spent in a later stage.

6. Storing in cold store
   - Storing in plastic bags at 5-10°C with low humidity.

7. Grading and packing
   - According to the market requirements.

8. Shipping
   - Shipping in reefer at 5 to 10°C with low humidity.
Supporting units and tools

**Washing unit** in receiving area for washing fresh tomatoes before cutting to remove any dirt or chemical residues, and to be used for Sulfur dioxide treatment. An air compressor is used to produce bubbles inside the tank to make the washing process more effective.

**Plastic crates** used for different carrying and transfer purposes within the facility.

**Different processing areas** for sorting, cutting and packaging are available to process SDT.