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KOSOVO NEW OPPORTUNITIES FOR AGRICULTURE PROGRAM

PICKLED AND PROCESSED VEGETABLES FARMER TO FARMER VOLUNTEER REPORT



July 2013

This publication was produced for review by the United States Agency for International Development. It was prepared based on a final report provided by Farmer-to-Farmer volunteer Richard Steinfeld.

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DISCLAIMER

This report was prepared by the New Opportunities for Agriculture project team of Tetra Tech ARD based on a Final Report prepared by Richard Steinfeld, a Farmer-to-Farmer volunteer. The authors' views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

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BACKGROUND

USAID supports economic growth in Kosovo through programs that strengthen and improve the competitiveness of Kosovo agribusinesses, improve the business environment, and encourage local economic development. Accordingly, USAID/Kosovo awarded Tetra Tech ARD the task order for the New Opportunities in Agriculture (NOA) in Kosovo Program.

The goal of the program is to increase economic growth in Kosovo through expanded, environmentally-sustainable production and sales of value-added agricultural products by enabling producers and processors to compete regionally and globally. The program has the following components:

1. Products and farmers linked with markets;
2. Agriculture products diversified and increased;
3. Food quality and safety improved;
4. Increased affordable and accessible credits; and
5. Improved coordination within the agriculture sector.

During the last few years the number and capacity of local fruit and vegetable processing companies in Kosovo has increased, unfortunately they are facing difficulties in raw material supply, proper use of equipment and production of sustainable quality products. Fruit and vegetable processing on a commercial scale in Kosovo is relatively new and processors need additional support in the areas of fruit processing techniques, proper use of equipment and development of new products. Taking this into consideration, there is a need for technical support to bolster processors' development and to increase their competitiveness.

PURPOSE OF ASSIGNMENT

The main purpose of this assignment was the provision on-the-job technical assistance to a fruit and vegetable processing company in Kosovo. In July 2013, a Farmer-to-Farmer volunteer was brought to Kosovo to assist the company “Koral” from Fushë Kosovë.

Desired Impacts:

- Identify main constraints within the existing processing facilities.
- Provide hands-on support to the processing company in product formulation, specifically pickled vegetables, jams and ketchup.
- Present/demonstrate best practices of fruit processing technologies at the targeted company – particularly as it relates to various types of recipes and formulations.
- Develop an investment plan for increasing production capacity and improving product quality.
- Develop a list for processing equipment required, along with the appropriate equipment specifications, to improve the company’s current situation, and assist the company in identifying vendors for the aforementioned equipment.
- Identify human resource capacity building needs for the company.
- Assess food laboratory and quality control (QC) capacities at the processing plant level.

Tasks:

- Field visit to fruit processing company “Koral” in Fushë Kosova.
- Identify main constraints within processing plant.
- Develop infrastructure investment plan for increasing production capacity and quality improvement.
- Evaluate storage facilities and suggest investment intervention required.
- Field visit to discuss new infrastructure and equipment investment plan.
- Assess food laboratory and QC capacities in the processing plant level.
- Present/demonstrate on-the-job best practices of food processing technologies within the processing plant – especially in relation to different types of recipes and formulation.
- Meet with management staff to discuss quality improvements and new product development opportunities.

Deliverables:

1. Summary report on the activities, results and recommendations of the technical assignment.
2. Specific recommendations for the visited fruit processing company, including:
 - a. Opportunities for the development of new products using existing equipment.
 - b. Practical technical assistance on new types of products, by-products and recipes in demand in the region (EU specifically) for products.
 - c. Equipment recommendations and equipment specifications to upgrade facility based on new formulations and products.

- d. Process improvement and recommendations for better organization of work force, standard operating procedures (SOP), labor needs for improved use of equipment and process procedure.
- e. Recommendations for equipment vendors.
- f. Recommendations for testing and QC facilities.

EXECUTIVE SUMMARY

Farmer-to-Farmer volunteer Richard Steinfeld was requested to assess the constraints faced by the processing company Koral and provide hands-on technical assistance in best practices in food processing technologies. Agro Koral Fruits and Vegetable processing Industry was established in 2009. Their products include pickled peppers, ajvar, cucumber, compote, marmalade, jams, pekmez, mushrooms, ketchup, mayonnaise, and juices. Average daily production is 6 MT of processed fruits and vegetables, and 2.5 MT of ketchup and mayonnaise.

Upon visiting Koral, the volunteer identified several limitations to Koral's production process, including inadequate equipment and lack of knowledge related to ideal pH levels and fill ratios. However, the staff were reluctant to carry on discussions with the volunteer following his initial recommendations. For this reason, the volunteer proceeded to meet with other processing companies during the remainder of his assignment.

Following these additional visits to processors such as FITMI, ABI and Eurofoods, the volunteer concluded that manufacturers of pickles and similar products in Kosovo are in need of further training in several key areas in order to ensure product quality and safety. This includes pH management, jar filling, handling, equipment, and pasteurization. In addition, the volunteer identified a need for training in new product development and marketing, among other areas.

The volunteer visited a cucumber collection center to view some of the raw product being used by the processors. In addition, several processing companies also came together for a meeting to discuss common issues and opportunities.

Finally, this report includes recommendations for future work to be done to improve the quality and safety of food products. There are many opportunities to improve competitiveness of food processors in Kosovo, as well as to help them develop new products and reach new markets.

FIELD ACTIVITIES TO ACHIEVE PURPOSES

Agro-Koral

The original assignment was to work closely with the Koral personnel to produce healthier and safer products by ensuring the highest quality. Unfortunately, during the volunteer's visit to Kosovo, he was unable to observe any manufacturing of cucumbers, as the line was missing several key pieces of equipment.

He was, however, able to discuss Good Manufacturing Practices (GMP) with Koral's technical staff. There appeared to be a lack of understanding regarding the need to incorporate basic Quality Control tests. The impression was that a formula had been established, and that was considered to be sufficient.

Furthermore, it seemed that the pH meter had not been standardized recently, and it was old. pH measures Hydrogen ion activity, which determines product safety. It is the most important measurement and a critical control point. Other measurements are more for flavor and consistency. Koral's pH meter was not calibrated when the volunteer measured the pickles, and there was a strong indication that the pH meter was not used on a regular basis. The volunteer recommends a target pH below 4.0 pH. In the US, the maximum allowed is 4.6. This allows for no margin of error.

Furthermore, when the volunteer discussed fill ratio and its consequences, it was new information to the Koral staff. The fill ratios in general all appeared to be too low, primarily because they did not blanch the cucumbers before they packed them. If the cucumbers are heated with hot salt water, it makes the cucumbers more pliable and easier to pack. In the US, the fill ratio is usually a minimum of 60% (pickles to brine). The two sample jars which were tested were at 50 and 58% fill ratios.

Koral currently uses an autoclave purchased by USAID pictured below. In the future, a review of the time and temperature of the pasteurization should be reviewed to assure adequate heat processing. The autoclave is one of the least effective methods of pasteurization.



Figure 1: Autoclave

The volunteer had lengthy sessions imparting information on appropriate fill ratios, formulations and basic concepts in estimating acid and salt in finished product. Routine titrations of acid and salt were noted as well as Brix measurements when appropriate.

Unfortunately, cooperation was lacking on behalf of Koral management to continue discussions. The project decided to have the volunteer visit other manufacturing operations and get an overall view of the pickle/pepper processing industry in Kosovo.

To compensate for these difficulties, and maximize the volunteer's utility in the field, it was decided that the volunteer would meet with additional processors of pickled vegetables and provide assistance to them as well.

FITMI

The volunteer visited FITIMI in Drenas, Kosovo. This is a small company that has minimal quality control procedures and needs additional technical assistance. The company did not have a pH meter. The acid and salt is measured in the brine.



Figure 2: FITIMI

ABI

The volunteer visited the processing company ABI in Prizren, Kosovo. Abi is a privately-owned company that purchased an old food processing plant from the former Government. ABI has been in production since the year 2000. They are currently in the process of modernizing their facilities with extensive capital investment. Current capacity exceeds 60 tons per day for fruits and vegetables. ABI also processes dairy products, non-food products, and also has a large distribution center. Currently ABI is using a chain pasteurizer. They use a hot fill briner and are able to create a vacuum on their products.

The volunteer had an extensive conversation with ABI management regarding the role of the Government and barriers which make local companies uncompetitive with imports. One of the primary constraints identified was that the local manufacturers have to pay VAT on ingredients and supplies as well as raw product. Other constraints include the prepayment of utilities, which has ramifications for cash flow and the speed of payment from customers.



Figure 3: ABI Production Area

Eurofoods

The volunteer visited Eurofoods in Prizren, Kosovo. The company manufactures hot peppers, ketchup, gherkins, and pepperoni. They implemented HACCP in 2006. All phases of the operation are hands-on, including washing cucumbers, filling, brining, capping and processing.



Figure 4: Washing Cucumbers



Figure 5: Filling and Placing Caps on Jars of Pickles

Mamusha Collection Center

The volunteer visited Mamusha, a Turkish minority enclave. The Mamusha Collection Center where surrounding farmers bring their fresh cucumbers (gherkins, kornichons or cornichons) for grading, cooling, and combining other farmer's produce to ship to various manufacturers.

The gherkins are weighed and sorted into three specific length grades:

Number 1	3-6 cm
Number 2	6-9 cm
Number 3	9-12 cm

Furthermore:

< 3 cm are designated Extra Number 1

> 12 cm is designated Market.

Below is a diameter grader. It sorts the product mechanically by the width of the gherkin.



Figures 6 and 7: Diameter Grader

The guide rails can be adjusted for various widths. Currently the cucumbers are sold by length. This presents a conflict. Rather, work should be conducted to determine the relationship between length and width.

Cucumbers in the Mamusha Collection Center Region are grown in greenhouses and outdoors. Below are pictures of the green house. The greenhouse cucumbers allow the grower to extend the season an extra 30 days.



Figures 8 and 9: Greenhouse Cucumbers

One of the challenges is the growth of the cucumbers in the greenhouses. As evidenced in the pictures above, the plants are very healthy. Unfortunately, this has had a negative impact on the shape of the cucumbers.

Cucumber varieties normally have a target of 3 to 1 length to diameter. The variety used in the greenhouse above is consistent with the 3 to 1 ratio. However, due to the ideal growing conditions, the cucumbers have grown with a 4 to 1 length to diameter ratio. The elongated cucumbers may not have the shape consistent with the customers' needs.

It is strongly encouraged to hold a meeting with the collection station personnel, farmers, and processors to fully understand the grading system. The graders are set up to be adjusted according to the processors' needs. They do not have to be standardized. For example, one processor thought he was buying cucumbers based on circumference. This can easily be remedied by contracts using illustrations regarding length and diameter.

Fruits and Vegetable Processors Meeting

The Fruit and Vegetable Processors held a meeting in Pristina, Kosovo. Firms in attendance included Abi, Eurofoods, Koral, Ask Foods, and Etlinger. Discussions centered on contracts with cucumber growers and promoting "local."

CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE ACTIVITY

The number one priority moving forward is food safety. Formal training is needed to ensure customers receive safe quality products. Specific recommendations are provided below:

1. Quality Control

The volunteer suggests a formal program be developed to teach the basic Quality Control Program focusing on pH. A possibility is to present to the processors the high acid section of the GMPs used in conjunction with the United States Food and Drug Administration (USFDA).

Additionally, a short course could include basic formulations, fill ratios, pasteurization, raw material handling, vacuum, brining, capping, metal detector, etc.

2. Manufacturing

Extensive review of all manufacturing facilities and progressive step-by-step instructions should be outlined to modernize production. It is advisable to have someone work hand-in-hand with the companies to implement new procedures.

- Introduce blanching of cucumbers in salt brine. This will assist filling of containers
- Create vacuum in finished product
- Replace autoclave/retort with pasteurizer. This will significantly increase capacity and improve quality.
- Material Handling. Mechanize all aspects from washing of cucumbers to filling machines.
- Introduce piecework concept in jar filling.
- Thorough review of all equipment to ensure safety standards are met.

3. New product development

In order to broaden the market, new product development will establish value-added products. The majority of processors have one formula for pickles. Research should be conducted regarding flavor profiles acceptable for export.

4. Outside Resources

- Pickle Packers International, Chicago
- NWFPA, Trade Association that works with Cluster Groups
- Visit to Germany to see Manufacturers
- ANUGA

5. Collection Center

- Review contract with processors.
- Study/introduce other varieties that may be more appropriate for greenhouse production.

6. Grant and Aid

Wherever possible GMP's should be incorporated in the Grant to assure safety.

In closing, the processors are enthusiastic in their desire to succeed. However, safeguards must be implemented to protect processors locally and abroad.

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