



USAID | **KOSOVO**
FROM THE AMERICAN PEOPLE

KOSOVO NEW OPPORTUNITIES FOR AGRICULTURE PROGRAM

Food Safety Technical Advice for Local Processing Plants

AUGUST 2012



AUGUST 2012

This publication was produced for review by the United States Agency for International Development. It was prepared by Tetra Tech ARD.

KOSOVO NEW OPPORTUNITIES FOR AGRICULTURE PROGRAM

Food Safety Technical Advice for Local Processing Plants

AUGUST 2012

DISCLAIMER

The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

ACRONYMS

AMIK	Association of Microfinance Institutions of Kosovo
CBK	Central Bank of Kosovo
DCA	Development Credit Authority
FI	Financial Institution
GOK	Government of Kosovo
IMF	International Monetary Fund
KBRA	Kosovo Business Registration Agency
KCGF	Kosovo Credit Guarantee Facility
MFI	Micro Finance Institution
MTI	Ministry of Trade and Industry
NBFI	Non-bank Financial Institution
NLB	Nova Ljubljanska Banka
NPL	Non-performing Loan
RBK	Raiffeisen Bank of Kosovo
SEE	South Eastern Europe
SME	Small and Medium Enterprise
TAK	Tax Administration of Kosovo
USAID	United States Agency for International Development

Table of Contents

BACKGROUND.....	2
PURPOSE OF ASSIGNMENT	2
EXECUTIVE SUMMARY	3
SUPPORTING FIELD ACTIVITIES.....	4
SCOPE OF WORK AND DELIVERABLES.....	4
TASK FINDINGS AND RECOMMENDATIONS.....	5
Company: SOLE KORAL.....	5
Company: ABI & ELIF 19.....	8
Company: AS PROMET.....	9
CONCLUSIONS AND RECOMMENDATIONS	12

BACKGROUND

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

The goal of the NOA project is to increase economic growth in Kosovo through expanded, environmentally sustainable production and sales of value-added agricultural products, thereby enabling producers and processors to compete both 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
5. Improved coordination within the agriculture sector

PURPOSE OF ASSIGNMENT

In March 2012, the program conducted a four-day HACCP training course for local fruit and vegetable (F&V) processing companies. Twelve representatives of different local processing companies attended the training, led by Vladimir Kokarev, a HACCP expert based in neighboring Macedonia.

Following Kokarev's training, and as a result of other one-on-one presentations by NOA staff and food-processing company representatives, three further processors are now discussing with the program future technical assistance required for HACCP certification. The three are:

- "Abi & Elif 19" (Prizren)
- "Sole Koral" (Fushe Kosovo/Kosovo Polje)
- "As Promet" (Leposaviq/Leposavic)

The three firms account for a significant proportion of Kosovo's food processing sector. The recent experience of one of the firms, Koral, underscores the importance of acting expeditiously in aiding all three in gaining certification.

The company recently invested in expanding its plant to accommodate additional processing lines, but was subsequently advised that it had paid insufficient attention to specific requirements to qualify for HACCP certification. A comprehensive plan to meet the objective of achieving HACCP certification, had it been developed from the outset, would have obviated these changes.

This activity has been designed to begin the process of preparing Kosovo's leading food processors for HACCP certification. The complete process may take several years yet. However, this activity will identify some of the structural changes processors will have to undertake in order to meet HACCP standards.

EXECUTIVE SUMMARY

In many developing countries, agriculture represents a mainstay of the economy. As such, agricultural and related activities account for a considerable proportion of output. Of the various activities considered agriculturally based, fruit and vegetable processing rank among the most important.

Even established fruit and vegetable canneries or small- to medium-scale processing centers can suffer huge losses due to erratic supplies. The grower may opt to sell produce on the open market, directly to consumers, or the produce may not be of sufficient quality to process, even if it is of a quality adequate for fresh consumption. This means that processing capacities often remain seriously underexploited.

The main objective of any fruit and vegetable-processing endeavor is to supply wholesome, safe, nutritious and acceptable food to consumers throughout the year.

During this assignment, the program began work with three companies that account for a significant proportion of Kosovo's food processing sector. One of the companies has invested in expanding its plant to accommodate additional processing lines, and has since received advice on the specific requirements for HACCP implementation.

Two local consultants assisted in visiting the companies, preparing recommendations and training staff. They also establish good working relationships with company staff, vital for future cooperation.

The three selected companies have specific assistance requirements. They also share different processing requirements, which in turn require the preparation of detailed analyses of their existing and future plans. Those analyses can lead to subsequent alterations and adaptations to ensure all plant construction fulfills HACCP food safety standard requirements.

The visits also underscored for company owners the need to implement HACCP system standards as well as the need for the continued training of their employees. The engagement also highlighted how the simple procurement of appropriate equipment and the adaptation of current and future facilities, all according to food-safety requirements, won't suffice, as there also exists a need for educated staff with practical experience—something that at this point does not exist in Kosovo. The greatest lack is in food technologists with practical experience in food processing and employees with laboratory experience.

Most university graduates have theoretical knowledge but little practical experience in food processing and food safety. In order to understand the requirements of the HACCP system, it is crucial to understand the entire food processing process, from planting through harvest, and from processing to the distribution of finished products.

The training and education of workers, and the establishment of laboratories within processing companies, will enable the complete control of all plant processes, starting from the receiving of raw materials, through processing, packing and distribution of finished products.

Investments in education and training involve a long process, but no factory can deliver safe, quality products and become a serious export-orientated company without a clear strategy for human resources.

The proper adaptation of facilities and the use of proper equipment will eliminate the possibility of contamination.

SUPPORTING FIELD ACTIVITIES

Meetings were held with the following key players within the industry in Kosovo:

- Sole Koral is a fast-growing company. The company was in the trade and distribution business, but has since invested in the processing and production industries. The company showed serious interest in cooperating in the implementation of all relevant food-safety standards, as well as in adopting the latest in processing technology and know-how. During this assignment, the company manager and staff actively participated in all training and related activities. Its new processing facility can process fruits and vegetables in different forms and packages.
- Abi & Elif 19 is among the oldest companies in the processing sector. The company was privatized this year. It seeks to build a new facility, as the cost of reconstructing and adapting its current space is too high. The company's equipment is old but efficient and in good condition. The company has a laboratory, trained staff and significant experience in the processing of fruit and vegetables.
- As Promet is a collection and processing center for wild-harvested products destined for export. The company seeks to implement HACCP.

SCOPE OF WORK AND DELIVERABLES

The Scope of Work for the assignment specified the following tasks:

1. Perform site visits to above-mentioned companies to follow the progress and the quality of work done by the companies.
2. Review prospective facility plans and make recommendations to fruit and vegetable processors in light of food safety requirements.
3. In cooperation with processors, prepare investment action plans, including timing and responsible parties.
4. Advise local experts engaged in the support of the HACCP certification process of the technical details of establishing facility sanitation, housekeeping and personnel hygiene systems.
5. Prepare Good Manufacturing Practices (GMPs) training plan, timelines and materials required for training.
6. Conduct at least one day of practical trainings at each processing plant, specifically for workers engaged in processing.

Deliverables of the SOW are as follows:

- Submit verification report for progress made on the implementation of the proposed investment-action plan.
- At the end of the assignment, and prior to departure:
 - Debrief of COP, DCOP, Chief Technical Advisor, Post-Harvest Handling Specialist and/or USAID and fruit and vegetable processors group, regarding the nature and scope of the assignment.
 - Prepare a brief, written report for each advised company on activities, observations, recommendations, assistance provided, results obtained, problems encountered and

recommendations for follow-up work and opportunities for the implementation of HACCP.

TASK FINDINGS AND RECOMMENDATIONS

Task 1: Export quality control and inspection of processed fruits and vegetables is directed at ensuring that final products have been processed in a registered export establishment that is constructed, equipped and operated in a hygienic and efficient manner; conforms to the requirements of the export regulations for processed fruits and vegetables, as well as those of the importing country, with respect to quality grades, defects, ingredients, packaging materials, styles, additives, contaminants, fill of container, drained weight; and conforms to labeling requirements. For that reason, each company was periodically visited together with local consultants. During each site visit, the progress attained was recorded.

Task 2: The secret of a well-planned fruit and vegetable processing center, according to food safety systems, is that it must be designed to operate for as many months of the year as possible and still produce safe products. This means the facilities, buildings, material handling and equipment itself must be inter-linked and coordinated properly to allow as many products as possible to be handled at the same time. Still, the equipment must be versatile enough to be able to handle many products without cross contaminating any final products.

A typical processing center or factory might process four or five types of fruits, harvested at different times of the year, and two or three vegetables. This processing unit must also be capable of handling dried/dehydrated finished products, juices, pickles, tomato juice, ketchup and paste, jams, jellies and marmalades, semi-processed fruit products without any food-safety issues.

Advanced planning is necessary to process a large range of products under varied weather and temperature conditions, each requiring a special set of manufacturing and packaging formulae. The end result of the efforts should be a well-managed processing unit with low initial investment.

Each company's facility plans were discussed with manager and owners. The final recommendations were presented to each company, with some of the recommendations implemented during the course of this assignment.

Company: SOLE KORAL

Subject: Recommendations

1. *Factory plan*

- The entryway for raw materials is made from concrete and must be replaced.
- Separate vegetable line with a divider from the mayonnaise line in order to prevent cross contamination of vegetable products with eggs (No. 3).
- Separate storage of ingredients used to produce mayonnaise from other raw materials (Nos. 2 & 4).
- Install more hand-washing stations at the worker and kitchen entrances and one emergency shower station.

- Create separate room for cleaning supplies and other corrosive agents (No. 1).
- Remove all chemicals from laboratory when not in use.
- Install incubation equipment for final product testing.
- Laboratory has to install ventilation and digester equipment for the storage of corrosive chemicals.
- The entryway for potatoes into the processing area should be as small as possible.
- Install system for recording temperature.

2. Procedures and work instruction

-Lab

- Define standards for raw materials and final product testing during daily production, prepare procedures and work instructions.
- Incubation of final product. Before any final product is release for sale it must be tested and incubation samples prepared for each batch. Lab personnel must oversee the process and keep records for each production day.
- The personnel responsible for the laboratory must be trained on each test procedure or possess adequate education.

-Cleaning

All equipment must be prepared and clean. The instructions regarding the frequency and use of chemicals must be in hard copy. All workers responsible for cleaning must receive appropriate training. After each cleaning of any equipment or space, a responsible individual must sign and date a record of its completion.

- Cleaning instructions must be developed for all areas of the factory.
- These must detail the cleaning agents to be used, together with required dilution and other materials necessary to carry out the cleaning process.
- Operators have to be trained in the correct cleaning procedures, based on the cleaning instructions, and records of this training will be maintained.
- Cleaning must be verified by visual inspection and by microbiological swabs taken according to the microbiological sampling schedule.
- The company should operate a “clean-as-you-go” policy with housekeeping monitored on an ongoing basis by all staff.

-Personal hygiene

- All employees and visitors to the site must follow company regulations regarding food safety and hygiene.
- All employees should be issued with a copy of the company hygiene regulations that they will sign to acknowledge understanding all requirements.
- Visitors and contractors to the site have to sign a specific personal hygiene and medical screen questionnaire before entering a production area.
- Compliance with hygiene regulations must be assessed during monthly housekeeping and hygiene audits.

-Pest control

Pest control of the site has to be carried out by a specialist, namely a pest control sub-contractor.

When the system is in place it should operate with controls in-place for monitoring:

- Rats/mice (interiors and exteriors).
- Crawling insects.
- Flying insects (with annual shatter-proof tube changes and quarterly catch-tray analyses recorded).
- [Pheromone traps with quarterly catch-tray analysis recorded, if necessary].
- A plan of all bait locations must be documented and maintained in the pest-control file.
- A schedule of equipment vulnerable to infestation shall be identified and inspected during routine inspections.

-Control and record of temperatures

- All temperature devices have to include a recording system.
- Potato storage facility must include systems for the control and recording of humidity and temperature.

-Equipment calibration

- As part of the HACCP system, all critical equipment regarding product safety and legality should be identified and the proper calibration of equipment is required to maintain product safety.
- A calibration schedule has to be documented detailing the equipment, calibration frequency, when last carried out and when next due.
- Verification of equipment may also be carried out against a calibrated unit, traceable to national standards (e.g., verification of temperature probes weekly with a calibrated temperature probe).
- All current calibration certificates have to be maintained and the status of calibration shall be identified on the equipment.

-Equipment maintenance

- All equipment has to be recorded and be accompanied by a plan for service. Evidence of records has to be provided for all equipment and service proved.

-Traceability

Develop and implement system for product coding. The effectiveness of the traceability system has to be challenged annually, either as part of a customer audit or as part of the internal audit procedure.

3. Raw product suppliers

At farm level

Plant-protection products

- List of plant-protection products, whether authorized by EU or in country.
- Training of farmers for plant-protection application.
- Application according to labeled instruction.
- Competent person has to make the choice of plant-protection products (agronomist).
- Record of application, date, chemicals, individual, location, quantity.
- Period from application until harvest must be recorded.
- EU for MRL.
- Equipment for application has to be regularly serviced.
- Test and analyses of residue.
- Storage of plant-protection products.
- Implement system for traceability of farmer products.

Company: ABI & ELIF 19

Subject: Recommendations

1. Factory Plan

The company is delaying the drawing up of its factory plans until it has finalized the move of its dairy plant equipment to a new building. For that reason, the assignment for this company was postponed until it completes its dairy plant.

2. Laboratory

- Company possesses a laboratory with separate spaces for microbiologic and chemical analyses. The workers are educated and are experienced in sampling, testing and evidence of results. All testing is done on a daily basis. It will be very useful for it to develop written procedures for its testing methods.
- The microbiological part of the laboratory is not in use and has to be re-established and start with the testing of samples.

3. Procedures and work instruction

Cleanliness

The following recommendations are for those individuals who work directly with food preparation, food ingredients or surfaces of equipment or utensils that come into contact with food.

- The workers must wear clean and appropriate work clothes and effective hair restraints, such as hairnets, caps, headbands or beard covers.
- Operators must not store clothing or other personal belongings in food-processing areas.
- The sanitizing station in the new building must be installed and kept in good condition.
- Anyone who actually handles food must remove any jewelry.

Personal hygiene

Hand-washing facilities

- The manual hand-washing station has to work with a sensor or other mechanism that prevents contact with the hands after washing.
- The entrance to the processing area should include a hand-sanitizing station.

Pest control

- The company must have a contract with a professional company to furnish pest control in the new building.

Sanitation of equipment and utensils

- Existing equipment is in good condition and is made of stainless steel. However, it must be repaired, cleaned and disinfected before moved to new facility.
- Equipment slated to be removed from service must be relocated.

Control and record of processing temperatures

- The old equipment is designed with adequate controls but has not recently undergone any repairs.
- All thermometers and controls must be repaired and checked for accuracy and calibrated before use.
- For all critical-control points, pasteurization, control of acidity records must be maintained in the daily production book.

Equipment calibration

- All scales and thermometers have to be regularly checked on a daily or weekly basis.

Traceability

- The company has installed a system for traceability but does not have any evidence of system testing.

Company: AS PROMET

Subject: Recommendation

1. Factory Plan

The company's facilities cover roughly 400 square meters, including space for the loading of goods. In 2011, it added space to accommodate new freezer equipment. In planning the location for the new equipment, the firm made several errors in arranging both the layout and movement of product. In order to avoid cross contamination, it must create a new door so products, once frozen, may be transported directly to the storage room.

Currently, the space used to store boxes is used also for drying products. Box storage must be in a different location away from the equipment used to dry mushrooms. The drying process produces much dust that can settle on the surface of clean boxes.

The toilets, dressing room and staff kitchen are all properly designed.

All windows and doors must be screened for fly protection. The floor must be repaired in some portions of the building.

2. Procedures and work instructions

Cleanliness

The following recommendations are for those individuals whose work brings them into direct contact with food preparation, food ingredients or surfaces of equipment or utensils that will contact food:

- They must wear clean outer garments, maintain a high degree of personal cleanliness and conform to hygienic practices while on duty.
- They should sanitize their hands before starting work, after each absence from the workstation and at any other time when their hands have become soiled or contaminated. They must also remove all unsecured jewelry.
- They should wear effective hair restraints, such as hairnets, caps, headbands or beard covers. Operators must not store clothing or other personal belongings in food-processing areas.

Personal hygiene

Hand-washing facilities

- There are adequate hand-washing stations but the firm should install hand-sanitizing facilities anywhere in the plant where the nature of an employee's job demands the washing, sanitizing and drying of the hands.
- Faucets must be fitted with sensors or other mechanisms to protect against the recontamination of clean, sanitized hands.

Pest control

- Company must contract with a professional company for pest control.
- Programs must be in effect to prevent contamination by animals, birds and other pests, such as rodents and insects.
- Insecticides and rodenticides may be used, as long as they are used properly (according to company recommended pest-control instructions).

Sanitation of equipment and utensils

- All equipment is in good condition and is made from stainless steel.
- Utensils and equipment surfaces that are in contact with food must be cleaned as often as necessary to prevent food contamination. This applies especially to the inspection table.
- Equipment surfaces that are not in use should be cleaned as frequently as necessary to minimize accumulation of dust, dirt, food particles, etc.
- Single-service articles, such as disposable utensils, paper cups, paper towels, etc., should be stored in appropriate containers.
- Replace all wooden pallets where there is the possibility of contamination. Utensils and equipment surfaces that come into contact with food must be cleaned and sanitized before use and following any interruption during which they may have become contaminated.

Control and record of processing temperatures

- There is no record of daily production and temperature data. The daily production book must include a system for the traceability of raw materials from suppliers, along with processing records and final product distribution.

Equipment calibration

- All scales and thermometers have to be calibrated and checked on a weekly basis. If they cannot be calibrated, the company should purchase new thermometers.

Traceability

At the moment, the company didn't have a developed system for traceability from raw materials to final products.

Task 3 - The firms' investment action plans were not developed because of delays in construction, equipment delivery and lack of qualified personnel.

Task 4 - The engaged local experts were active participants during this assignment. The technical details of each process step (receiving, storage, calibration, cleaning, washing, processing and packing) were explained. Education of the local staff was kept to a practical level in order to relate the requirements in implementing a food-safety regimen.

Task 5 - Prerequisite programs and procedures, including GMPs, which address operational conditions, provide the foundation for HACCP. All programs and activities are required and must be in place if a HACCP program is to be effective. HACCP is only one component of an agriculture food-safety program. GMPs are production and testing practices that help to ensure a quality product. Many countries have legislation that requires food companies to follow GMP procedures. Firms have created their own GMP guidelines that correspond to local legislation. The basic concepts underlying all of these guidelines remain more or less similar in that they share the ultimate goal of safeguarding the health of the consumer as well as producing good quality products. In Kosovo, all food products must be produced in conformance with local regulations.

GMP guidelines are not prescriptive instructions on how to manufacture products. They are a series of general principles that must be observed during manufacturing. When a company is setting up its quality program and manufacturing process, there may be many ways it can fulfill GMP requirements. It is the company's responsibility to determine the most effective and efficient quality process.

Task 6 - At each of the three companies, together with local consultants, NOA organized GMP training for company staff. Altogether, 76 individuals took part.

Deliverables - The debriefing meeting was conducted on the last day of this assignment. During the meeting, activities, observations, recommendations, assistance provided, results obtained, problems encountered and recommendations for follow-up work and opportunities for implementation of the HACCP system at the supported companies were all presented.

Verification reports were not submitted because action plans for the three companies were not developed (as explained in task 3 above).

A report on the findings and recommendations specific to each company was provided to those companies for their review and further action.

CONCLUSIONS AND RECOMMENDATIONS

Kosovo's fruit and vegetable processing sector in the future could become the single largest exporter of value-added products. Over the last few years, there have been significant investments in this sector in increasing and modernizing its processing capacity. It is very important that farmers receive adequate training and develop an interest in increasing production all while remaining in contract with processors. This value chain should soon mature, with Kosovo products being exported beyond the region.

All investments in the processing sector, especially in adapting existing or constructing new facilities, must be done according to food safety requirements and HACCP principles.

The three companies that formed part of this assignment are all very aware of the necessity of implementing a food-safety system and training staff according to GMPs. Implementing a HACCP system forms more than just part of buyer requirements; it's also required by law, namely Regulation 11/2011. Food-safety system implementation is mandatory and all companies in the food sector must implement the HACCP system. At this moment, only a few companies have done so.

One of the problems that companies face is the lack of educated personnel with experience in the food-processing sector. Nor do most companies employ personnel trained in food safety.

Local staff was very active during this assignment and participating in visits, discussions and company training. The relationships established with the processors will benefit both the firms and staff. In the future, the companies can use the services provided by local consultants for solving problems or obtaining advice.

At present, not enough companies or consultants offer professional services in this sector. Some companies seek to hire technologists and other staff with experience in processing from abroad, but this represents a temporary solution. The education and training of local staff must be undertaken as soon as possible, given the needs of the processing sector.

The relationship between processors and producers/farmers starts with dialogue. It is very important that this dialogue continues and be supported by an organization that can educate and implement new forms of cooperation, such as contract farming. This would address not only concerns about the quantity and quality of products but also their safety. The biggest risk posed by suppliers is their pesticide use; this cannot be eliminated during processing.

Recommendations in this sector include the following:

- 1) Continue with the education of local staff, to cover food chemistry, food microbiology, blanching, along with the use of preservatives, pasteurization, acidification, sterilization, vacuum filling, packaging, and laboratory testing. In order to understand food-safety requirements, employees must understand the complete process, starting from the production of raw materials at the farm level through the distribution of final products.
- 2) Prepare a program for the training and education of company staff, especially managers.

- 3) Start as soon as possible with food-safety standard operations at processors and farms (HACCP and GlobalGAP).
- 4) Conduct laboratory pesticide analyses, and work with government laboratories on the possibility of increasing different ways of pesticide testing.
- 5) Organize short training courses for company staff in other countries and visit some processing facilities and laboratories.

Sole Koral and As Promet are ready to start with HACCP implementation.

In conclusion, this report would like to stress that the fruit and vegetables sector shows great potential in exporting products throughout the region and EU. The existing production of fruit and vegetables can quickly expand, as can the capacity to process them.