

**Partnerships for Food Industry Development
A U.S./Ukrainian/Moldovan Partnership**

Leader-with-Associates Agreement No: PCE-A-00-01-00012-00

Funded by

The United States Agency for International Development

USAID M/FM/CMP

1300 Pennsylvania Avenue, N.W.

Washington, DC 20523-7700

2001 Assessment Report

February 2002

Submitted by

International Programs

Louisiana State University Agricultural Center

Baton Rouge, Louisiana

In association with

The World Food Logistics Organization,

The World Laboratory, Ukraine Branch, and

The National Institute of Animal Husbandry and Veterinary Medicine of Moldova

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List of Acronyms and Abbreviations

ACDI.....	Agricultural Cooperative Development International
BN.....	Basarabia Nord
CAC.....	Codex Alimentarius Commission
CIS.....	Commonwealth of Independent States
CNFA.....	Citizen’s Network for Foreign Affairs
FNFM.....	(National Federation of Farmers in Moldova)
HACCP.....	Hazard Analysis Critical Control Point
IAR.....	Initial Assessment Report
IARW.....	International Association of Refrigerated Warehouses
INZMV.....	National Institute of Animal Husbandry and Veterinary Medicine
LSU AgCenter.....	Louisiana State University Agricultural Center
NAUU.....	National Agricultural University of Ukraine
NGP.....	Nominal Group Process
NRA.....	National Refrigeration Association of the Republic of Moldova
OSAR.....	Odessa State Academy of Refrigeration
PFID.....	Partnerships for Food Industry Development
PPP.....	Purchasing Power Parity
"Ukrmiasso".....	Ukrainian Meat Processor Association
Ukrptakhoprom.....	Ukrainian Poultry Production Association
USAID.....	United States Agency for International Development
VAT.....	Value-Added Tax
“Vinnitsa”.....	Support for Ukrainian Private Farming Sector and Scientific Collaboration Project
VMPF.....	Vinnitsa Meat Processing Facility
VOCA.....	Volunteers in Overseas Cooperative Assistance
WFLO.....	World Food Logistics Organization
World Lab.....	World Laboratory, Ukraine Branch
WTO.....	World Trade Organization

Section I. Introduction

This report documents the results of the PFID's 2001 assessment activities of the meat, poultry and seafood industry in Ukraine and Moldova. In doing so, it addresses the Project's first two objectives: investigating the industry's current status, and develop awareness for critical issues in the industries.

The major sources of this information are: the initial assessment (submitted in 2001) - as well as reactions to that assessment by Ukrainian and Moldovan partners, findings from the Client Profile and results of the Stakeholders Meetings. Additional sources include literature from the Ukrainian Academy of Agrarian Sciences.

It is evident that after the demise of the Soviet Union in August of 1991, Moldova and Ukraine have attempted to address the demands of the transition to democratic governance and a market economy. Ukraine and Moldova have been in transition for nearly 10 years, and structural reform elements seem now in place, although there are many deficiencies in the system.

A. Executive Summary

This overall assessment was performed under the auspices of the Partnerships for Food Industry Development (PFID) Program, a food industry development program focusing on meat, seafood and poultry. The PFID's Technical Committee collected the initial information through visits with key stakeholders in the meat and seafood processing industries during an assessment trip to the two countries in May and June 2001. This resulted in an Initial Assessment Report, the findings of which were reviewed by World Lab, INZMV and collaborating agencies in Ukraine and Moldova. Additional assessment data was obtained from a Client Profile Survey, and a series of stakeholders meetings. The latter identified key issues facing each sector of the industry through the Nominal Group Process.

Team members from WFLO observed that cold chain methodology and logistics were under-developed. They noticed a lesser emphasis placed on improved refrigeration and distribution processes as value-added components, little or no use of information management systems and a poor transportation pipeline. Most frozen or refrigerated products are exported to Russia. Low income has limited domestic demand for processed meat products. The sector also is severely limited by a lack of quality raw materials. These factors resulted in processing plants and cold storage facilities operating at a low level of capacity. WFLO witnessed other challenges facing Ukraine and Moldova similar to those facing other emerging markets such as: third-country competition, financing problems and unfamiliarity with the demand for quality. WFLO can provide analysis instruments and reference information for cold chain issues, including energy consumption patterns.

Compliance with international guidelines would be facilitated through cooperative endeavors within associations. Associations visited by the assessment team include the Ukrainian Poultry Producers Association (Ukrptakhoprom), the "Beza" Association of Odessa-based seafood industries, the National Federation of Farmers in Moldova (FNFM) the National Union of Meat Producers in Moldova and the members of the National Refrigeration Association of the Republic of Moldova (NRA). Academic institutions, such as the Odessa State Academy for

Refrigeration (OSAR), also have links to the processing industry. WFLO suggested that a weak local association could improve by linking with a stronger and more global association. Recommendations for further analysis include an assessment survey for associations, partnerships and networks. WFLO can also conduct training of trainer courses, in collaboration with academic institutions and other development projects in the area, for association development.

In Ukraine, there are more than one thousand small meat plants and approximately thirty plants that produce more than one thousand kilograms per day. In Moldova, there are approximately a dozen meat-processing plants with daily production capacity larger than one thousand kilograms. Pork is the most highly consumed meat, with little beef or lamb consumption due to livestock supplies. A majority of the production of the large meat plants is shipped to former Soviet Union countries. Most of the meat plants have a combination of old and new equipment. In Ukraine, there are about 320 poultry enterprises, with thirty percent currently idle. The poultry plants seemed to have moderate to high capacities, but were limited by the numbers of birds. The Moldova poultry industry is largely dependent upon small producers.

There are limited natural fishery resources in the Ukraine. However, the Port of Odessa could serve as one of the most important hubs for seafood processing in Eastern Europe by importing raw materials for value-added food processing. It has large facilities but has suffered from neglect over the last ten years. Nearly all facilities visited were operating at only a fraction of their production capabilities. Moldova has potential for establishment of freshwater species capable of pond culture. The team recommends identification and promotion of finished seafood products acceptable outside Ukraine and Moldova.

Slaughter equipment was generally less modern than processing equipment, requiring additional care and sanitation practices. In the Ukraine, it was indicated that the government has regulatory personnel assigned to each plant. There was considerable indication of a high regard and concern for product sanitation but a need does appear for Hazard Analysis Critical Control Point (HACCP) and sanitation training. Sanitary practices can be further assessed through chemical, physical, and microbiological analyses. A translation of governmental standards for specific chemical, physical, bacteriological, and radiological compounds, as well as testing procedures, would be useful for the technical team. The sanitary condition of the air and ventilation, water, and other inputs, as well as official standards for such conditions and the frequency of testing for both countries, should be examined. HACCP pre-course preparation activities also could serve as a final assessment of training needs. Improved temperature controls of products, as part of an overall improvement in cold chain techniques, would be warranted to maintain product safety and quality. The bulk of seafood training should be concentrated in Ukraine and focus on sanitation and standards.

The economic constraints to food processing in Ukraine and Moldova are linked to weak domestic markets, export markets that are closely tied to the unstable Russian economy, and lack of good quality animals for processing. The weak demand can be traced to low incomes relative to food prices and a high inflation rate. The health of the Russian economy has an excessive impact on its neighbors. Most livestock are owned and raised by the smaller operators who have limited capacity to improve the raw product. These factors result in the underutilization of processing and cold storage capacity. Further development of export markets may increase the

demand for processing but will require marketing plans. The supply of raw products could be improved with a “model” central livestock market and forward contracts.

All recommendations by the assessment team, as well as key suggestions from World Lab, INZMV, the Nominal Group Process results and other collaborators, are summarized at the end of this document.

B. Review of Project

The Louisiana State University Agricultural Center (LSU AgCenter), World Food Logistics Organization (WFLO), the World Laboratory, Ukraine Branch (World Lab), in Kyiv, Ukraine, and the National Institute of Animal Husbandry and Veterinary Medicine, Chisinau, Moldova (INZMV) presented a proposal. This was in response to USAID’s Request for Applications for The Partnerships for Food Industry Development (PFID) Program. The program presented was anchored on the following themes: 1) industry awareness; 2) support mechanisms; 3) post-harvest and processing technologies; 4) capacity building; and 5) business partnerships.

The partners to this proposal planned a four-year food industry development program focusing on meat, seafood and poultry. They believed that the above themes would provide a solid foundation for success of the program. The implementation approach involved a five-stage process: 1) industry assessment/crosscutting analysis; 2) assembly of key stakeholders; 3) identification of critical issues, prioritization of needs, and impact on local cultures; 4) development of solution strategies; and 5) implementation of strategies. Resulting commercial gains for the food industry would include improved food plant efficiencies, plant capacity utilization, and product quality. These impacts were expected to increase the demand for the raw product, which in turn will enhance incomes of agribusinesses and small farmers. The program would reinforce USAID mission strategic objectives.

Preliminary information gathered in Ukraine and Moldova indicated concerns regarding standards and quality control management for processed meat products. As both nations aspire to full participation in the World Trade Organization (WTO; Moldova already has joined), the program’s efforts would focus on assisting in the development of proper standards that are consistent with Codex Alimentarius Commission (CAC) guidelines. This initiative is expected to assist Ukraine and Moldova to regulate this Category I industry as well as facilitate their entry into WTO.

The management structure for this program was designed with the guiding principles of communication and collaboration. To this end, a simple and effective approach was proposed to ensure systematically articulated and coordinated implementation without compromising accountability and oversight.

Section II. Overview of Methodology

A. Initial Assessment

As previously mentioned, the Project aimed to conduct an initial assessment of the food industry in Ukraine and Moldova. The PFID’s Technical Committee collected the necessary information during an assessment trip to the two countries from May 27 to June 5, 2001.

The Technical Committee consists of the following members who contributed to the assessment:

- Dr. Michael Moody of LSU Ag Center's Department of Food Science, who recorded technical and safety issues relating to the processing of fish and seafood;
- Dr. Kenneth McMillin of LSU Ag Center's Department of Animal Science, who noted technical and safety issues relating to the processing of meat and poultry;
- Dr. Wes Harrison of LSU Ag Center's Department of Agricultural Economics, who analyzed the economic situation facing the food industry; and
- Mr. Bill Hudson and Mr. Brinkley Seward of WFLO, who assessed issues pertaining to the cold chain, industry associations and logistics.

Information was gathered through visits and informal interviews with key stakeholders in the meat and seafood processing industries. These included the following organizations:

- Representatives of World Lab of Ukraine and INZMV of Moldova;
- Meat, poultry and seafood producers in Ukraine and Moldova (a total of nine plants);
- Six Academic institutions, including the Odessa State Academy of Refrigeration (OSAR) and the National Agricultural University of Ukraine (NAUU);
- Trade associations – Meat Producer Association of Ukraine, Ukrainian Poultry Production Association (Ukrptakhoprom), the National Federation of Farmers in Moldova (FNFM), Moldovan National Union of Meat Producers and the National Refrigeration Association of the Republic of Moldova (NRA);
- USAID offices in Kiev, Ukraine and Chisinau, Moldova;
- Three wholesalers and retailers; and
- Other organizations, including, Odessa Port Cold Storage and Citizen's Network for Foreign Affairs (CNFA).

In most of the processing plants, the technical team met with the Director General. The technical team was allowed to discuss and ask questions regarding production and business practices of each enterprise. Usually, visual inspection of processing facilities was also allowed. From these interviews, each team member acquired information relevant to his area of expertise, which has been synthesized into and Initial Assessment Report (IAR).

Staff of World Lab, INZMV and other organizations involved in the Ukrainian and Moldovan food industries reviewed the IAR. Their comments, as well as the original findings in the IAR, are included in this document.

B. Client Profile

From July to September 2001, World Lab and INZMV surveyed potential participant processors, using the Client Profile attached in Annex A.

The goals of the Profile, *in order of priority*, were as follows:

1. Generate a representative sample of potential participants for the stakeholder meeting (refer to the next section);
2. Provide the basis for a database of potential participants; and
3. Analyze data for preliminary findings.

In general, the survey procedure was as follows:

1. An information letter about the project was sent out to the clients along with the questionnaire and instructions;
2. Participating companies returned the completed forms either by mail or by fax; but
3. In some cases the Project specialists had to call to the plants in order to get the needed information.

The numbers of establishments responding to the profile were 282 in Ukraine (providing a total of 559 product lines) and fifty-three in Moldova (providing a total of 140 product lines).

A complete presentation of the findings is provided in Annex B. It contains fifteen summary tables, based on data from the Client Profile survey. These tables provide descriptive statistics for red meat, poultry and seafood industries in Ukraine and Moldova. The data includes production capacities, capacity utilization, sales, and employment data.

Note that a refrigeration survey also was conducted in Moldova; the survey form is found in Annex D and the findings are in Annex E.

C. Stakeholders Meeting

World Lab held a stakeholder meeting on October 30, 2001 and INZMV held one on November 2, 2001. Processors and other key participants in the industry attended both of these meetings. A nominal group process was a key activity in these meetings. A nominal group process (NGP) is defined as a group decision process to produce a list of ideas or statements that are rank-ordered according to importance and/or likelihood of success. The process usually involves the following (Source - <http://www-vatam.unimaas.nl/terms/d0000080.htm>):

1. Participants generate silently, in writing, responses to a given *central question*;
2. The responses are collected and posted for all to see;
3. Responses are clarified by participants; a round-robin format may be used;
4. Further iterations of silent, written response, posting may follow; and
5. A final set of responses is established by weighted voting/ranking.

In the NGP conducted in both meetings, participants were divided into three breakout groups corresponding to the following sectors of processing: meat, poultry and seafood. Every participant in each group generated a response to the following two-part central question:

- What are the key constraints to growth and development of the Ukrainian/Moldovan meat, seafood, and poultry industries?
- Which of these constraints could best be addressed through partnership between Ukrainian/Moldovan stakeholders and PFID project staff?

A complete presentation of the findings of the Nominal Group Processes in both stakeholders meetings is provided in Annex C. Key findings of each NGP session are also cited throughout this document's sub-sections pertaining to partner's and stakeholder's comments regarding recommendations.

Section III. Cold Chain and Related Logistical Issues

A. Methodology and Approach for Initial Assessment

It is WFLO's goal to broaden and promote more efficient warehouse and distribution services and to promote the business of product protection and integrity. Team members from WFLO assessed cold chain methodology and logistical issues, summarizing its findings with a comparison of Ukraine and Moldova in their current state to other emerging markets. This section will include recommendations for further analysis and future project activities.

In the initial assessment trip, the WFLO team members repeatedly asked the following questions to obtain the information found in this section:

- What was the degree to which value was added to the original product by processors?
- Why was storage, particularly of locally produced raw materials, under capacity?

B. Summary of Preliminary Findings

Cold chain efficiencies and methods, as observed by the assessment team, were under-developed. The team also noticed a lesser emphasis placed on improved refrigeration and distribution processes for better preservation of the food commodity. For example, the Director of the Odessa Corporation of Poultry Industries stated that all six poultry units in Odessa Oblast are currently non-operational, primarily due to lack of deep freeze storage. According to the National Refrigeration Association (NRA), ninety percent of refrigeration in Moldova is based on freon systems, not the more efficient ammonia systems. OSAR-conducted analysis of refrigerators' conditions showed ninety-five percent of the units are unserviceable because compressors chilling systems, insulation and pipelines are worn out. Lastly, it was observed that there was little or no use of information management systems in tracking product for enhanced efficiencies. All of these limitations were due to a lack of capital.

One of the great detriments to any commerce in Ukraine is the transportation pipeline. The roads are in disrepair, limiting vehicular transportation. The rail system was not studied in detail but the track system appears satisfactory from observations of moving trains. WFLO also noticed a lesser emphasis placed on improved refrigeration and distribution processes and a weak link between the cold chain and food science concepts of safety and sanitation. Put another way, they felt that cold storage was not seen as a value-added component of the cold chain and that its relevance to marketing strategies was overlooked.

Ukraine and Moldova traditionally salt and dry meat, poultry, and fish products. Dr. Igor Chumak of OSAR noted that the Academy has researched cooling, freezing, and storage of packaged and single fish but that there is no extensive use of cooling and freezing in warehouses. Cold storage warehouses are now used to store the salted and dried produce. Dr. Gennady Palshin of World Lab stated that only three of sixteen refrigeration plants in Ukraine are currently in operation. These included 145 refrigeration units in Ukraine, most of which were obsolete with a minimum of fifty percent depreciation. According to the Ukrainian Poultry Producers Association (Ukrptakhoprom), most of its members' products are chilled, not frozen, and marketed to supermarkets and restaurants. No similar figures were available for Moldova.

Dr. Palshin added that most meat, seafood, and poultry products that are frozen or refrigerated are exported to Russia. An average monthly family income is not sufficient to provide adequate demand for processed meat products (such economic issues are discussed later in this report). This explains why meat consumption is down and why forty to seventy percent (depending on the location) of meat is sold without processing. One must conclude that the valued-added to refrigerated and frozen products is not relatively important in the target sites and therefore, the capacity of processed product was limited by the low demand.

The production and processing sector also is severely limited by a lack of quality raw materials. For example, Taur wholesaler of Moldova stores meat and milk with fairly modern compressors but only at twenty-five to thirty percent capacity. The Director wants to increase the capacity by storing fruits and vegetables. The fish and poultry sector are both suffering from competition in the market from imported products. Ukraine and Moldova are able to import the chicken, fish, and seafood products less expensively than local product can be produced.

As a result of this lack of raw material, the processing plants and cold storage facilities were stated to be at twenty percent capacity, but were more realistically at ten to fifteen percent capacity. As such, processing issues per se appeared to be of lower priority compared to production. Generally, those emphasizing food safety in the many discussions held in Moldova and Ukraine, were those of the assessment team. Production was paramount, quality and valued-added were of second importance.

C. Comparison of the Ukrainian and Moldovan Situation with Those of Other Developing Countries or Emerging Markets

WFLO has witnessed many of the same challenges that face Ukraine and Moldova in other emerging markets. These challenges and observations include:

1. Weak purchasing power of the majority of the population;
2. Exporters must establish close business relationships with local importers/agents;
3. Infrastructure, including ports and cold storage facilities, are poorly developed;
4. Third-country competition remains strong, financing remains a problem as banking system remains weakened by the impact of the financial crisis that began in 1991;
5. Global purchasing organizations buy from the cheapest acceptable source;
6. Sites tend to be in remote areas where transportation and lack of infrastructure presents barriers to cost-efficient distribution of imported food products

7. Participants in the cold chain lack educational resources for professional development; and
8. Many producers and processors are unfamiliar with the demands for quality food products and tend to emphasize price over quality.

The Ukrainian consumer population prefers domestic refrigerated poultry, which is considered fresher than imported frozen poultry. Management at the Kerchinski and Bershadski poultry plants both supported this conclusion by stating that each supplies products to seventeen sites throughout the Ukraine. As pointed out, the upper three to five percent of the public consume twenty to thirty percent of the processed products. As in the emerging markets of Southeast Asia and Central and South America, production prices and cold storage are high as it relates to purchasing power of the people adding to the cost, but western influence is gaining. With the proliferation of television, tourism, and two income families, the use and convenience of refrigerated and frozen products continue to rise.

D. Initial Recommendations

Developing a relationship with WFLO would be helpful to any food processing enterprise. The WFLO reference library contains information on food quality and safety, product processing and packaging, process safety management, energy conservation, proper storage, etc. Energy was a recurring concern; for example the Carmez processing company of Moldova complained of high-energy costs. The WFLO suggested that warehouses could alleviate this problem by switching to ammonia-based refrigeration systems. This could be facilitated through collaboration with the European members of IARW.

E. Reactions and Additions to Initial Assessment of Cold Chain

1. Responses to WFLO's Request for Further Analysis

WFLO suggested further activities in cold chain analysis, including technical assessment, production efficiency and energy consumption patterns. As a result of such analysis, INZMV found that the share of energy costs was 30% of total processing expenses; in developed countries this ratio ranges between 3-10%. The Institute concluded that the re-equipment of refrigerating facilities would reduce of power consumption and total costs.

The Director of the Ukrainian Poultry Producers Association (Ukrptakhoprom) provided findings based on his own experience. He confirmed low capacities for refrigeration and handling of refrigerated products plus the use of outdated equipment, requiring high utility costs. He noted that, recently, poultry enterprises have refused to utilize centralized boiler rooms and install local heating - such as liquid fuel/gas heat generators, gas heaters and electric brooders - in manufacturing areas. The Ukrainian Meat Producer Association favored conducting such analyses as part of an initiative to improve efficient energy consumption.

In response to WFLO's recommendation, INZMV conducted a refrigeration survey. The survey form is found in Annex D and the findings in Annex E. Those findings led INZMV to reach several conclusions:

- Transport for the majority of clients is obsolete and does not provide continued maintenance of necessary temperature, especially during the summer period
- Compressor equipment is obsolete or in need of in the majority of plants, having been made in the old USSR;
- Refrigerative Refrigeration capacities are not fully utilized which results in economic inefficiencies;
- Storage and refrigeration facilities, particularly insulation, are often in need of repair and are expensive to operate.

INZMV made several recommendations to address these issues. Its staff repeated the need for an information system to provide processors and refrigerated warehouses with WFLO resources on the cold chain. Recommended capacity building activities include training in the best practice in refrigeration management, as well as proper storage (including temperature control), packing and transportation. Many of these recommendations were made in the context of association development. Lastly they suggested that expanded work on the refrigeration survey would reveal what concrete equipment should be replaced and categorize clientele in terms of refrigeration needs and current financial resources.

2. Partners and Stakeholders Comments Regarding Recommendations

The Director of OSAR stated that the lack of refrigerated warehouses, ice-producing plants, and fish-freezing facilities on the sea-coast is a critical limitation to the industry. Coastal refrigeration equipment is more related to trade cold storage and uses freon-12 prohibited by Montreal and Kyoto protocols. Cold chain technology is also absent in the process of production, which is inconsistent with quality processing standards for seafood.

The Director also recommended development of operational instructions for Ukraine under the PFID Project. These instructions should correspond to specifics of processing industry of Ukraine and comply with international standards. OSAR is ready to offer its services in fulfilling this task jointly with WFLO, as it has been administering refrigeration technology application in meat, dairy, poultry and fish industry for more than 5 decades. It also would be useful to develop a reference manual on refrigeration technology with computer software of quality control, drying losses and energy cost control.

Mr. Boris Gudyma, a senior official of the Department of Fish Industry of Ukraine, concurred with WFLO's observation regarding the under-development of cold chain methodology and logistics, little or no use of information management systems and poor transportation pipeline. The Moldovan Poultry NGP supported WFLO's observation regarding low energy efficiency.

Section IV. Institutional Issues - Associations, Networks and Partnerships

A. Methodology and Approach for Initial Assessment

The assessment team members from WFLO and the Ag Center's International Programs Office addressed the importance of associations and association building as it applies to Ukraine and Moldova. During the initial assessment exercises, trade associations, retailers, warehousemen and the CNFA were seen as having information that was particularly relevant for the assessment of associations, networks and partnerships in the target countries.

During those interviews, the following questions specifically related to institutional development were asked:

- What are potential areas for collaborative research?
- Is there any communal activity or potential in the areas of marketing, exports and logistical issues?

B. Summary of Preliminary Findings

WFLO realized that the professionals in Moldova and Ukraine recognized the essential need and use of international standards and that the differences in cold-chain approaches must be harmonized through using global standards. As noted in discussions, WTO membership in three to five years will depend heavily on compliance with international guidelines on proper handling and refrigeration of product. The achievement of such goals would be facilitated through cooperative endeavors.

During the course of the assessment exercise, various associations were identified as being in varying stages of institutional viability. For example, the Meat Producers Association ("Ukrmiasso"), with 115 members in Ukraine, evolved out of a government agency. It has been established as a National Association of livestock processors and meat product manufacturers of any type ownership with a purpose of defending its members' interests and coordinating technological, standard, research and engineering activities.

The Ukrainian Poultry Producers Association (Ukrptakhoprom) offers services to its members in the following fields: marketing, promotion, breeding coordination, chick supply, other inputs, joint stock issuance, advocacy/lobbying and technical assistance. The Ukrptakhoprom's Deputy General Director states that it facilitates contracts with foreign and domestic corporations for equipment and technical assistance. It also acquires technical assistance through attending international expositions. Ukrptakhoprom coordinates between members, retailers, wholesalers and oblast offices. According to the Director, the Ukrptakhoprom's members produce twenty percent of the country's total poultry supply. Active members include six large, vertically integrated enterprises, fifteen small-scale producers and 185 egg producing enterprises. The Association has a representative office, often operating independently, in each oblast. Contracts between the Association and its members result in fee transfer. Unfortunately, thirty percent of the Ukrptakhoprom's officially listed 320 members are currently idle due to closed market links and increased input prices (particularly in feed and energy). This has resulted in decreased

participation in the Association. The Deputy also noted some conflict with redundant government programs, particularly regarding breeding.

The Director of the Illytchevsk Fish Factory and Cannery in Odessa stated that he relied on informal contacts for marketing. The Ocean seafood market in Odessa sources its product from individual suppliers. The Odessa State Academy of Refrigeration has a provisional list of fifty-two seafood producers and processors as a result of a state directive. These enterprises are located on the Black Sea coast, lakes and rivers. This list facilitates access for training and dissemination of information. Within this list, eighteen enterprises form an association called “Beza” for joint promotion and networking (others might be informally affiliated). The academy also has worked with port warehouses in design assistance and technical consulting.

Its President described the National Federation of Farmers in Moldova (FNFM) as an umbrella of twenty-nine smaller organizations, with 56,000 members in 814 rural communities. It manages seven consulting centers. Services include advocacy, training, organizational and cooperative development, informational sharing, model farmer programs, networking with potential buyers, and the promotion of international markets. The National Union of Meat Producers in Moldova coordinates regulation of food processing. Its goals are to mobilize producers to consistently achieve standards. Some members are also processors. Although farmers seemed well organized through the Farmer Federation, the food processing industry in Moldova is decentralized and does not appear to have a solid organization.

The members of the National Refrigeration Association of the Republic of Moldova (NRA) have a maximum combined capacity of seventy thousand tons. The NRA provides the following services for members: international contacts, networks, technical and marketing assistance. The Director is a colleague of Vice Rector Chumak at OSAR. NRA has 200 office staff and its dues-paying members have a combined total of 3,000 employees.

Unfortunately, the organizational capacity of associations to provide useful services to member processors is not always apparent. For example, Basarabia Nord, the second largest (and possibly most progressive) meat processor in Moldova, sees no reason to enter in such formal networks. By the same token, associations often lack a broad-based membership; the Director of the Ukrainian Poultry Producers Association stated that this was a constraint to his organization’s capability.

C. Comparison of the Ukrainian and Moldovan Situation with Those of Other Developing Countries or Emerging Markets

WFLO’s experience with associations in emerging markets is comparable to those in Moldova and Ukraine. They are typically weak, not living up to their full potential. In many situations, there are only a few participating members and they lack the financial resources and technical wherewithal to lift the membership as a whole. This is also reflected in their governance in which only a few individuals attempt to address all the management concerns of a loosely structured body. If a weak local association can link with a stronger and more global association with a broad-based membership, much can be accomplished. Domestic associations can then be empowered with a greater transfer of knowledge, methodology, techniques, changed attitudes and marketing opportunities.

By working through a larger association, networks and partnerships occur more readily. For example, the recently created Vietnam Cold Chain Group and the newly formed Egyptian Cold Chain Association, have greatly benefited through their new relationship with IARW and WFLO. Ukraine and Moldova could reap similar benefits in receiving the needed technical and educational benefits and services, which in turn makes the member stronger, thereby making the domestic association healthier.

D. Initial Recommendations

Even with basic constraints to growth in the refrigerated warehouse business, WFLO sees great potential in its role as educator and disseminator of information through developing a relationship with producer and processor associations. These would include the Meat Processing Association, National Union of Meat Processors, Odessa State Academy of Refrigeration and the Poultry Producers Association of Ukraine, as well as the National Federation of Farmers and the National Refrigeration Association of Moldova. It was conveyed to the team that there is a lack of qualified trainers working within professional organizations. WFLO can play an essential role in “training the trainer” to alleviate this lack. It was noted that education and training, coupled with the commercial function, makes for a successful program for a complementary association. The need exists to create such a complementary association, as have been established in developing countries around the world. WFLO has helped develop such associations in Vietnam, China, Japan and Egypt.

OSAR’s ability to contact up to fifty seafood enterprises for training access, as well as marketing, makes it a potential partner for the promotion of capacity building. It also provides degree courses for four specializations in refrigeration at bachelor and graduate level but suffers from a lack of facilities. Another potential linkage is the Department of Food Processing at Moldova’s National University, which provides formal educational programs and wishes to include practical internships. Unfortunately, the Department’s Chairman complained of a lack of willing processors to accept interns (he stated that international processors are more willing to participate). The challenge, particularly in such a difficult employment market, would be for the Department to show processors what they can offer as an inducement to participation in their internship program.

Strong associations enable the industry to improve standards and advance the interests of its member and to the community at large. Such organizational development also will facilitate more efficient warehousing services. It allows for collection and sharing of statistical information and exchange of ideas. This practical concept has been proven to expand networking opportunities among the membership, which in turn improves business. For example, the Odessa Seafood enterprises do not have the capacity to effectively market their individual production. This limitation could be overcome if they were to coordinate their marketing endeavors.

A relationship with Agricultural Cooperative Development International/Volunteers in Overseas Cooperative Assistance (ACDI/VOCA) also would improve development of networks and associations. ACDI/VOCA has considerable experience in association development, having promoted food fairs and seminars in processing in Ukraine. They are currently concentrating in the country’s west and central region. The potential benefit for exchange activities between the

staff and clientele of the Project and ACDI/VOCA is significant. Likewise, collaboration with the Citizen's Network for Foreign Affairs (CNFA), which conducts USAID-sponsored activities in Moldova, would also prove useful. Such collaboration could include sharing technical information, networking, and joint programming in meat processing. In joint programming, PFID could offer technical expertise while CNFA provides their established contacts and experience with Moldovan associations. Other institutions with which the Project could cooperate include the following:

- The East West Management Institute, which is conducting a project on policy, cooperative development, dissemination and training; and
- Development Alternatives International, which has activities in association development and credit facilitation (currently in Ukraine with a possible expansion to Moldova).

Lastly, networking with research institutions will be very useful. Food science research, in which WFLO is routinely involved, is greatly needed in Moldova and Ukraine. WFLO team members observed opportunities in assisting in the training through in-country food science and technology seminars similar to those recently completed in Egypt and Greece. This will attract producers, processors, warehousemen, and retailers.

The assessment team noted that strong industry associations with depth of membership are few and their development will be vital to business networking and general industry improvement. WFLO can assist in forwarding the thought that proper management can make a business profitable. Strong association ties can aid in analyzing the food processing chain and needed investment. WFLO can advise, through its members, on business alternatives and food industry data to assist small Ukrainian and Moldavian companies to progress. The Ag Center could also expand the information system developed by World Lab for the Support for Ukrainian Private Farming Sector and Scientific Collaboration Project (the "Vinnitsa" Project – after the oblast where it is located), a cooperative agreement between the LSU Ag Center and USAID. Such an expansion would facilitate the access to processors of information useful for business decisions, availability of capacity building activities, dissemination or technical information, etc.

It is WFLO's intention to collaborate with the existing associations to enhance post harvest/processing technologies; standards and regulatory compliance; food safety and sanitation of products; processing strategies; cold chain availability market potential, and other infrastructure demands. Such a network could include academic institutions, such as the NAUU, which can help develop laboratory facilities for food quality control.

E. Reactions and Additions to Initial Assessment of Institutional Issues

1. Responses to WFLO's Request for Further Analysis

WFLO asked that World Lab learn of the operations undertaken by the Ukrptakhoprom's oblast representative offices. That Association's Director responded to the request, stating that each oblast poultry office generally includes ten to twenty poultry enterprises. Oblast offices train specialists in key poultry-related professions, help supply breeding stock, facilitate input acquisition (feeds, fuel and oil) and consult on technologies, legal services and protection.

WFLO also asked INZMV for the points of reference of the National Refrigeration Association of the Republic of Moldova (NRA). It was founded in June, 1999 by heads of refrigerating firms, and others involved in refrigerating engineering. The Association is a voluntary, public organization that derives its funding due to memberships fees, sponsorships and Association earnings.

The NRA's primary activity is to render information and consulting assistance to any interested party. It also carries scientific research for government agencies and economic agents. It represents members' interests to government, international exhibitions and foreign firms such as Grasso (Netherlands), Bitzer (Austria), Guntner (Germany). The NRA developed the National Program of ozone free environment for refrigeration with the technical assistance received from Multilateral Fund of Montreal Protocol

The FNFM contributes to the protection of local raw material producers on both the internal and external markets. The Federation organizes different exhibitions, auctions and markets for livestock. As the President of the Federation, Vasile Mirzenco, stated he is willing to collaborate with the PFID Team in order to organize an association for both the Producers of raw material and processors. Such an association could supervise the production, processing and commercialization of meat products.

2. Partners and Stakeholders Comments Regarding Recommendations

WFLO's recommendation to improve weak association by linking with a stronger and more global association is strongly supported by World Lab. Organizational development of both pre-existing associations (such as Ukrmiasso) and new associations was a recurring theme in the NGP at the stakeholders' meetings (Ukrainian Meat, Ukrainian Seafood, Moldovan Meat, Moldovan Poultry Moldova Seafood NGPs). World Lab also advocated that associations linked with the processing industry should concentrate on improvement of economic mechanisms that promote product markets particularly through the following activities:

- Coordinate marketing efforts;
- Lobbying for the industry's interests in the Government; and
- Facilitate the exchange of information, as well as provide training and technical assistance to help members make appropriate operation decisions.

The last activity could also address WFLO's observed lack of an information system, which was also cited by the Ukrainian Seafood NGP.

The association in Odessa is a state-owned entity and OSAR's Director doubts that it can unite all enterprises of private and state ownership. Quite a different Association is needed, capable of promoting products to the markets and working with customhouse and legislative bodies. A possible variant could be establishment of a technopark in the Southern region on the basis of large cold storage with processing capacities and trade regional supermarkets.

Section V. Post-Harvest Procedures and Technical Issues

A. Processing of Meat and Poultry – Initial Assessment

The Director of the Ukrainian Meat Producers Association informed the assessment team that, in Ukraine, there are more than one thousand small meat plants producing less than one thousand kilograms per day. Up to fifty percent of this meat is consumed without passing through an officially documented marketing channel. There are approximately thirty plants that produce more than one thousand kilograms per day. These plants are mostly slaughter and processing plants, although World Lab staff stated that about seventy percent of the meat consumed in Ukraine has not been processed as a value-added or sausage product. One plant near Kiev was capable of producing ninety tons of meat per day, but currently is producing thirty-six thousand tons of sausage, seven thousand tons of value-added products, and three thousand tons of canned meat annually. The Director of the Kiev Meat Processing Plant stated that four of the plants in the Kiev area have total slaughter capacity in excess of thirty thousand head per day. There are five large plants in the Vinnitsa area. According to one of them, Vinnitsa Meat, they have a combined capacity of more than eighty thousand tons per year. Pork is the most highly consumed meat, with little beef or lamb consumption due to livestock supplies according to Dan Sweery of Kiev-Atlantic.

Mr. Sweery stated that perhaps fifty to seventy percent of the production of the large meat plants is shipped to Russia or former Soviet Union countries. Most of the meat plants have a combination of old (twenty years or more) and new (less than five years) equipment. The products that were viewed appeared competitive in workmanship and overall composition with those produced in Europe, Asia, and North America and those that were sampled had excellent palatability characteristics. Most plants were judged to be capable of producing sausages of different varieties with minimal changes in equipment and to produce value-added intact or restructured products with minor changes in procedures and moderate equipment expenditures. One plant had very modern dry sausage greening and fermentation rooms. Plants vary in their analytical expertise, with the larger plants able to maintain on-site testing laboratories for quality control.

There are about 320 poultry enterprises, with thirty percent currently idle. There are approximately 25,000 tons of poultry meat produced by large processors, those with integrated operations from chicks to meat, and about 29,000 tons of broiler meat produced by smaller operators annually (Ukrptakhoprom). The poultry plants seemed to have moderate to high hourly production capacities, but were limited by the numbers of birds produced. Poultry plants seem to be expanding their production faster because of the shorter production cycle from egg to product than for red meat species. Several of the poultry plants had broilers of similar genetics and were achieving similar production targets (i.e. 42 days to 2.2 kg) to Europe and North America integrators.

In Moldova, there are approximately a dozen meat-processing plants with production capacity larger than one thousand kilograms per day. The number of smaller plants is unknown. Almost twice as much pork is produced as beef and mutton production is one tenth that of pork (INZMV). The Carne DK meat slaughter plant that was toured and had some very old, but functional, equipment in the abattoir, while the sausage and processed meat production areas

were relatively modern. Two larger slaughter and processing plants had much greater capacities. Carmez SA, with capabilities of 1,200 swine and 500 cattle per eight-hour shift, was producing about forty percent of the current meat supply in Moldova. Basarabia Nord had a capability of producing fifty thousand tons per year, but was producing four thousand tons per year. The sausage production areas had sufficient modern equipment and the sampled products had excellent palatability in comparison to other meat products marketed around the world. The technological capabilities appear sufficient to provide processed meats of high quality.

The Moldovan poultry industry is largely dependent upon small producers. There are fewer than a dozen integrator companies and these usually produce broilers and eggs for markets (INZMV). The Floreni plant is producing in four hundred tons a year out of an annual capacity in excess of thirty thousand tons. Russia and former Soviet Union countries are the major export markets. Most of the poultry plants seemed to have modern equipment and to be capable of efficient plant operations if sufficient birds were available for processing. The products were of generally high quality.

B. Processing of Seafood – Initial Assessment

There are limited natural fishery resources in the Ukraine. However, this is not a limiting factor in developing a substantial valued-added seafood processing industry in Ukraine. On the contrary, the strategically important Port of Odessa could serve as one of the most important hubs for seafood processing in Eastern Europe. Many countries import raw materials for value-added food processing and are quite successful. For example, the US depends heavily upon importation of seafood raw materials (60% of all seafood products consumed in the US are imported) for its significant seafood processing industry. Odessa has historically served the former Soviet Union as a focal point for seafood processing and the adequate processing facilities are still in place. The facility is capable of freezing, smoking and canning fish or fishery products. The facility is large but has deteriorated from neglect over the last ten years. Nearly all facilities visited were operating at only a fraction of their production capabilities, as was mentioned in the previous section on Cold Chain. The greatest limiting factor, and our greatest challenge, will be attracting investment capital.

An examination of Odessa's port storage facilities is encouraging. The Port allows excellent facilities for the import of raw materials and access to nearby processing plants. In addition, the port will facilitate export of finished products. On-going renovations show improved freezer and cold storage on the docks. There was a multi-story frozen warehouse storage capable of storing substantial product.

Moldova has no access to a seaport and is, consequently, greatly limited in export capability. There is aquaculture potential for establishment of landlocked seafood processing. This processing needs to focus primarily on the freshwater species capable of pond culture. Of particular significance is pond culture of paddlefish, carp and perhaps trout. Dr. Moody believes that the potential for catfish culture is limited. Like Ukraine, most processing facilities were not in operation at the assessment team's visit but the infrastructure seems to be in place. Overall equipment appears to be well maintained but underutilized.

C. Initial Recommendations

Recommendations for further analysis include a survey of meat and poultry plants to determine their total capacity, current operating volume, types of products and customers. Such a survey has been designed and sent to World Lab and INZMV for translation (refer to Annex A) Follow-up surveys could determine the following additional information: marketing plans for potential or future customers; plans expansion or reduction of production; and information and technical needs in processing techniques, marketing strategies and worker training.

An associate award proposal could be prepared for a marketing study to compare the following:

- Meat and poultry product types and wholesale prices in areas of Western Europe; with
- Product types and shipped product costs of products made in Ukraine and Moldova.

This would allow determination of their competitive status in regards to technical production and economic viability for export to geographically close and economically stable countries.

Dr. Moody recommends that an associate award proposal be prepared to conduct research on finished seafood products acceptable to regions outside Ukraine and Moldova. This research would identify available fishery products, including imports, and recommend the development of products that would be acceptable to other nations. He believes that these products should be displayed in both the Boston Seafood Show and the Tokyo Seafood Show by 2003-2004. He would be willing to assist in the preparation of a booth at both shows that would provide information on seafood processing opportunities in Ukraine and Moldova.

D. Reactions and Additions to Initial Assessment of Post-Harvest Procedures and Technical Issues

The NGP results of several breakout groups (Ukrainian Poultry, Ukrainian Seafood, Moldova Meat, Moldova Poultry, Moldova Seafood) included the contention that low levels of raw materials limited meat, poultry and seafood processing¹. The Moldovan Meat NGP resulted in a similar result, citing the “Lack of Integration Program between raw material producers and processing enterprises”. Other NGP results (Ukrainian Poultry, Moldovan Meat) pertained to outdated equipment and technology, which in turn is linked limited financial resources. Another recurring theme was the lack of qualified personnel (Ukrainian Poultry, Moldovan Poultry NGP).

Ukrmiasso supported the exploration of export possibilities, as did Mr. Gudyma, from Ukraine’s Department of Fish Industry. He felt that the Ukrainian seafood products, which could be attractive for the western markets are chilled (live) crawfish, chilled (live, including pike-perch, flat-fish and pelengas) fish and various shellfish species - i.e. *rapana*, mussels, snails and others. Mr. Gudyma states that the reason for Ukrainian seafood products not being exported to the West countries is not their low quality and safety, but the fact that Ukrainian producers are not familiar with legislative and regulation demand of those countries. Therefore, he would add

¹ However, the Director of World Lab noted that supply of other raw materials increased in the past year. He cited the Ministry of Agrarian Policy of Ukraine, which stated that the increase of broiler production was particularly high, increasing by 2.3 times relative to 2000.

establishment of an Information and Marketing Center of Trade Promotion in Ukraine to the list of recommended activities.

Mr. Gudyma, also agreed that the industry suffered from a lack of raw materials. He added three additional recommendations to revitalize the seafood industry in Ukraine. The first was to utilize the high concentration of production capacities and infrastructure in the Southern area of Ukraine (Azov and Black Sea region) – an issue that also was strongly advocated at the Seafood NGP in Ukraine. He mentioned an urgent need in re-establishment of the domestic fishing fleet to provide quality raw material supply for coastal fish processing operations, which also was recommended by the Director of OSAR. Lastly, he advocated realizing the large potential for aquaculture in the country. He strongly supported Dr. Moody's proposal to promote export niches for some seafood items from Ukraine.

Section VI. Safety, Sanitation and Standards

Slaughter equipment was generally less modern than processing equipment, requiring additional care and sanitation practices to insure proper standards of cleaning and sanitizing. Facilities were typically twenty to forty years old, but of construction typical of that era to allow adequate cleaning and sanitization. Such standards could be achieved if preventive maintenance would be conducted to prevent deterioration of walls, ceilings, and floors in processing areas. Utility areas such as stairwells, offices, and auxiliary areas were generally less well maintained than processing areas. Instances of insufficient lighting due to power shortages were commonly observed. This makes facility, personnel, and product inspection very difficult.

A. Meat and Poultry – Initial Assessment

In Ukraine, it was indicated that the government, presumably national, has veterinary personnel assigned to each meat and poultry plant to inspect animals and products. Each raion has jurisdiction over sanitation control. The Director at the Kiev Meat Processing Plant stated that chemical, bacteriological, and radiological tests are required of meat sold in Ukraine.

The plant manager at BN indicated that the plant had ISO 9001 certification. ISO 9001 refers to certification by a 3rd party that the plant does conform to the standards that the 3rd party believes are required by the ISO 9001 guidelines. The manager added that the stores owned by BN would sell products from other food companies if they produced a certificate of quality, but not necessarily of ISO 9001 designation.

Most plants are twenty to thirty years old. Walls commonly were constructed of materials such as tile or plastic board that could be cleaned and sanitized. Floors were often concrete that had worn in some places, preventing proper cleaning. Product contact surfaces were generally stainless steel, allowing for effective microbiological control.

The appearance of products, the personal hygiene of plant line workers, the sanitary requirements for plant visitors, and the attitude of the supervisory personnel would generally reflect that there is a high regard and concern for product sanitation and quality. The level of training will probably vary from plant to plant and the degree of implementation will be proportional to the monetary requirements, urgency, and market standards for the required level of sanitation.

B. Seafood – Initial Assessment

Dr. Moody's visual inspection of the facility at the Port of Odessa indicated to him a need for sanitation and good manufacturing training. Since most facilities in Ukraine were not operating, it was difficult to get a clear picture of food safety and sanitation knowledge. However, most of the processors met by Dr. Moody seem to at least have a basic understanding of good manufacturing practices. There appears to be a great need to provide Hazard Analysis Critical Control Point (HACCP) and sanitation training to bring facilities personnel up to international standards. Examination of the quality control facilities in Odessa revealed a well-equipped laboratory and seemingly knowledgeable personnel.

Because the fish processing facilities in Moldova were not operating at the time of this assessment trip, it is difficult to determine manufacturing and sanitation practices. However, discussion revealed at least a basis for understanding.

C. Initial Recommendations

Observations of practices, equipment, facilities, and overall hygiene indicated that there was capability of producing very safe products, but improved temperature controls would be warranted to maintain product safety and quality.

Dr. Moody recommends that the bulk of seafood training efforts should be concentrated in Ukraine and focus on sanitation and standards issues. In his proposed work plan, Dr. Moody recommends the conduct of seafood HACCP and sanitation train-the-trainer workshops with cooperators in Ukraine and Moldova during May to June of 2002. The train-the-trainer workshops would last three days for HACCP and one day for sanitation. An extra day will be provided for university lectures on the topics and to wrap up discussion.

In May-June of 2003, Dr. Moody recommends conducting seafood HACCP and sanitation workshops for seafood processors in Ukraine and Moldova. These would follow the same general itinerary as the train-the-trainer workshops. He suggests that these trainings be followed by plant evaluations for seafood processors and the facilitated preparation of HACCP plans. He anticipates that most of this work will be conducted in Odessa.

All training in Odessa should be coordinated through the OSAR. Our point of contact at the Academy is the Vice Rector, Professor Victor Mazur. Kiev is also a key location for HACCP and sanitation training. The city provides a central training location for the rest of the country, excluding the Odessa area. The National Agricultural University is an ideal HACCP and sanitation training site. Professor Dmytro O. Melnychuk, Rector of the National Agricultural University, stated a willingness to host the training. Dr. Moody suggests holding a single HACCP and sanitation training session in Chisinau. The INZMV's fisheries specialist, Dr. Vitalii Lobchenko, will serve as the primary contact in this endeavor. Later, Dr. Moody proposes a follow-up visit to assess the design and implementation of HACCP plans by training participants. At this time, safety of products and sanitary practices can be assessed through chemical, physical, and microbiological analyses.

D. Reactions and Additions to Initial Assessment of Safety, Sanitation and Standards

1. Responses for Request for Further Analysis

The LSU Technical Team wished to know of the governmental standards for specific chemical, physical, bacteriological, and radiological compounds. Ukrptakhoprom's Director replied, stating that sanitation control of enterprises is sufficient. Quality control is guaranteed by Ukrainian regulation GOST 46 179-85 "Sanitation of Poultry Keeping Premises (engineering procedure)" up to January 1, 2002. New governmental standard of Ukraine is being developed. By comparison, Ukrmiasso's supported analysis regarding sanitary practices. Further information on standards in both Ukraine and Moldova are available in Annex F.

Dr. Hennadii Mironiuk, First Deputy Chairman of the State Committee of Standards stated that harmonization of Ukrainian food product standards is being fulfilled through the following reforms:

- Institutional reform, including establishment of an independent National Accreditation Body; and
- Legislative reform, including the adoption of the following Laws of Ukraine in 2001: standardization, acknowledgement of conformity and accreditation of conformity assessment.

Dr. Mironiuk added that his committee would facilitate harmonization with European standards and regulations in the next 7 years. This will include compliance with 5000 international standards and 100 EU directives.

Dr. Moody has recommended that pre-course preparation activities, conducted to maximize the applicability of an HACCP training course to local conditions, could serve as a final assessment of information and technical needs in food safety, standards and grades, and the various export requirements. Such a course is mentioned in the next sub-section and was supported by the Director of Ukrmiasso.

2. NGP Results and Related Comments

As a result of the NGP, several breakout groups identified harmonization of standards as a critical issue. This includes a uniform standards system without redundant or conflicting enforcement by multiple agencies (Ukrainian Meat, Ukrainian Seafood NGPs). Such a system also should be compatible with international and European systems so to maximize the Ukrainian and Moldovan industries' integration with European structures. World Lab and the State Committee for Standards have jointly recommended the establishment of an International Training and Methodological Center of Food Safety as an affiliation with WFLO/IARW. This center could be eventually registered as an entity officially designated for HACCP certification of industrial enterprises.

Section VII. Economic Issues

The section that follows reflects the observations and preliminary conclusions of Dr. Wes Harrison². The findings are based on a series of personal interviews with industry leaders in Ukraine and Moldova, as well as comments provided by Dr. Suzanna Kamilova³. Where possible, selected data sources are cited in order to support observations and conclusions.

A. Primary Constraints to Growth – Initial Assessment

The primary constraints to growth and development of meat, poultry, and seafood processing in Ukraine and Moldova are linked to the following three factors: 1) weak domestic markets relative to total processing capacity; 2) export markets that are closely tied to the Russian economy; 3) lack of good quality animals for processing. The third factor results from a fragmented livestock production sector, where growth and productivity is limited by high costs of borrowed capital, poor genetics, and the lack of confined feeding. These three factors result in the underutilization of processing and cold storage capacity, which is hypothesized to result in high processing costs.

1. Domestic Demand for Meat and Seafood

A weak demand for processed meats in Ukraine and Moldova can be traced to two factors. First, consumers in both countries have low incomes relative to food prices, as was mentioned in the previous section on the cold chain. In 1998, nominal per capita incomes were approximately \$980 and \$380 USD in Ukraine and Moldova, respectively (World Bank, 2000). Adjusting these incomes using purchasing power parity (PPP) rates show real incomes for both countries to be below poverty levels. For instance, PPP annual per capita incomes in 1998 were approximately \$3,130 USD in Ukraine, and about \$1,995 USD in Moldova (World Bank, 2000). Even after adjusting for difference in domestic prices, real average incomes are well below the Europe Union (EU) and United States (US) poverty rates. Consequently, the average consumer in Ukraine and Moldova spent about thirty-four percent and thirty one percent, respectively, of their PPP adjusted annual incomes on food. This compares to about thirteen percent in the US and fourteen to twenty percent in the EU⁴.

Another important factor affecting demand for meats and seafood in these countries is a relatively high inflation rate over the 1990 - 1998 period. For instance, the general price level, as measured by the CPI, increased by an average of 413.4% annually in Ukraine (World Bank, 2000). Inflation was more moderate in Moldova over the 1990-1998 period - only about 12.3% annually. However, food prices in Moldova rose by 98% on average over this period. In general, when a relatively high percentage of a consumer's income is spent on food, this leads to

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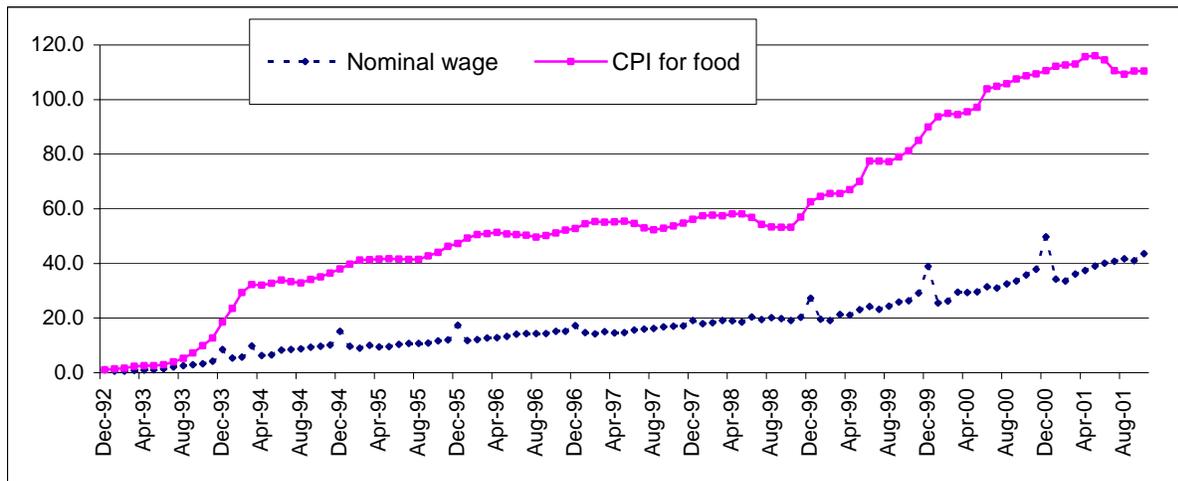
³ Dr. Kamilova is an Economist with World Lab – Ukraine Branch, Kiev, Ukraine.

⁴ Source: The World Bank, *World Development Indicators*, Published by the Development Data Center, The World Bank, Washington D.C., 2000. PPP conversion factors account for differences between international price levels and domestic prices. PPP reflects the relative purchasing power of the domestic currency given domestic price levels.

a relatively elastic demand (i.e., consumption that is quite sensitive to price) for certain foods like meat and seafood. Consequently, demand for meat and seafood has been most affected by price increases in the Ukrainian and Moldovan economies, since consumers replace relatively higher priced meats with staples such as potatoes and bread in their diets. As food prices increased in both countries, the demand for meat, seafood, and dairy products declined more than proportionally due to relatively high elasticities of demand for these type products.

Evidence of the decline in meat and seafood consumption for Ukraine and Moldova are presented in Table 1 and Table 2. For instance, per capita consumption of meat in Ukraine has declined from 68.2 to 34 kilograms per year between 1990 and 1999. This represents a 50.2 percent decline over the sample period. Similarly, seafood consumption in Ukraine has also declined over the sample period. Consumption of fish and fish products declined from 17.5 to 5.5 kilograms per person in Ukraine, which represents a 68.6 percent decline since 1990. In Moldova the decline was even higher; meat consumption declined by 57.8% (from 58 to 24.5 kilograms) and consumption of fish and fish products registered a decline of 69.2% (from 12 to 3.7 kilograms). In contrast, declines in staples such as potatoes and bread products have been more moderate ranging from 8.4 to 12.2 percent, respectively in Ukraine and from 2.7 to 10.9 percent, respectively in Moldova. It is important to note that the decline in local market could be attributed to a number of factors, including declining income levels, higher prices for meats relative to close substitutes, as well as changing consumer preferences. However, in both countries, the decline is most likely due to income levels and relative price effects (Judging the graph below we can mention that during the years 1993 – 2001 the price of food products in Moldova has increased 2.5 times more than the salary amount). A study that examines changes in the demand for meats and seafood would be necessary to determine the causal relationships.

Graph 1. The evolution of average nominal wage and prices for food in Moldova



Note: Department of Statistics and Sociology, Republic of Moldova, 2001. Own calculations.

Table 1. Annual Per Capita Consumption of Selected Food Products (kg/year) -Ukraine

FOOD PRODUCTS	Years									
	1990	1992	1993	1994	1995	1996	1997	1998	1999	% Change
Meat and meat products in measure by meat (including by-products and fat-cob)	68.2	53.4	46.4	32.5	38.9	37.1	34.7	33.2	34	-50.2
Milk and milk products (in measure by milk)	373.2	284.5	264.2	256.2	243.5	230.2	210.4	213.0	215	-42.4
Eggs, units	272.0	227.0	206.0	183.0	171.0	161.0	151.0	154.0	158	-41.9
Potatoes	131.0	132.9	150.0	135.8	123.7	127.9	134.4	126.0	120	-8.4
Vegetables and melons	102.5	88.9	90.1	83.7	96.6	91.9	90.5	94.1	90	-12.2
Bread products (bread and pasta products in measure at the flour, legumes, cereals)	141.0	142.5	144.5	134.8	128.4	123.5	126.5	129.4	125	-11.4
Fruits, berries, and grape	47.4	37.9	40.4	26.8	33.4	34.8	39.5	28.2	23	-51.5
Sugar	50.0	45.4	39.0	33.0	31.6	32.6	30.6	31.5	31	-38.0
Vegetable oil	11.6	11.2	10.6	10.0	8.7	8.2	8.6	8.2	8.5	-26.7
Fish and fish products	17.5	12.2	7.3	3.7	3.5	3.6	4.3	5.0	5.5	-68.6

Source: Ministry of Agriculture, Republic of Ukraine, 2000.

Table 2. Annual Per Capita Consumption of Selected Food Products (kg/year) –Moldova

FOOD PRODUCTS	Years									
	1990	1992	1993	1994	1995	1996	1997	1998	1999	% Change
Meat and meat products in measure by meat (including by-products and fat-cob)	58	N/A	N/A	30	23	25	25	26.7	24.5	-57.8
Milk and milk products (in measure by milk)	303	N/A	N/A	163	165	161	154.5	155.4	145	-52.1
Eggs, units	203	N/A	N/A	100	107	116	121.1	121.9	132.3	-34.8
Potatoes	69	N/A	N/A	84	68	71	68.8	65.1	61.5	-10.9
Vegetables and melons	112	N/A	N/A	78	86	65	69	112.5	109	-2.7
Bread products (bread and pasta products in measure at the flour, legumes, cereals)	171	N/A	N/A	139	135	127	134.9	133.9	133.1	-22.2
Fruits, berries, and grape	79	N/A	N/A	68	60	59	77.5	47.7	27.2	-65.6
Sugar	48.9	N/A	N/A	22.3	21	22.5	21.2	
Vegetable oil	14.1	N/A	N/A	8	8	8.2	7.6	
Fish and fish products	12	N/A	N/A	1.4	2	3.5	3.2	4.0	3.7	-69.2

Note: Department of Statistics and Sociology, Republic of Moldova, 2001

2. Trade Issues

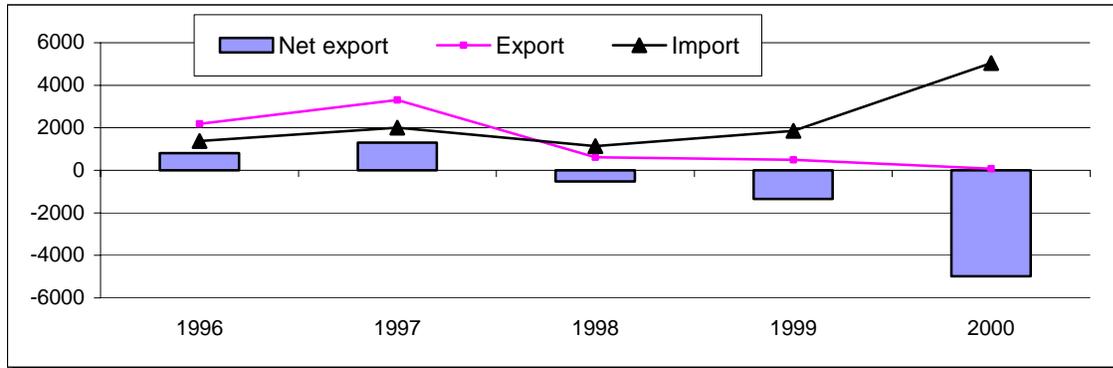
Since Russia has traditionally been Ukraine's primary trading partner, a significant factor effecting Ukraine's export markets is the health of the Russian economy. Consequently, the 1998 devaluation of the Russian ruble had significant effects on Ukrainian meat exports. For example, Ukraine's net exports were about 93,840 tons in 1998 (Table 1). This is a 42.7% decline relative to 1997, which can be attributed to the 1998 devaluation of the ruble. Similarly, 1997 net exports of Ukrainian pork fell to approximately 7,283 tons, and in 1998 Ukraine had a net import of 1,928 tons of pork. Most of this was due to a significant decline in exports to Russia. Moldova experienced similar trends regarding beef and pork exports over the 1997-1998 period.

Note that Ukrainian and Moldovan exports rebounded in 1999 as a result of some strengthening in the Russian economy. However, this improvement may only be temporary as the Russian government imposed a 10% value-added tax on meat effect July 1, 2001.

Ukraine is a net importer of poultry products. Poultry imports increased significantly after 1995 and since have stabilized in 1999 at about 88 thousand tons (Table 3). The rise in poultry imports is one factor often cited as a reason for declining domestic production. High excise taxes and import duties were established in 1997 to help mitigate this problem. Moldova's poultry trade is

relatively small (Table 4). However, until 1998 Moldova was mostly self-sufficient with poultry products. In 1996 and 1997 poultry exports exceeded poultry imports by 806.4 tons and 1300.4 tons, respectively. Since 1998 Moldova has become a net importer of poultry products. Net import of poultry products increased from 520 tons in 1998 to almost 5000 tons in 2000. One of the major factors that contributed to poultry meat import increase is the lack of local raw material and significantly lower prices for poultry products (roughly fifty percent) than the price for of pork and beef.

Graph 2. Net export of poultry products in Moldova (metric tons)



Note: Department of Statistics and Sociology, Republic of Moldova, 2001

Table 3. Beef, Pork and Poultry Trade For Ukraine

Year	Exports			Imports		
	Beef	Pork	Poultry, Fresh	Beef	Pork	Poultry, Fresh
	~~~~~Metric Tons~~~~~					
1995	206,667	8,263	495	166	1,349	913
1996	188,910	10,125	290	1,846	1,316	91,465
1997	164,637	9,388	234	906	2,105	56,920
1998	96,210	1,189	75	2,370	3,117	51,469
1999	130,793	7,459	831	1,134	4,466	88,716

Source: Food and Agriculture Organization of the United Nations; FAOSTAT Agriculture Data

**Table 4.** Beef, Pork and Poultry Trade For Moldova

Year	Exports			Imports		
	Beef	Pork	Poultry, Fresh	Beef	Pork	Poultry, Fresh
	~~~~~Metric Tons~~~~~					
1995	29,579	4,948	568	672	13	134
1996	13,621	10,005	565	542	1,329	2,000
1997	18,014	15,768	3,595	1,213	2,544	1,312
1998	7,286	7,000	864	2,282	336	1,425
1999	10,623	7,059	475	936	1,111	1,846

Source: Food and Agriculture Organization of the United Nations; FAOSTAT Agriculture Data

3. *Fragmented Livestock Production Sector*

In 1999, Ukraine produced about 11.7 and 10.1 million head of cattle and swine, respectively. This represents a 53.5 and 49.5 percent decrease since 1990, respectively (Table 5). Cattle and swine are produced on farms that range in size from small one-to-five hectare plots (referred to as home production operations) to large joint-stock farms of more than 1500 hectares. However, despite the existence of larger farms, most cattle and swine are owned and raised by the smaller operations. Most of the smaller farmers have limited access to affordable credit and purchased inputs (including feed), which limits their ability to produce adequate supplies of good quality livestock for the processing sector. For example, the interest rate on borrowed capital was about 54% and 31% in Ukraine and Moldova in 1998, respectively (World Bank, 2000). These factors have led to a steady decline in both the quality and number of livestock produced in both countries.

The poultry industry in Ukraine tends toward modern vertically integrated production systems. However, competition from lower priced imports has contributed to a steady decline in poultry production between 1990 and 1999 (51.7%, Table 5). Moldova's livestock and poultry sector has experienced similar trends regarding farm-level production (Table 6). Consequently, the Moldovan meat-processing sector also suffers from lack of good quality raw materials. Inefficient and fragmented livestock production sectors in both countries have resulted in increased procurement and processing costs for meat processors.

Table 5. Livestock Inventories, all farms, Ukraine

Year	Cattle	Hogs	Sheep & Goats	Poultry
~~~~~ <i>THOUSAND HEAD</i> ~~~~~				
1990	25,195	19,947	9,003	255,100
1991	24,623	19,427	8,419	246,104
1992	23,728	17,839	7,829	243,119
1993	22,457	16,175	7,237	214,578
1994	21,607	15,298	6,863	190,478
1995	19,624	13,946	5,575	164,862
1996	17,557	13,144	4,099	149,748
1997	15,313	11,236	3,047	129,449
1998	12,759	9,479	2,362	123,340
1999	11,722	10,083	2,026	

Source: State Statistics Committee of Ukraine: USDA/ERS

**Table 6.** Livestock Inventories, all farms, Moldova

Year	Cattle	Hogs	Sheep & Goats	Poultry
~~~~~ <i>THOUSAND HEAD</i> ~~~~~				
1990	1,061	1,850	1,282	24,624
1991	1,000	1,753	1,289	23,716
1992	970	1,487	1,352	17,128
1993	916	1,165	1,445	14,544
1994	832	1,061	1,507	14,415
1995	726	1,015	1,423	14,740
1996	646	950	1,372	13,410
1997	551	797	1,235	13,446
1997*	483	728	1,234	N/A
1998*	453	785	1,107	N/A
1999*	416	705	1,039	N/A

Source: Department of Statistical and Sociological Analysis

*Note: For political reasons, the Transnistria region was excluded from the inventories for these years.

B. Initial Conclusions and Recommendations

Growth and development of meat, seafood, and poultry processing in Ukraine and Moldova is constrained by lack of markets for primary and secondary processed meats. Domestic markets

are relatively small compared to total processing capacity. This is largely due to depressed consumer incomes, which remain low in Ukraine, Moldova, and Russia - a primary export market for both countries. Consumer incomes will improve only when the general health of the Ukrainian and Moldovan economies improve. Strategies for solving this problem are beyond the scope of PFID, but would include national monetary and/or fiscal policies aimed at promoting general economic growth. Moreover, poor economic conditions, underdeveloped transportation and telecommunication infrastructure, and the uncertainty of business transactions provide few incentives for foreign investment.

One strategy within the scope of PFID would involve providing assistance to develop new export markets, which may partially mitigate depressed domestic markets. Other CIS states may be potential markets, but these economies are also affected by low consumer incomes. Romania may also be a possible market. It may also be possible to develop niche markets for sausage and other processed meats in selected western European countries as well. However, a key constraint here would be complying with HACCP regulations, label and packaging requirements, as well as other non-tariff import restrictions. Selected enterprises may also experience growth by improving their domestic niche marketing efforts (i.e., targeting upper income consumers).

Well-developed marketing plans would be essential to expanding and establishing export markets as well as domestic niche markets. This would include analyzing potential markets, selecting target markets, and developing specific strategies for production (including HACCP), distribution, and promotion of selected meat products. A solution strategy might include providing technical assistance in developing marketing plans for carefully selected target markets both domestically and internationally. This could be accomplished through a collaborative project between the LSU/PFID team and CNFA's Agribusiness Partnership Program in Moldova and Ukraine.

Another constraint of the meat/poultry processing sectors is inadequate and inconsistent supply of good quality animals for processing. The disassembly of the former collective farms has resulted in very few confined feeding operations (pork or beef). This has resulted in a fragmented livestock production sector with inadequate breeding stock. Consequently, meat processors must assemble shipments of animals from a geographically dispersed supply of poor quality livestock. Inadequate and inconsistent supply of raw material means that processors operate in a high cost, high-risk environment. In general, these factors result in high costs of production and low profitability, which implies that businesses are less able to attract investment capital and less able to compete in export markets.

A possible solution to this constraint may be the establishment of a "model" central livestock market that provides for assembly, grading, and sale of animals. This would provide for price discovery and improve market efficiency for both farmer and processor. The top ranked issue reported by the Ukrainian meat industry during the stakeholder meetings conducted in October 2001 was "establishment of equal rules of competition for all entrepreneurial entities" and the Ukrainian Seafood and Moldovan Meat NGPs raised similar issues (Annex C). Central markets create a forum for orderly exchange, which is regulated by a set of equal rules and standards. Moreover, an observation provided by Dr. Kamilova cites a problem of monoposonistic behavior by local processors. The existence of local monopsonies may potentially lead to low livestock prices. The existence of centralized markets would provide alternative markets for livestock

producers, thus leading to improved competition. According to the Ministry of Agrarian Policy, there are 112 livestock auctions registered in the Ukraine. A potential area of collaboration between the PFID economists would be to study the degree of monopsonistic behavior in local markets, measure the welfare effects of such behavior, and determine ways to improve the efficiency of these markets.

Another possibility might be a pilot project where processors utilize forward contracts with price and production management specifications with selected farmers. The processor could provide some of the inputs necessary to raise good quality animals and the farmer would benefit from secured markets for their animals. The LSU/PFID team could partner with World Lab and the current LSU/USAID project in Vinnitsa to implement this solution strategy.

Economic seminars are recommended to improve stakeholders' skills in implementing the fore-mentioned activities. Dr. Harrison, the LSU AgCenter agricultural economist, can coordinate design and conduct of these courses. Possible topics include US price, trade and consumption patterns, as well as the role of market research and trade associations in promoting exports.

C. Reactions and Additions to Initial Assessment of Economic Issues

1. Stakeholder Responses

Ukrmiasso concurred that developing some niche markets for sausage and other processed meats and developing a "model" central livestock market had potential as future project activities.

Mr. Gudyma of the Department of Fish Industry of Ukraine concurred with Dr. Harrison's observation regarding the prevalence of food product exports to Russia and low income of the population, which result in limited domestic demand for all kinds of processed products. He recommended that the Project give priority to the financial and economic constraints, which processing industries face today, i.e. crediting, taxation, lack of steady civilized "rules of the game" for all business operators.

Another recurring theme from the NGP results - including those from the Ukrainian Meat, Moldova Poultry and Moldova Seafood breakout groups – was the need to increase processors' access to financial credit.

2. Ukrainian Academy of Agrarian Sciences

The Institute of Cattle Breeding from the Ukrainian Academy of Agrarian Sciences prepared an Evaluation of the Meat and Meat Products in Kharkiv Oblast⁵. In this paper, the authors explored the possibility of creating direct economic incentives through the reform of tax mechanisms for all entities engaged in producing, processing and sales of products. As one option, they presented the possibility of setting up techno-parks as a way of lowering the tax pressure of agricultural producers and in order re-equip the agricultural sector. These techno-parks have already been set up according to the Law of Ukraine "On Special Treatment of

⁵ S.Ruban, V.Hnatuschenko: Evaluation of the Meat and Meat Products Market Formation in the Kharkiv Oblast, Institute of Cattle Breeding from the Ukrainian Academy of Agrarian Sciences (2001)

Investment and Innovative Activities of Technological Parks”. A technological park would represent a legal entity or association created on the basis of the agreement on common activities of ‘legal persons’ (participants), whose main goal would be: the implementation of investment and operational innovation activities; introducing research findings and new technologies into manufacturing practices; and developing globally competitive products. The Valued-added Tax (VAT) amount, which is calculated according to the amount of goods and services produced in the parks, would not be transferred to the national budget. Instead, it would go to special accounts and used solely for R&D activities and development of scientific, technological, research and testing facilities of interest to the entities in the park.

Another document prepared by Institute staff⁶ proposed a market analysis to investigate the mechanism of market formation for the main food products in Ukraine (using the Kharkiv oblast as an example). The proposed activities include an analysis of the dynamics of meat product consumption in Kharkiv for the last 10 years; analysis of regulations, normative acts and tax legislation of the tax mechanism for entities in the sector; cost and price analysis; and consumer demand analysis. This should lead to an assessment of potential options and projected volumes of production of various types of meat and processed products in the oblast.

While the Institute’s proposals merit further inquiry, they do not yet reflect the view of the Project staff.

Section VIII. Summary of Recommendations

The viability and priority of these recommendations will be discussed in the Project’s first annual Advisory Committee Meeting. Those judged to be of sufficient priority and feasibility (given the Project’s available resources) will be included in the Project’s Solution Strategy Paper and in future Annual Work Plans.

A. Possible Project Activities Suggested in the Initial Assessment Report

The following possible activities have been suggested in the original Initial Assessment Report (IAR) and are summarized below.

- IARW/WFLO is willing to develop a working relationship with any food processing enterprise that participates in this project. This will provide those participants with access to WFLO’s reference information and collaboration with members of IARW.
- The PFID Technical Committee can also provide assistance to processor associations and academic institutions. This could include capacity building activities such as “train the trainer programs”, internships and cooperative development programs.
- WFLO is well placed to respond to informational and educational inquiries through its Scientific Advisory Council and the members of its affiliated organization, the International Association of Refrigerated Warehousemen (IARW). It also has an extensive library of manuals on such specific commodity storage, energy efficiency and other cold chain issues.

⁶ V.Hnatuschenko, G. Litvinov, S.Ruban, Assessment of the Meat Market in the Kharkiv Oblast, Institute of Cattle Breeding from the Ukrainian Academy of Agrarian Sciences (2001)

- Linkages with existing projects promoting association development would be useful. PFID also could buy into the information system developed by World Lab in another project.
- Finished seafood products that can be exported could be identified and promoted in international seafood expositions.
- Improved temperature controls would better maintain product safety and quality.
- Seafood HACCP and sanitation workshops will be conducted during 2002, followed by impact evaluations. These evaluations could focus on how participants' products improved as a result of their participation in the workshops.
- It may be possible to develop some niche markets for sausage and other processed meats in selected Western European countries. This would require compliance with HACCP regulations and well-developed marketing plans possibly leading to a test market launch. Such accomplishments could be facilitated by collaboration with CNFA's Agribusiness Partnership Program.
- A "model" central livestock market could provide assembly, grading, and sale of animals. Another possibility to improve market efficiency might involve forward contracts between processors selected farmers. PFID could partner with the Vinnitsa Project to implement this solution strategy.

It should be noted that many of these recommendations were supported by other sources, such as the NPG results and a review of the IAR by World Lab, INZMV and other organizations in Ukraine and Moldova.

B. Additional Recommendations

After reading the IAR's submission, some additional possibilities were identified. INZMV and World Lab provided some after reviewing the following additional suggestions for Project activities

- Conduct energy analyses as part of an initiative to improve efficient energy consumption;
- Develop operational instructions for the cold chain;
- Facilitate organizational development of both pre-existing associations and new associations as the need arises in the industry;
- Address the low levels of raw materials that limit processing of meat, poultry and seafood;
- Promote the harmonization of standards;
- Include HACCP and sanitation training for meat and poultry, as well as seafood;
- Address financial and economic constraints – such as credit, taxation, and competition – faced by processing industries; and

- Develop a pilot project based on a model meat processing enterprise for in a rural area.

Project staff members realize that the implementation of several of these recommendations could be beyond PFID's resources. It will be the responsibility of the Project staff and of key stakeholders to determine which recommendations have both the importance and the feasibility to justify implementation.

**ANNEX A
PFID CLIENT PROFILE**

Identification			ID Number	
Company Name			Address	
Key Contact Person, Name:			Title	
Phone	Fax	e-mail		
Form of ownership:				
Production				
Number of Plants beef ____, swine ____, poultry ____, seafood ____. Please provide the following information for each type of production (beef, swine, poultry, seafood):				
Type of Production	Plant Name/Location	Total Capacity (ton per day)	Current utilization of total capacity (percent)	Wear of Assets/ Equipment
(use another page if necessary)				
Characteristics of Refrigerator Equipment				
Cooling agent applied	Capacity (tons of standard units of cargo)		Chilling (tons per day)	Freezing (tons per day)
	Total	Including subzero temperatures		
Sales				
Total annual sales (for each currency)				
Hrvna:	Lei:	US Dollar:	Other (Specify):	
Sales for each product type (sausage, chilled meat, canned goods, etc.)				
Product types	Tons per year sold	Percent of total sales		
Percent sales to export ____, Percent sales to domestic market ____				
Total Number of Employees:				
License and certification				
Sources of raw material				
Proposals and necessities				
Date of Completion				

ANNEX B

FINDINGS OF CLIENT PROFILE

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Table B1. Basic Information

Item	Ukraine	Moldova
Total number of establishments responding to survey	282	53
Number of establishments mentioning at least one permanent employee	75	49
• Of those, average number of employees	243	90
Number of establishments mentioning sales in local currency	115	38
• Of those, average sales	15,260,044.05 Hrivna (\$2,879,253.59 USD equiv.)	4,984,126.37 Lei (\$380,467.66 USD equiv.)
Number of establishments mentioning sales in Dollars	6	5
• Of those, average sales	\$1,645,714.40 USD	\$621,729.40 USD
Response Rate, Meat Producers		
Reliable estimate of the total number of processors	358 (State Statistical Committee of Ukraine) ¹	43
Total number of processors responding to the survey	137	27
Response rate (%)	38.27	62.80
Response Rate, Poultry Producers		
Reliable estimate of the total number of processors		28 (Official Statistics Department, 2001)
Total number of processors responding to the survey		11
Response rate (%)		39.29

¹ The State Committee did not distinguish between red meat and poultry processors so, for Ukraine, the calculated response rate for these two sectors was combined.

Table B1. Basic Information

Response Rate, Seafood Producers		
Reliable estimate of the total number of processors	35 (State Statistical Committee of Ukraine)	18 (Official Statistics Department, 2001)
Total number of processors responding to the survey	30	17
Response rate (%)	85.71	94.44

Note. The surprisingly low number of establishments mentioning at least one permanent employee in Ukraine might be due to several reasons. Many firms might not have included seasonal/temporary/part time workers, management or family labor. Future surveys should take this into account. Dollar equivalents are based on November 30 exchange rates when one US Dollar equaled 5.30 Hriva and 13.10 Lei.

Table B2. Production Figures

Item	Ukraine	Moldova
Total number of product lines	559	140
Meat Processors		
Total number of:		
• Establishments	79	27
• Product lines	140	67
Average capacity (tons per day), by:		
• Establishment	62.40	24.41
• Product line	35.21	9.84
Number of		
• Small processors (capacity less than 10 tons/day)	5	11
• Medium processors (capacity from 10 to 100 tons/day)	56	15
• Large processors (capacity more than 100 tons/day)	18	1
Average current utilization (% of capacity)		
• Un-weighted average	31.53	26.56
• Weighted average	21.61	36.08
Poultry Processors		
Total number of:		
• Establishments	72	11
• Product lines	75	22
Average capacity (tons per day), by:		
• Establishment	17.15	38.78
• Product line	16.46	19.39
Number of		
• Small processors (capacity less than 6 tons/day)	13	1
• Medium processors (capacity from 6 to 14 tons/day)	31	2
• Large processors (capacity more than 14 tons/day)	28	8
Average current utilization (% of capacity)		
• Un-weighted average	31.52	44.03
• Weighted average	38.08	31.95

Table B2. Production Figures

Item	Ukraine	Moldova
Seafood Processors		
Total number of:		
• Establishments	30	17
• Product lines	32	45
Average capacity (tons per day), by:		
• Establishment	228.01	18.46
• Product line	212.28	6.97
Number of	<i>3 non-responses</i>	
• Small processors (capacity less than 1.5 tons/day)	2	2
• Medium processors (capacity from 1.5 to 10 tons/day)	3	11
• Large processors (capacity more than 10 tons/day)	22	4
Average current utilization (% of capacity)		
• Un-weighted average	27.23	26.86
• Weighted average	2.14	26.55

Note. The criteria for categorizing small, medium and large meat processors were provided by the Ukrainian Meat Association. The Ukrainian Poultry Association provided similar criteria for that sector while seafood criteria were provided by INZVM. Weighted averages of current utilization are calculated by divided total combined production of all firms over total combined capacity. This has the effect of giving larger processor a greater weight relative to smaller processors. Un-weighted averages treat all processors equally.

Note. For the following and future tables, “Region” will refer to the oblasts (or provinces) in Ukraine and to judetsene (or districts) in Moldova. Also the figures in the last row refer to national *totals* of the second and third columns (Total Productive Capacity and Total Actual Production) and to national *averages* of the fourth column (Percent Utilization).

Table B3. Total Regional Productive Capacity, Actual Production and Percent Utilization – Meat Processing in Ukraine

Oblast	Total Productive Capacity (tons/day)	Total Actual Production (tons/day)	Percent Utilization
Zaporizka	547.00	73.87	13.50
Vinnitska	492.00	203.88	41.44
Cherkaska	470.31	61.67	13.11
Zhitomirska	430.00	28.96	6.73
Poltavska	424.00	71.94	16.97
Sumska	406.00	58.27	14.35
Luganska	296.00	47.62	16.09
Kharkivska	294.00	17.00	5.78
Lvivska	292.60	61.21	20.92
Crimea	242.00	0.00	0.00
Khmelnitska	220.00	141.08	64.13
Chernigivska	206.00	45.35	22.01
Kirovogradska	197.00	93.52	47.47
Volhynska	155.00	66.20	42.71
Ivano-Frankivska	90.00	34.20	38.00
Kyivska	61.00	36.50	59.84
Transcarpathian	48.80	1.94	3.98
Dnipropetrovka	47.00	0.66	1.40
Rivnenska	10.00	0.00	0.00
Mykolaivska	1.20	0.00	0.00
TOTAL/AVG.	4,929.91	1,043.87	21.61

**Table B4. Total Regional Productive Capacity, Actual Production and Percent Utilization
– Poultry Processing in Ukraine**

Oblast	Total Productive Capacity (tons/day)	Total Actual Production (tons/day)	Percent Utilization
Kyivska	235.88	106.80	45.28
Dnipropetrovsk	145.20	105.04	72.34
Odeska	108.00	5.88	5.44
Vinnitska	105.00	48.50	46.19
Transcarpathian	90.00	70.00	77.78
Crimea	82.11	1.85	2.25
Mykolaivska	65.00	1.20	1.85
Lvivska	63.00	6.63	10.52
Kharkivska	62.50	8.45	13.52
Luganska	57.50	13.01	22.63
Donetska	48.00	28.80	60.00
Cherkaska	31.20	31.20	100.00
Poltavska	24.80	9.24	37.26
Kirovogradska	20.00	20.00	100.00
Volhynska	20.00	0.93	4.65
Zaporizka	20.00	4.44	22.20
Zhitomirska	18.00	2.34	13.00
Khmelnitska	17.00	1.40	8.24
Khersonska	7.00	1.54	22.00
Sumska	6.00	0.15	2.50
Chernivetska	6.00	1.58	26.33
Rivnenska	1.30	0.80	61.54
Ternopil'ska	1.00	0.34	34.00
TOTAL/AVG.	1,234.49	470.12	38.08

Table B5. Total Regional Productive Capacity, Actual Production and Percent Utilization – Seafood Processing in Ukraine

Oblast	Total Productive Capacity (tons/day)	Total Actual Production (tons/day)	Percent Utilization
Odeska	5,907.40	18.58	0.31
Crimea	147.02	70.57	48.00
Zaporizka	40.00	6.80	17.00
Cherkaska	20.00	19.60	98.00
Mykolaivska	19.20	7.91	41.20
Khersonska	16.44	4.88	29.70
Poltavska	5.40	3.44	63.63
Transcarpathian	0.80	0.50	63.00
TOTAL/AVG.	6,156.26	132.28	2.14

Table B6. Total Regional Productive Capacity, Actual Production and Percent Utilization – Meat Processing in Moldova

Judets	Total Productive Capacity (tons/day)	Total Actual Production (tons/day)	Percent Utilization
Baltsi	205.64	141.00	68.57
UTAG	145.00	4.99	3.44
Ungheni	69.80	7.02	10.05
Chishinau Municipy	63.90	31.76	49.70
Chishinau	58.00	36.60	63.10
Edinets	51.80	0.00	0.00
Soroca	38.57	15.43	39.99
Dubasari	20.23	0.25	1.24
Orhei	5.66	0.33	5.86
Lapushna	0.60	0.48	80.00
TOTAL/AVG.	659.20	237.86	36.08

Note. In Romanian “Judets” refers to a single district, while “Judetsene” is the plural form.

Table B7. Total Regional Productive Capacity, Actual Production and Percent Utilization – Poultry Processing in Moldova

Judets	Total Productive Capacity (tons/day)	Total Actual Production (tons/day)	Percent Utilization
UTAG	143.54	0.00	0.00
Chishinau Municipy	130.90	97.61	74.57
Baltsi	94.46	13.60	14.39
Dubasari	20.23	0.25	1.24
Soroca	20.00	20.00	100.00
Chishinau	17.50	4.88	27.86
TOTAL/AVG.	426.63	136.34	31.95

Table B8. Total Regional Productive Capacity, Actual Production and Percent Utilization – Seafood Processing in Moldova

Judets	Total Productive Capacity (tons/day)	Total Actual Production (tons/day)	Percent Utilization
Orhei	135.50	42.50	31.37
Chishinau	92.25	3.60	3.90
Chishinau Municipy	62.00	32.36	52.19
Edinets	11.80	4.00	33.90
Tighina	5.00	0.75	15.00
Soroca	4.00	0.00	0.00
Lapushna	2.00	0.00	0.00
Baltsi	1.00	0.10	10.00
Ungheni	0.25	0.01	5.70
TOTAL/AVG.	313.80	83.32	26.55

Table B9. Total Sales of Processed Products in Ukraine

Product	Tons of Product Sold	Recorded USD Value (est.)	Leading Oblasts
Fresh or Chilled			
General and miscellaneous fish	103,897.00	6,800.94	Crimea, Mykolaivska, Zaporizka
General and miscellaneous meat	33,103.00	33,946,572.45	Ivano-Frankivska, Lvivska, Vinnitska, Cherkaska
Meat and variety meats	26,558.00	21,118,282.09	Khmelnitska, Vinnitska, Cherkaska
Broiler meat	26,382.00	45,070,116.23	Dnipropetrovka, Kyivska
Fresh fish	23,863.00	-	Donetska, Odeska, Poltavska
Egg-layer meat	15,364.62	3,391,751.21	Dnipropetrovka, Kyivska, Poltavska
Beef	7,927.00	5,150,547.17	Kyivska, Lvivska, Poltavska
Pork	1,230.00	1,907,264.15	Kyivska, Poltavska
Chilled meat	925.00	3,048,825.22	Zaporizka, Vinnitska
Variety meats (poultry)	656.00	901,045.60	Kirovogradska, Cherkaska
Black Sea anchovy	322.00	99,747.17	Odeska, Chernivetska
Whole eviscerated poultry	87.35	-	Lvivska
Variety meats	70.85	259,821.13	Cherkaska, Mykolaivska
Semi-eviscerated poultry	11.07	-	Lvivska
Broiler variety meats	6.00	5,160.75	Volhynska

Table B9. Total Sales of Processed Products in Ukraine

Product	Tons of Product Sold	Recorded USD Value (est.)	Leading Oblasts
Frozen			
Frozen meat	13,178.00	15,882,541.79	Volhynska, Cherkaska, Zhitomirska
Frozen chicken mess meat	6,020.00	8,565,637.67	Kirovogradska, Vinnitska, Transcarpathian
Frozen chicken meat	2,686.20	3,422,198.64	Cherkaska, Vinnitska, Donetska
Frozen meat blocks	2,532.00	3,360,862.45	Chernigivska, Vinnitska, Donetska
Frozen products of poultry meat processing	1,500.00	305,210.38	Crimea
Frozen bone-in meat	735.00	645,142.08	Chernigivska
Canned			
Canned meat	379,268.80	9,837,484.37	Zhitomirska, Vinnitska, Khmel'nitska
Canned fish	49,926.00	-	Crimea, Khersonska, Mykolaivska, Odeska
Canned poultry	398.40	650,529.24	Cherkaska, Kyivska
Sausage			
Sausage products	65,895.00	134,802,026.97	Kirovogradska, Luganska, Poltavska, Zaporizka

Table B9. Total Sales of Processed Products in Ukraine

Product	Tons of Product Sold	Recorded USD Value (est.)	Leading Oblasts
Preserved (i.e. dried, salted or smoked)			
Dried feeds	36,796.00	776,818.87	Crimea, Vinnitska, Odeska, Mykolaivska
Smoked fish	29,512.00	234,254.72	Crimea, Odeska, Zaporizka
Preserves	6,745.00	27,959.43	Crimea, Odeska
Dried animal meal	183.00	46,415.09	Chernivetska
Smoked chickens	53.50	40,018.87	Vinnitska
Salted fish	47.00	41,561.32	Chernivetska
Other			
Fish products	5,449.30	800,371.70	Odeska, Poltavska, Khersonska
Eggs	5,109.00	237,198.11	Vinnitska
Meat half-prepared food	2,187.00	1,545,660.38	Luganska, Zaporizka
Sprat	1,300.00	286,395.28	Odeska, Chernigivska
Technical products	1,228.00	802,630.19	Volhynska
Other products	1,008.70	1,286,150.06	Sumska, Donetska
Raw hide material	992.00	413,580.38	Sumska
Bone semiproducts	676.80	908,421.06	Luganska
Gelatin	624.70	856,511.29	Luganska
Drugs	424.00	516,419.96	Sumska
Bone glue	402.90	545,052.64	Luganska
Pelengace	228.00	15,868.87	Odeska
Industrial fat	203.20	285,503.76	Luganska
Heads, feet, necks	156.00	517,260.38	Cherkaska
Hide	80.00	20,377.36	Chernivetska
Edible fat	70.00	18,113.21	Chernivetska

Table B9. Total Sales of Processed Products in Ukraine

Product	Tons of Product Sold	Recorded USD Value (est.)	Leading Oblasts
Confectionary products	28.00	80,572.64	Mykolaivska
Powdered eggs	28.00	-	Cherkaska
Bream, roach	23.00	20,402.83	Chernivetska
Melted fat	7.40	2,389.42	Chernivetska
Soup sets	5.38	-	Mykolaivska, Lvivska
Cheese	5.00	-	Poltavska

Note. Dollar equivalent values of sales are based on the November 30 exchange rate of 5.3 Hrivna to the dollar. The respondents as a whole were less forthcoming in giving values of sales than in giving volume so a direct relationship between volume and value should not be expected.

Table B10. Total Sales of Processed Products in Moldova

Product	Tons of Product Sold	Recorded USD Value (est.)	Leading Judetsene
Fresh or Chilled			
Poultry meat	2,875,799.00	2,559,261.98	Chisinau
Chilled meat	537.70	488,725.34	Soroca, Baltsi
Chilled fish	515.00	269,264.12	Chisinau, Orhei, Chisinau Municipy
Swine meat	120.00	31,968.00	Dubasari
Beef	50.00	24,050.00	Dubasari
Frozen			
Frozen meat	5,792.25	4,202,340.69	Baltsi, Soroca
Canned			
Canned Goods	6,088.00	22,475.30	Soroca
Sausage			
Sausages	4,496.60	1,770,761.08	Chisinau Municipy
Preserved (i.e. dried, salted or smoked)			
Salt fish	1,550.00	1,637,249.67	Chisinau Municipy
Smoked fish	509.00	551,455.74	Chisinau Municipy
Smoked meat	568.5	448,870.55	Chisinau Municipy, Soroca
Other			
Meat sub-products	143.00	248,378.93	Baltsi
Fish semi-fabricates	140.00	171,725.19	Chisinau Municipy
Meat semi-fabricates	138.00	2,744.14	Chisinau Municipy
Egg powder	46.00	76,410.46	Chisinau

Note. Dollar equivalent values of sales are based on the November 30 exchange rate of 13.1 lei to the dollar. As with Ukraine, respondents were less forthcoming in giving values of sales than in giving volume so a direct relationship between volume and value should not be expected.

Table B11. Total Regional Sales in Ukraine, in Hrivna and Dollars

Oblast	Total Sales in Hrivna	Total Sales in Dollars	Leading Products
Vinnitska	355,895,000.00	-	Meat and variety meats, canned meat, sausage products, meat, eggs, frozen meat blocks
Luganska	209,326,600.00	136,168.00	Sausage products, fresh fish, chicken meat, meat half-prepared food
Poltavska	187,374,800.00	3,100,000.00	Sausage products meat, smoked fish, fresh fish, beef
Kyivska	137,040,508.00	278,584.00	Sausage products, broiler meat, poultry meat, beef
Lvivska	112,807,000.00	-	Meat, beef, fresh fish, sausage products
Sumska	82,471,100.00	-	Sausage products, fresh fish, canned meat, frozen meat
Volhynska	79,792,000.00	-	Sausage products, frozen meat, technical products
Kirovogradska	70,500,000.00	3,100,000.00	Sausage products, frozen chicken mess meat, variety meats (poultry)
Chernigivska	66,548,900.00	-	Sausage products, meat, frozen meat blocks
Cherkaska	63,402,600.00	191,934.41	Sausage products, meat, meat and variety meats, frozen meat
Dnipropetrovsk	62,541,000.00	-	Broiler meat, poultry meat, chicken meat
Khmelnitska	51,187,000.00	-	Meat and variety meats, canned meat, fresh fish
Odeska	47,568,000.00	-	Canned fish, smoked fish, fresh fish, fish products
Ivano-Frankivska	45,000,000.00	-	Meat, sausage products, fresh fish

Table B11. Total Regional Sales in Ukraine, in Hrivna and Dollars

Oblast	Total Sales in Hrivna	Total Sales in Dollars	Leading Products
Zaporizka	40,658,000.00	-	Sausage products, smoked fish, fish
Crimea	26,574,700.00	3,067,600.00	Fish, canned fish, dried feeds, smoked fish
Zhitomirska	23,583,000.00	-	Canned meat, frozen meat, sausage products, fresh fish
Mykolaivska	23,344,400.00	-	Fish, canned fish, smoked fish
Kharkivska	21,800,000.00	-	Fresh fish, poultry meat
Transcarpathian	17,099,958.00	-	Sausage products, frozen chicken mess meat
Donetska	12,049,200.00	-	Smoked fish, broiler meat, fish
Khersonska	8,948,000.00	-	Canned fish, smoked fish, fish, fresh fish
Ternopilska	8,006,000.00	-	Fresh fish
Rivnenska	1,203,000.00	-	Poultry meat
Chernivetska	184,300.00	-	Fresh fish, poultry meat

Table B12. Total Regional Sales in Moldova, in Lei and Dollars

Judets	Total Sales in Lei	Total Sales in Dollars	Leading Products
Chishinau	72,350,000.00	-	Poultry meat
Soroca	42,294,000.00	-	Cans, frozen meat, sausages
Chishinau Municipy	30,450,000.00	530,710.00	Sausages, salted fish
Baltsi	29,208,311.00	2,503,937.00	Frozen meat
Ungheni	7,077,800.00	-	Frozen meat
Orhei	3,598,000.00	-	Chilled fish
Edinets	2,110,000.00	-	Frozen meat, chilled fish
Lapushna	1,056,000.00	-	Sausage, chilled fish
UTAG	952,691.00	-	Frozen meat
Tighina	300,000.00	-	Smoked & salted fish
Dubasari	-	74,000.00	Swine, beef and poultry

Table B13. Regional Distribution of Employees in Ukraine

Oblast	Total Employees
Luganska	3,530
Poltavska	3,348
Kyivska	2,941
Vinnitska	2,230
Cherkaska	2,072
Odeska	1,955
Lvivska	1,808
Dnipropetrivska	1,655
Sumska	1,646
Volhynska	1,282
Chernigivska	977
Crimea	925
Kharkivska	854
Zaporizka	835
Zhitomirska	820
Khmelnitska	718
Mykolaivska	710
Transcarpathian	457
Rivnenska	365
Khersonska	303
Kirovogradska	250
Ternopilska	250
Donetska	157
Chernivetska	83
Ivano-Frankivska	<i>No permanent employees</i>

Table B14. Regional Distribution of Employees in Moldova

Judets	Total Employees
Chishinau Municipy	1,678
Chishinau	883
Baltsi	831
UTAG	308
Soroca	307
Dubasari	260
Edinets	172
Orhei	148
Ungheni	146
Lapushna	60
Tighina	3

Table B15. Industry Concentration Ratios

Item	Ukraine	Moldova
Meat Producers		
Number of processors	79	27
Total Productive Capacity (tons per day)	4,929.21	659.20
Percentage of total capacity by top four producers	21	52
Percentage of total capacity by top eight producers	34	76
Poultry Producers		
Number of processors	72	11
Total Productive Capacity (tons per day)	1,234.49	426.63
Percentage of total capacity by top four producers	19	77
Percentage of total capacity by top eight producers	33	96
Seafood Producers		
Total number of processors responding to the survey	30	17
Total Productive Capacity (tons per day)	6,156.26	313.80
Percentage of total capacity by top four producers	66	87
Percentage of total capacity by top eight producers	88	96

ANNEX C

Results of the Nominal Group Process in the PFID-Sponsored Stakeholders Meetings in Ukraine and Moldova

NGP Results, Ukraine

Meat

The five most important issues, as identified by the meat breakout group in Ukraine are described below. They were also identified, in the same order, as those that could most likely be addressed by the Project.

1. *Establishment of equal rules of competition for all entrepreneurial entities* - This means both improvement of the legal basis for business operations and the elimination of the "shadow" support mechanisms of individual enterprises. More than one thousand small private plants have emerged in the last decade throughout Ukraine, which produce sausages and other products without respect to sanitary, environmental and safety standards. Most of them are illegal and do not pay taxes. Even products of large operators are often sold at farmer markets without being officially accounted. As result, their prices, which do not include tax, are much lower as compared to the officially sold products. (47 weighted votes for importance, 37 for likelihood)
2. *Allotment of lax credits to meat processing enterprises* – Specific suggestions included allotment of long-term (1 year) credits for processing enterprises with a minimum of annual interest rate of 7-12%, which will allow replenishing of current assets, installing new equipment and introducing advanced technologies. Participants noted that there is no state financial support (in terms of lax credit) to national food producers (29 weighted votes for importance, 36 for likelihood).
3. *Merging of all quality control agencies (State Standards Committee, veterinary medicine agencies, Sanitary and Epidemiological Service) into one body* - In Ukraine the State Committee for Standards, veterinary medicine authorities, Sanitary and Epidemiological Service are all involved in regulating the food industry. Unfortunately, their regulations often are not consistent. In many cases, two or three different safety auditing groups may work at the same enterprise at the same time or within a short interval, interfering with production activities (26 weighted votes for importance, 24 for likelihood).
4. *Promote the development of the Association of Meat Producers of Ukraine* – Some participants claimed this to be the only body effective, fast-acting and capable to protect and advance its constituents' interest in an organized way. Others stated that processor associations still are not strong enough to provide strong support to their members. Many enterprises, especially large operations, do not feel they would have any advantage from membership. Furthermore the legal environment is not favorable for association activities. Not only does Ukrainian legislation not allow associations to be registered as a group of legal entities, but also the procedure of registration itself is not easy. Ukrmiasso's Director also stated that the Association should claim

financial support from the implementation of activities for members benefit (15 weighted votes for importance, 16 for likelihood).

5. *To develop distribution markets* - Due to the economic situation there are no marketing outlets in Ukraine. Participants also stressed the importance of distribution for their products, the potential for which is limited to the home market and to some extent the CIS markets, particularly Russia. Ukrmiasso's Director feels that this could be facilitated by Ukraine's active membership in the WTO (15 weighted votes for importance, 16 for likelihood).

Other issues raised in this NGP session included the following:

- An imperfect taxation system and the absence of the professionally developed legislation base;
- The absence of raw material production zone resulting in high costs;
- A not-always-sufficient level of vocational training (other breakout groups discussed this in greater detail);
- The development of thorough regulatory documentation for meat processing, harmonized with international and European standards;
- Education of the population in the culture of meat products consumption;
- A technology of manufacturing meat products using "meat mass" that should be based on fundamental food biochemistry research;
- The establishment of modern pilot laboratory for meat and meat products quality control;
- A certification of sausage production;
- A severe certification of low capacity plants to organize their work or close them down; and
- The unified state control over production.

Poultry

The six most important issues, as identified by the poultry breakout group in Ukraine are described below.

1. *Outdated slaughter equipment* - Current equipment was installed at the early eighties and is completely worn out. (17 weighted votes).
2. (Tie) *Targeted assistance to poultry farms in organization of recovery* – involving replenishment of poultry herd and providing for modern feeding technologies; and *Absence of modern high technological equipment* (16 weighted votes each).
3. *Shortage of professional personnel* (10 weighted votes).
4. (Tie) *Enterprises have no current assets* - it is necessary to invest in the processing industry and establish joint ventures; and *Processing of meat mass* (mechanically separated poultry meat) – determine the allowed content of bone inclusions during

manufacturing process and in finished products without threat to human health. (6 weighted votes each)

The poultry breakout group also identified the following five issues, in the order of likelihood that they felt could be addressed by the project.

1. *Outdated slaughter equipment* - Possible ways to replace them could be two-three year leasing of the equipment or credits with low interest rates. (18 weighted votes)
2. (Tie) *Shortage of professional personnel* – solved through training and vocational programs; and *Absence of modern high technological equipment* – This could be addressed by a study of modern world technologies and their adaptation to local conditions, as well as the simplification of the mechanism of high technologies introduction. (16 votes each)
3. *Targeted assistance to poultry farms in organization of recovery* (13 weighted votes)
4. *Processing of meat mass* (8 weighted votes)

Other issues raised in this NGP session included the following:

- No available funds to acquire modern technologies, poor credit and financial system;
- A low level of logistics of the poultry processing, which could be addressed by machine-building industry;
- An absence of testing equipment for quality control, microbiological analysis, etc.;
- The development of modern methods of poultry products quality control;
- Weak market/low purchasing power; and
- Harmonization of Ukrainian state standards.

Seafood

The five most important issues, as identified by the seafood breakout group in Ukraine are described below.

1. *Increased cost-effectiveness of the fish industry in the Southern region* (19 weighted votes)
2. *Financing and development of cultural (farm) seafood and fish growing in the Azov and Black Sea basin* - Given the deficiency of raw material (18 weighted votes).
3. *Combating shadow fish processing* (15 weighted votes)
4. *Simplified veterinary control of raw materials*, as well as issuing certificates for catching areas (13 weighted votes)
5. *Development of Internet-based information system of fish processing* - To develop a data bank of the needs of food markets, both domestic and international, and packing lines (11 weighted votes).

The seafood breakout group also identified the following five issues, in the order of likelihood, that they felt could be addressed by the project.

1. *Increased cost-effectiveness of fish industry in the Southern region* - Possibly through establishing a Service of private and state-owned enterprises providing the following components of the cold chain: movable ice-making plants, refrigerated transport and/or sectional coolers with changeable refrigerator equipment (18 weighted votes).
2. *Development of an Internet-based information system of fish processing* (17 weighted votes).
3. *Financing and development of cultural (farm) seafood and fish growing in the Azov and Black Sea basin* – Including widening the network of farms producing pond fish, mullets and mussels (16 weighted votes).
4. *Simplified veterinary control of raw materials* - By decreasing the number of controlled indices, as well as issuing certificates for catching areas (10 weighted votes)
5. (Tie) *Fight against shadow fish processing; Lack of quantity and assortment of domestic raw material* - for fish processing industry; and *Foundation of association of fish processors* - uniting fish-catching, fish processing and trade enterprises (7 weighted votes each)

Mr. Boris Gudyma of the Ukrainian Fish Industry Department noted that combatting unlicensed fish processing would be beyond the Project's scope (he also wondered if the NGP session resulted in issues that were important to the whole industry). Other issues raised in this NGP session included the following:

- Financing and promoting aqua-culture throughout Ukraine;
- Simplifying the control (not only veterinary) of fish and seafood processing products;
- The re-development of incubators for the necessary fish breeds to upgrade productivity of pond fishery;
- Transporting live commercial fish and parent stock;
- Harmonization of Ukrainian legislation with European regulations in the sphere of fish processing;
- Unified and simplified regulation of seafood processing;
- Stiffening of control of valued fish and seafood breeds catching; and
- Financial shortcomings – credit, taxation and selected monopolies.

NGP Results, Moldova

Meat

The five most important issues, as identified by the meat breakout group in Moldova are described below.

1. *A lack of a complete scientifically justified program of animal husbandry sector development* – For the supply of genetically improved animals for processing (20 weighted votes).
2. *The need to re-equip the processing facilities of plants* - Up to the European level (18 weighted votes).
3. *Local producers that produce competitive products according to current standards are not protected* – Due to the lack of Government interest and concern towards the situation of local meat producers (of raw material) and processors (15 weighted votes).
4. *The lack of an Association of animal and fodder producers and meat processors* (15 weighted votes)
5. *The problem of technological chain is not completely solved* – This includes weaknesses of the following links in the technological chain: genetic improvement, animals breeding and fattening for processing supplies, slaughtering and processing, storage, transportation and commercialization of products. (11 weighted votes)

The meat breakout group also identified the following five issues, in the order of likelihood that they felt could be addressed by the project.

1. *Local producers that produce competitive products according to current standards are not protected* – One possible solution would be to establish equal commercial conditions (import and export) between Moldova and the countries of CIS and Europe while another would be to change VAT stipulation for the raw material purchase (22 weighted votes).
2. *Lack of a complete scientifically justified program of animal husbandry sector development* – One possibility would be to restore the system of pedigree breeding farms in each branch of animal husbandry industry while another would be to increase the fattening conditions of cattle by utilizing sugar factories. An overall goal would be to develop an economically transparent environment characterized by correct competition, favorable to processors and consumers with the support of professional organizations (20 weighted votes).
3. *Need to re-equip the processing facilities of plants up to the European level* (17 weighted votes)
4. *Lack of an Association of animal and fodder producers and meat processors* (11 weighted votes)
5. (Tie) *The problem of technological chain is not completely solved; Protection of local manufacturers* (9 weighted votes each)

In analyzing the voting results, the major priority areas related to issues concerning the protection of local processors, which was reinforced in the stump speeches. There also were concerns regarding the need of investment that identified a need for the support of local producers to use working capacities more efficiently, update the facilities and increase the products quality.

The NGP participants also stated that the difficult situation of meat processing industry was due to the decline of the animal production sector that supplies the processors with raw material. The cattle purchased in the majority of cases do not meet the demands weight grades, due to a low fattening process.

Other issues raised in this NGP session included the following:

- The need for a common control commission;
- Personnel training through capacity building;
- The need to restrict imported natural additives for meat products;
- The need to develop a well targeted investing policy;
- The need to give to cattle producers 5% subsidies instead to take 5% of a special tax;
- The need to certify slaughtering equipment to promote reduction of energy consumption;
- Establishment of cattle processing plants in rural areas; and
- The need to identify each enterprise' critical issues in regard to power reduction generation

Poultry

The seven most important issues, as identified by the poultry breakout group in Moldova are described below.

1. *Lack of Integration Program between raw material producers and processing enterprises* (24 weighted votes).
2. (Tie) *Need to train poultry and processing specialists; Lack of poultry deep processing technologies* – addressing this would be a sure way to increase the profitability of poultry branch; *Lack of preferable credits* - with a interest of 3-5% for poultry breeders (15 weighted votes each).
3. *Need to reduce the price cost of poultry products by reduction of energy consumption for poultry products processing* (14 weighted votes).
4. *Need to create a Poultry Association* - This would facilitate: the export of poultry products, poultry processing, receiving of international credits and investments and standardize meat processing technology to export poultry products (12 weighted votes).
5. *Need to train the processing specialist at processing plants* – In ex-Soviet Georgia, USA, etc. (8 weighted votes).

The poultry breakout group also identified the following five issues, in the order of likelihood that they felt could be addressed by the project.

1. *Lack of Integration between raw material producers and processing enterprises* – Addressing the lack of fodder manufacture and restoring the system of pedigree reproduction facilities could help solve this problem (26 weighted votes).
2. *Lack of modern technologies of deep processing* (15 weighted votes).
3. *Lack of preferable credits* (14 weighted votes).
4. *Imperfect training system within the production and processing field* (13 weighted votes).
5. *Excessive cost of poultry products* (11 weighted votes).

Other issues raised in this NGP session included the following:

- Stimulation of the local processors by imposing taxes upon imported products;
- Lack of a centralized warehouse with sales distribution programs of poultry products in Chisinau and of a quick freezing tunnel with a high cold productivity of 10 t/hour for poultry products;
- Lack of broilers processors support by the subsidies;
- Lack of a technical scientific program that would facilitate the re-equipment of existing facilities and modern technologies application;
- Lack of sub-products producing technologies; and
- Exemption of taxation of poultry breeders that have a real contribution to raw material supply increase.

Seafood

The five most important issues, as identified by the seafood breakout group in Moldova are described below. They were also identified, in the same order, as those that could most likely be addressed by the Project.

1. *Lack of a Fish Industry Federation* - It is necessary to create a system of fish branch management, coordination and organization to unify manufacturers, processors and trading enterprises. (49 weighted votes for importance, 49 weighted votes for likelihood).
2. *Imperfection of Financial and Crediting Policy* - The Seasonal character of fish production limits the amount of inventories that can be used as collateral. The fixed assets of these enterprises are hydro-technical constructions (weirs, overflow weirs, dikes, dams etc.) but they cannot be used as collateral under existing legislation (23 weighted votes for importance, 29 weighted votes for likelihood).
3. *Inadequate and Reduced sources of local raw material for processing* – Imported marine products were the traditional raw material for processing. The local fresh-water fish were sold live, cooled and in part as culinary products. The local market is

currently glutted with unprocessed fresh-water fish. It is therefore necessary to organize and support the fresh fish processing industry, to sell salty, smoked, preserved and canned fish using local raw material. (23 weighted votes for importance, 20 weighted votes for likelihood).

4. *Lack of specialized fish sale markets in rural areas* - The main fish sales markets currently are concentrated in Chisinau and other large cities. Rural inhabitants do have the opportunity to purchase fish and fish products. (15 weighted votes for importance, 20 weighted votes for likelihood).
5. *Under-developed channels of fresh fish and fish products distribution and commercialization* - Processors of fish products are not able to promote the commercialization of fish and fish products by themselves. It is necessary to identify large centralized warehouses for grading, storage and marketing of fish products at the wholesale level. These centralized warehouses should be enabled with modern products distribution facilities, including pick and pack services or less-than-a-truckload programs (15 weighted votes for importance, 15 weighted votes for likelihood).

Other issues raised in this NGP session included the following:

- Absence of technological conditions for fish canning
- Lack of appropriate technical conditions of fish commercialization
- Too high price of raw material
- Need to meet the requirements of fish processing technologies
- Limited existing circulating financial means

ANNEX D
PFID, REFRIGERATION SURVEY

#, 1	Questions, 2	Answers, 3				
1.	Company name and address					
2.	Key contact person (name, title, phone, fax, e-mail)					
3.	Main types of products refrigerated for storage and processing					
4.	Refrigerative Storage capacity, tons of product					
5.	Annual product turnover, tons per year					
6.	Cargo is delivered to storage facility by <hr style="border-top: 1px dashed black;"/> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; text-align: center;">%</th> <th style="width: 50%; text-align: center;">%</th> </tr> </thead> <tbody> <tr> <td style="vertical-align: top;"> <ul style="list-style-type: none"> - refrigerated transport - insulated transport - conventional transport </td> <td style="vertical-align: top;"> <ul style="list-style-type: none"> - truck - rail - ship </td> </tr> </tbody> </table>	%	%	<ul style="list-style-type: none"> - refrigerated transport - insulated transport - conventional transport 	<ul style="list-style-type: none"> - truck - rail - ship 	
%	%					
<ul style="list-style-type: none"> - refrigerated transport - insulated transport - conventional transport 	<ul style="list-style-type: none"> - truck - rail - ship 					
7.	Cargo is delivered from storage facility by <hr style="border-top: 1px dashed black;"/> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; text-align: center;">%</th> <th style="width: 50%; text-align: center;">%</th> </tr> </thead> <tbody> <tr> <td style="vertical-align: top;"> <ul style="list-style-type: none"> - refrigerated transport - insulated transport - conventional transport </td> <td style="vertical-align: top;"> <ul style="list-style-type: none"> - truck - rail - ship </td> </tr> </tbody> </table>	%	%	<ul style="list-style-type: none"> - refrigerated transport - insulated transport - conventional transport 	<ul style="list-style-type: none"> - truck - rail - ship 	
%	%					
<ul style="list-style-type: none"> - refrigerated transport - insulated transport - conventional transport 	<ul style="list-style-type: none"> - truck - rail - ship 					
8.	Name of plant designer and number of standard or custom design of refrigerator (processing line)					
9.	Date of beginning operation					
10.	Have the facility been modified? If so, with what purpose? Is documentation available?					
11.	General condition of the facility (refrigerator, sectional coolers, processing lines): <ul style="list-style-type: none"> - excellent - good - satisfactory - non-satisfactory 					
12.	Type of cooling agent (ammonia, freon, other)					
13.	Cooling system: <ul style="list-style-type: none"> - primary refrigeration circulation - secondary refrigeration circulation 					

#, 1	Questions, 2	Answers, 3
14.	Type of chamber cooling: - ceiling - pipe cooling - fan coil evaporator	
15.	Compressor plant equipment (date of production and producer): - compressors - pumps (water, brine, ammonia) - evaporators, condensers, subcoolers - cooling tower/evaporative condensers - receivers (linear, drain, circulation) - liquid trap - oil collector - spray cooling pond/underfloor system - brine heating device	
16.	Chamber equipment (indicate type of equipment and year of production): - plain-tube piping - finned coils - air coolers	
17.	Condition of thermal insulation (wet, satisfactory, needing repair)	
18.	Total installed power of refrigeration equipment (connected electrical horsepower or equivalent)	
19.	Quantity of primary refrigerant in system, kg	
20.	Quantity of secondary refrigerant in system, kg	
21.	Annual refilling of primary and secondary refrigerant and refrigerating medium, kg	
22.	Average annual power consumption, kWh	
23.	Total number and list of personnel attending the refrigeration system, with references to qualification certificates	
24.	List of governmental (national or international) standards and regulations applied to specification of quality of delivered, stored and shipped products	
25.	Methods and instruments used for assessment of quality of products	
26.	Do you provide regular training for your personnel – what kind What resources do you use for this training; Is there an need for additional training – what kind?	
27.	Do you have an experience of exporting your own products?	

ANNEX E

REFRIGERATION, STANDARDS AND METHODS FOR ASSESSMENT OF QUALITY CONTROL ANALYSES

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Note. Complete findings are available from the project although identification of individual companies will require their approval.

Table E1. Type of Transportation to Storage Facility

Number of companies (and percentage of all fifty-six) that use Refrigerated transport			
Below 50 %	Between 50 and 100 %	All the time	Total
2 (3.6%)	3 (5.4%)	9 (16.1%)	14 (25.0%)
Number of companies (and percentage of all fifty-six) that use Insulated transport			
Below 50 %	Between 50 and 100 %	All the time	Total
3 (5.4%)	2 (3.6%)	1 (1.8%)	10 (17.9%)
Number of companies (and percentage of all fifty-six) that use Conventional transport			
Below 50 %	Between 50 and 100 %	All the time	Total
1 (1.8%)	2 (3.6%)	36 (64.3%)	39 (69.6%)

Note: Every company (100%) use trucks to deliver cargo to storage facility but only five (8.8%) companies use rail to deliver cargo to storage facility.

Table E2. Type of Transportation from Storage Facility

Number of companies (and percentage of all fifty-six) that use Refrigerated transport			
Below 50 %	Between 50 and 100 %	All the time	Total
2 (3.6%)	11 (19.6%)	17 (30.4%)	30 (53.6%)
Number of companies (and percentage of all fifty-six) that use Insulated transport			
Below 50 %	Between 50 and 100 %	All the time	Total
5 (8.9%)	2 (3.6%)	8 (14.3%)	15 (26.8%)
Number of companies (and percentage of all fifty-six) that use Conventional transport			
Below 50 %	Between 50 and 100 %	All the time	Total
3 (5.4%)	4 (7.1%)	19 (33.9%)	26 (46.4%)

Note: Every company uses trucks for cargo delivery from storage facility. Eighteen companies (32.1%) use railway transport for cargo delivery from storage facility. Such rail transport involved moving carcasses and half-carcasses by pendant roller transport to a cooling chamber where they are preserved at a temperature from 0 up to +4 degrees (24 hours). After cooling, meat goes on either to retail or for further processing on the same suspended rollers in insulated transport.

Currently the following technologies of transportation are applied for frozen meat long storage terms (6 month and more): From slaughterhouse on a pendant way carcasses move to the frost chamber (-30 degrees). After frosting, meat intended for long storage is delivered to storage chambers where it's developed in stacks and is maintained at temperature of -20 degrees C. For realization meat from these chambers by loaders moves in refrigerator transport (trucks, rail transport).

Rail cars are of two types: 1. Each car has refrigerating equipment; 2. Four cars have one source of refrigeration.

Some companies, which export meat to Russia, separate meat from bones and pack it in blocks in vacuum package. In such packages frozen meat by refrigerated transport (track or rail) goes on export.

Insulated transport at the majority of clients is obsolete and does not provide endurance of necessary temperature, especially during the summer time.

Table E3. Instruments for Temperature and Meat Quality Control Utilized by SA “Carmez” Laboratory

Instrument	Description of method
Poliarograf PLS-1	Determination of toxic elements concentration: copper, cadmium, lead, zinc
Photoelectrocolorimetr KFK-2	Determination of elements concentration: arsenic, tin, iron and sodium nitrit
Mercury analyser “Iulia”-2M	Determination of mercury vapour concentration
Chromatograph “Cristall-2000”	Determination of complicated organic compounds (pesticides)
Universal Ionometer	pH determination in water solutions
Universal Refractometer	Measurement of refraction indexes of liquid and solid substances
Biologic Microscopes	Determination of microbiologic indexes
Radiometer “Beta”	Determination of total radionuclids
Rotary evaporator	Solution evaporation
Autoclaves	Sterilization
Trichinascop	Trihina determination
KCM-4 and KCM-5	Automatic temperature control in refrigerated chambers
KCM-3	Temperature control of sausage during termal processing
KCD-3	Temperature control during cans sterilization

Compressor Equipment - Only 6 (7.1%) PFID client companies have imported compressor plant equipment. One is partly equipped with the German equipment, installed in 1999. Another is equipped with new German and Italian equipment. The third is equipped with new imported equipment and a Cooperative Agricultural Enterprise is partly equipped with the German equipment and Yugoslavian compressor equipment installed 1990.

All other companies have obsolete equipment made in the old USSR, or in the countries of the CIS - Russia, Ukraine, Moldova (1960-1994 years). Much of this compressor equipment should be replaced with modern facility.

Table E4. Condition of Thermal Insulation (based on 47 responses)

Condition of thermal insulation	Number of companies
Wet	1 (2.1%)
Needing repair	9 (19.1%)
Needing partial repair/replacement	2 (4.3%)
Need to replace insulation	1 (2.1%)
Satisfactory or above	34 (72.3%)

Table E5. Cooling System (out of 48 responses)

	Primary refrigeration circulation ¹	Secondary refrigeration circulation ²
Number of companies	35 (72.9%)	13 (27.1%)

Table E6. Chamber Equipment (out of 53 responses)

	Plain-tube piping	Finned coils	Air coolers
Number of companies	3 (5.7%)	25 (47.2%)	25 (47.2%)

Table E7. Level of Processing Companies

	Number of Companies	Refrigerative Storage capacity, tons of product			
		Total	Limits		Mean
			min.	max.	
Up to 100 tons	28 (51.9%)	465.5	0.3	80	16.6
From 100 up to 1000 tons	21 (38.9%)	4,737.0	100	540	225.6
Over 1000 tons*	5 (9.3%)	16,266.0	1,000	9,200	3,253.2
Total:	54	21,468.5			

* - SA “Carmez”, IRCR “Carnlaptcom”, FA “Anina”, SA “Iahny”, ICS “Free Fisheries”

¹ Primary refrigeration circulation is a system that lowers the temperature through a system of direct evaporation or through air-cooling from a vaporizer (air/evaporation). Primary refrigeration circulation has more advantages in comparison to secondary refrigeration including less power consumption, no required expenses to install adherent equipment for intercooler and reduced thermal inertia of the facility.

² Secondary refrigeration circulation is a refrigerating system using an intercooler that is a liquid.

Table E8. Refrigerative Storage Capacity of PFID Clients (tons) and Annual Product Turnover (tons/year) on Category of Processing

Products	Number of Companies	Refrigerative Storage capacity, t	Annual product turnover, tons/year
Meat	30	7,556.0	84,127.9
Poultry	10	2,981.0	16,394.0
Seafood	13	1,731.5	3,355.0
Total:	53	21,468.5	103876.9

Table E9. Levels of PFID clients according to the type of cooling agent

Type of cooling agent	Number of companies	%
Freon	34	64.2
Ammonia	15	28.3
Mixed	4	7.5
Total:	53	100.0

ANNEX F

SAFETY, SANITATION AND STANDARDS IN UKRAINE AND MOLDOVA

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Tables Pertaining to Standards, Sanitation and Quality Control in Moldova

Note. This information was compiled by INZVM

Table F1. Most Frequently Mentioned Standards in the Moldovan Food Industry

Products	Standards
Meat and meat products	
Pork	GOST 7724-77
Beef	GOST 779-55 GOST 1995-55
Horse meat	GOST 27095-86
Sub products	TU 10.02.01.75-88
Frozen meat in blocks	OST 10.02.01.124-90 OST 10.02.01.04-86
Meat semi fabricates	TU 10.02.01.124-90 OST 49 38-35 OST 49 208-88
Force-meat	TU 10.02.01.124-90
Rendered fat of animal origin	GOST 25292-82
Rendered technical fat of animal origin	GOST 1045-73
Boiled sausage, frankfurters, wieners	GOST 23670-79 TU 49 1068-84 TU 10.02.01.37-87 TU 10.02.01.-134-90 TU 10.02.01.133-90 TU 10.02.01-76-88 TU 49 1053-84 PT MD 67-00458868-001-94 PT MD 67-00458868-002-95 PT MD 67-00458868-004-95 PT MD 67-00458868-007 PT MD 67-00458868-008-96 PT MD 67-00458868-009-96 PT MD 67-00400053-016-95 PT MD 67-00400053-026-96 PT MD 67-00400053-028-96 SP MD 67-05-008-96 SP MD 67-05-033-98

Table F1. Most Frequently Mentioned Standards in the Moldovan Food Industry

Products	Standards
Sausage boiled-smoked, semi-smoked, summer sausage and meat products	GOST 16290-86 GOST 16351-86 GOST 16131-86 TU 49 734-80 GOST 18255-85 GOST 18236-85 RST MSSR 330-93 RST MSSR 19-87 GOST 18256-85 TU 10.02.01.143-91 PT MD 67-00458886-003-95 PT MD 67-00458886-005-95 PT MD 67-00458886-006-95 PT MD 67-00458886-010-95 SP MD 67-05-031-98 SP MD 67-05-032-98 GOST 16594-85 SP MD 67-05-022-97 TU 255.060-195-93 TU 10-02-01-123-90 SP MD 10530-84
Canning meat	GOST 697-84 GOST 7993-90 GOST 12424-77 GOST 123 19-77 GOST 1987-79 GOST 9936-76 GOST 5284-84 GOST 82856-90 TU 10.02.01.220-95 TU 10.02.01.219-95 TU 10.02.01.218-95 TU 49 187-82
Poultry	
Poultry meat (chicken, duck, goose, turkey, guinea fowl carcasses)	GOST 21784-76
Chicken (broilers) meat	GOST 25391-82
Agricultural poultry for slaughtering	GOST 18292-85
Poultry meat products	GOST 18447-91

Table F1. Most Frequently Mentioned Standards in the Moldovan Food Industry

Products	Standards
Poultry meat	GOST 28825-90
Poultry cans	GOST 608-93
Poultry canning meat. Stewed poultry meat	GOST 7991-77
Canning meat "Poultry meat stewed in own juice"	GOST 28589-90
Seafood	
Chilled fish	GOST 814-96
Frozen fish	GOST 1168-86
Filletted frozen fish	GOST 3948-90
Frozen squid and cuttlefish	GOST 20414-93
Frozen tunny-fish, mackerel, marline and sword-fish	GOST 17661-72
Special dressed frozen fish	GOST 17660-97
Salt fish	GOST 7448-96
Salt herring	GOST 815-88
Spicy salt and marinaded herring	GOST 1084-88
Spicy salt mackerel and horse-mackerel	GOST 18223-88
Canning fish. Fish in oil (blanced, predried or dried)	GOST 7454-90
Cold-smoked fish	GOST 11482-96
Natural fish cans with oil	GOST 13865-68
Fish cans in tomato sauce	GOST 16978-99

Note: INZVM has provided the most frequently used standards.

Table F2. The Main Methods of Quality Control in Moldova

Method	GOST (standard)
Meat and meat products	
Raw material and foodstuffs. Method of mercury determination	26927-86 RM 5178-90
Foodstuffs. Method of iron determination	26928-86
Raw material and foodstuffs. Method of arsenic determination	26930-86
Raw material and foodstuffs. Method of copper determination	26931-86
Raw material and foodstuffs. Method of lead determination	26932-86
Raw material and foodstuffs. Method of cadmium determination	26933-86
Raw material and foodstuffs. Method of zinc determination	26934-86
Canning foodstuffs. Method of tin determination	26935-86
Principles guidelines of determination, identification and control of aflotoxines contents in foodstuffs	#2273-80
Methodical recommendations to determine, identify and control of levomycetin residues in products of animal origin	#4-18/1980
Principles guidelines of pesticides micro-contents residues determination in foodstuffs	1974
Meat products. Methods of moisture content determination	9793-74
Meat products. Methods of phosphorus total contents determination	9794-74
Meat and meat products. Methods of fat determination	23231-90
Sausage and meat boiled products. Method of acid phosphatase residual activity	23231-90
Pork, beef and mutton sausage and products. Method of sodium chloride contents determination	9957-73
Meat products. Method of nitrate, nitrite determination	8558.1-78 8558.2-78
Meat products. Method of starch determination	10574-91
Meat and meat products. Method of protein determination	25011-81
Canning foodstuffs. Method of organoleptic indexes determination	8756.1-79
Foodstuffs. Methods of microorganisms cultivation	26670-91

Table F2. The Main Methods of Quality Control in Moldova

Method	GOST (standard)
Methodical recommendations to determine antibiotic residues in products of animal origin	3049-84
Meat. Methods of bacteriologic analyses	21237-75
Sausage and meat products. Methods of bacteriologic analyses	9958-81
Cans. Method of industrial sterility determination	30425-97
Foodstuffs. Methods of Escherichia coli group bacteria determination	50474-93
Foodstuff. Method of Proteus, Morganella, Providencia bacteria kinds determination	28560-90
Foodstuffs. Method Salmonella bacteria kinds determination	50480-93
Foodstuffs. Method of mesophilic aerobic and elective-anaerobe pathogenic bacteria determination	10444.15-94
Foodstuffs. Methods of Staphylococcus exposure and amount determination	10444.2-94
Foodstuffs. Methods of sulphitereducing clostridia exposure and amount determination	29185-91
Foodstuffs. Method of Bacillus cereus determination	10444.8-98
Foodstuffs. Method of Clostridium perfringens determination	10444.9-88
Foodstuffs. Method of yeast and micelial fungus determination	10444.12-88
Foodstuffs. Method of botulinic toxins Clostridium Botulinim determination	10444.7-86
Foodstuffs. Method of lactobacillus determination	10444-11-89
Hand-book for order of cans sanitary-technical control on processing plants, wholesale depots, retail trade and public catering	#01-19/9-11
Radionuclids determination	CMB 5061-89 SanPin 2.3.2.56096
Meat temperature control	28498-90
Poultry meat products	
Poultry meat, poultry subproducts and semifabricates. Method of Salmonella determination	7702.2.2-93
Poultry meat. Methods of chemical and microscopic analyses of meat freshness	7702.1-74

Table F2. The Main Methods of Quality Control in Moldova

Method	GOST (standard)
Poultry meat, poultry subproducts and semifabricates. Method of samples collection and preparation to microbiological tests	7702.2.0-95 P 50396.0-92
Poultry meat, poultry subproducts and semifabricates. Method of mesophilic aerobic and elective-anaerobe pathogenic microorganisms determination	7702.2.1-95 P 50396.1-92
Poultry meat, poultry subproducts and semifabricates. Method of exposure and amount determination of Escherichia group bacteria (Escherichia, Citrobacter, Enterobacter, Klebsiella, Serratia)	7702.2.2-93
Poultry meat, poultry subproducts and semifabricates. Method of Salmonella exposure	7702.2.3-93
Poultry meat, poultry subproducts and semifabricates. Method of exposure and amount determination of Staphylococcus aureus	7702.2.4-93
Poultry meat, poultry subproducts and semifabricates. Method of exposure and amount determination of Listerella	7702.2.5-93
Poultry meat, poultry subproducts and semifabricates. Method of exposure and amount determination sulphitereducing Clostridia	7702.2.6-93
Poultry meat, poultry subproducts and semifabricates. Method of Proteus kinds of bacteria determination	7702.2.7-95 P 50396.7-92
Seafood	
Fish, sea mammals, sea invertebrates and products of its processing. Acceptance regulations, organoleptic methods of quality control, methods of samples collection for laboratory testings	7631-85
Fish, sea mammals, sea invertebrates and products of its processing. Analyses methods.	7636-85
Fish preserves. Buffering determination methods	19182-89
Fish and seafood cans and preserves. Methods of organoleptic indexes determination, mass netto and mass share of component parts	26664-85
Fish and seafood cans. Methods of dry matter determination	26808-86
Caviar and fish and seafood preserves. Method of preservatives determination	27001-86
Fish and seafood cans and preserves. Methods of total acidity determination	27082-89
Fish and seafood cans and preserves. Methods of aluminium determination	28914-91

Table F2. The Main Methods of Quality Control in Moldova

Method	GOST (standard)
Cans and products of fish and non-fish fisheries. Method of active acidity determination (pH)	28972-91
Fish, sea mammals, sea invertebrates and products of its processing. Methods of mass share carbamide determination and estimation of crude protein	P 50032-92
Fish, sea mammals, sea invertebrates and products of its processing. Method of ammonia mass share measurement in fish	P 50846-96
Water	
Drinking water. Methods of sanitary-bacteriological control	18963-73
Drinking water. Hygienic requirements and quality control control	2874-82, md 1,2

Note: The majority of PFID clients has no completely equipped laboratories for quality control and relies on regional laboratories for quality control. Only such large enterprises such as SA “Carmez” and “Carnlaptcom” have well-equipped laboratories. Three special laboratories provide bacteriologic and other kinds of control: the Republican Diagnostic Center and two Regional Diagnostic Centers.

Table F3. The List of Product Bacteriological Control Measures by A “Carmez” (as an example)

	Products	Control	Plant name	Periodicity of the control
1	Meat (carcasses, corpse)	Presence of anaerobic and aerobic pathogenes and conditionally pathogenic bacteria. The total number of cells	Slaughter and point of animal reception	During reception
2	Sausage	Presence of pathogenic conditionally pathogenic microflora	Sausage plant	Once in 5 days
3	Canning meat	The total number of cells. Control of anaerobic bacteria in cans before and after sterilization	Canning plant	Every units
4	Meat and bone flour	The total number of cells. Presence of pathogenic and conditionally pathogenic microflora	Meat and bone flour plant	Every party
5	Water	The total number of cells Presence of anaerobic bacteria	Rezervuars and cranes Canning plant	Once in a month Once in a month
6	Auxiliary materials	The total number of cells. Coliform bacteria. Presence of pathogenic microflora, salmonella, clostridium sulfitreducing	Warehouse	During reception
7	Spices	The total number of cells. Presence of pathogenic and conditionally pathogenic microflora, mould.	Warehouse	During reception

Table F3. The List of Product Bacteriological Control Measures by A “Carmez” (as an example)

	Products	Control	Plant name	Periodicity of the control
8	Sanitary treatment of the equipment, coveralls, instruments	Presence of Escherichia coli, salmonella	Every meat processing plants	Once in a week
9	Refrigeration chambers	Presence of fungicides	Refrigeration chambers	Once in a quarter
10	Poultry (carcasses, intestines, corpses)	Presence of salmonella	Poultry processing plant	Once in a week
11	Blood and blood serum	Presence of pathogenic and conditionally pathogenic microflora	Sausage plant	Once in a week
12	Meat	Presence of antibiotics	Slaughter and sausage plant	Once in a quarter

Information Pertaining to Standards, Sanitation and Quality Control in Ukraine

New Standards for Adoption regarding Processed Meat Products in Ukraine -

Note. Compiled by the Ukrainian State Committee for Standards

After the President and the Government of Ukraine adopted a strategy of entering into the global economic processes, particularly through joining WTO and integrating with EU, the State Committee of Standards of Ukraine has faced the task of developing new, market-oriented advanced system of technical regulation, favoring sustainable economic growth, increased competitiveness and quality of national products, and elimination of technical constraints in trade with our foreign partners.

Such a system should be established through implementation of the Laws of Ukraine “On Standardization”, “On Acknowledgement of Conformity” and “On Accreditation of Conformity Assessment”, adopted on May 17 this year by the Verhovna Rada (the Parliament of Ukraine) and on July 8 signed by the President of Ukraine.

These laws are the first Ukrainian legislative acts in the sphere of technical regulation, corresponding to the objectives of the national economy reform and developed with consideration of European and international standards, codes and norms.

The Law of Ukraine “On Standardization” establishes legal and economic basis of the national standardization system, and defines the ways of its reforming in compliance with international and European practices. Basic provisions of the Law are as follows: voluntary participation of all parties concerned in development and application of standards; openness of the standards and information thereof for users; adaptation to the latest scientific and technological advances with regard to the national economic conditions; compliance with international and European rules and procedures; participation in international and regional standardization process.

Due to the Ukrainian economic condition, regard is given to the step-by-step transition to voluntary application of national standards and adoption of appropriate national technical regulations. Obligatory application of standards is established through legislative references made in the above-mentioned technical regulations.

The Law of Ukraine “On Acknowledgement of Conformity” provides for legal and organizational grounds of acknowledgement of conformity of products, quality and environment management systems, and personnel to the established requirements. This document defines objects of acknowledgement of conformity, general principles of the national policy in the sphere of acknowledgement of conformity, powers of executive authorities.

The basic provision of the Law is an obligatory acknowledgement of conformity of products in legally regulated area by acquiring conformity declaration or certificate.

Acknowledgement of conformity in the area, out of legal regulation, is fulfilled on the voluntary basis.

The Law also establishes the duties of producers and suppliers, responsibility in case of violation of legal requirements of the acknowledgement of conformity legislation and procedures of contesting actions of authorized agencies, financial sources.

Adoption and enforcement of this Law will help producers to reduce expenditures for obligatory acknowledgement of the conformity procedure. In this case the safety of products for consumers will be ensured exclusively through increased requirements for producers self-control and efficient activity of certification and state control bodies.

The basic provision of the Law of Ukraine “On Accreditation of Conformity Assessment” is that the accreditation system is separated from the system of conformity assessment and will work both within the legally regulated and non-regulated (voluntary) spheres.

Accreditation becomes a voluntary procedure. Accreditation activity is fulfilled at the national level in compliance with procedures and criteria used in international practice.

The National accreditation body consists of the Accreditation Council formed on parity basis of representatives of all parties concerned, technical accreditation committees, commission of appeals, and executive subdivisions.

This Law, when adopted and enforced, will promote consumers' confidence in conformity assessment activities, and facilitate establishment of conditions for mutual recognition of the results of activities of entities at the international level.

Adoption of laws meets the demands and requests of Ukrainian industry and our trade partners, ensures the recognition of the national technical regulation system, eliminates technical barriers in international trade, and mutually simplifies an access of the products to markets.

Analysis of the legislation shows that it fully complies with the requirements of the World Trade Organization and the EU.

Among legislative enactments necessary to be worked out the following documents have already been prepared:

- Draft laws of Ukraine “On Introducing Amendments to the Decree of the Cabinet of Ministers of Ukraine “On the State Control of Adherence to the Standards, Codes and Rules and Responsibility for Violation thereof” and “On Introducing Amendments to the Law of Ukraine “On Quality and Safety of Food and Food Raw Materials” to adjust them to the provisions of the Law of Ukraine “On Acknowledgement of Conformity”;
- Draft decree of the President of Ukraine “On Introducing Amendments to the Provision On State Committee of Standardization, Metrology and Certification”;
- Draft resolutions of the Cabinet of Ministers of Ukraine:
- On the Procedure and Duration of Application of Branch Standards and Equitable Other Regulations of the Former USSR;
- On Standardization Council;
- On Measures for Establishment of State System of Products Codification;
- On Approval of the Description and Rules of Application of the National Conformity Mark;
- On Requirements for Authorized Certification Agencies/bodies and the Procedure of their Authorization;
- On Approval of the Rules of Determination of the Costs of the Conformity Acknowledgement Activities in the Legally-Regulated Sphere;
- On Approval of the Procedure of Accreditation of the Conformity Assessment Bodies.

The draft regulations on the National Accreditation Body, technical accreditation committees, and Accreditation Council have been prepared.

The State Standardization System (SSS) standards “Standardization and Allied Activities, Terms and Definitions” and “Rules and Methods of Adoption of International Standards” have been adopted and other basic SSS standards are being revised.

To execute the Decree of the President of Ukraine #113 of February 23, 2001 “On Measures to Increase Quality of National Products” by approving the resolution of the Cabinet of Ministers of Ukraine #800 of July 11 2001, the Ukrainian Institute of Quality was established and state standards of Ukraine (DSTU) ISO 9000, 9001, 9004, complying with international standards of version 2000 were adopted. The Standards will enter into force as of October 2001.

A number of draft regulatory acts that should encourage national enterprises to implement the quality management systems based on international standards ISO 9000 and total quality management (TQM).

Among them are the following:

- Draft Law of Ukraine “On the Principles of the State Quality Policy”;
- Draft resolutions of the Cabinet of Ministers of Ukraine “On the Award of the Cabinet of Ministers of Ukraine for Quality Management”, “On the Preparation and Holding of European Quality Week” etc.

The Cabinet of Ministers of Ukraine issued the Order “On Approval of the Schedule of Top-Priority Actions on Implementation of Quality Management Systems at enterprises and organizations of Ukraine”, which provides for ensuring initial and advanced training of quality management specialists and developing appropriate curriculums, establishing a wide network of methodological and extension centers, developing fundamental and applied researches in this sphere, organizing national and regional competitions and competition “for best products”. The winner of regional competitions will qualify for the final of the national one and will contest for the Quality Management Award of the Cabinet of Ministers of Ukraine.

The above-mentioned Decree of the President of Ukraine imposes a new function on the State Standards Committee – cross-sectoral coordination and functional regulation of quality management issues.

Ukraine has to fulfill a great amount of work to harmonize its legal base. Taking into account Ukrainian economic conditions, a step-by-step implementation of European directives and international and European standards is provided for. Along with existing standards which comply with legislation, new ones will be introduced. This will assist Ukrainian producers to prepare themselves for voluntary application of national standards.

About 5, 000 of European standards and about 100 EU directives are scheduled to be introduced in the next 7 years. For this year it is planned to develop 11 national technical regulations based of the EU directives and more than 1300 national standards harmonized with European and international ones. For the years 2002-2004 the schedule of adaptation

of Ukrainian legislation to the European Union legislation provides for introduction of 65 EU directives. This opens up a wide perspective for innovations, updating the means of production and product assortment.

In the near future the State Standards Committee, ministries and other central authorities have to fulfill a number of tasks for implementation of provisions of the new legislation.

The next stage of the technical regulation system reform is an institutional reform.

According to international and European rules and procedures, an independent National Accreditation Body will be established by the end of this year; it will ensure competent, transparent, and independent assessment of certification bodies and testing laboratories. The Body will allow Ukraine to join international and European accreditation organizations, open the door to recognition of the national technical regulation system by countries – trade partners can significantly facilitate the access of Ukrainian goods to world markets.

For the startup of this Body a number of statutory documents and regulations should be elaborated and specialists trained.

Today Ukrainian Certification Bodies face the problems of operating in conditions of severe competition while the scale of obligatory certification is reducing and new conformity acknowledgement procedures are being introduced.

The possible solution is to associate several bodies certifying products of similar type into one authorized competitive body complying with the requirements of international and European standards and able to be accredited both in Ukraine and abroad.

With this aim three operating bodies of electrical equipment certification were associated and the Ukrainian Center of Electrical Machinery Certification was established in Kyiv.

The European Union countries highly appreciated the progress Ukraine have recently made in the sphere of technical regulation and suggested to nominate Ukraine to the ISO Council as a third group country.

Adaptation and adjustment of the technical regulation system of Ukraine to the European one is recognized as a priority issue of its development, in accordance with Articles 51 and 56 of Agreement on Friendship and Cooperation Between Ukraine and the EU. Therefore the Ukrainian part is highly interested in cooperation with countries - WTO candidates and also in close study of their experience. Concluding bilateral agreements on mutual recognition of certification results is one of the ways of such cooperation.

Standards Applicable to Catching and Processing of Fish

Note. Compiled by World Lab

Frozen fish

- GOST (State Standard of the former USSR) 20057-96 Frozen fish of ocean fishery
- GOST 7631085 Fish, oceanic mammals, invertebrates and products of their processing (sampling, assessment of organoleptic indices, size and body)
- GOST 7636-85 Fish, oceanic mammals, invertebrates and products of their processing (fat, wt.)
- State Standard of Ukraine 15-25-98 Frozen small-sized fish. Specifications
- State Standard of Ukraine 15-12-98 Frozen herring. Specifications

Chilled fish

- GOST 1368-91 Fish of all types of processing. Length and weight
- TU (Specs) of Ukraine 15-95-97 Chilled small-sized fish

Raw fish

- GOST 15-3-94 Small-sized fish Specifications
- TU (Specs) of Ukraine 15-83-96 Black Sea sprat, sardelle and raw Black Sea anchovy
- TU (Specs) of Ukraine 15-84-96 Raw inland fish

Cold-smoked fish

- GOST 11482-96 Cold-smoked fish
- GOST 15-3-97 Cold-smoked small-sized fish. Specifications

Salted herring

- GOST 815-88 Salted herrings

Sun-dried fish

- GOST 1551-93 Sun-dried fish. Specifications

Canned fish in tomato sauce

- GOST 16978-89 Canned fish in tomato sauce. Specifications
- TU (Specs) of Ukraine 26-94 Black Sea Anchovy in tomato sauce. Specifications
- GOST 8756.0-70 Canned foods. Sampling and preparation for testing

- GOST 26664-85 Canned foods. Methods of assessment of organoleptic indices, net weight and weight of components
- GOST 11771-93 Canned and preserved fish and seafood. Packing and marking
- GOST 26808-86 Canned foods. Method of determination of solids
- GOST 26808-86 Canned foods. Methods of determination of fat
- GOST 27082-89 Canned foods. Methods of determination of total acidity
- GOST 27207-87 Canned foods. Methods of determination of common salt
- GOST 304425 Canned foods. Methods of determination of commercial sterility

Canned fish natural in oil

- GOST 13865-68 Canned fish natural in oil. Specifications
- GOST 15-1-02 Canned inland fish natural in oil. Specifications (sampling)

Fodder fish flour

- GOST 2126-82 Fodder fish flour
- GOST 7636-85 Fish, oceanic mammals, invertebrates and products of their processing

Potable water

- GOST 2874-82 Potable water. Hygienic requirements and quality control
- GOST 24481-80 Potable water. Sampling
- GOST 3351-74 Potable water. Methods of analysis (organoleptic indices)
- GOST 18963-73 Potable water. Methods of sanitary and bacteriological analysis (bacteriological indices)

Incoming control

- State Standard of Ukraine 2316-93 Sand sugar. Specifications (organoleptic indices)
- GOST 12569-85 Sand sugar. Refinery sugar. Rules of acceptance and methods of sampling
- GOST 13685-84 Edible salt. Methods of testing (sampling)
- State Standard of Ukraine 3583-97 Table salt. General specifications (organoleptic indices)

Condiments and spices

- GOST 28880-90 Condiments and spices. Acceptance and methods of analysis

- GOST 28875-90 §3.4 Spices (sampling, organoleptic indices, insect contamination)
- GOST 29045-91 Pimento. Specifications
- GOST 29047-91 Cloves. Specifications
- GOST 29049-91 Cinnamon. Specifications
- GOST 29050-91 White and black pepper. Specifications
- GOST 29053-91 Powdered red pepper. Specifications
- GOST 29055-91 Coriander. Specifications
- GOST 29056-91 Cumin. Specifications

Bacteriological tests

- GOST 10444.8-88 Food products. Method of *Bacillus cereus* determination
- GOST 10444.11-89 Food products. Methods of determination of lactic-acid bacteria
- GOST 10444.12-88 Food products. Methods of determination of yeast
- GOST 10444.15-94 Food products. Methods of determination and evaluation of mesophilic aerobic and facultative anaerobic microorganisms
- GOST 26668-85 Food products and flavors. Methods of sampling for microbiological analyses
- GOST 26669-85 Food products and flavors. Preparation of samples for microbiological analyses
- GOST 26670-91 Food products and flavors. Methods of cultivation of cultivation
- GOST 304425-97 Canned food. Methods of determination of commercial sterility
- GOST 29184-91 Food products. Methods of determination and evaluation of
- Enterobacteriaceae
- GOST 29185-91 Food products. Methods of determination and evaluation of sulphite-reducing clostridia
- MI (Procedural instruction) #1121-73 Regulation on the procedure of sanitary and hygienic inspection of canned food at manufacturing enterprises, wholesale warehouses, retail businesses and public catering establishments
- MI (Procedural instruction) #4222-86 Procedural instruction on sanitary and microbiological inspection of production of fish and sea invertebrates foods
- MI (Procedural instruction) #5319-91 Instruction on sanitary and microbiological inspection of production of fish and sea invertebrates foods

- MBT (Medical and biological requirements) #5061-81 Medical and biological requirements and sanitary quality standards of food raw materials and foods

Storage Life of Canned Goods According to Regulations

Table F4. Canned Comminuted Fish with Vegetables

# of Standard		Storage life
State Standard of Ukraine 15-48-2000	"Zavtrak Turista" (Tourist Breakfast)	12 months
State Standard of Ukraine 15-48-2000	Ready-to-serve Fish and Vegetable salade in tomato sauce	12 months
State Standard of Ukraine 15-47-2000	Bighead Pilaff	12 months
State Standard of Ukraine 15-47-2000	Bighead with pearl and vegetables	12 months
State Standard of Ukraine 15-37-2000	Seaside ("Primorskaya") Solyanka (a sharp tasting thick soup of laminaria and fish)	12 months

Table F5. Canned Meat; Canned Meat and Vegetables

# of Standard		Storage life
TU (Specs) of Ukraine 013903778-74-99	Liver paste "Odessky"	12 months
TU (Specs) of Ukraine 013903778-74-99	Poultry paste "Odessky"	12 months
GOST 8687-65	Beef <....>	2 years
GOST 8286-90	Beef meat with Buckwheat	2 years
GOST 8286-90	Beef meat with Rice	2 years

Table F6. Tinned Mussels

# of Standard		Storage life
TU (Specs) of Ukraine 15-86-96	Smoked Black Sea mussels in oil	12 months

Table F7. Canned Fish in Tomato Sauce

# of Standard		Storage life
GOST 16978-89	Black Sea fried sprats in tomato sauce	2 years
GOST 16978-89	Fried bighead in tomato sauce	2 years
GOST 16978-89	Fried mackerel in tomato sauce	2 years
GOST 16978-89	Minced fish in tomato sauce	2 years
GOST 16978-89	Fried sardelle in tomato sauce	15 months
TU (Specs) 15 of Ukraine 26-94	Fried Black Sea anchovy in tomato sauce	1 year
GOST 16978-89	Fried bullhead (goby) in tomato sauce	2 years
GOST 16978-89	Fried bream (<i>freshwater fish</i>)	2 years
GOST 16978-89	Fried pike-perch in tomato sauce	2 years

Table F8. Canned Fish and Vegetables in Tomato Sauce

# of Standard		Storage life
GOST 12161-88	"Peasant's" Fish	18 months

Table F9. Canned Fish Natural

# of Standard		Storage life
GSTU 15-1-96	Bighead "Novinka" (" <i>Novelty</i> ")	1 year
GOST 13865-68	Atlantic Herrings Natural with oil addition	2 years
GOST 18423-97	Squid natural (with skin)	15 months

Table F10. Canned Paste

# of Standard		Storage life
GOST 7457-91	Sprats Paste	18 months
GOST 7457-91	Paste "Mayak" (" <i>Light-house</i> ")	18 months
GOST 7457-91	Paste "Zdorovye" (" <i>Health</i> ")	18 months
GOST 7457-91	Sprats Paste "Lubitelsky" (" <i>Fancy</i> ")	12 months