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# Food Safety and Agricultural Health Management in CIS Countries: Completing the Transition



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# Food Safety and Agricultural Health Management in CIS Countries:

Completing the Transition



**THE WORLD BANK**  
**AGRICULTURE AND RURAL DEVELOPMENT DEPARTMENT**

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# Acronyms and Abbreviations

<b>ARD</b>	Agriculture and Rural Development Department
<b>ASEAN</b>	Association of Southeast Asian Nations
<b>BEEPS</b>	Business Environment and Enterprise Performance Survey
<b>BNPP</b>	Bank Netherlands Partnership Program
<b>BRC</b>	British Retail Consortium
<b>BSE</b>	Bovine spongiform encephalopathy
<b>CAC</b>	Codex Alimentarius Commission
<b>CARDS</b>	Community Assistance for Reconstruction, Development, and Stabilization
<b>CEE</b>	Central and Eastern Europe
<b>CFIA</b>	Canadian Food Inspection Agency
<b>CIS</b>	Commonwealth of Independent States
<b>CMEA</b>	Council for Mutual Economic Assistance
<b>Codex</b>	Codex Alimentarius
<b>CSF</b>	Classical swine fever
<b>DALY</b>	Disability-adjusted life year
<b>DDP</b>	Development data platform
<b>EASC</b>	Euro-Asian Council for Standardization, Metrology, and Certification
<b>EBRD</b>	European Bank for Reconstruction and Development
<b>EC</b>	European Commission
<b>ECA</b>	Europe and Central Asia
<b>EFSA</b>	European Food Safety Authority
<b>ELISA</b>	Enzyme-linked immunosorbent assay
<b>ENP</b>	European Neighbourhood Policy
<b>EPPO</b>	European and Mediterranean Plant Protection Organization
<b>EU</b>	European Union
<b>EUREPGAP</b>	European Retailers Produce Working Group good agricultural practices
<b>FAO</b>	Food and Agriculture Organization
<b>FAOSTAT</b>	FAO Statistical Database
<b>FMD</b>	Foot and mouth disease
<b>FSU</b>	Former Soviet Union
<b>FVO</b>	Food and Veterinary Office (European Commission)



<b>GAO</b>	Government Accountability Office (United States)
<b>GAP</b>	Good agricultural practice
<b>GDP</b>	Gross domestic product
<b>GLP</b>	Good laboratory practice
<b>GMP</b>	Good manufacturing practice
<b>GOST</b>	<i>Gosudarstvennyy standart</i> , or state standard
<b>GOST-R</b>	Standards of the Russian Federation
<b>GPAI</b>	Global Program for Avian Influenza
<b>GSP</b>	Generalized system of preferences
<b>HACCP</b>	Hazard analysis and critical control points
<b>I&amp;R</b>	Identification and registration
<b>IPPC</b>	International Plant Protection Convention
<b>ISO</b>	International Organization for Standardization
<b>ISPA</b>	Instrument for Structural Policies for Pre-Accession
<b>MARD</b>	Ministry of Agriculture and Rural Development (Vietnam)
<b>MFN</b>	Most favored nation
<b>MRL</b>	Maximum residue level
<b>OECD</b>	Organisation for Economic Co-operation and Development
<b>OIE</b>	<i>Office International des Epizooties</i> , or World Organization for Animal Health
<b>PCA</b>	Partnership and cooperation agreement
<b>PHARE</b>	Poland and Hungary: Assistance for Restructuring Their Economies
<b>RASFF</b>	Rapid Alert System for Food and Feed
<b>RFID</b>	Radio frequency identification
<b>SAPARD</b>	Special Accession Program for Agriculture and Rural Development
<b>SFVS</b>	State Food and Veterinary Service (Lithuania)
<b>SPS</b>	Sanitary and phytosanitary
<b>STDF</b>	Standards and Trade Development Facility
<b>TACIS</b>	Technical Aid to the Commonwealth of Independent States
<b>TBT</b>	Technical barriers to trade
<b>TCP</b>	Technical Cooperation Program (FAO)
<b>USAID</b>	United States Agency for International Development
<b>USSR</b>	Union of Soviet Socialist Republics
<b>WCR</b>	Western corn rootworm
<b>WHO</b>	World Health Organization
<b>WTO</b>	World Trade Organization

### Currency Equivalents

(as of May 1, 2007)

US\$ 1 = 0.7342 €

# Foreword

Sanitary and phytosanitary (SPS) standards provide an important means of protecting human health from unsafe food and of shielding crops and livestock from pest and disease hazards. Lack of compliance with international standards can be an obstacle to successful participation in international trade for transition countries.

In 2002, the World Bank initiated research on the implications of public and private food safety and agricultural health standards for development of country trade. The resulting report, based on country case studies focusing on different products, examined stakeholder responses and costs incurred to comply with international SPS standards. Its conclusions emphasized the countries' need for advice and assistance in their efforts to strengthen their SPS management capacity. Subsequent work thus focused on preparing country strategies for building SPS management capacity, based on assessments of current capacity and potential trade opportunities. These studies examined capacity in Armenia, Lao People's Democratic Republic, Moldova, and Vietnam.

The work on Moldova and Armenia brought to the fore the unique situation of transition countries. Transition countries encounter challenges similar to those faced by other developing countries, but their participation in global trade is complicated by the persistence of standards systems inherited from the former Soviet Union—the so-called GOST system—which differ from the standards used in the WTO-based global trading system. Indeed, the eventual transition away from GOST standards has implications for market access, public health, plant and animal health, and the domestic market.

Cognizant of the World Bank role in capacity building for trade and development, its ability to deal with concerns that cut across disciplines and borders, and the dearth of pertinent studies applicable to transition countries, this study was undertaken to provide a comprehensive review of issues relevant to the transition from GOST to international standards on food safety and agricultural health. This study aspires to offer guidance to policy makers in transition economies charged with developing SPS policies and to the staffs of the development agencies that provide them with support.

This sector work represents a broader application of the

country strategies previously developed. It seeks to examine the constraints on but also the capacities and responses of the member countries of the Commonwealth of Independent States, both as individual countries and as a region, as they deal

with the unfamiliar tenets of the international standards system they encounter in their transition toward the market economy.

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\*\* A list of interviewees is included in References.



# Executive Summary

Commonwealth of Independent States (CIS) countries continue to use the standards established by the Soviet Union and modified by the individual nations after independence, known as GOST-based standards, which are not WTO compliant and are not recognized by most of the world's trading countries. This use forms an increasing constraint on CIS participation in international trade, trade diversification, and competitiveness in agriculture and food production.

Although the GOST system provided adequate health protection in the Soviet Union's planned economy, the standards systems, as presently applied, provide insufficient protection for human health, plant health, and animal health. Deficiencies stem in part from the standards' inflexibility, lack of upgrades and modernization, and limited recurrent funding.

Human health food safety outcomes in both Central Asia and the European CIS countries lag behind those in OECD countries. Control of animal diseases and plant pests is weak, leading to increases in some zoonoses and to increased risk of the spread of pests and diseases due to insufficient quarantine.

Transition economies have already made considerable progress in replacing the institutions appropriate to a planned economy with institutions appropriate to a market economy. They all still face important challenges, however, in their efforts to replace their former standards systems with systems that comply with the 1994 WTO SPS and TBT agreements.<sup>1</sup> Even CIS countries that have already joined the WTO—Armenia, Georgia, Kyrgyz Republic, and Moldova—have only begun the considerable amount of work required.

This study draws four main conclusions:

1. Replacing GOST-based systems with WTO-compliant systems has proven more complex and difficult to achieve than expected, and WTO members among CIS countries have experienced major problems with their transition processes because of the inherent difficulty of the SPS shift as well as their unresolved institutional problems, limited human and financial resources, and the dominance of intra-CIS trade relations, in which compliance with GOST standards is still the general reality.

There is a general misperception among senior policy makers and public sector managers in most CIS countries about the required scope, timeframe, and extent of the process required to change from GOST to international standards. Few realize the



- significant legislative reforms and institutional reorganizations needed.
2. The capacity to implement the changes in quality and safety management required for access to OECD markets varies across the CIS countries. CIS countries, with the exception of the Russian Federation and, perhaps, Ukraine, have limited human skills and financial resources. The difficulty of making the transformation is clear from the experiences of the WTO CIS countries Armenia, Georgia, Kyrgyz Republic, and Moldova. They still, for the most part, lack the capacities needed to benefit from WTO membership.
  3. CIS countries have diverse opportunities for integrating into trade systems beyond CIS. The Russian Federation's comparative advantage in agriculture is weak, and the nation remains a major food importer. For Central Asian countries, the market requirements for trade in neighboring areas such as southern Siberia, China, and South Asia are more important than are those in distant OECD markets. Countries bordering the European Union and in the Caucasus have more opportunities to access the better paying market segments in the EU and the Russian Federation.
  4. The Russian Federation is the major trading partner with the CIS countries, and thus its decision to join the WTO and its timing in doing so will be a dominant factor in their economic futures. It is important that CIS countries anticipate the changes that will follow from the Russian Federation's WTO membership and adopt SPS standards that meet WTO requirements. Consultation and coordination among countries in the region can contribute much to a smooth transition that avoids trade disruption. The principles and concepts of the international standards system are still new, if not alien, to the legislation and regulatory systems in place in CIS countries.

## OBJECTIVE AND AUDIENCE

The overall objective of this study is to contribute to efforts at improving food safety and agricultural health, market access, competitiveness, and economic growth in transition economies. The direct objective of this study is to provide general analysis and recommendations for policy makers in transition economies undertaking the progressive adap-

tation of existing food safety and agricultural health management systems to comply with international standards. The study is also expected to be useful to professional staff in bilateral and multilateral agencies providing support on trade policies and SPS capacity building. The needs of CIS countries are the main focus of this study, but many of the findings will be relevant to other transition economies, and several generic issues covered will have relevance for developing countries as well.

## ADJUSTMENTS AND IMPACT

After the dissolution of the Soviet Union, the CIS economies went through drastic adjustments. With the removal of subsidies, many enterprises and logistic chains collapsed. Without regional subsidies, major adjustments occurred in the geographic spread of production. Declining incomes and abolition of subsidies resulted in drastic declines in consumption levels, especially of animal products. As a result of liberalization and privatization, many enterprises collapsed, and many workers lost their employment. With the privatization of land, many former employees of large enterprises became farmers on small, fragmented holdings. Their aim was often mainly for subsistence production. This production contraction bottomed out in the late 1990s, and since then many CIS countries have experienced increasing economic growth, in several cases at high rates.

The economic decline, however, severely affected the countries' capacities to manage food safety and agricultural health. Budgets for maintenance and renewal of laboratories and quarantine facilities are very limited, staff numbers are declining, and salaries are low. In various cases, the breakdown of the water-supply and sewage infrastructure has increased the occurrence of food- and water-borne diseases. The structure of livestock holdings changed drastically with the emergence of large numbers of small farms, and the composition of livestock populations has changed as well, with increased numbers of sheep and goats. Veterinary services have had difficulties adjusting to changing animal health risks and, as a result, zoonotic diseases on smallholder farms have increased. Some private enterprises, especially in dairy and poultry, have introduced their own veterinary services. The risk of pest introduction has increased due to weakened border control and coordination within the region.

Most food companies in CIS countries use old facilities inherited from the Soviet era that do not meet modern structural and hygiene requirements. To comply with international good manufacturing practice (GMP) requirements, major investments are needed in structures, equipment, water, and sewage. In addition, major efforts are needed to improve hygiene practices, management, and worker training and to introduce food safety and quality management systems, such as use of hazard analysis and critical control points (HACCP). Because of the small scale of farms, quality control is difficult, but it is essential for meeting quality and safety requirements in the demanding markets of the EU and, increasingly, in the CIS countries. Parts of the food industry have already undergone thorough upgrading, and many of the modernized companies have successfully introduced coordinated supply chains linking to small farms (World Bank 2005d). Direct foreign investment has played a major role.

## PRINCIPLES FOR MODERN FOOD SAFETY AND AGRICULTURAL HEALTH SYSTEMS

In response to food scandals, increased demand for securing food safety, and WTO principles on transparency, many countries have reassessed their systems and made various reforms. Main international trends in managing SPS measures include the following:

1. Risk assessment and analysis of costs and benefits are the main building blocks for policymaking on and management of food safety and agricultural health, both in government and in private enterprises.
2. Food safety management has shifted from end-of-pipe controls imposed by government to prevention throughout the supply chain, and basic responsibility for food safety compliance has shifted to the private sector, with the government taking on advisory, oversight, and enforcement roles.
3. Separation of policy making, policy implementation, and policy evaluation increases transparency and helps avoid conflicts of interest.
4. Close cooperation among government, the private sector, and civil society has emerged as a cornerstone of food safety and agricultural health management.

## EXPERIENCE REPLACING GOST STANDARDS SYSTEMS

Based on the experiences of the Central and Eastern European countries that have joined the European Union and of countries such as Vietnam, the transition from a GOST-based system to a WTO-compliant system involves a large amount of work. This work, which has generally been underestimated in initial planning, includes the following:

- *A complete overhaul of laws and regulations.* This overhaul requires between 5 and 10 years of work by teams with thorough knowledge of food safety, plant health, and animal health regulations as well as international experience and language skills.
- *Capacity building in risk assessment.* The WTO discipline requires that risk assessment be used as the scientific basis for standards and measures. Expertise in these areas is not generally available and must be built up from scratch. In the short and medium term, less formal risk evaluation can be a good second-best tool.
- *A thorough overhaul of inspection and monitoring programs.* New inspection and monitoring programs must be based on new regulations and prioritized according to degrees of proven old and perceived new risks.
- *Adjustment of testing facilities.* Originally designed for Soviet-era GOST conformity testing and animal disease surveillance on a massive scale, and poorly maintained and repaired since, testing facilities require major upgrades and modernization and a new focus suited to their new tasks. This effort will include a major consolidation of infrastructure and functions, which may be politically difficult.
- *Staff training.* Staff skills in all policy units and services must be upgraded and adjusted for the new tasks. In addition, staff attitudes must change to reflect their units' new advisory, supervisory, and enforcement (as opposed to control) roles. Experience in new EU member states has shown these changes to be essential but difficult to accomplish.

Several CIS countries see convergence with EC regulations as an important policy goal, and some have applied for EU membership. Cost levels for replacing standards systems have proven to be

high. Action plans for selectively introducing WTO compliance in Armenia and Moldova suggest public investment levels of about US\$3 per capita, and project duration has been estimated at four to six years. The Baltic countries and other new EU member countries in Central Europe went through reform processes with much higher requirements than those needed for WTO compliance, since they had to adopt the entire EC legislation, the so-called *Acquis Communautaire*. The investment on public sector reform and capacity building is about 1 to 2 percent of agriculture GDP annually for a period of six to seven years.

The cost for the private sector of achieving compliance with international requirements is much higher than for the public sector. The cost level will depend on the extent to which requirements are imposed on different market segments, such as demanding export markets, upcoming domestic urban food markets, and traditional markets. For EU accession, the fundamental requirement is that all aspects of legislation harmonize with the *Acquis Communautaire*, and experiences in the new member countries show that, despite high levels of accession support, many food enterprises had to be closed. CIS countries may also decide to follow a differentiated approach for the different market segments. By doing so, they will be able to manage the different risks in each segment effectively without unnecessarily raising public expenditure or the burdens on small enterprises or increasing food prices for poor consumers.

## CHALLENGES FOR THE CIS COUNTRIES

Market outlets for CIS countries' food and agricultural products are changing rapidly. Countries in Central Europe, the traditional export markets for the CIS countries, have entered the European Union, and their imports from CIS countries have been in decline, in part because CIS-country producers cannot meet EU standards. Moreover, as indicated above, commercial requirements for the EU market are high and are increasing rapidly in the urban markets of CIS countries. Because of import liberalization, local producers in CIS countries must compete heavily with foreign suppliers for a market share in the rapidly growing quality segment. Those who can meet higher public and private requirements can capture price premiums. Producers who cannot meet competition can only supply shrinking traditional food

markets, the prices in which are likely to be increasingly depressed.

All CIS countries that are not yet WTO members, except Turkmenistan, have applied for WTO accession. Of dominant importance for the region is the expected accession of the Russian Federation. This would result in a progressive replacement of its GOST-R standards by international standards, requiring the other CIS countries to adopt international standards as well in order not to lose access to the Russian market. In the medium term, producers in these countries must prepare for the dissolution of the GOST-based systems.

For countries in Central Asia, the challenge is to comply with evolving SPS requirements in their not very sophisticated export markets and with their limited product mix. This requires periodic consultation with authorities in their main export markets. Their transition from GOST- to WTO-based systems would best be guided by what happens in the Russian Federation and other markets in the region. Their challenge will be to manage a gradual change process with priorities based on trade interests, sanitary and phytosanitary risks, and domestic public health risks.

Countries bordering the European Union and those in the Caucasus face the more dynamic and more remunerative market segments in the European Union and the Russian Federation, with higher requirements for at least part of their products. Export diversification is attractive to them, and the ability to compete with exporters from EU countries and Turkey in their traditional export markets is crucial. Their initial focus will likely be only on meeting SPS standards for a few products with export potential to neighboring countries. Selectivity and priority setting here require, in addition to mitigating domestic sanitary and phytosanitary risks, a focus on products with export potential. Since imports compete in urban markets with domestic production, attention is needed to differentiate policies for the domestic market in such a way that complaints of discrimination can be avoided.

## RECOMMENDATIONS FOR THE CIS COUNTRIES

The following are the main recommendations for CIS countries:

1. A smooth and cost-effective transition from a GOST-based system to a WTO-compliant sys-

- tem requires strong political leadership from the government level and major consensus building among all stakeholders, guided by a clear strategy and an implementation plan supported by donors and trading partners.
2. Since costs of transition are high and benefits will only gradually emerge, CIS countries, while taking into account their longer-term preferences for economic integration, will be best served by implementation sequences and priorities based on careful assessment of costs, benefits, trade opportunities, and health risks for their population, crops, and livestock.
  3. Similarities in inherited systems, similarities in agro-ecosystems, dominance of intraregional trade, and common use of the Russian language among political, business, and professional leaders are compelling reasons for CIS countries to explore synergies in cooperative activities at the regional and subregional levels for achieving successful transition from GOST-based systems to WTO-compliant systems.

## IMPLEMENTATION

The pending transition from GOST and related animal and plant health systems to systems compliant with WTO and other international standards has major implications for institutions and staff. To prepare for major complex choices and to guide the work ahead, assignment of a high-level task force is recommended. Since different ministries are involved, it is recommended that the task force be mandated by the government with the consent of the parliament. Important elements of the task-force mandate include the following:

- Involving all stakeholders in the process of change, including the private sector and civil society.
- Prioritizing legislative tasks based on stakeholder consensus regarding market opportunities and major health and commercial risks.
- Designing the architecture of the new system, based on the priorities established, with clear roles and mandates for all institutions involved. Overlapping tasks should be eliminated, and institutional mandates realigned. Especially for the smaller countries, consolidation of inspection services in a single agency—the organizational model used by Lithuania and Slovenia—is an interesting option, though not the only one.
- Providing an action plan and road map with cost estimates, a schedule, and a framework for coordinating the work ahead. This is needed to render transparent the choices available to government, parliament, stakeholders, and donors.
- Mobilizing domestic and donor resources, based on the action plan and roadmap: it is undesirable to have individual agencies competing for donor funding.
- Operating, in general, as change managers, paying particular attention to changing the attitude of staff in the agencies.

The following are important steps in implementation:

- Progressively abolish inspections and certifications not aligned with international SPS standards, incompatible with international trade, and not serving clear health or economic purposes;
- Achieve institutional alignment and institutional reform;
- Start the process of legislative and regulatory change; and
- Plan for consolidation of laboratory infrastructure and mandates.

## RECOMMENDATIONS FOR TRADING PARTNERS, DONORS, AND INTERNATIONAL AGENCIES

1. Effectiveness of external support for SPS capacity building could be improved by providing more support to governments for planning and strategizing their SPS transition. SPS action plans and roadmaps would also form a basis for more effective donor coordination.
2. Donor support for the simplification and consolidation of food safety and SPS institutions in the smaller and lower-income CIS states would help to improve the sustainability of their own and national investments. In this effort, donors could provide greater emphasis on:
  - early support for risk analysis and cost-benefit assessments of policy, regulatory, and enforcement options; and
  - sequencing of investments to ensure that priority risks, whether domestic or trade-related, are considered first.

3. Smooth transition of systems for managing food safety and agricultural health in CIS countries could be enhanced by linking institutions and exchanging staff between donor and former transition countries.

The costs of adjustment for compliance with international standards are much higher for the pri-

vate sector as compared to the public sector. In lower-income countries, donors will need to work closely with national governments to identify the proper mix of business environment improvements, incentives, and subsidies needed to induce the rapid change in the food value chains required to restructure farms and firms to compete in domestic and international marketplaces.



After the dissolution of the Soviet Union, gradually all countries of the former Soviet bloc and other socialist countries opted for market economy systems and went through a period of economic contraction and adjustment. Their transition has progressed well, and their economies have by now largely recovered. Yet, except for the countries that joined the European Union (EU), they have not yet fully integrated into the global economy, which thwarts their economic diversification and keeps them from reaping the full benefit of their comparative advantages and trade opportunities. A primary obstacle to further integration is the standards system these countries inherited from the former state-planned economy. This study explores the challenges faced by the Commonwealth of Independent States (CIS) in making their standards systems more compatible with the demands of a market economy and more consistent with the principles of the World Trade Organization (WTO).

## INTERNATIONAL TRADING SYSTEM

The international trading system is the multilateral trading system accepted by most trading countries in the world, and the rules of trade are the principles laid down in the agreements of the World Trade Organization. Given our focus on food and agricultural products, the agreements most relevant to this report are the 1994 Agreement on Sanitary and Phytosanitary (SPS) Measures (see box 1) and, to some extent, the Agreement on Technical Barriers to Trade (TBT). Sanitary and phytosanitary measures ensure food safety and protect animal and plant health (see box 2). The standards recommended by the international trading system, referred to in this report as *international standards*, were established by international standards setting bodies: the joint FAO/WHO Codex Alimentarius Commission (Codex) for food safety; the World Organization for Animal Health (also Office International des Epizooties, or OIE) for animal health; and the International Plant Protection Convention (IPPC) for plant health. Many countries or regional blocs, such as the European Union, have established their own standards for certain products. The SPS and TBT agreements provide discipline on the use of SPS standards and measures, preventing their inappropriate use as non-tariff barriers. The SPS agreement allows countries to implement SPS standards and measures more stringent than the international standards if these measures are based on science and are consistent with principles of nondiscrimination, equivalence, and transparency (box 1).



### Box 1 WTO Principles on the Use of SPS Measures

The WTO Agreement on the Application of Sanitary and Phytosanitary (SPS) Measures was adopted in 1994. Its purpose is to enable member states to protect human and agricultural health (animal health and plant health) against risks of hazards related to trans-border trade of agricultural and food products while avoiding unnecessary trade interruptions. The agreement set up the following rules for adopting SPS measures:

**Harmonization.** The agreement encourages governments to establish national SPS measures consistent with international standards, guidelines, and recommendations. These include international standards adopted by Codex in the area of food safety, by OIE in the area of animal health, and by IPPC in the area of plant health. These international standards are based on scientific analysis of health risks.

**Transparency.** Governments are required to notify other countries of any new or changed sanitary and phytosanitary requirements affecting trade and to set

up offices (called *enquiry points*) to provide responses to requests for more information on new or existing measures. Governments must also allow scrutiny of the manner in which they apply their food safety and animal and plant health regulations.

**Scientific basis.** The agreement allows governments to use standards different from international standards. If the national requirements result in greater restriction of trade, however, the country must provide scientific justification.

**Nondiscrimination.** Member states' SPS standards and control measures must be no less favorable for imported products than for domestic products and cannot discriminate between foreign exporters or exporting countries.

**Equivalence.** An acceptable level of risk can often be achieved by alternative means. One country should accept another country's measures as equivalent if they provide the same level of health protection.

Source: WTO Agreement on the Application of Sanitary and Phytosanitary Measures.

## SPS MANAGEMENT

Many developing and transition countries, in particular the small and poor ones, face serious difficulties establishing new SPS measures. Building the SPS management capacities requires sustained efforts for a range of services over extended periods of time as well as the infusion of significant amounts of money, technical expertise, and management skills. Capacities are needed for surveillance and control of domestic markets and for surveillance of the country's pest and disease situation. These capacities are crucial to achieving import controls compliant with the SPS agreement. Box 3 summarizes the elements included in SPS and agricultural health management.

The need for SPS management capacities extends to export facilitation. Exporting companies must invest in quality and safety management systems that comply with both public requirements and private buyer specifications in export markets. In many cases, exporting countries are required to provide adequate information on their pest and disease situation so that importing countries can assess risks related to imports. Exporters also require certain

control and certification capacities to ensure that food and agricultural products meet international and trading partners' norms for pests, pathogens, and dangerous contaminants. Exporters have a choice of markets: they can focus on high-end markets with high requirements and high prices, or they may go to less demanding but also less remunerative markets. Their choice, however, is often limited by logistics and by the capacities of their governments to meet international and bilateral requirements for groups of products. Governments, in turn, must choose the products and countries for which they want to improve market access, given the limited availability of skills and financial resources. Hence, countries (and exporters) with weak capacities may be forced to compete in lower-end markets.

SPS management capacities are therefore important in ensuring both adequate protection of human and agricultural health and market access.

Integration in global trading systems requires more than adopting international standards systems and meeting the requirements of OECD and other main trading countries. It also implies trade liberalization, including the possibility that better-

## Box 2 Some Terms Explained

*Food Safety* deals mainly with microbial or chemical contamination, levels of natural toxins, zoonotic diseases, food additives, allergens, the indirect addition of residues of chemical substances (for example, pesticides, heavy metals, antibiotics, hormones, and other drug or animal-feed additives), and decomposition of the food product.

*Agricultural health* includes animal health and plant health. *Animal health* refers to issues pertaining to diseases of fish, bees, and livestock and the prevention thereof. *Plant health* refers to issues pertaining to pests and diseases affecting plants and the prevention thereof.

*GOST standards.* GOST is acronym of *gosudarstvennyy standart*, or “state standard.” GOST standards were originally developed in the Soviet Union and are now administered by the Euro-Asian Council for Standardization, Metrology, and Certification (EASC), a standards organization chartered by the Commonwealth of Independent States (CIS).

*SPS management capacities* include capabilities to enact a proper regulatory framework for control of pests, diseases, and harmful substances in food and agricultural products, including enforcement, prevention, detection, monitoring, surveillance, inspection, control of outbreaks, sharing information with trading partners, and risk assessment (or risk evaluation).

*Transition economy* is the term applied to a country formerly organized under a state-planned economy but that has now opted to establish a market economy. These countries are in the process of changing their laws, institutions, trade regimes, and enterprise ownership. This process is largely finished in the new EU member states, and these countries’ economies are no longer considered to be transitional. Countries currently in economic transition include CIS, Mongolia, and several countries of the Balkans; several countries in Asia and Africa also share some of the relevant characteristics.

Source: The authors.

Note: A fuller Glossary appears at the end of this report.

## Box 3 Elements of an SPS and Agricultural Health Management System

*Good agricultural practice (GAP) and good manufacturing practice (GMP).* The know-how and technology needed by farmers and processors to produce products that meet food safety requirements.

*Legislation and regulations.* Government-generated specifications regarding requirements for food safety, plant health, and animal health and requirements and authority for services necessary to policy making, implementation, and enforcement.

*Surveillance and monitoring.* The detection of the incidence and spread of plant pests, animal diseases, and potential food safety hazards.

*Inspection.* The detection of hazards affecting the food chain, crops, livestock, fish, and traded agricultural products.

*Quarantine.* Isolation procedures to prevent contact between healthy and possibly infected animals, crops, and products.

*Response (emergency).* Reaction to a hazard by containment, seizure, and destruction.

*Conformity assessment.* Testing, calibration, inspection, and certification to determine whether products, processes, systems, and people meet specified requirements.

*Establishing and operating laboratories.* Resources needed for testing food safety, plant health, animal health, and the quality of feed and agrochemicals used in the production process.

*International negotiation.* Efforts needed for market-access agreements with trading partners for many products.

*Participation in international bodies.* Key organizations include the WTO-SPS Committee, Codex Alimentarius, IPPC, and OIE.

*Education and training.* Efforts needed for awareness and improved skills at all levels.

Source: The authors.

quality imports may crowd local products out of the domestic market.

Enforcing international standards in the domestic market is often difficult. Effectively controlling the thousands of small enterprises in informal local markets is, in most cases, impossible, and efforts to do so may lead to high costs for taxpayers, increased food costs for poor consumers, and, possibly, only limited gains in food safety and human health. Obligations under WTO membership, however, require that countries adhere to principles of nondiscrimination between importers and domestic producers and that negative disease spill-over is prevented. This requires balancing domestic interests and international requirements.

## TRANSITION ECONOMIES AND THE GOST STANDARDS SYSTEM

Trade in CIS countries is still dominated by intraregional trade with other former Soviet republics, with particular focus on the Russian Federation. At their independence, the CIS countries and other transition economies inherited the GOST (*gosudarstvennyy standart*, or “state standard”) system of standards used in the Soviet Union’s central planned economy. This system and subsequent updates of it comprise thousands of standards, including a mixture of technical prescriptions, quality parameters, agricultural health standards, and safety standards. Not only do the GOST standards differ from international stan-

dards, so do their systems of implementation, the organization of their inspection services, and their requirements for testing facilities.

While suitable for the top-down implementation of the Soviet planned economy, the GOST system in its present form does not provide optimal food safety and agricultural health protection for the population and its agriculture. Moreover, GOST standards, in general, because they are not recognized in market economies, form an obstacle to access to markets beyond those of other former Soviet countries. GOST standards restrict producers’ ability to respond to market trends and changing consumer tastes, thereby reducing export competitiveness. They also involve costly inspections throughout production and trade channels. In addition, the market segment in which GOST standards are accepted is declining: the former Eastern Bloc countries that joined the European Union now require that their imports meet EU standards, and the Russian Federation and Ukraine, the region’s main economies, will have a mixture of international and GOST standards in the near future as a phase toward WTO accession.

Four CIS countries have joined the World Trade Organization: Kyrgyz Republic (1998), Georgia (2000), Moldova (2001), and Armenia (2003). The remaining CIS countries, except Turkmenistan, have applied for membership, and accession talks are in progress.<sup>2</sup> Most CIS countries have also joined the international SPS bodies: Codex Alimentarius, IPPC, and OIE (see table 1). Their

**Table 1 CIS Membership in WTO and SPS Bodies**

Country	WTO Membership	Codex	OIE	IPPC
Armenia	Yes; 2/2003	Yes	Yes	Yes
Azerbaijan	Applied	No	Yes	Yes
Belarus	Applied	No	Yes	Yes
Georgia	Yes; 6/2000	Yes	Yes	Yes
Kazakhstan	Applied	Yes	Yes	No
Kyrgyz Republic	Yes; 12/1998	Yes	Yes	Yes
Moldova	Yes; 7/2001	Yes	Yes	Yes
The Russian Federation	Applied	Yes	Yes	Yes
Tajikistan	Applied	No	Yes	No
Turkmenistan	No; no application	No	Yes	No
Ukraine	Applied	Yes	Yes	Yes
Uzbekistan	Applied	Yes	Yes	No

Sources: Websites of the respective organizations.

Note: Most CIS states were represented in international standards bodies by the Soviet Union until independence and had to reapply for membership following independence. Budgetary constraints have delayed or hindered full membership by several states.

transitions from systems based on GOST standards to systems based on international standards have been very slow or have hardly begun, even in countries that are already WTO members.

Finally, requirements in consumer markets, especially in OECD countries but also in the urban markets of developing economies, are evolving rapidly in response to developments in consumer preferences, quality and safety requirements, and progress in modern retail systems.

## OBJECTIVE OF THE STUDY

The overall objective of this study is to contribute to improving food safety and agricultural health, market access, competitiveness, and economic growth in CIS countries, in particular, and in transition economies, in general. The direct objective of this study is to provide general analysis and recommendations for policy makers in CIS countries seeking to adapt existing systems of food safety and agricultural health management to comply with WTO principles. The study also is intended to serve professional staff in bilateral and multilateral agencies providing support to countries on trade policies and SPS capacity building. The main focus of this study, again, is the situation and needs of CIS countries, but many of the findings will be relevant to other transition economies and several generic issues have relevance for developing countries as well.

## METHOD

The study draws on earlier analytical work and projects in CIS countries carried out over the past ten years by various organizations, donors, and the World Bank in the areas of food safety, animal health, and plant health. Earlier World Bank work produced basic documentation consisting of a global study on the impacts of food safety and agricultural health standards on exports from developing countries (World Bank 2005b), followed by a series of studies on individual countries' strategic options and plans for future action. Particularly relevant to smaller transition economies are the World Bank's food safety and agricultural health action plans for Armenia, Lao People's Democratic Republic (Lao PDR), Moldova, and Vietnam (World Bank 2007a, 2007c, 2007b, 2006b, respectively).

These plans provide guidance for capacity building for each country based on comprehensive assessments of their food safety and plant and agricultural health situations, their trade potential, and the state of their SPS management capacities. Relevant lessons are also drawn from the experiences of EU accession countries that adopted and transposed the *Acquis Communautaire* into their national legislation and underwent rapid transformation with EU support. Reports on accession were studied, and study visits were made to Lithuania and Poland, which became EU members on May 1, 2004.

**Country groups** Although the SPS management systems of the CIS countries are similar in many ways, they also show major differences depending on country size, income level, institutional capacities, market orientation, and logistics. This study therefore distinguishes three groups:

- Group I: Belarus, Kazakhstan, the Russian Federation, and Ukraine
- Group II: Armenia, Azerbaijan, Georgia, and Moldova
- Group III: Kyrgyz Republic, Tajikistan, Turkmenistan, and Uzbekistan.

The main characteristics of these groups and the ways in which these characteristics define their policy options for food safety and agricultural health will be discussed in subsequent chapters.

**Structure of the report** The report starts with an overview of agricultural production and trade in CIS countries (Chapter 2). Chapter 3 describes the GOST standards system, which remains the basis for the national standards systems in CIS countries. It also examines the food safety and plant and animal health situations in these countries. Chapter 4 describes lessons and experiences to date with efforts made in various countries to transform GOST-based standards systems into WTO-based standards systems. The main examples are Lithuania and Poland and the Asian transition countries Lao PDR and Vietnam. Chapter 4 also analyses the further work to be done by the CIS countries in achieving transition and the costs, benefits, and impacts of transition on the various stakeholders. Chapter 5 summarizes the report's main conclusions and recommendations.



## Agriculture and Markets in CIS Countries

The dissolution of the Soviet Union had dramatic impacts on the economies of the former Soviet republics. The shift from central planning to a market economy and the decollectivization of farms brought about major changes in the agricultural sector. Initially, agricultural output dropped to levels far below those of the pre-independence era, but the contraction bottomed out in the late 1990s, and the agricultural sector is now on track for recovery and growth. Structures of primary production are adjusting to better fit individual countries' comparative advantages. Most CIS countries run deficits in the trade of agro-food products, and both export and import are dominated by trade with other CIS countries, making them vulnerable to political risks and economic fluctuations within the region. As other transition economies in Central and Eastern Europe join (or prepare to join) the European Union and shift their trading relations toward the west, CIS countries face the risk of a shrinking market, with the resulting failure to tap their full potentials in agricultural production and export. A few countries have joined the World Trade Organization, and others are in various stages of accession. All transition countries are trying to adapt to the new realities of international competition and rapidly evolving supply chains.

### DIFFERENCES AMONG CIS COUNTRIES

At the onset of its disintegration, the Soviet Union's republics had major differences in income and levels of development. Its north-western republics were highly developed while its southern and eastern states were in many respects far behind. The Baltic countries and areas in the western part of the Russian Federation and Ukraine, especially, had experienced centuries-long commercial and scientific interaction with Western and Central Europe with fair transport possibilities. The areas of the Caucasus, Central Asia, and much of Russia's hinterland, on the other hand, were landlocked, mostly populated by non-Russian ethnic groups with distinctly different cultures, and had limited exposure to the most developed parts of the world. Within the Soviet Union much effort was made to connect and economically integrate these parts with the more developed parts of the Union through investments in transport and infrastructure and subsidies for production, but this process was far from being completed. The command economy and the subsidies provided by the Soviet Union had also created specialization among the republics, which was not always based on comparative advantage. After independence,



many of the infrastructural achievements proved unsustainable without subsidies and effective policy coordination. At their independence, therefore, these countries had highly different heritages and assets available for their further development.

## AGRICULTURAL PRODUCTION SINCE TRANSITION

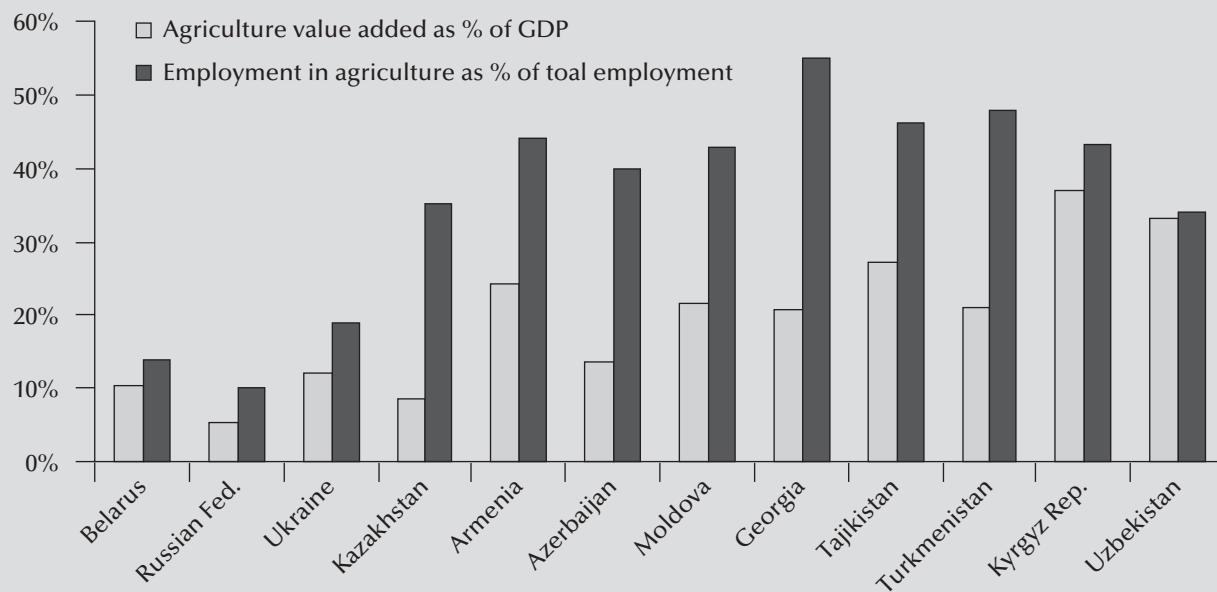
Agriculture is an important sector for the CIS economies. Agricultural value-added accounts for over 10 percent of the gross domestic product (GDP) for all CIS countries, except for Kazakhstan and the Russian Federation. With the exception of the Russian Federation, agriculture also employs a large share of the working population in CIS countries—as high as 40 to 50 percent in Armenia, Georgia, Kyrgyzstan, Moldova, Tajikistan, and Turkmenistan. Figure 1 illustrates the role of agriculture in CIS economies in terms of its share in GDP and total employment.

The figure shows that in almost all CIS countries, the percentage of agricultural employment in total employment is significantly higher than the contribution of agriculture to GDP, pointing to its low productivity as compared with other sectors. The

high rate of employment in agriculture is partly the legacy of Soviet-era artificial “full-employment” and restrictions on internal migration and partly the result of many people turning to subsistence farming following the collapse of industries and former state-owned enterprises during the transition and the distribution to households of small plots of state and cooperative land. As the agricultural labor force declines with increased emigration, economic recovery, and increasing job opportunities in other sectors, this problem is gradually being corrected, as can be observed in a number of CIS countries over the last few years. For instance, agriculture in Moldova, the Russian Federation, and Ukraine dropped from 50, 12.7, and 20.5 percent of employment, respectively, in 2000 to 43, 10, and 18.9 percent in 2003.<sup>3</sup> Since there were no smallholder farmers in the Soviet Union, many independent states struggled with the question of whether and how to support small farmers. Some of the issues will be discussed in the next chapters.

Agricultural production contracted sharply in the early years following the break-up of the Soviet Union. By 1997, most countries had seen a dramatic fall in their agricultural production (see table 2).

Figure 1 Role of Agriculture in CIS Economies, 2003



Source: World Bank Development Data Platform (DDP) Time Series; CIA, *The World Factbook*.

Note: Data from 2003 on agriculture employment in Armenia, Belarus, Tajikistan, Turkmenistan, and Uzbekistan are not available. The most recent data available (2001 or 2002) have been used instead.

**Table 2 Agricultural Value Added, Constant 2000 (US\$M)**

	1990	1991	1993	1995	1997	1999	2001	2003	2004
Russian Federation	21,085	20,305	17,738	14,361	13,940	13,254	16,641	18,098	18,624
Ukraine	7,867	6,500	6,173	5,303	4,737	4,041	4,992	4,588	5,478
Kazakhstan	2,978	2,305	2,762	1,649	1,553	1,533	1,737	1,832	1,834
Belarus	2,185	2,105	1,964	1,611	1,546	1,414	1,563	1,730	1,971
Armenia	451	442	380	408	397	455	496	531	546
Azerbaijan	—	—	855	694	665	757	942	1,059	1,107
Georgia	1,988	1,395	1,349	784	717	716	682	741	688
Moldova	—	1,017	558	362	355	320	342	318	361
Kyrgyz Republic	432	398	354	317	410	457	503	534	556
Tajikistan	440	420	295	234	199	218	274	345	—
Turkmenistan	872	787	745	616	358	560	805	—	—
Uzbekistan	3,825	3,910	3,712	3,657	3,649	4,008	4,305	4,874	5,366

Source: World Bank DDP Time Series.

Georgia and Moldova suffered a contraction of around two-thirds in their agricultural output from the pre-independence level. Agricultural production in Ukraine, the “bread basket” of the former Soviet Union, declined by half between 1990 and 1999. Essentially, the decline was the result of the economy-wide collapse. Moreover, some factors specific to the agriculture sector also contributed to the decline, such as the reduction and elimination of government subsidies on agriculture, the dismantling of state and collective farms, and the disintegration of previous channels for the supply of inputs and the marketing of products under the command economy.

CIS countries have different product mixes as a result of their varied agroclimatic conditions and histories.<sup>4</sup> The main agricultural products in Russia, Ukraine, and Belarus are grains, potatoes, and meat and dairy products. Moldova and Transcaucasia (Armenia, Azerbaijan, and Georgia) have favorable conditions for growing vegetables, fruits, and grains. Wine is the most important high-value agricultural product in this region. Main agro-food products in the countries of Central Asia include wheat, animal products, cotton,<sup>5</sup> vegetables, and fruits. Figure 2 and figure 3 illustrate the output of major crops and animal products of the CIS, as a whole, from 1992 through 2005.

For most crops and animal products, the downward trend in production flattened out around 1999, after which production began to grow or sta-

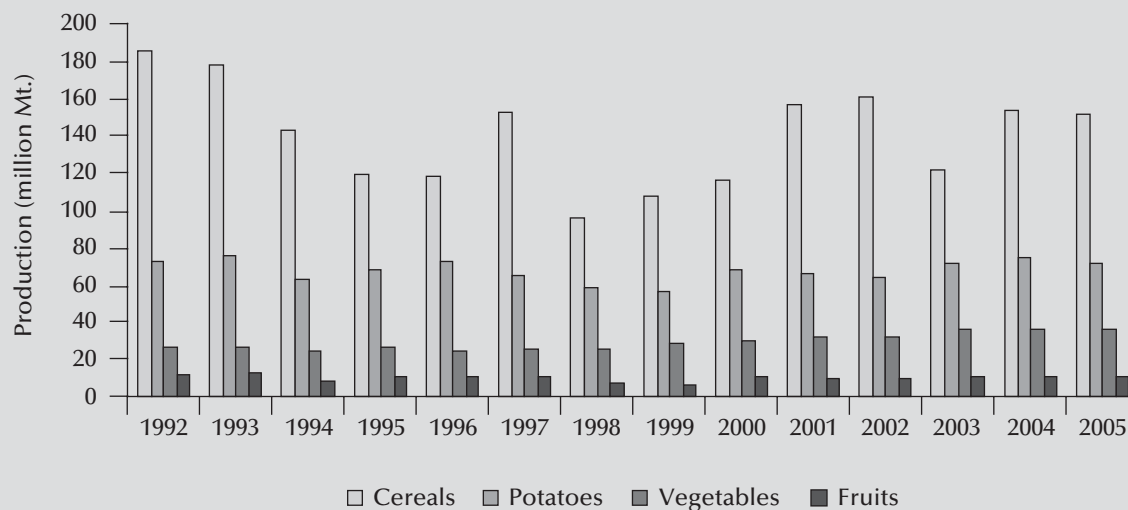
bilize. It is worth noting that crop production has recovered to levels close to or even above the production level immediately following the start of the transition, while for animal products, particularly meat, production has stabilized far below the 1992 level. The contraction in the livestock sector is partly the result of the removal of Soviet-era subsidies for livestock production and a related decline in effective protection.

## CONSUMPTION AND MARKETS

As shown in table 3, consumption of animal products, especially meat, fell during transition because people’s real income fell, and the price went up due to the elimination of government subsidies, as noted above. The consumption of fruits also dropped significantly, because fruits, like meat, are more income-elastic than, say, cereals. By contrast, potatoes were the only food item for which consumption increased. As overall economic conditions improve and people’s real income rises, the consumption of most food products, particularly animal products, fruits, and vegetables grows. This trend emerged in the CIS countries after 2000.

As in many other countries, domestic markets in CIS countries consist of different markets, each with varying levels of safety and quality requirements, catering to consumers of differing income levels; these include traditional local markets, modern urban retail markets, and export markets (see

Figure 2 CIS Production of Major Crops, 1992–2005

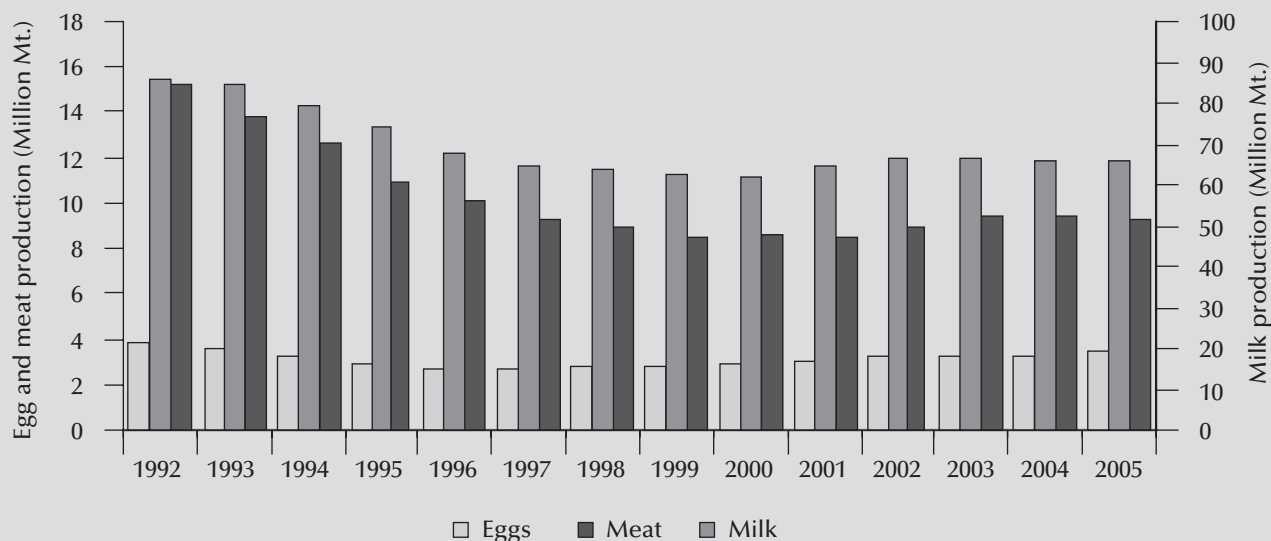


Source: FAOSTAT.

box 4). For the transition countries, the traditional local markets, with low quality and safety requirements, dominate. The export market segment serving the demanding OECD markets is still very small. The most dynamic and rapidly growing market segment in CIS countries is the emerging modern urban retail segment. Starting around

2000, modern retailing has grown very fast in CIS, particularly in the Russian Federation and Ukraine, but also in other CIS countries (Dries, Reardon, and Swinnen 2004).<sup>6</sup> The share of food products sold in Russian cities through modern retailing channels is estimated to have been over 20 percent in 2004 (Kaipio and Leppanen 2005). In Ukraine, also for

Figure 3 CIS Production of Major Animal Products, 1992–2005



Source: FAOSTAT.

**Table 3 Change in Per Capita Food Supply in CIS (kg)**

	1989*	1993	1995	1997	1999	2000	2001	2002	2003
Cereals	160.5	171.5	166.9	164.0	156.6	156.3	158.4	162.7	161.9
Vegetables	90.3	79.6	83.8	82.1	90.1	92.0	98.2	100.6	105.9
Fruits	42.0	36.3	34.2	36.2	28.1	35.6	36.3	40.6	42.1
Potatoes	97.8	112.7	104.6	110.7	100.9	104.0	107.1	106.1	110.6
Meat	72.2	50.9	45.0	41.2	36.1	35.2	38.2	41.1	42.5
Milk	182.4	130.9	143.2	146.6	153.9	150.1	150.4	157.7	154.6
Eggs	15.0	11.4	9.6	9.2	9.6	9.8	10.2	10.8	10.9

Source: FAOSTAT, accessed July 2006.

\*USSR average (including the three Baltic states).

2004, supermarkets and hypermarkets are estimated to have accounted for 34 percent of food retail (A.T. Kearney 2005). A survey on consumers' shopping habits at the end of 2006 found that 49 percent of Russian consumers choose supermarkets or hypermarkets as their primary place for food shopping. This ratio is as high as 79 percent in Kiev (INCOMA 2007).

Many features of modern retail chains have major implications for agro-food production (see box 5). For one, sourcing by the leading chains at the regional or even the global level imposes competition pressure on local producers. Many international retail chains have their own private standards for product quality and safety, and these can be quite different from the existing standards in the CIS countries. Foreign retailers in the central and eastern European (CEE) countries are introducing similar private standards as in their home countries including the relevant BRC (British Retail Consortium) or EUREPGAP (European Retailers Produce Working Group good agricultural practices) standard (FAO 2006a). This trend will pose great challenges for food producers and processors: they will need to adapt to the new standards or risk exclusion from this growing market segment.

## INTERNATIONAL TRADE IN AGRO-FOOD

The value of agro-food export and import of all CIS countries in 2004 is given in table 4.<sup>7</sup> Belarus, Kazakhstan, the Russian Federation, and Ukraine are the largest exporters and importers. With the exceptions of Moldova, Ukraine, and Uzbekistan,<sup>8</sup>

all the other countries are net importers of agro-food products.

Among the CIS countries, the contribution of agro-food trade to the economy varies from being the largest source of foreign exchange, in the case of Moldova, to being virtually negligible, in the case of the Russian Federation. As figure 4 shows, food accounts for over half of total export for Moldova and about one-third for Georgia.

Table 5 presents the value of agricultural exports relative to agricultural GDP of the CIS countries. Comparing these values with those of other transition economies in Central and Eastern Europe (referred to as CEE10), we find that despite the latter's lower share of agriculture in total GDP, the ratios of their agro-exports to agro-GDP are generally higher than those of CIS countries, with the exception of Moldova for the CIS group and of Romania for the CEE10 group.

Before the breakup of the Soviet Union, most of the foreign trade of the Eastern Bloc (the former Soviet Union and the central and eastern European countries) took place within the framework of the Council for Mutual Economic Assistance (CMEA) and was characterized by central planning and command. During the transition period, former CMEA members have demonstrated distinctively different orientations in their foreign trade relations. The central and eastern European countries, in line with their objective to join the European Union, have shifted toward the markets in industrial countries in the West, while the CIS countries generally have maintained strong economic ties among themselves, and particularly with the Russian Federation. This development in agro-food trade is consistent with the development of

## Box 4 Market Segments

Markets in developing and transition countries exhibit a continuum from traditional local markets on the one hand to highly demanding international markets in

OECD countries on the other, with emerging urban domestic markets in between (World Bank 2006a; Van der Meer 2007).

### Characteristics of Three Market Segments

Market characteristics	Type of market		
	Traditional local markets	Emerging modern urban domestic markets (supermarkets, tourist hotels/restaurants, educated affluent consumers)	Export markets in industrial countries (retail markets, modern food services)
<i>Participation</i>			
Participation of small-scale producers	– No constraints	– Emerging constraints in meeting requirements of quality, safety, consistency of product, regular supply	– Only if well organized in out-grower schemes and able to guarantee safety and uniform quality
<i>Organization</i>			
Supply-chain leader/ coordinator	– Usually none	– Large producer or buyer, sometimes producer organization	– Processing company or exporter; sometimes importer on behalf of retailer; rarely the retailer directly
Supply-chain organization	– Supply-driven – Transaction-based – Little or no net benefit from coordination – Little durability in relation among private actors – No technical cooperation	– Efforts by retailers to control quality, safety, and reliability of supply – Net financial benefits from coordination still fragile – Emerging coordination, occasional technical support	– Strongly demand-driven – Durable relations within supply chain, often on contractual basis – Cooperation among buyers, exporters, and growers on technology, information, and sometimes finance
<i>Results</i>			
Competitiveness depends mainly on	– Supply at low cost	– Sufficient quantity – Improved quality	– Large quantity – Efficient, effective coordinated supply chains – Flexible response to changing demand – Market and product innovation
Price level for grower and consumer	– Relatively low – Limited willingness to pay for quality and safety	– Moderate – Moderate willingness to pay for quality and safety	– Relatively high – High willingness to pay for quality and safety
Value added	– Very low	– Low to moderate	– Moderate to high
Standardization, grading, supply	– Virtually absent – Irregular supply	– Emerging importance of grading, stable supply	– High requirements of grading, consistency, supply schedule
Food safety control	– Unreliable – Little consumer awareness, concern – Little private effort, limited public control	– Improving – Emerging consumer awareness, concern – Retailers try to control and sell “safety”	– Effective – High consumer concern – High retailer requirements imposed on suppliers

Source: The authors, adapted from World Bank 2006a.

(Box continues on the following page.)

#### Box 4 Market Segments (continued)

Requirements and players in these market segments differ widely. In traditional local markets, safety and quality requirements are low, with little grading. Production for these markets is supply-driven, and prices can fluctuate heavily with over- and undersupply, especially for less tradable perishable products. Prices are generally low and consumers are price-sensitive. The highly demanding foreign markets are demand-driven, and the producers must supply on schedule. There are many preconditions to acceptance as a supplier, and contractual arrangements include quality and safety prescriptions and process-control requirements. Buyers in this segment are paying premium prices for services added to the physical product. The emerging domestic urban markets, consisting of supermarkets, parts of the food processing in-

dustry, restaurants, and the tourist industry, tend to go in the same direction as the markets in OECD countries, but their requirements remain lower. The emerging urban markets encounter strong competitive pressure from traditional markets.

Enterprises usually specialize because cost structures differ for each market segment. A fruit and vegetable exporter to the EU, for example, produces at high levels of cost that generally cannot be recovered at domestic markets prices. Producers in local markets often cannot meet the quality and safety requirements of emerging urban markets, although wholesalers will try to bulk up volume from dispersed local sources for distant urban markets. Producers who specialize in emerging urban markets usually cannot meet the quality and safety requirements of demanding export markets.

Sources: World Bank 2006a; Van der Meer 2007.

overall merchandise trade patterns in the Europe and central Asia (ECA) region (Broadman 2006).

The next two tables compare the structures of the food-trade relations of the CIS and the group of new EU members (CEE10). Table 6 shows that CIS continues to rely on the CIS market for export and that its exports to the EU15 and CEE10 have dropped slightly in the last few years (except in 2002, during which there was large cereal export to the EU15). On the other hand, the CEE10 have greatly reduced their exports to the CIS region and substantially increased exports to EU15 and other CEE countries, showing a rise from 36 and 15 percent to 49 and 25 percent between 1996 and 2004, respectively. In terms of sources of import (table 7), the three groups' shares in CIS imports remained more or less stable, while the CEE10 group imports less from the CIS countries but more from both the EU15 and other CEE countries.

Table 8 compares the change in export destinations between CIS and CEE countries at the country level. Clearly, the CEE countries have shifted their trading relations westward: their exports to the European Union (old and new member countries) have significantly increased while those to CIS countries declined in the last few years.

Within the CIS, however, trading relation development trends are not homogenous. Different countries have demonstrated different orientations. Some emphasize developing markets in the West, particularly in the enlarging European Union. Others are becoming ever more dependent on the CIS and, especially, on the Russian Federation market. Table 9 compares the shares of various markets for CIS countries' agro-food exports.

The table shows that while the CIS region remains the predominant destination for the food exports of all CIS countries, the level of concentration varies. Belarus has the highest level of concentration, with over 90 percent of its food exports going to other CIS countries. Armenia, Azerbaijan, and Kazakhstan also send over 80 percent of their food exports to CIS markets. Georgia, the Kyrgyz Republic, and Moldova are slightly less concentrated in CIS markets, but these nevertheless account for over 70 percent of their exports. Georgia and Moldova have managed to export a higher share of their food products to the European Union, largely beverages, vegetables, and fruits. The Russian Federation and Ukraine have the most diverse trading partners as a result of their large



### Box 5 Features of Modern Retailing and Implications for Producers and Processors in CIS

Modern retailers' procurement practices differ widely from those of traditional stores or open markets.

Supermarket chains often have centralized procurement systems: procurement is no longer the business of individual stores; rather, it is handled by centralized buying offices, and large distribution centers handle product movement. This practice lowers transaction costs by reducing the number of suppliers and, at the same time, lowers purchase prices because of the large volumes purchased. Moreover, central procurement helps chains control the quality, safety, and consistency of purchased products. The use of distribution centers is already very common in Central and Eastern European countries such as the Czech Republic and Poland; supermarket chains in the Russian Federation and Ukraine are also shifting in this direction. The Pyaterochka chain in Russia has built large distribution centers in Moscow and St. Petersburg and has continued to expand facilities. At the end of 2005, 50 percent of the products at its stores were delivered directly from the distribution centers, and the company plans to increase the share to 75 to 80 percent by 2007–08 (Pyaterochka 2005, accessed March 2007).

Such procurement systems, especially those under multinational supermarket chains, often operate across national borders. The distribution center in one country may serve the chain's stores in several countries in which it operates. EU enlargement has greatly facilitated the regionalization of procurement in Central Europe, as new EU members become part of the European single market. Multinational chains in countries farther to the east also apply this approach. For instance, it is estimated that 70 to 80 percent of the products sold in supermarkets in Moscow and St. Petersburg are imported from the European Union.

Since supermarkets in these countries are still competing for consumers with traditional open markets, they use high quality and safety standards for product differentiation. Many retail chains have private standards. Experience with food retailing developments in the CEE countries shows that the private standards used in these countries were transferred from the retailer's home country by replicating the company's

own guidelines or by applying the relevant BRC or EUREPGAP standard (FAS 2006).

For food producers and processors in the CIS countries, the rapid growth of modern retailing and its associated new procurement practices pose great challenges. Producers and processors must compete with their colleagues in other areas of the country or in foreign countries. The private standards adopted by the leading chains are expected to have increasing influence as the retail market continues to consolidate and personal income continues to grow in the leading CIS economies, mainly Kazakhstan, the Russian Federation, and Ukraine. If producers in the CIS countries cannot meet the modern retailers' requirements for product quality, food safety, volume, consistency, and others, it will be very difficult for them to participate in this growing market segment.

Conversely, the market changes also offer new opportunities. Those who can make quick adjustments, adopt new practices, and improve product quality and safety will have the chance to benefit from the expanding modern food retail segment: they can sell not only into the high-end domestic market, they will also have access to foreign markets through the supermarket chains' procurement networks. This is especially important to countries with good potential in high-value food products, such as fruit and vegetables, fisheries products, and meat and dairy products.

The agroprocessing industry plays a critical role in the new market environment. Many food products, such as dairy, meat, bakery, and others, must be processed. Even for fresh products such as fruit and vegetables, the market trend is to sell them with some processing, such as cleaning, cutting, and packaging, since consumers increasingly demand ready-to-eat foods. The challenges faced by the agroprocessors are three-fold. The first is organizational: they must ensure a reliable supply of raw materials of high levels of quality and safety. Second, they must seek and develop new marketing channels, as processors often play an important role in modern supply-chain coordination. Finally, processors face a major challenge regarding physical facilities, technology, and modern management.

**Table 4 Agro-Food\* Export and Import of CIS Countries, 2004 (US\$ 000)**

	Export	Import	Trade balance
Russian Federation	2,461,085	12,486,519	-10,025,434
Ukraine	3,400,641	1,854,695	1,545,946
Kazakhstan	805,394	911,681	-106,287
Belarus	1,155,764	1,701,652	-545,888
Armenia	81,532	276,835	-195,302
Azerbaijan	153,991	411,224	-257,232
Georgia	200,851	386,898	-186,047
Moldova	521,873	206,926	314,948
Kyrgyz Republic	79,423	126,962	-47,539
Tajikistan**	46,376	133,169	-86,793
Turkmenistan**	4,338	101,228	-96,890
Uzbekistan**	333,965	215,728	118,237
Total	9,245,233	18,813,517	-9,568,281
Total extra-CIS trade***	3,790,545	13,733,867	-9,943,321

Source: UN COMTRADE.

Notes: \* Unless otherwise indicated, agro-food trade data in this report refer to the total of trade in the SITC categories food and live animals, beverage (both alcoholic and non-alcoholic) and tobacco, oil seeds, and animal and vegetable oil/fat/wax (SITC Code 0+1+22+4).

\*\* Export and import data are actually other countries' import and export figures.

\*\*\* CIS export to and import from the rest of the world.

**Figure 4 Share (percentage) of Agro-Food Trade in Total Trade, Selected CIS Countries, 2004**

Source: WITS UN COMTRADE.

**Table 5 Agricultural Exports Relative to Agricultural GDP, Average, 2001–2003 (%)**

CIS		CEE10	
Russian Fed.	9.5	Czech Rep.	57.0
Ukraine	43.1	Estonia	123.1
Belarus	49.2	Hungary	128.3
Kazakhstan	30.1	Latvia	70.6
Armenia	10.2	Lithuania	68.3
Azerbaijan	12.1	Poland	60.3
Moldova	120.3	Slovakia	52.6
Georgia	17.8	Slovenia	70.0
Kyrgyz Rep.	18.0	Bulgaria	40.0
Turkmenistan	12.6	Romania	8.7
Uzbekistan	28.8		
Tajikistan	41.8		

Source: FAO 2005a, 176.

Note: Agricultural exports refer to agriculture products in the narrow sense, excluding forestry and fisheries products.

**Table 6 Agro-Food Export Markets: CIS vs. CEE10**

Exporting region	Destination of export	Share in total export value (%)								
		1996	1997	1998	1999	2000	2001	2002	2003	2004
CIS	CIS	64	58	55	60	57	53	42	54	59
	EU15	12	13	13	10	13	13	19	11	9
	CEE10	9	9	7	6	6	6	5	6	6
CEE10	CIS	30	34	25	15	14	12	12	13	11
	EU15	36	33	35	41	40	41	43	43	49
	CEE10	15	17	21	23	24	25	24	25	25

Source: UN COMTRADE, accessed July 2006.

**Table 7 Origins of Agro-Food Imports: CIS vs. CEE10**

Importing region	Origin of import	Share in total import value (%)								
		1996	1997	1998	1999	2000	2001	2002	2003	2004
CIS	CIS	28	21	19	21	28	23	19	25	27
	EU15	26	29	26	24	23	23	26	23	23
	CEE10	9	10	11	8	8	6	7	8	8
CEE10	CIS	5	3	3	2	3	3	2	3	2
	EU15	45	44	45	45	46	46	47	46	50
	CEE10	13	15	17	19	20	21	20	22	22

Source: UN COMTRADE, accessed July 2006.

**Table 8 Agro-Food Export, 1997 and 2004, Selected CIS and CEE Countries (US\$ Million)**

	Export to EU15		Export to CEEC		Export to CIS		Total export	
	1997	2004	1997	2004	1997	2004	1997	2004
Armenia	1	3	0	2	21	68	23	82
Azerbaijan	4	6	2	2	44	129	54	154
Georgia	5	28	2	5	68	158	76	201
Moldova	40	46	63	52	255	395	378	522
Kazakhstan	18	17	10	25	717	706	790	805
Ukraine	263	407	121	291	1,074	1,594	1,731	3,401
Czech Rep.	413	956	417	1,005	229	97	1,199	2,261
Estonia	77	175	73	131	305	66	477	410
Hungary	1,071	1,995	526	786	570	318	2,675	3,694
Lithuania	123	441	72	313	356	247	607	1,056
Latvia	21	97	41	155	162	105	232	402
Poland	1,174	3,507	275	1,066	1,333	819	3,169	6,193
Slovakia	99	313	217	654	87	37	438	1,051
Slovenia	79	128	12	17	18	14	328	431

Source: UN COMTRADE.

**Table 9 Food Export Destinations for Selected CIS Countries, 2004**

Export destination	Exporting country (share of total food export value, %)							
	Armenia	Azerbaijan	Belarus	Georgia	Kazakhstan	Kyrgyz Rep.	Moldova	Russian Federation
CIS	83.3	83.5	91.2	78.8	87.7	73.2	75.6	43.2
EU25	6.1	4.8	4.0	16.7	5.2	5.8	18.8	17.5
EU15	3.8	3.7	2.0	14.1	2.1	1.9	8.9	12.1
CEE10	2.3	1.0	2.1	2.6	3.1	4.0	9.9	5.3
USA	4.6	0.6	0.1	1.7	0.2	0.0	2.1	1.2
Rest of the world	6.0	11.2	4.6	2.7	6.9	20.9	3.4	38.2

Source: UN COMTRADE.

Note: Tajikistan, Turkmenistan, and Uzbekistan are not listed in this table because of poor data quality. Approximate data show that agro-food exports from these countries go almost exclusively to CIS markets.

agricultural economies and geographic locations. Both countries send around one-fifth of their food exports to the EU market. Much larger shares (38 percent and 32 percent, respectively) go to markets outside the European Union and the United States, such as the Middle East, South Asia, and East Asia.

The composition of CIS countries' agro-food exports varies. The most important items include cereal (Kazakhstan, the Russian Federation, and Ukraine),<sup>9</sup> beverages (Armenia, Georgia, and Moldova), fruit and vegetables, and meat and dairy

products (Belarus and Ukraine). Table 10 looks at the export of several products particularly sensitive to SPS concerns: meat and meat preparations, dairy products and eggs, fish and shellfish, and vegetables and fruit. For these products, Georgia and Moldova seem to rely least on the CIS market; both export a considerable quantity of vegetables and fruits to the European Union. But the remaining countries (except for the Russian Federation) all export over half of their SPS-sensitive products within the CIS region.

**Table 10 Export of SPS-Sensitive Products by Exporting Country, 2005 (US\$'000)**

	SPS-sensitive food products					Total agro-food	Share of SPS-sensitive products in total food export (%)	Export of SPS-sensitive products to other CIS countries	CIS share in total SPS-sensitive export (%)
	Meat and preparations	Dairy and eggs	Fish, shellfish, etc.	Vegetables and fruit	Total				
Russian Federation	53,418	152,271	517,099	201,651	924,440	3,881,509	24	357,352	39
Ukraine	167,613	554,118	21,839	265,914	1,009,483	4,232,209	24	748,644	74
Kazakhstan	4,744	19,530	53,636	60,903	138,813	669,221	21	74,275	54
Belarus	289,226	501,811	60,452	47,089	898,578	1,319,129	68	864,528	96
Armenia	1,015	4,097	3,184	8,039	16,335	112,230	15	11,781	72
Azerbaijan	1,078	598	7,276	192,446	201,398	325,142	62	118,760	59
Moldova	3,215	14,000	202	111,684	129,101	580,790	22	58,563	45
Georgia	562	2,619	1,004	84,006	88,192	302,069	29	23,969	27
Kyrgyz Republic	400	16,235		19,711	36,345	75,663	48	23,163	64

Source: UN COMTRADE.

Generally speaking, CIS countries' current patterns of agro-food trade are far from optimal. Heavy reliance on the CIS market renders them extremely vulnerable to regional economic fluctuations and border control risks, as demonstrated by the 1998 ruble crisis and the Russian Federation's import bans in recent years. The Russian Federation has banned imports from a number of countries in the EU, the CIS, and elsewhere. In many cases, bans were triggered by limited violations, such as forged documents, occasional non-compliance with sanitary and phytosanitary standards, and errors in inspection procedures in exporting countries. Several bans have been sector-wide and very long lasting, with sometimes profound economic impacts on the exporters.<sup>10</sup> Appendix 1 provides some examples of import bans imposed by the Russian Federation. Trading partners complain that the Russian Federation's use of bans is disproportionate and could be applied on similar grounds to other products and countries whenever inspections are intensified. This has created the perception among CIS countries that the Russian Federation market presents high risks, prompting them to diversify their trading relations.

## SUMMARY: COUNTRY GROUP CHARACTERISTICS

Following the three-group classification introduced in chapter 1, table 11 provides a summary of

the features of the CIS countries and groups. The countries of Group I, especially the Russian Federation, are the most developed economically and the countries in Group III are the least. Statistical data for Group III countries are relatively weak. Citizens in CIS countries have high levels of education. Even the poorer CIS countries perform very well in this respect, as compared to developing countries with comparable income levels.

CIS countries have divergent opportunities for integration into trade systems outside CIS. The Russian Federation is by far the biggest and wealthiest of the CIS countries in the region. Its comparative advantage in agriculture is limited, making it a major importer. These factors give it considerable market power, as it can set requirements for its imports while remaining independent of other countries' requirements. Thus, the Russian Federation's incentives are meager for making the transition to a WTO-compliant standards system for agriculture and food trade. Kazakhstan is well positioned to export meat and a variety of products to markets both within and outside the region. For Central Asian countries, the natural markets are neighboring regions such as southern Siberia, China, and South Asia; the requirements of these markets are more important. For them, requirements in the demanding OECD countries hardly play a role, other than for a few products.

For countries bordering the European Union and in the Caucasus, the situation is different. For

Table 11 Characteristics of Three Groups of CIS Countries

	Group I				Group II				Group III			
	The Russian Federation	Ukraine	Belarus	Kazakhstan	Armenia	Azerbaijan	Georgia	Moldova	Kyrgyz Republic	Tajikistan	Turkmenistan	Uzbekistan
Land area, population												
Surface area (1000 sq.km)	17,098	604	208	2,725	30	87	70	34	200	143	488	447
Population, 1000 (2005)	143,151	47,111	9,776	15,146	3,016	8,388	4,474	4,206	5,156	6,507	4,833	26,593
Development level		Moderate to high				Small, partly landlocked	Low to moderate				Small, landlocked	
GDP per capita (constant 2000 US\$), 2005	2,444	959	1,868	1,972	1,128	1,182	971	429	319	237	..	673
School enrollment, secondary (% gross), 2004	93	92.9	93.5	98.1	91.4	83.1	82.3	82.8	88	81.8	..	94.6
Agriculture productivity		Moderate to high				Low to moderate					Low to moderate	
Agriculture value added per worker (constant 2000 US\$), 2003	2,323	1,400	2,766	1,436	2,809	1,076	1,503	706	961	454	1,352	1,601
Economic reforms	Mixed (moderate to high) *					Mixed (moderate to high)				Mixed (moderate to low) **		
Main export products	Cereals, beverages, oil seeds, meat, dairy and egg, vegetables and fruit					Beverages, vegetables and fruit, sugar and honey				Vegetables and fruit, sugar and honey, cotton, wool		
Export destination	Neighboring countries, EU, distant markets					Neighboring countries, Middle East, partly EU				Southern Russia, neighboring countries including China		
SPS requirements in present export markets	Moderate to high					Moderate to high				Low to moderate		
Urbanization		Moderate to high				Moderate to low				Low		
Urban population (% of total)	73	68	72	57	64	52	52	47	36	25	46	37
Domestic market potential	Rapid urbanization and consumer markets change Still large traditional domestic markets					Limited to moderate Modest urbanization and consumer market change Traditional domestic markets still dominate				Limited to moderate Low urbanization and consumer market change Small, relatively unsophisticated domestic markets		

Data sources: WDI database; FAO 2006; the authors.

Notes: \*In Group I, Belarus has been slow to reform.

\*\* Kyrgyz Republic undertook more reforms than did the other countries in this group.



them, the European Union offers real opportunities for market diversification and access to better-paying market segments, provided they can meet EU requirements. Moreover, they face increasing competition in their own markets and in their traditional export markets, the Russian Federation and other CIS countries, from countries meeting high international safety and quality standards, such as the OECD countries, Latin American countries, and Turkey. Moldova and Ukraine have the highest potential to export to the EU and the most to gain from integration with trading partners in the West. The Caucasus countries (Armenia, Azerbaijan, and Georgia) have similar potential, but they are also close to the markets in the Middle East. For all countries, the main export products are vegetables and fruit and some animal products.

To increase access to other markets, especially the demanding food markets of the OECD countries, the CIS countries must overcome many obstacles and improve their competitiveness. One key challenge is to strengthen their SPS management capacities and to adopt standards and practices compatible with international norms.

The ability of these countries to make the necessary changes in quality and safety management for access to OECD trading partners differs widely. With the exception of the Russian Federation and, perhaps, Ukraine, CIS countries have limited human skills and financial resources for a smooth transition within a five-year time span. They especially need to gain knowledge and skills from abroad and, in most cases, financial support as well. On the private sector side, the modernized processors and retailers in the Russian Federation and Ukraine are best prepared to meet the new challenges in terms of access to capital and experience with modern consumer markets. The diffi-

culty of making the transformation is clear from the experiences of Armenia, Georgia, Kyrgyz, and Moldova. They have not gained much more benefit in the SPS area than they could have achieved without WTO membership. Their laws were adjusted to meet formal WTO requirements, whereas a start has hardly been made on the long and difficult reforms needed on the regulatory and institutional levels to move from GOST to international standards. The capacities these nations need to benefit from WTO membership are still largely lacking.

Only the two largest and most economically diversified countries seem to be making reasonably rapid progress toward modification of their systems; these are the Russian Federation and Ukraine. The Russian Federation has the finances, the tradable natural resources, and the clout as a major buyer of agricultural products to set its own course and to insist that sellers to its markets follow its regulations and interpretations of its regulations. The Russian Federation can deal with regulatory authorities and commercial buyers in foreign markets on an equal footing. It can also afford to finance the scientific and enforcement institutions that give its arguments before international regulators and standards bodies a "voice," as it is termed by a World Bank report (2005b). In this case, the voice is strong and carries far. Ukraine, though much smaller than the Russian Federation and having a lower per capita income, also has a voice because of the size of its market and its export potential; it also has many of the resources needed to actively participate in trade negotiations and in the technical committees in which international and regional standards are developed. In export markets, these two countries have most of the resources needed to manage SPS requirements to expand or maintain levels of exports.

# GOST System and Its Implications for Health and Competitiveness

The GOST-based standards system inherited by the CIS countries from the planned economy of the Soviet era forms the core of their food safety and agricultural health management systems. CIS countries are responsive to the challenges of today's global economy, but they still have a long way to go to adapt their food safety and agricultural health management systems to meet international requirements. The rate of change—especially for the smaller CIS countries—is slow. This chapter examines the current status of food safety and agricultural health within CIS, from the perspectives of both public health and agricultural competitiveness. Major weaknesses and deficiencies in management systems or capacities are identified to provide insights into the key challenges facing the CIS countries as they complete the transition to new systems compatible with their new market economies and with the global trading system.

## GOST-BASED STANDARDS

After the economic transition started, the Commonwealth of Independent States commissioned the Euro-Asian Council for Standardization, Metrology, and Certification (EASC) to maintain the GOST standards. A series of the standards were eliminated from regional and national use, but EASC members currently accept about 20,000 GOST standards in addition to national standards.

In many former Soviet republics, GOST standards were transposed into national standards with minor modifications. The Russian Federation, for example, created the GOST-R standards, Moldova established the Moldova Standard, Ukraine instituted UkrSEPRO, Kazakhstan has GOST-K, and Belarus has RB. Hence, the fundamentally prescriptive nature of the Soviet-era GOST standards was maintained.

Significant intraregional trade perpetuates the existence of the GOST-based system and complicates the transition to a market-based system. A CIS country exporting to another CIS country requiring GOST-based certification must be able to comply, even if the exporting country is changing to a system that complies with international standards. Also, vested interests, combined with bureaucratic inertia, help maintain the GOST system to justify the existence of bureaucracies and, possibly, to protect some domestic industries.

## GOST-BASED SYSTEMS AND SYSTEMS BASED ON WTO PRINCIPLES

Developed in the USSR to serve its planned economy, GOST standards are incompatible with a market economy and with the principles of the WTO international trading system.

- GOST standards are highly prescriptive *mandatory* standards that specify the materials, processes, analytic methods and techniques, and final product characteristics, including packaging, for all processed products. They were intended to provide almost complete compatibility and interchangeability of domestically manufactured products and their distribution systems and to set a single quality standard for each processed product. This conflicts directly with the market principles informing the international system, which permits each country to define a set of *mandatory regulations* covering product safety and acceptability for entry into its commerce and a set of *voluntary standards* permitting different qualities and types of the same product to be produced according to market demand.
- Because of its prescriptive nature and mandatory requirements, the GOST standards system is very rigid and stifles innovation. Over time, it often supports retention of anachronistic technologies, analytic methods, and management practices, and it cannot keep up with the new industrial developments and emerging issues in product safety. In Ukraine, for example, the GOST-based food safety standards require checking milk and meat products for the traditional pathogenic bacteria only; they do not require tests for bacteria of emerging concern, such as *Listeria monocytogenes* and *E. coli* O157 (GFA Consulting Group 2006).
- In modern food safety systems, such as those of the European Union and the United States, the primary responsibility for food safety compliance lies with the private sector—producers and processors—and not with the state, as under the GOST system. End-of-pipe control through conformity assessment by inspection services is, to a significant extent, being replaced by preventive controls throughout the supply chain, for which the private sector has the primary responsibility, with the government in advisory, oversight, and enforcement roles.
- Most GOST health and safety standards are implicitly included in its prescriptions and technical standards. They are not necessarily based on transparent scientific criteria, and they have little basis in the type of risk assessment and other scientific principles that underlie WTO provisions.<sup>11</sup> Under GOST provisions, food safety requirements are often lower than those of the Codex Alimentarius and other international standards. Standards for plant and animal health, in part, differ from IPPC and OIE standards because they overlap with other technical requirements.
- Standards bureaus played a major role in the state-planned economy, and they still play a much more important role in transition economies than do standards bureaus in market economies.
- In the area of public inspection, the system used in the OECD countries is participatory, and inspection fulfills advisory and verification functions. The GOST applies a top-down, hands-on control function. The inspection and conformity assessment programs are basically designed to ensure that production and distribution activities follow the prescriptions imposed by the planned economy. The number of required inspections for the domestic, import, and export markets in the CIS countries is much larger, and the inspections themselves more comprehensive, than comparable oversight in market economies. GOST inspections are carried out by a range of agencies, the services and mandates of which often overlap.
- The existence of more than 20,000 detailed, mandatory standards makes it almost impossible for private companies to comply with all of the requirements or for government agencies to supervise compliance. As a Russian expert observed: “We have found ourselves in an absurd situation when requirements deemed mandatory cannot be promptly and fully registered by those expected to fulfill these requirements, nor by supervisory authorities” (Rybtsov 2006).

## FOOD SAFETY AND AGRICULTURAL HEALTH

Food safety and agricultural health management have multiple dimensions. Most directly, food safety is a public health issue and agricultural health has immediate impact on agricultural income and productivity. On the other hand, these issues include an agro-food industry competitiveness dimension. This section looks at the public and agricultural health dimension; the following section focuses on the effect of food safety and agricultural health issues on the competitiveness of the food industry, particularly with regard to exports to the neighboring EU market.

### Impacts of the disintegration of the Soviet Union

The disintegration of the Soviet Union and the member nations' transition to market economies resulted in a number of food safety and agricultural health management challenges.

- The break-up of the Soviet Union resulted, in many of the smaller countries, in the breakdown or deterioration of transport and logistic systems and in reduced access to the advanced scientific and technological centers of the Russian Federation. Widespread infrastructure breakdown, affecting, for example, the decrepit water-supply and sanitation systems and the weak power supply and transportation systems, had direct impact on food safety and public health.
  - Contaminated water and poor sanitation are largely responsible for the region's increased risk of infection with diarrheal diseases and parasitic infections. In Moldova, one of the reasons identified in a 2005 nationwide household health survey for the country's sharp increase in food- and water-borne diseases since 2000 was the failure of one-third of the nation's urban water-supply pipelines (World Bank 2007b).
    - Authorities are understandably reluctant to seal off contaminated shallow wells in urban and rural areas with no alternative water supply.
    - The erratic and expensive power supply makes it less likely for households and food processors to follow proper hygiene practice in food handling.
  - Poor roads, which increase collection and transport time (and cost) for raw materials, such as milk, and for finished products, such as chilled meat and dairy products, combined with the use of nonrefrigerated vehicles, increase the risk of microbial growth and spoilage.
- Transition adjustments have, likewise, adversely affected government programs, especially for the low-income CIS countries, bringing about a deterioration of the public health system.
  - Insufficient public resources have weakened the surveillance, diagnostic, and research capacities of public health departments, leading to increased incidence of illnesses.
  - In Tajikistan and Kyrgyzstan, reduced public budget to control livestock diseases resulted in an increase in the incidence of brucellosis (mainly transmitted through the consumption of infected goat and sheep milk) among the population (WHO 2003).
- Decollectivization in the agro-economy resulted in the emergence of a large number of smallholders, who move varying but important amounts of food through informal supply chains to sales in towns and urban centers.
- Increases in vertical integration in the agro-food industries have improved delivery of finance, services, and markets to smallholders and have boosted productivity in Eastern Europe and, to a lesser extent, in middle-income CIS countries, such as the Russian Federation and Ukraine, but these processes are still developing slowly in the lower-middle-income and lower-income CIS states (World Bank 2005d).
- Privatization of state-owned enterprises and at least one wave of restructuring in their ownership and management have created "islands of excellence" that are turning around portions of some important agro-food industries. They represent a small core of companies that maintain high hygiene standards, use food safety management systems (such as HACCP) to ensure food safety, and, in some vertically integrated industries (such as poultry and wine), apply advanced codes of agricultural and manufacturing practices audited by third parties.

### Impacts of the GOST system

Several notable weaknesses of the GOST system have implications for the food safety and agricultural health system.

- As a legacy of the command economy, the system lacks transparency with regard to regulations: there is no consultation with stakeholders. As will be discussed in later chapters, this may lead one or both of to two things: (a) legislation that does not respond to market requirements; and (b) excessive discretion for officials implementing the law, opening the way to rent-seeking.
- One of the problems cited in EC veterinary assessment missions to CIS states is the weakness of animal quarantine systems (DG-SANCO 2005). Some national animal quarantine centers function more like collection centers and lack the facilities needed to adequately segregate different batches of animals for long enough periods to fulfill quarantine needs. A similar concern was expressed when Poland and Hungary acceded to the EU, and major efforts were made to reinforce the eastern border. In addition, CIS countries importing breeding stock do not usually perform disease risk analysis; the only livestock screening is a check for its source on the OIE list of epizootic disease outbreaks.
- In those countries that have become WTO members, confusion arises among inspection services as to which national regulations are current and valid.

### Food safety and public health

The belief remains widespread among technical specialists in transition economies that GOST standards are inherently safer because they are more prescriptive in defining methods of production. Although with adequate funding the system provided adequate health results in the Soviet-era planned economy, evidence shows that the present GOST system is not very effective in protecting the well-being of the domestic populace.

The main concerns in food safety are food- and water-borne diseases, such as shigellosis, hepatitis A, and E. coli enteritis; food poisoning due to botulism and chemical agents; and zoonotic diseases such as brucellosis, salmonellosis, and echinococcosis.<sup>12</sup> Food-borne and water-borne diseases may be encountered in homes, schools, and restaurants and canteens. They are generally caused by inade-

quate reheating of food and contamination of food and water by infected persons and animals. Cases may involve ready-to-serve meals, milk products (brucellosis from infected milk), or egg products. The high incidence of ascarid parasite infections in Moldova suggests significant cycling of parasites through households and their environment. The concentration of livestock among rural households may also explain the occurrence of these diseases; salmonellosis is linked to poultry, for example, and echinococcosis is caused by tapeworms in sheep.

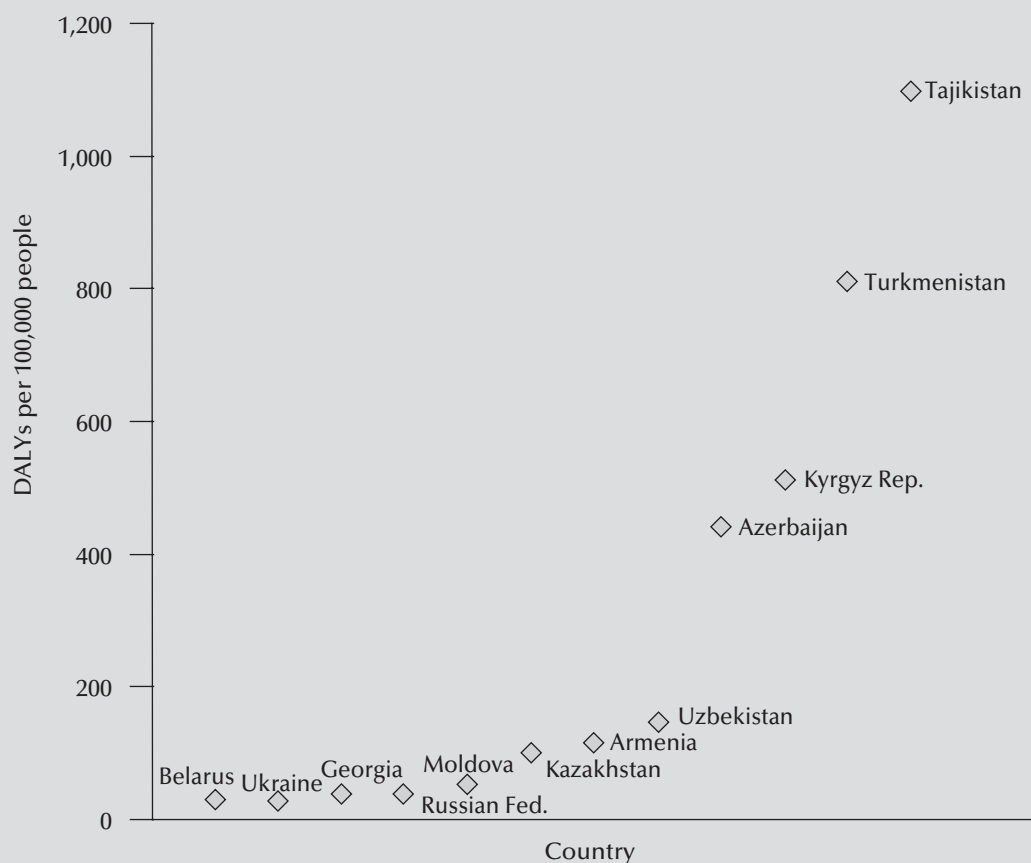
The incidence of food- and water-borne diseases can serve as a key indicator of food safety.<sup>13</sup> A relatively well-accepted international measure of disease impact combines incidence of illness (morbidity) and of death (mortality) into a standardized indicator called the Disability-Adjusted Life Year (DALY).<sup>14</sup> One DALY may be thought of as one year of “healthy” life lost to illness or death. DALYs are estimated only for the most important global diseases. This report uses the DALYs on diarrheal diseases (either food- or water-borne) as a crude proxy indicator for the *relative* food safety status among CIS countries.<sup>15</sup> Figure 5 shows the large spread across CIS countries of DALYs caused by diarrheal diseases (see the third column of table 12).

The countries in the lower range (Belarus, Ukraine, Georgia, the Russian Federation, and Moldova), at a DALY rate averaging about 38, are still a third above the EU15 average rate of 28 per 100,000 (the rate for the United States and Japan is 29). The next three countries (Kazakhstan, Armenia, and Uzbekistan) have an average rate of 121 DALYs per 100,000—more than 4.3 times the EU15 average rate. The last four (Azerbaijan, Kyrgyz Republic, Turkmenistan, and Tajikistan) have DALY rates 15 to 40 times higher than the EU15. These results approximately correspond to the three groups in table 11, with the exception of Moldova, Georgia, and Uzbekistan, which have relatively better rankings than other countries in their groups. The economic magnitude of food- and water-borne diseases can be illustrated by multiplying DALYs by estimated annual wage data (table 12).<sup>16</sup>

The rise in the incidence of zoonotic diseases (diseases transmitted from animals to humans) as a result of smallholder livestock rearing is a major concern for public health. Under family-based animal management (as opposed to concentrated industrial management), herds and some flocks (ducks and geese) are aggregated for grazing during the day and redistributed and held at family homesteads at night. These



Figure 5 DALYs Lost to Diarrheal Diseases, 2002



Source: Prepared from WHO Burden of Disease Statistics 2002 data.

Table 12 Estimated Wage Loss Due to Food- and Water-Borne Diseases

Country	Total DALYs lost to diarrheal disease (proxy measure)	DALYs per 100,000 pop.	Estimated annual wage (US\$)	Estimated economic loss for total DALYs ('000 US\$)
The Russian Federation	55,000	38	1,386	76,230
Belarus	3,000	31	1,152	3,456
Ukraine	16,000	33	732	11,712
Kazakhstan	16,000	101	1,488	23,808
Azerbaijan	37,000	440	684	25,308
Armenia	4,000	114	360	1,440
Georgia	2,000	38	600	1,200
Moldova	2,000	52	300	600
Kyrgyz Republic	26,000	512	372	9,672
Tajikistan	68,000	1,103	151	10,268
Turkmenistan	39,000	812	360	14,040
Uzbekistan	38,000	147	180	6,840

Source: DALYs for 2002 are from the WHO Burden of Disease statistics Website.

Annual wage estimates are based on interviews and from statistics on the ILO LABORSTA Website (<http://laborsta.ilo.org>).



practices have increased the contact between livestock and wildlife and between humans and wildlife in ways that have contributed to the emergence or reemergence of some zoonotic diseases, such as tuberculosis, rabies, brucellosis, and internal parasites. A recent survey in CIS countries in Central Asia reported that human incidence of echinococcosis is well over 10 cases per 100,000 population, far above the 1 to 5 cases per 100,000 level during the Soviet period (Torgerson et al. 2006) (see appendix 3). A more scattered poultry sector, with many households involved in free-range production and small flocks, together with larger units of poultry production, has increased the risk of infection from and the spread of the highly pathogenic H5N1 bird flu.

### **Agricultural health status**

Given the extremely diverse set of animal and plant species in agriculture and the diverse points of view about what constitutes a healthy agricultural system as compared to an unhealthy one, there is no globally accepted quantitative indicator for agricultural health. In the CIS countries, however, as their cropping patterns shifted to less pest-sensitive cereal crops, no major changes seem to have occurred in the crop pest and disease situation. Some exceptions are related to pest control capacity being swamped by outbreaks of locusts and rats in some countries and the threat posed by the introduction and spread of quarantine pests, such as the western corn rootworm in Eastern Europe (see appendix 2).

Under transition practices in pesticide use have improved. There has been a sharp decrease from the elevated and environmentally unsound levels of pesticide applications practiced in the Soviet

Union, although disposal of banned and out-of-date pesticide stocks remains a serious problem.

Emerging and reemerging disease problems appear to exist more generally in the livestock sector, despite decreased livestock populations. In the early transitional period, after the crash in livestock populations, some countries and donors imported breeding stock in an effort to rebuild herds and improve local breeds. In Armenia, the importation of pure breed dairy goat stock<sup>17</sup> appears to have led to the introduction of caprine arthritic encephalitis, a viral disease in goats; this nonlethal disease of small ruminants has no human health impact, but it is a drain on the productivity of infected juvenile and adult animals. This incident indicates weaknesses in Armenia's animal quarantine system.

Fragmentation of livestock holdings and lack of adequate compensation for culling diseased animals complicates official efforts at veterinary supervision (see box 6). It is often believed that small farms have more problems with animal diseases and plant pests. This is generally not true. Some pests and diseases, such as the western corn rootworm, represent a greater problem for large-scale production units because of their greater epidemiological vulnerability. Other diseases arise from the inadequate hygiene on small farms, and, therefore, are more difficult to eradicate; these include brucellosis and echinococcosis. No matter the source or circumstances, key to an effective response is the provision of necessary support services and the establishment of quarantine policies. In many cases, state veterinary and extension services have failed to develop effective systems of support for smallholders. Responsibility for supporting animal health and im-

### **Box 6 Sanitary Compliance by Smallholder Livestock Farmers**

Because of intense economic pressure, mandatory testing and vaccination efforts are occasionally frustrated by the active resistance of smallholders who do not want their animals tested for fear the diseased animals will be culled with little or no compensation or that low quality vaccines will infect the animals. In some cases, farmers have beaten inspectors and driven them from their villages. Dairy processors indicate

that producers will feed contaminated milk to their other animals, pigs, for example, sometimes boiling it but at other times not. As happens in many countries, it is very likely that herders in Armenia slaughtered and sold the meat of diseased animals to avoid economic loss during the anthrax outbreak in 2001, possibly causing the large number of human anthrax cases that appeared at the time.

plementing quality assurance programs at the farm level is increasingly assumed by private companies and cooperatives. The impact of these arrangements is limited, however, given the relatively low level of penetration of vertical coordination.

## STANDARDS AND OTHER CONSTRAINTS TO MARKET ACCESS IN THE OECD

While located close to Western Europe's high-priced, premium-paying market for agricultural products, intra-CIS trade dominates the agricultural exports of all CIS countries. Moreover, as countries in Central and Eastern Europe join the European Union and implement the strict EU requirements, CIS countries find themselves losing share in the CEE market, which had traditionally been easy to access. More than half of the CIS exports rejected by the EU were intercepted at the borders of these CEE countries (see appendix 4).

As a result, dependence on the CIS markets increases while opportunities to benefit from exports to a larger market likely to offer higher returns decline.

Many factors constrain CIS countries' market access to OECD countries, and to EU countries, in particular. Some are due to the GOST system, some to protectionism, and some to weaknesses in the public and private sector.

### The GOST system and the competitiveness of the agro-food industry

The GOST system weakens competitiveness of agribusiness in different ways.

- The GOST system of standards is not recognized in OECD markets. It makes use of different measurements and classifications for grades and standards, among other factors, and, thus, restricts the acceptability of products in non-GOST markets. Box 7 illustrates some differences between GOST-based standards and international standards, taking Ukraine as an example.
- The laboratories cannot meet many of the surveillance, certification, and inspection requirements for the European Union and other industrial countries. The facilities, equipment, and analytical methods were designed to meet the inspection and certification requirements of the GOST system.

- The rigidity of the GOST standards system thwarts product and process innovation since it requires difficult-to-obtain approvals of new standards. Since quality upgrading is an important aspect of market access to the European Union, the existing standards system constitutes a liability.
- The transaction costs are high for a number of reasons.
  - Many inspection agencies have responsibilities for parts of production processes. Overlap in responsibilities often leads to repeated inspections and laboratory analyses for certifications or approvals.
  - Large numbers of mandatory requirements expose companies to excessive multiple inspections by various government agencies.
  - The complexity of the GOST standards gives supervisory bodies great discretionary power. Combined with a weak rule of law and limited scope for appeal in courts, this leads to a high level of arbitrariness in law enforcement and provides much room for administrative rent seeking (see the section on governance issues below).

### Tariffs constrain entry into the EU market

Agriculture remains the EU's most heavily protected sector. While EU tariffs for industrial goods are generally low (below 4 percent), they remain high for agricultural products (about 20 percent).<sup>18</sup> The European Union provides reduced tariffs on selected products from developing countries through various preferential trade arrangements, such as the Generalized System of Preferences (GSP) for all developing countries and the "Everything But Arms" program for the Least Developed Countries.<sup>19</sup> The GSP scheme covers 7,200 products, classified as either nonsensitive or sensitive. Nonsensitive products enjoy duty-free access, while sensitive products benefit from a tariff reduction of 3.5 percentage points on the "most favored nation" (MFN) tariff. All CIS countries are beneficiaries of the GSP scheme; however, it excludes certain agricultural and food products important to CIS countries, such as wine, meat, and dairy products. For products eligible for GSP tariffs, the actual utilization is relatively low, largely due to the *rules of origin* requirement: if the cost involved in satisfying these requirements exceeds the margin of preference, there is no point to utilize the GSP scheme—and in some cases, the processors do need to use raw materials from other countries. Box 8 il-

### Box 7 Ukraine's Kefir and Sour Cream Standard as Compared to Codex and EU Standards

Under the EU TACIS project "Ukraine: Establishment of an Agricultural Standards Certification and Control Mechanism in Line with WTO-SPS Requirements," experts conducted detailed assessments of Ukraine's standards for kefir, sour cream, wheat, and sausage. Significant differences were identified between the GOST-based Ukrainian standards and those of the Codex and the EU. The following is a partial list of the differences in the kefir and sour cream standards.

#### Raw milk

- Ukraine has three grades of raw milk versus one grade for raw milk in the EU.
- Even the highest grade ( $\leq 300.000/\text{ml}$ ) of raw milk in Ukraine does not comply with EU requirements ( $\leq 100.000/\text{ml}$ ).

#### Food contaminants

- *Pesticides*. Ukraine's limited list of pesticides is not in accord with the extensive Codex list of pesticides.
- *Antibiotics*.
  - Ukraine checks for three types of antibiotics; the Codex and EU standards include a much more extensive list.

- Ukraine's measurements are expressed in units; Codex and EU standards are expressed in  $\mu\text{g}/\text{kg}$ .
- If expressed in the same unit of measure, all three of Ukraine's maximum residue levels (MRLs) differ from those of the Codex and EU, which have two with lower limits and one with higher limits.
- Ukraine checks antibiotics in both raw materials and finished goods. The purpose of checking antibiotics in fermented products requires justification.
- *Nitrates*. Ukraine checks on nitrates as a safety parameter in raw milk; the question arises as to the scientific evidence for the need to check on nitrates in milk. Neither the Codex nor the EU makes reference to checking nitrates in milk.

#### Food hygiene

- Ukraine's dairy standard makes no clear reference to the application of HACCP. Both the Codex Codes of Hygiene Practices and EU directives represent solid documents that make reference to the implementation and application of HACCP.

Source: Sonneveld 2006.

illustrates the limitations of the benefits provided by the GSP for agricultural products.

#### Regulatory constraints

For many products, CIS countries cannot access EU markets because the CIS legal system and institutional capacities are considered insufficient. For exports of most livestock products and fish, the EC requires a *third-country status* (see box 9). When Armenia, Azerbaijan, Georgia, and Moldova became WTO members, they changed their general food safety and agricultural health laws to comply with WTO requirements. Implementation and enforcement of these laws are lacking, however, because the needed regulatory system has not been developed and the necessary institutional reforms were not carried out.

Certain requirements in animal health, livestock production, animal welfare conditions, milk and

meat handling and transport must be met to receive EU authorization for animal product entry, for example. A surveillance program is needed with regard to the animal health situation. In Moldova, no new cases of foot and mouth disease (FMD) have been diagnosed in the course of surveillance of imported animals and animals in border zones since the last outbreak in 1980 and following a long campaign of vaccination and control that ended in 1994. Although OIE doesn't indicate any FMD risk for Moldova, the EC does not accept exports of animal products from Moldova for other reasons. An EC Food and Veterinary Office (FVO) report on Moldova (DG-SANCO 2005) noted that FMD and classical swine fever (CSF) surveillance programs are limited, and the quality-control system for raw cows' milk and the stunning methods used in slaughtering animals do not meet EU requirements.

### Box 8 EU GSP for Moldova and Ukraine

**Moldova.** In 2002, almost 73 percent of Moldova's exports to the European Union were eligible for GSP, but the preference quotas were not fully utilized. Only 60 percent of the eligible preferences were actually requested, which means the remaining 40 percent entered the European Union with full MFN tariff. In agriculture, 67 percent of the exports requested preferences. There were big variations within agriculture, however. For instance, 84 percent of shelled walnut exports requested preferences, but only 22 percent of fruit juice exporters did so. The underutilization is largely due to the rules-of-origin requirements. As a result, a large proportion of Moldovan fruit juice exports actually paid the full MFN tariff of over 22 per-

cent, and they had to compete with products from Central and Eastern European countries, Turkey, and a number of Balkan countries able to enter the EU market duty-free.

**Ukraine.** Preferences play a very small role in Ukraine's export to the European Union. Products of primary importance to Ukraine, such as cereal, meat, and dairy, are excluded from the GSP scheme. The only Ukrainian agricultural products that receive preferences are animal and vegetable oils and processed vegetables and fruits. GSP is of so little value to Ukraine that some analysts have observed that nobody even talks about GSP in Ukraine.

Sources: World Bank 2004a, 2005a; Aslund 2003.

### Box 9 Requirements for Third Countries Exporting Animal Products to the EU

To obtain EU approval for exporting certain animal products from a non-EU member state (the *third country*), a national institution should be accepted as the *competent authority*. The competent authority should be able to demonstrate satisfaction of the following principles:

- The animal health situation in the third country satisfies EU requirements for imports of the animals or products in question.
- National authorities in the third country can provide rapid, regular information on the existence of certain infectious or contagious animal diseases on its territory, in particular those diseases on the former OIE list A (OIE list of animal diseases requiring notification to the OIE).
- There is effective legislation in the third country on the use of certain substances (for example medication), particularly concerning the prohibition or authorization of substances, their distribution or release onto the market,

and rules covering their administration and inspection.

- There is an acceptable program in the third country to monitor the presence of certain substances and the residues thereof in live animals and animal products for which export approval is sought.
- The veterinary services in the third country are capable of enforcing the necessary health controls. (This emphasizes the importance of a complete chain of command.)
- Effective measures exist in the country to prevent and control certain infectious or contagious animal diseases.

In addition, and more relevant to the producers of meat products in third countries, the national authorities must guarantee that the processing establishment at which products intended for human consumption are produced satisfy EU requirements. This means that these establishments must comply with requirements similar to those for establishments within the EU.

Source: Moody 2005.

Currently, few establishments in CIS countries have received approval for exporting to the European Union. Kazakhstan has a few establishments allowed to export fish and fishery products; the Russian Federation has approved establishments in fish and fishery products, milk and milk products, and rabbit and farmed game meat. All other approved establishments are for low-value products, such as gelatin (Belarus) and animal casing (Turkmenistan, Ukraine, and Uzbekistan).<sup>20</sup> Prior reviews have shown that the EC FVO animal and animal product inspection teams usually find a large gap between EC requirements and current CIS public and private sector food safety infrastructure, skills, and transparency in monitoring and reporting (Schillhorn van Veen 2004). Despite this major gap, many smaller CIS states continue to seek approval to export fish, meat, and dairy products to the EC, although the public and private sector investment costs to achieve compliance are high and returns from that investment may come only slowly, especially because of the relatively low productivity in livestock sectors and the low potential to generate significant amounts of products for export.

### Compliance problems

Compliance with the SPS requirements of the European Union can constitute an obstacle. The two most frequently cited reasons for rejection of food and feed consignments at the EU border inspection posts are the presence of mycotoxins and residues of veterinary chemicals (RASFF 2005). Shipments of food and feed from CIS countries to EU markets exhibit the same pattern, with the top two reasons cited in the rejection notifications involving mycotoxins (aflatoxins, specifically) and veterinary antibiotics in honey (see appendix 4). It may well be that insufficient diagnostic capacity is contributing to the compliance problem. In many laboratories, the capacity to analyze pesticide and veterinary residues and mycotoxins is absent or deficient. With the possible exceptions of the Russian Federation and Ukraine, many of the CIS veterinary and public health laboratories do not have the equipment and methods in place to accurately test for these residues.

Notifications of mycotoxins in nuts and raisins, important products from Azerbaijan and Uzbekistan, have increased to about two dozen cases in recent years. There were nine cases of border interceptions for Azerbaijan hazelnuts in 2005 representing about 2.5 percent of its total hazelnut export to the EU or about US\$ 1.7 million (see appendix 4).

For certain products, intercepted shipments undergo treatments and are then allowed to enter the EU markets or are sold to other markets at lower prices.

### Weak private sector capacities

In many cases, it is not SPS constraints but the lack of competitiveness that may be the main reason for lack of market access. Most CIS countries cannot generate an exportable surplus of meat, and, consequently, the Russian Federation imports large amounts of meat from Latin American countries and elsewhere. So in this case, the lack of exports to the EU is not caused by the high tariffs. Wine represents a similar case. The market share in CIS countries of wine from Australia, South Africa, and Latin America has increased (Development Alternatives, Inc/Bizpro 2004; CNFA 2004) because producers in these countries are more competitive than those in Georgia and Moldova. To improve their competitiveness, experts recommend upgrading quality while keeping production costs low.

In particular, fresh produce producers in CIS countries have major difficulties meeting the volume, quality, and consistency requirements of modern retailers, not only in the European Union but also in the high-end markets of Moscow and other cities in the Russian Federation and Ukraine. In the case of fruit and vegetables, meeting EU SPS requirements is almost solely in the domain of private enterprises, since it requires organization of competitive coordinated supply chains. Although much progress has been made in this area (World Bank 2005d) few companies have been able to generate exports and much of the demand of the region's supermarkets is met by imports from outside the region.

## GOVERNANCE ISSUES

In many countries in the world, food safety and animal health inspections and customs are riddled with governance problems. The root of the problem is the inspectors' large measure of discretionary enforcement powers and the systems' lack of transparency. During field work on food safety and agricultural health, analysts and researchers come across many examples of rent seeking, bribery, and extortion. Examples include (i) inspection programs that focus on inspections for which fees can be levied rather than on inspections addressing health risks; (ii) informal payments required for each form processed; and (iii) inspections waived for payment.

CIS countries also offer many examples. In a series of surveys of business establishments in



Europe and Central Asia,<sup>21</sup> bribery is presented as a problem in doing business, during transport and inspections, for example (see box 10). As it presently functions, the GOST system provides typical opportunities for rent-seeking and bribery. It requires far more tests than capacity allows, and, in many cases, enterprises cannot meet all requirements, providing inspectors with considerable discretionary power. Moreover, in CIS countries that have joined the WTO there is no clarity about which regulatory system should apply.

A survey done in Ukraine revealed more cases of bribes involving inspections on safety (specifically those by the fire departments and sanitation services) than inspections on business matters (IFC 2005c). Herein lies a dangerous aspect of corruption: the ultimate losers are not the business people

dealing with corrupt officials but the consumers who end up with unsafe food. Undoubtedly, this pattern also seriously undermines the protection of livestock and crop health.

Some external factors have proven more successful than anticorruption drives in helping to spur change in these countries (Anderson and Gray 2006). Accession to the European Union has motivated changes in governance. Strong leadership is essential in the push for reforms. Trade liberalization, particularly membership in the WTO, exposes certain domestic law enforcement activities to the scrutiny of trading partners and international organizations. On the other hand, the greater emphasis on market reforms and inadequate attention to institutional reforms to promote accountability and transparency was thought to be a contributing fac-

#### Box 10 Issues on Governance

Some documented examples of corruption include:

- As much as 20 percent of the costs of domestic truck transport in Tajikistan are due to informal payments at checkpoints (World Bank 2005e).
- Local authorities in Kazakhstan organized so-called vegetable trains to supervise delivery of fruits and vegetables and to avoid corrupt policemen (World Bank 2005f). There was a report of a Kazakh Minister of Interior who rode with a delivery truck, after which the government took action and removed many of the internal checkpoints (World Bank 2005e).
- In Ukraine, a correlation exists between a firm's earnings and the likelihood it will be inspected, rather than between violations and penalties and inspections. Inspections thus do not serve the purpose of preventing violations (IFC 2005a).
- It has also been noted that business managers in Ukraine sometimes opt for the less costly alternative of making an unofficial payment rather than eliminating a violation (IFC 2005a).

The main causes of corruption may be found in weaknesses in institutional and legislative frameworks.

- An example of multiple agencies can be seen in Georgia, where numerous state and local inspectors and inspectorates are involved in sanitation:

- a. Inspectorate for State Supervision of Sanitary and Hygienic Norms, under the Ministry of Health, Labor, and Social Security
- b. State Inspectorate for Sanitary Surveillance at Border Checkpoints, under the Ministry of Health, Labor, and Social Security
- c. State Inspectorate of Sanitary Surveillance under the City Services of the City Government of Tbilisi
- d. Central and Regional Services of the State Central Sanitary Inspectorate under the Ministry of Health, Labor, and Social Security.

For these inspectorates and agencies, activities are prescribed in eight laws and more than 15 intraministerial norms, rules, and decrees, only a few of which are made public (IFC 2004a).

- The laws in Belarus prescribe sanitary inspections but do not specify procedures, frequency, or duration (IFC 2005b).
- The sanitary and epidemiological stations in Uzbekistan have extrabudgetary funds from fines arising from violations of sanitary regulations; 15 percent of this fund is allocated as bonuses to the staff (IFC 2004b).



tor to the rise of corruption among transition countries (Anderson and Gray 2006).

Despite the complexities involved, a solution can be found by establishing transparency in the regulatory system, both in the process of drafting regulations and in the conduct of inspections according to clear procedures and guidelines. In Tajikistan and Belarus, some enterprises have used an Inspections Registration Book to deter unauthorized inspections (IFC 2003 and 2005b). Inspection systems should be based on risks; this will provide incentives to those who comply and penalize violators (IFC 2005a). Indeed, to design a sound regulatory and institutional framework that minimizes the room for corruption is one of the biggest challenges in the reform of food safety and agricultural health management.

## SUMMARY: SPS ISSUES AND COUNTRY GROUPS

Food safety and agricultural health situations are summarized in table 13 according to country

groups. Using the DALY rate to compare the countries' food safety situations, and considering the outliers, the third group shows the least favorable condition, with Turkmenistan and Tajikistan having the highest DALY rates.

With regard to agricultural health, changes resulting from the break-up of the Soviet Union give rise to certain concerns: the shift to smallholder livestock rearing has caused increases in zoonotic diseases due to more frequent contact among humans, livestock, and wildlife; weakened border controls may permit entry of plant pests that affect crops.

The standards systems in CIS countries pose direct and indirect constraints on the competitiveness of potential exporters. Lack of capacity to comply with SPS requirements, however, is only one cause of the lack of market access. In some cases, the causality may be the reverse: lack of competitiveness is caused by other factors, and, in fact, lack of competitiveness constrains the ability to make the investments necessary to improve compliance.

**Table 13 SPS Issues for Country Groups**

	<b>Group I: Russian Federation, Ukraine, Kazakhstan, and Belarus</b>	<b>Group II: Armenia, Azerbaijan, Georgia, and Moldova</b>	<b>Group III: Turkmenistan, Uzbekistan, Tajikistan, and Kyrgyzstan</b>
Food safety situation	Good to moderate DALY rate: 33–101	Good to moderate DALY rate: 31–440	Moderate to poor DALY rate: 147–1103
Animal health situation	<ul style="list-style-type: none"> <li>Perceived increases in zoonotic diseases from smallholder farms, although official databases show strong decline in tuberculosis and brucellosis in Moldova, the Russian Federation, and Ukraine</li> <li>Emergence of HPAI</li> </ul>		<ul style="list-style-type: none"> <li>Rise in Echinococcosis and other zoonotic diseases</li> </ul>
Plant health situation	<p style="text-align: center;">Threat of introduction of pests due to weakened border controls</p> <ul style="list-style-type: none"> <li>Good capacity to detect mycotoxin and pesticide residues</li> <li>Moderate capacity to deal with emergency outbreaks of pests and diseases</li> <li>Moderate plant quarantine</li> </ul>		
		<ul style="list-style-type: none"> <li>Weak capacity to detect mycotoxin and pesticide residues</li> <li>Weak capacity to deal with emergency outbreaks of pests and diseases (locust, rats)</li> <li>Weak plant quarantine</li> </ul>	<ul style="list-style-type: none"> <li>Very weak capacity to detect mycotoxin and pesticide residues</li> <li>Very weak capacity to deal with emergency outbreaks of pests and diseases (locust, rats)</li> <li>Very weak plant quarantine</li> </ul>
Capacity to meet requirements in OECD markets for sensitive products	Moderate to low	Moderate to low	Low
Competitiveness in OECD and top-end CIS markets	Moderate to weak	Weak	Very weak

# Replacing GOST-Based Systems by Systems Based on WTO Principles

CIS countries have already made a number of key choices for the future. They have decided to adopt market-driven economic systems, and they have applied for WTO membership. Many choices remain to be made about how best to proceed, however. This chapter first discusses the options, paying special attention to evolving thoughts about how to manage SPS and organize the relevant institutions. Next, it considers the general experiences of transition countries that joined the European Union, the experiences of Lao PDR and Vietnam, and EU reforms of food and feed policies. The chapter proceeds to analyze thematic issues relevant to the change from GOST to international system, including legal and regulatory systems, diagnostic capacities, issues relevant to the private sector, and options for regional cooperation. The last section of this chapter discusses the costs and benefits of reforming standards systems and the international assistance provided to CIS countries.

## CHOICES TO BE MADE

Most CIS countries have successfully recovered from adjustments to their economies due to their market transitions following independence. In recent years, they have experienced encouraging growth rates for their economies and agricultural sectors, in particular. The challenge for sustained agricultural growth ahead is to develop comparative advantages further, upgrade product quality, and seek product and market diversification. Since all CIS countries, except Turkmenistan, have either joined the WTO or applied for membership, their decisions to shift toward a market economy and to integrate further into the global trading system are implicitly fixed. But the question of how to transform from GOST to a WTO-compliant system is complex.

As indicated in the previous chapter, with the abolition of the state planned economy the GOST system ceased to be suitable and will increasingly become an obstacle to obtaining international market access. The former transition economies that have joined the EU have replaced GOST with new systems as a result of their adoption of the *Acquis Communautaire* and now apply EU requirements to their imports. This means that CIS countries' access to their traditional export markets in Central and Eastern Europe is at risk and has already been disrupted in several cases. Two emerging major changes within the CIS region form equally big challenges. First, the main economies in the region, the Russian Federation and Ukraine, are moving closer to

the conclusion of WTO accession negotiations. Although no date for accession has yet been set, it is to be expected that in about five years from now the Russian market will have a mixture of international and GOST standards. Countries that don't move in the same direction risk losing market access there as well. The second factor is the rapid growth of modern retail systems in urban areas of the Russian Federation and other CIS countries. It should be expected that retail chains, just as in the OECD countries, will increasingly require the use of quality and safety assurance systems based on good practice. As a consequence, there will be increasing differentiation among market segments within the transition economies, with lower prices paid in the shrinking market segment for which GOST standards are accepted.

The effective management of sanitary and phytosanitary measures requires capacities for border control, surveillance, diagnosis, inspection, certification, and appropriate responses to stop or contain threats to food safety and agricultural health. The basic requirements for SPS management are appropriate institutions, legislations, and regulations. Sound technical capacities are required to formulate appropriate regulations and for their effective enforcement. Human skills, in fact, are fundamental in all aspects of SPS management. All of these capacities entail costs and choices must be made based on priorities in trade, emerging threats, and identified risks of health hazards.

To more fully integrate into the European and global markets, the CIS countries need to work on multiple fronts, including improvements to the regulatory environment, business facilitation, governance, product quality, and, very importantly, improving SPS management. These changes are important for improving their competitiveness in their domestic and intraregional markets and are crucial to increasing actual access to the EU market. The European Union (currently with 27 members) has an economy almost 30 times as large as that of the CIS and should become a more important trading partner for CIS.

## EVOLVING PRINCIPLES FOR SPS MANAGEMENT IN MARKET ECONOMIES

Two factors have profound effect on the way in which market economies manage and organize

their food safety and agricultural health systems. The first is the 1994 WTO SPS agreement, which brought new disciplines to the trade relations between countries. The second is the increased sensitivity of consumers in OECD countries about food safety in reaction to many recent food scandals and food scares. The result is that major principles in the management of food safety and agricultural health have evolved in many countries, including an integrated agricultural health safeguarding system, the farm-to-table concept, and the use of risk analysis.

- An *integrated agricultural health safeguarding system* covering the entire disease and pest control process from quarantine, surveillance and control to export certification protects crops and livestock (and the food chain) from pests and diseases (see box 11).
- The *farm-to-table concept* provides the basis for a comprehensive management of risks at all stages of production, marketing, processing, retailing, and consumption.
- The use of a *risk analysis framework*, including risk assessment, risk management, and risk communication to recognize and incorporate differences in risks, provides guidance to policymakers with regard to priorities and allows resources to be used efficiently.

To effectively manage food safety and agricultural health, therefore, countries must have in place institutions and legislations supporting the effort and technical facilities equipped to make accurate diagnoses on which evaluations of risks will be based.

### Legislative and regulatory framework

A good legislative and regulatory framework for food safety and agricultural health should be based on modern principles for market economy and meet the following conditions:

- It should be compliant with the international requirements to which the country has committed or is planning to commit itself. This implies that laws should be compliant with WTO agreements; with the requirements of OIE, Codex, and IPPC membership; and with bilateral, regional, or other multilateral trade agreements, such as those with the EU.
- Laws can only be effective if regulatory frameworks and public—and often also private—capacities are adequate to implement them.

- The legal and regulatory framework should be broadly endorsed by all public agencies and private stakeholders or should at least have broad legitimacy. If this condition is lacking it will be very difficult for the government's services to implement it effectively.
- The regulatory system should provide rule of law, limit the discretionary powers of implementing agencies, and reduce rent-seeking behavior by services and individuals.

Effective legislation must not only institute laws and regulation ensuring food safety and agricultural health, it should also allow authorities to inte-

grate preventive measures. Responsibilities among the different institutions should be clarified and delineated and the measures of interaction defined. Provision should be made for checks and balances, and enforcement and control measures should include effective and proportionate penalties.

### Functions

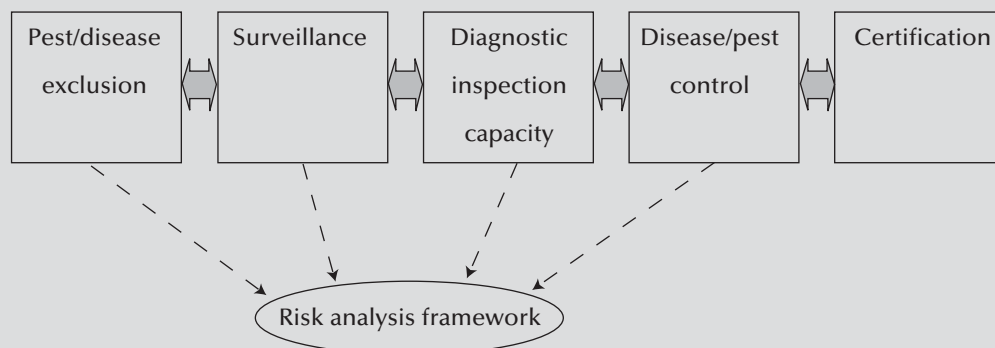
SPS management requires the performance of three different functions:

- Policy making, legislation, and determination of a system architecture;
- Implementation of the system, including the three elements of the risk analysis framework,

### Box 11 Integrated Agricultural Health Safeguarding System

The *integrated agricultural health safeguarding system* aims to prevent the introduction and establishment of alien pests and diseases and to reduce the economic impact of established pests and diseases through exclusion, detection and surveillance, in-

spection and certification, and control and eradication. The system supports and is supported by risk assessment. Information gathered by the system is used to assess risks that, in turn, guide appropriate interventions.



The risk analysis framework forms a critical part of food safety requirements currently requested by OECD countries. It can also be a most valuable tool in the process of national priority setting to decide which food safety and agricultural risks require most immediate attention. It is comprised of three components: risk assessment, risk management, and risk communication (FAO 2003).

- *Risk management* is the process of weighing policy alternatives using input from risk assessment. The function extends to inspection and intervention in cases of emergency.
- *Risk communication* is the interactive exchange

of information among risk managers, risk assessors, consumers, industry, the academic sector, and other interested parties throughout the entire process of risk analysis.

- *Risk assessment* involves the identification and characterization of hazards, an evaluation of likely exposure to the hazard, and the characterization of risk. The setting of standards should be based on assessed risks. Risk assessment receives the most attention during capacity building, not because it is more important, but because it requires specific procedures, skills, training, and data requirements.

- integrated safeguarding, and the farm-to-table concept; and
- Evaluation of the system and its performance.

Consensus is growing that these functions should be separated to a significant degree to promote transparency and to reduce conflicts of interest, which can undermine the credibility of food safety and agricultural health management systems.

- A basic issue in food safety is the potential conflict between supporting agricultural producers and protecting consumers; thus these different functions should at least not reside in one department or service. Most countries delegate the political responsibilities for consumer protection to the ministry of health and for producer support to the ministry of agriculture.
- Policy making, implementation, and evaluation functions may also require separation. Inspection services should not set policies, only implement them, and evaluation of food safety and agricultural health management should be independent of both policy making and implementation.
- Risk assessment and risk management in standards setting and adoption of measures can also be clearly distinguished. Risk assessment should be science-based and, preferably, independent of government agencies charged with policy making and inspection; it is often charged to specialized teams in research institutes or in dedicated agencies. Risk management is a function of government agencies with the responsibility of deciding what risks are acceptable and how to deal with diseases. These agencies should adopt measures based on the findings of risk assessments. An efficient risk analysis framework is an iterative interaction between risk managers and risk assessors. The integrity of this entire process depends on the independence of the two functions and on transparency. Risk communication constitutes a separate special role of providing the transparency that sustains trust in regulators by consumers and trading partners.

In practice, food safety and agricultural health systems differ greatly from country to country, and adjustment to these principles is often slow and partial because of cost, the complexity of the required reorganizations, and opposition from

vested interests. Some systems are far from optimal, but without a major crisis demand for reform is often lagging. Since CIS countries must make significant adjustments to adopt standards systems based on international principles, however, they are well advised to look at broader options for choosing policies and institutional architecture.

Small, low-income countries may not need full-scale risk assessment capacity of their own; they could use internationally recognized resources to perform the risk assessments needed. However, they need a capacity to do less rigorous risk evaluations for tasks such as resolving questions about allowing certain imports, designing preventive measures, and developing information for public policies and priority setting.

Effective systems require policy and operational coordination starting at the national level and extending to implementation and enforcement at the district and local levels. Food inspectors are better able to do their jobs when guided by adequate regulations. Laboratories can do more efficient analysis if sample specimens are properly obtained by inspectors; and these results, in turn, will better support policy making (FAO 2003). Policy making offices at the national level will be better able to make appropriate decisions (which may save lives or resources) when local authorities promptly report occurrences of diseases.

## ADJUSTING THE INSTITUTIONAL ARCHITECTURE

At the national level, several public institutions are involved in managing food safety and agricultural health, for example, ministries of public health, trade, and agriculture, and several services within these ministries, such as veterinary services and inspection, plant inspection, food safety inspection, laboratories, and research units. Different levels of local government can also have various roles.

Proper functioning of and coordination among responsible offices are critical to the implementation of a food and agro-health safety system. Many countries have long had problems in their food safety systems, however, such as lack of coordination among government agencies, insufficient rule of law, contradictory regulations used by different agencies, and high cost of implementation as a result of multiple inspections. Typical problems are overlaps and conflicts between food safety regulators in public health ministries and veterinary ser-



vices in agricultural ministries. Plant protection services have less overlap with other agencies and, therefore, are less often involved in interagency conflicts, but in the interests of efficiency and consistency, an integrated approach to food safety and agricultural health is desirable. Rivalries lead to costly duplication of effort, but they are also dangerous when they lead to a lack of clarity in leadership in response to calamities, such as food hazards or disease outbreaks. These problems became more visible and calls for change became more urgent with the signing of the WTO SPS agreement, requiring harmonization with international standards and greater transparency in member countries' regulations and practices, and with rising consumer awareness and demands for food safety and environmental protection in the wake of a series of food scandals.

### **Organizational options for food control system**

OECD countries and other countries have tried to reform their food safety and agricultural health management systems in recent years. There are three possible institutional arrangements for a food safety and agricultural health control system: a multiple agency system, a single agency system, and an integrated system.<sup>22</sup> The choice depends on the country's situation and characteristics, including, but not limited to, the size of its export sector, domestic health issues, and the capacity of the various agencies involved.

*Multiple agency system.* This is the common setup in most countries, resulting from the varying sectoral objectives—public health concerns with food-borne diseases, a trade ban on animal products from countries with certain animal diseases, negotiations about pest-free status, and so on. The responsibilities for food control and agricultural health are shared by a number of government offices at the national level and often with subnational-level agencies. Coordination among the different agencies is crucial for this arrangement to function efficiently; otherwise, possible problems include duplication or gaps in regulatory activities, fragmentation among the offices, uneven implementation due to varying degrees of capacities across agencies, and conflicts and confusion in implementation of laws. On the borders, three units perform separate inspections on food safety, animal health, and plant health.

*Single agency system.* In this system, responsibility for animal health and food safety inspections is

consolidated into a single food control agency. In some cases, this includes phytosanitary controls as well.<sup>23</sup> Policy making and standards setting usually remain in the ministries of health and agriculture. Although consolidation of food inspection functions has merit, its acceptability will depend on the country's history and political environment.

*Integrated system.* In this setup, a national autonomous food control agency coordinates, monitors, and audits all food control activities; formulates all policy; performs and manages risk assessments; and develops standards and regulations. The responsibilities for food inspection and enforcement, education and training, and other implementation functions remain with the existing agencies at the national, regional, and local levels. In the European Commission, the DG SANCO performs such a role; its mandate includes phytosanitary controls. The autonomous food control agency assures an integrated approach that provides coherence to the whole food control system. The setup is also more politically acceptable since it does not deviate too much from agencies' existing inspection and enforcement roles.

### **Examples of single agency food control systems**

In the last decade or so a number of countries have streamlined and consolidated their systems for effectiveness and efficiency, that is, food safety functions formerly scattered among several agencies were transferred to a single agency. Examples include Canada, Denmark, Ireland, and New Zealand among industrial countries and Lithuania and Slovenia among former socialist countries now members of the EU. The U.S. Government Accountability Office (GAO) conducted two studies on the experiences of these countries<sup>24</sup> and found the net effect of consolidation to be generally positive. Reported improvements in food safety management include better service delivery due to the single contact point for consumer and industry clients; more consistent or timely enforcement of food safety laws and regulations; reduced overlap in inspections; streamlined communications; and so on. Box 12 describes one consolidation effort: the creation of the Canadian Food Inspection Agency (CFIA) as Canada's single food agency has made it one of the most successful food safety management models around the world.

No one "best system" exists that fits all countries; after all, each country must undertake insti-



tutional reforms and restructuring in accord with its own historical and political context. The needed reforms are complicated as they will involve reallocation of resources and staff, and they are essential to the effective implementation and well-functioning of the food safety and agricultural health systems. There are difficult issues that should be considered at the outset.

- The absence of strategic guidance by the political leadership is one of the reasons for interagency rivalry, delayed adjustments, and slow performance by legislative institutions. It has also contributed to confusion, uncertainties on the validity of the regulations, and ineffective enforcement.
- The clarification and alignment of responsibilities among government agencies deserve first priority in the restructuring of food safety and agricultural health management systems. It is essential to define clearly the tasks to be performed and the functions of each agency involved.
- This is the key to reducing overlaps and replications in the system to make better use of scarce public resources and reduce the costs for the private sector.
- A clear division of responsibilities allows the public to know what to expect from every agency, and thus to hold them accountable for meeting their responsibilities.
- CIS countries' food safety and agricultural health systems generally need some consolidation. A common problem in most CIS countries is the presence of too many agencies with weak capacities and few resources. Consolidation of certain functions and resources not only improves efficiency by reducing repetition in inspections and testing but enables more targeted capacity building and technological upgrades.
- Competition among agencies involved in food safety is a general issue in many countries, but it is especially serious in CIS countries. The transformation process from GOST to a WTO-compliant system involves redistribi-

### Box 12 Canada's Creation of a Single Food Inspection Agency: CFIA

Before Canada consolidated its food safety system, its food safety responsibilities were shared by three federal ministries: Health Canada, Agriculture and Agri-food Canada, and Fisheries and Oceans Canada. In the mid-1980s, when officials from the three ministries tried to work out a pesticide policy together, it became evident that they had very different interests: Health Canada had an interest in the impact of pesticides on humans; Agriculture had an interest in the impact on soil, water, crops, and animals; and Fisheries had an interest the impact on fish. It became clear that such problems, caused by several departments having divided authority, were to be found in all aspects of government regulation of the food supply chain. In the ensuing years, food regulations were gradually rationalized between Agriculture Canada and Health Canada. To further clarify responsibilities, improve effectiveness, and reduce federal spending, the Canadian Food Inspection Agency (CFIA) was created in 1997 to take over all responsibility for food safety inspection activities, including inspection of im-

ported and domestic products, as well as export certifications. It is also responsible for animal health and plant disease control.

Responsibility for standards setting relating to public health, including research, risk assessment, and setting acceptable residue levels, are consolidated within Health Canada, in line with the principle of the separation of risk assessment (Health) and risk management (CFIA). Standards not related to human, animal, or plant health continue to be set by Agriculture Canada; for example, quality standards for grading crops (color, shape, size), animals (percentage of fat in meat), and food (size of eggs).

It is reported by some officials that the creation of a single food agency has reduced government expenditure on food safety control operations. Moreover, the consolidation has been well received by stakeholders, who cite benefits of improved communications, easier interaction with regulators through the single enforcement contact point, and fewer inspectors visiting processing plants.

bution of authority and resources and increases competition between institutions.

## EXPERIENCES OF REFORM

### Completed transitions

Lithuania and Poland, both Central and Eastern Europe countries and western neighbors of the CIS, are now members of the European Union. In a period of four to seven years, both countries were able to harmonize their food safety and SPS laws, regulations, and enforcement practices with those of the European Union, although small enterprises and some sectors are being allowed transition periods. In Poland, for example, the smaller meat processors have been granted a grace period lasting until December 31, 2009. These countries' primary and secondary food industries, distribution systems, and wholesale and retail organizations had to renovate their facilities and operations to comply with the broad set of market regulations that is part of the *Acquis Communautaire*. A significant part of the cost of these changes was borne by the European Union.

*EC pre-accession instruments.* Before 2007, the following pre-accession support programs were available to acceding and candidate countries: PHARE, ISPA, SAPARD, the Turkish pre-accession instrument, and CARDS (for the Western Balkans).<sup>25</sup> The PHARE program involved measures on institution building and economic and social cohesion. The ISPA program provided large-scale environment and transport investment support. The SAPARD program supported agricultural and rural development. Starting January 1, 2007, all pre-accession assistance instruments were replaced by a single Instrument for Pre-accession Assistance.

*Poland.* The initial fear that the agro-food industry would suffer from the entry of Western European food products proved unfounded. Poland developed from being a food importer before the transition into a food exporter at present. It has fully integrated the *Acquis Communautaire* into its legislation. A major restructuring and consolidation took place in both the public and the private sectors and is continuing as some slaughterhouses were given grace periods through the end of 2009. The number of labs under the Ministry of Health fell from 248 to 66, not including consolidation with animal health district labs.

- The number of slaughterhouses declined from 2,600 in 1999 to 1,200 in 2006.

- The meat industry declined from about 7,000 companies in 2001 to 3,000 in 2006.
- The new system, which delegated more responsibility to the producers and processors, required fewer veterinarians for meat inspections.

These adjustments were financed by support from the European Union:

- The cumulative EU investment to upgrade the public food safety and SPS capacity before accession in 2004 was about €175 million, while the cumulative EU investment in the restructuring of private industry totaled about €1.2 billion.
- The total PHARE budget for strengthening agricultural administration institutions amounted to about €178.5 million, of which 26 percent (€46.7 million) covered veterinary services and 17 percent (€29.9 million) covered improvements in plant protection institutions.
- The food and agriculture sector has received about €450 million in annual transfers to complete the transition since joining the EU. These transfers offset the costs of a major consolidation in the national food industry.

Experiences derived from the transition in Poland's standards system and perhaps relevant to CIS countries indicates the need for the following:

- Careful sequencing and timing of activities. Inventorying regulations and the status of food processing facilities was the first step, followed by development of plans for adapting existing institutions, with emphasis on training, and then by introduction of new legislation and regulations.
- Clarity and transparency in drafting the legislation in local language. This requires skilled translators. It also requires lawyers with understanding of the technical issues involved. Mistakes can have undesirable practical implications. For example, the supermarket sector was not covered properly in the new legislation, and hence its supervision was included both within retailing (which falls under the Ministry of Health) and food preparation (under the Ministry of Agriculture).
- Adequate time for industry to adapt to new regulations, with strong emphasis on capacity building. Poland suffered from the inexperience of both government staff and private

consultants on the technological aspects of the new quality systems of good agricultural practice (GAP), good manufacturing practice (GMP), and hazard analysis and critical control points (HACCP).

- Major attitude changes undergirding the public inspection system as inspectors change their function from top-down supervision and control to a much more advisory role under the HACCP, GAP, and GMP systems.

*Lithuania.* Lithuania has actively sought integration with the European and global market ever since gaining its independence from the Soviet Union in 1990. It joined the WTO in 2000 and became a member of the European Union in 2004. Great efforts have been made to improve its food safety and SPS management to meet accession requirements and fulfill its obligations as a member of the WTO.<sup>26</sup> Major achievements include the following:

- *Acquis Communautaire* was fully transposed into domestic legislation.
- A reorganized and streamlined administrative framework for food safety and agricultural health, with a very clear division of responsibilities among all the agencies involved, was established. A State Food and Veterinary Service (SFVS) was also created to serve as the single official food control agency.
- Necessary administrative capacities were built up.
- The HACCP system was introduced in all food establishments. HACCP is applied in levels: bigger companies adopt the full system, while small enterprises employ either a simplified system or the list of “13 Good Hygiene Practices” as formulated by the government.
- The laboratory system was consolidated.
- Modern, effective border controls were instituted.

The EU provided large amounts of financial support and technical assistance for Lithuania’s transition. Nearly €30 million was spent in new and renovated laboratory facilities and equipment alone. From 1997 to 2003, the PHARE program allocated roughly €40 million to agriculture in Lithuania, of which nearly €30 million was used for projects related to SPS. Below are a few examples of SPS projects funded by PHARE.<sup>27</sup>

- Assessment of needs related to veterinary and phytosanitary control, €0.15 million;

- Veterinary and phytosanitary control, €1.7 million;
- Veterinary and phytosanitary border control measures, €3.5 million;
- Strengthening and enforcement of EU food control system, €3 million;
- Strengthening of control on infectious animal diseases in Lithuania, €6.11 million;
- Strengthening of food safety control and food control laboratories, €2.9 million; and
- Strengthening the implementation of policies and procedures for plant protection and plant variety identification, €1.47 million.

Knowledge gleaned from the transition of Lithuania’s standards system perhaps relevant to CIS countries includes the following:

- In July 2000, three separate agencies for food safety control—the State Hygiene Inspection, the State Quality Inspection, and the State Veterinary Service—were merged into the State Food and Veterinary Service (SFVS), reporting directly to the Prime Minister.
- The functions and responsibilities of various ministries and agencies were more clearly defined: the Ministry of Health establishes mandatory requirements for food, such as maximum residue levels (MRLs), and monitors food safety and food-borne diseases, for which it uses expertise from research institutions; the SFVS is responsible for the implementation and enforcement of food safety and veterinary controls, both for domestically produced and imported products; and risk assessment is undertaken at the Center for Risk Assessment and Information at a university institute.
- The number of inspections required was significantly reduced, and the total number of government staff performing inspections decreased. Employment in parts of the Ministry of Agriculture charged with implementation of EU policies increased, however.
- Laboratories inherited by SFVS from the previous separate agencies were consolidated. The number of labs was cut from 50 in 1994 to only 10 in 2001, and further consolidation is anticipated, with the goal of cutting down to one central lab and four regional ones. With fewer labs, the limited resources for lab renovation, equipment upgrading, and training are utilized with better targeting and focus. The National Veterinary Laboratory, a reference

lab for the diagnosis of animal diseases and food safety testing, received EU accreditation in 2000; its three branches and a county SFVS laboratory were accredited by the EU in 2005.

- Throughout the accession process, Lithuanian authorities had good understanding of the issues and were determined to resolve the problem of overlapping government responsibilities and to establish agencies adequately organized to implement the *Acquis Communautaire*. Political drive and leadership were important factors in Lithuania's success.

*Lessons learned.* It is important to note that before accession Poland and Lithuania were already relatively advanced trading economies within the former communist bloc. Yet the transition from GOST standards to EU standards was a major and demanding project. Some important lessons can be drawn for CIS countries facing this transition:

- Strong political leadership is an important factor for success in the transition process.
- Officials and industry representatives in both countries describe the process of transition as causing tremendous changes in the regulatory framework, institutional alignments, training, and industrial and marketing management; but more than all these, it caused a huge shift in the "way of thinking" about managing food safety and agricultural health.
- The transition required a huge investment and enormous operating expenditures before compliance with the EU standards could be reached, allowing the free circulation of goods within the EU and establishing a new eastern frontier for the common market.
- Major consolidations took place in diagnostic capacity.
- Access to relevant information and the need for specialized language skills constituted the main bottlenecks.
- Standards bureaus were relegated to background roles.
- Transposition was gradual, and both countries retained significant numbers of GOST-based regulations, standards, and enforcement procedures until the late 1990s.

### **Transition of standards systems in Southeast Asia**

Vietnam and Lao PDR were both socialist countries that have now adopted a system of market

economy. In both countries, the socialist planning system and GOST were much less developed than they had been in countries of the former Soviet Union. But several control principles of a state-planned system, similar to Soviet GOST principles, had been implemented and consequently had to be replaced by WTO principles. Vietnam became a WTO member in 2007; Lao PDR has applied for membership. WTO membership in both cases requires extensive legal and institutional reforms and capacity building. Both countries offer examples of achieving success in international trade by adopting standards compatible with principles of the market economy; by allowing, and even promoting, the development of the private sector; and by complying with the SPS requirements of their trading partners (World Bank 2006b and 2007c).

### **EU food safety system**

Reform of food safety regulation is also on the agenda of OECD countries. The European Union fundamentally reworked its food and feed legislation in 2004, with most provisions entering full effect as of January 2006. The system is based on WTO principles, but it includes many other principles not part of the WTO system. It was introduced after much discussion with other WTO members who voiced many concerns about various requirements. This shows that the WTO system is far from unambiguously prescribing the precise form and particularities of a food safety or SPS system.

The new rules on food safety, known as the "hygiene package," included five pieces of legislation.<sup>28</sup> Covering certain products of animal origin intended for human consumption, the legislation applies systems approaches to risk management in food hygiene and health conditions and lays down specific rules for organizing official controls for production and marketing. Following the principles of the international system, producers are recognized as having primary responsibility for food safety, and food policies are based on risk analysis. The following important concepts are also included:<sup>29</sup>

- Food and feed establishments should have traceability systems enabling them to identify business supplying them with input and businesses to which they in turn supply their products. Importers must be able to identify from whom products were obtained in the country of origin.<sup>30</sup>



- HACCP controls<sup>31</sup> must be implemented by all food establishments other than those operating at the primary level.
- The legislation imposes the same hygiene requirements on food imported into the EU from third countries as on food produced within the EU.

Over the past few years, more EU regulations have been instituted that affect the production, processing, and marketing of many products as the EC implements its farm-to-table approach. This has meant substantial changes in general principles (for example, abandonment of the principle that mycotoxins in animal feed could be diluted to safe levels before feeding) and an increasing level of concern about the risk of chemical contaminants and the migration into food of metals from packaging, cookware, and tableware, among several others. The range of products and materials regulated under food safety and agricultural, especially animal, health regulations is increasing.

## LEGAL AND REGULATORY REFORM IN CIS COUNTRIES

The change agendas of CIS countries include legal reform. In late 2002, the Russian Federation passed the Federal Law on Technical Regulation (effective July 2003) to bring its standards regime into closer compliance with WTO norms and to streamline the adoption of standards and the certification process for imported goods. The provisions of this law made many once mandatory standards voluntary.

### Reform processes

Many other CIS countries have also started to reform their GOST-based standards systems, mostly with assistance from bilateral aid agencies and international organizations (USTR 2006). Ukraine passed a draft law in late 2005 aimed at meeting the requirements of the WTO on technical barriers to trade and amending its law titled On Quality and Safety of Food Products and Food Raw Materials to comply with the SPS agreement (see box 13). In Kazakhstan, the law titled On Technical Regulations, which became effective in May 2005, defines the division of responsibilities between the state and the private sector: the government is responsible for product safety while responsibility for quality control resides with the private sector. The government of Uzbekistan is also in the process of drafting a new

law on technical regulation designed to bring its standards system in line with WTO requirements.

The four CIS states that have joined the WTO (Armenia, Georgia, Kyrgyz Republic, and Moldova) had modified the language of their framework laws to make them more generally compliant with broad WTO principles, although they have yet to modify many of their industry and product regulations. In addition, they are only beginning to change the way their public health, veterinary, and phytosanitary services administer and enforce regulations. Armenia formally abandoned the GOST standards in January 2005, but it has only partially developed the regulations, voluntary standards, and enforcement practices needed to replace the GOST system. This has created a legal void that is bridged, in practice, by the continued use of GOST standards in inspections and of GOST methods in testing, accompanied by new regulations established by decree and administrative order at all levels of government.

Not only are new laws required for food safety, plant protection, veterinary services, and metrology, the primary task is to reassess the thousands of persisting GOST standards. The Russian Federation law discussed above includes a seven-year transition period for reform of technical regulations, during which time mandatory requirements must be transformed into technical regulations and the remaining standards will become voluntary (USTR 2006). Current technical regulations will remain in effect until new ones have been developed and approved by the government or until the end of the seven-year transition period. The law enables the Russian Federation to prolong application of any unmodified veterinary and phytosanitary regulations for an additional two years, however. Foreign trading partners consider this effort to be a monumental task requiring the development and enactment of several thousand laws and regulations. The objective is to have 87 percent of all regulations in compliance with international standards by the end of the transition period (Kalinova 2005). Currently, some foreign observers believe that between 25 and 30 percent of Russian laws and regulations comply with international standards (Becker 2006).

It is expected that the Russian market in 2010 will still employ a mixture of international and GOST standards. If 75 percent or more of the Russian Federation's regulations do converge with international standards by that time, CIS states that retain older transposed versions of GOST stan-

### Box 13 Ukraine's Legislative Efforts

#### GOST standards

According to the Derzhstandart, the State Committee of Ukraine on Technical Regulations and Consumer Policy, about 16,000 GOST standards are still in effect (Garcia 2006).

#### Harmonization

On December 2004, the Cabinet of Ministers established the Department for Legislative Approximation under the Ministry of Justice to manage the approximation of Ukrainian legislation to EC legislation in all areas, including food safety. The progress in food safety, however, has been slow because both the Department for Legislative Approximation and the Ministry of Justice lack expertise in food safety (Halloran 2006). It was suggested that a food safety section be created within the Department.

#### Priorities

For the domestic food safety, the Technical Committee on Regulatory Reform recommends that pesticides and food contamination be priorities in the legislative approximation because of concerns that domestic laws are less strict than EU laws, which may allow products rejected in EU into Ukraine (Halloran 2006). To encourage exports of dairy, meat, and cereal products, the Committee recommends making

food products—especially milk and meat products—and control of imports and exports priorities.

#### Food law

Ukraine's new Food Law includes adjustments in institutions, import documentation, and border control procedures (Garcia 2006). The law has given rise to some concerns, however, including:

- Several offices oversee food safety, among them the Ministry of Health, the Ministry of Agrarian Policy, and a number of directorates. Even with the delineation of responsibilities among the various offices, the law does not provide for overall coordination of monitoring and auditing activities.
- The Food Law requires implementation of HACCP among food manufacturers. It is not clear, however, whether the private sector's capacity to adopt HACCP has been taken into account. At present, only a few companies have HACCP in place, and understanding of the system is limited in the private sector and even among public officials.
- The state plays the primary role in ensuring the safety and quality of food products, not the private establishments, as recommended in the international system (Moody 2006).

Source: Various sources, as cited.

dards (for example, dating from the mid-1970s to the early 1990s) and related analytical methods will risk losing market access and especially access to the Russian Federation's higher-value differentiated market segments (that is, those likely to be applying the private standards of supermarket chains).

The situation is made more complicated because CIS countries that are not yet WTO members still apply GOST standards, and exporters from other CIS countries must meet these requirements. In addition, continued government services for conformity assessment are required to facilitate this ongoing trade among CIS countries. This means that while the whole regulatory system is being transformed, the GOST system remains intact, at least as voluntary standards, with government endorsement.

#### Language issues

Lack of language proficiency also sometimes causes regulatory staff and other stakeholders to work from different and sometimes mistaken versions of the same information. This was reportedly one of the major issues faced by the acceding CEE states as they worked to achieve legislative and regulatory enforcement convergence. Poland found that the lack of translation capacity, and particularly the lack of translators who also understood the basics of food safety and agricultural health, was a major constraint in its transition to the *Acquis Communautaire*. One cannot transpose what has not been understood. Translation capacity, though basic, is made difficult by the numerous technical terms and the lack of corresponding words or concepts in the target language. Particularly for CIS countries, food



safety experts have grown familiar with a system, terminology, and language remote from that used in OECD countries.

Language also plays a role in participating in the multilateral rules-based system. The four CIS WTO members have so-called enquiry points that receive SPS notifications; states that are members of CODEX, IPPC, and OIE also receive various notifications in the official languages of those institutions. While the notifications in Russian are communicated readily, communications in English, French, and Spanish create real problems, because these enquiry points generally lack personnel with sufficient foreign-language proficiency to read and translate these notices for distribution to the relevant technical staff. Service directors and technical specialists in Armenia who receive WTO SPS notifications in English or French often ignore them until a translation in Russian is provided by the Russian Federation or by the regional CIS bodies.<sup>32</sup> Since comment periods are limited, lack of timely technical translations constitutes a weakness that slows or excludes CIS reactions to changes in SPS regulations and standards. Apart from a general lack of capacity, lack of language skills has been a primary explanation for the CIS countries' limited participation in the WTO, a limitation reflected in the very few SPS notifications submitted to the WTO: as of December 2006, three had been submitted by Armenia, none by Kyrgyz, and two by Moldova; Georgia was doing better, with 22 notifications.<sup>33</sup>

## DIAGNOSTIC CAPACITY

Food safety and agricultural health management requires laboratory facilities for testing. The former Soviet Union had an extensive system of labs. After the demise of the Soviet Union, most of the independent states lacked budget to maintain and modernize the remaining infrastructure. As a result, the state of these countries' testing capacities is poor. Many of the central reference laboratories are outdated, and some have unsafe designs and construction. In general, public health laboratories are better equipped and operated, but even some of these have substantial infrastructure problems. Moving to the subnational level, laboratory facilities and quality decline rapidly. Basic laboratory safety and bio-safety requirements are not met in many district laboratories. Few food safety and veterinary laboratories use internationally recognized good laboratory management practices. Budgetary

shortfalls often require staff to work in facilities needing urgent repair, to use outdated equipment and reagents, and even to resort to saving and using broken glassware.

Some analytic mandates appear too broad and unnecessary from a food safety or SPS perspective and could be streamlined through some laboratory consolidation. There would appear to be no need, for example, for the plant quarantine laboratories to invest in pesticide residue detection capacity or pesticide compositional analytics. In the smaller countries, the public health laboratory would seem to be a more logical home for the former, and an industrial chemistry laboratory for the latter.

The laboratory capacity in CIS countries is oversized and in a poor state of maintenance. This was also the situation of the new member states at the time of their adjustment and accession to the EU. A substantial consolidation of food safety, public health, and veterinary laboratories would therefore be justified for the CIS countries. Box 14, using a World Bank study, illustrates the point in the case of Kazakhstan. The use of centralized analytic services for some of the more costly analyses should be considered as an alternative to investment in expensive equipment with high annual operating and maintenance costs.

But more than the inadequacy, the diagnostic capacity of CIS countries is inconsistent with the standards system required by the international trading system: the CIS laboratories are designed and equipped to test GOST-based standards. To facilitate trade with countries outside CIS, lab infrastructure, equipment, and methods must be adjusted to new requirements.

## Surveillance of diseases

Surveillance and diagnostic capacity go hand-in-hand when determining a country's status in terms of food safety and animal and plant health. As established by the former central government (and maintained by the individual countries), the CIS countries usually have a network of epidemiological stations at the district or city levels to monitor occurrences of food- and water-borne diseases.<sup>34</sup>

- At the local level, individual cases are registered and investigated by local public health authorities. In Armenia, local hygienic and epidemiological centers have microbiological labs to perform confirmation tests. (Some centers have chemical labs as well.)

- Some CIS countries have regional centers responsible for regional strategies and the outbreak management.
- The ministries of public health, the policy-making agencies at the national level, are notified in cases of outbreaks.

In Moldova, a separate and overlapping system monitors for salmonellosis under the State Veterinary Service and the State Sanitary Surveillance (the latter covers the food industry).

### Technical skills

Another legacy from Soviet days is the emphasis on technology; thus, CIS countries have a stronger technical infrastructure and more skilled human resources than do most developing countries (Frienkman, Polyakov, and Raveneso 2004). The technology and equipment needed for the tests performed in a WTO-based system, however, differ from those available, and retooling and retraining would be necessary to equip and acquaint the staff for these new methodologies.

## THE PRIVATE SECTOR

One legacy of Soviet-era economic planning is the dominance of public agencies and the weakness of civil society organizations. With regard to food safety and agricultural health, this has led to over-reliance on government regulation and inspection, with the state providing food of low, undifferentiated quality

with little consumer input. The private sector, only in its second decade of existence, is still engaged in rehabilitating, rebuilding, or building new enterprises in a physical and managerial sense. Civil society is only beginning to make its voice heard.

### Stakeholder consultation and participation

The integrated safeguarding system and the farm-to-table concept of the international system emphasize the vital importance of including all players in the food chain, from the agricultural input providers, farmers and processors, to consumers. SPS management is not the sole responsibility of the public sector; indeed, a more efficient and responsive system can be achieved through effective co-operation between the public and private sectors. As indicated above, it is preferable that the private sector in market economies have primary responsibility for food safety compliance and that government agencies retain responsibility for oversight and for issues the private sector cannot address.

Government assumption of the dominant role in food safety inspection and certification is ineffective and often too costly. A public sector persisting in a command and control mode will find it extremely difficult to set priorities and mobilize the private sector and public opinion. It is also extremely difficult to develop trust through one-way communication. The public sector's role goes far beyond inspection. It includes ensuring transparent implementation of legislation and regulations; the provision of public goods, such as complemen-

### Box 14 Streamlining Kazakhstan's Veterinary Laboratories

A World Bank report on Kazakhstan's livestock sector notes that the country's veterinary system has 44 zonal and 152 rayon laboratories and small market laboratories, a figure considered "excessive." The report recommends that Kazakhstan streamline its veterinary lab services by taking the following measures:

1. Review the caseload and cost structure of various types of labs to gauge their accessibility and viability;
2. Clearly define the role of state, institute, and private laboratories in providing public and private services;
3. Develop guidelines on minimal lab standards and cost recovery;

4. Reduce the number of laboratories while improving the capacity of the service; and
5. Expand lab quality control programs, including ISO 17025 and the associated good laboratory practices (GLP).

The report emphasizes the need to consider cost-effectiveness when reforming a lab system. For instance, given the low labor cost and long distance between farms in Kazakhstan, a labor-intensive and widely distributed diagnostic system would be more cost-effective and offer easier access than would one with modern, automated equipment.

tary infrastructure for certification, transport, telecommunications, and energy; and the development of human skills (World Bank 2003).

Specialized private enterprises may provide food safety services to the food industry, including product testing and certification, which in CIS countries are often provided by government agencies or their affiliates. Private provision is more cost-effective from a public expenditure perspective. Moreover, improvements regarding import-export trade rule compliance issues and the equally thorny questions of domestic market regulation require that all parties come to the table.

Consumer groups also have important roles in the food safety system. They act as watchdogs alert for food safety problems and augment the scope of government monitoring and surveillance programs. Due to their political legacies, the CIS countries, generally speaking, do not have many active civil society groups, and government agencies don't have much established contact with them.<sup>35</sup> With the growing awareness of consumer rights, however, it is likely that more groups will form and that they will seek a louder voice on matters of consumer protection, including food safety. They should become integral partners in stakeholder consultations on food safety policies, and they should be encouraged to monitor the performance of government agencies and private businesses, thus improving their accountability.

### **Private sector capacities**

As agricultural production in the region continues to grow and becomes more and more open to foreign competition as a result of WTO membership, the market for agricultural products is likely to change. To participate in modern supply chains, small- and medium-scale producers will need the capacity to produce foods that meet high quality and safety standards. As in other countries, family farms in CIS can be competitive and develop over time into small commercial farms (box 15). Supportive policies will be needed to encourage and facilitate the formation of producer organizations both to reduce transaction costs and to strengthen marketing capacities. This will be particularly challenging in a region in which people recall bad experiences with cooperatives and collective farms and in which many public service officers developed their experience and skill in the context of the large state and cooperative farms of a planned economy.

With the privatization of state-owned enterprises, many production and processing facilities moved into private hands. The new owners, however, often acquired degraded physical facilities and plant designs dating back to the 1960s (see box 16). Many of these new owners are also unfamiliar with modern codes of industrial sanitation and hygiene and lack knowledge of the basic requirements for use of HACCP approaches to food safety management.

### **Infrastructure constraints**

As discussed earlier, the widespread infrastructure breakdown in CIS countries after transition has created additional difficulties for food safety management and has borne heavily on public health. Generally, greater access to improved water supply and sanitation should lead to a decrease in food- and water-borne diseases. It would also reduce the cost to individual companies of developing their own expensive water supply and sanitation systems to meet national or international standards. Under current conditions, however, meeting public international standards, and those of private clients, will almost always require CIS food processing firms to make substantial investments in these two areas.

Progress is being made on the water supply and sanitation front, but in most CIS countries the investment costs for rehabilitation and modernization are huge, and operations and maintenance are also expensive. Poorer states have great difficulties gathering the financial resources for such an investment. Bilateral and multilateral donors provide support in this regard, but the rate of investment does not seem to have caught up with the need.

### **Food safety management and coordinated supply chains**

Modern agricultural product marketing is increasingly characterized by the development of coordinated supply chains. Large supermarket chains and agro-food processors, to assure a steady and reliable supply of goods or raw materials that meet their quality standards, often engage in various arrangements with suppliers, traders, and producers rather than rely on the traditional wholesale market to meet their sourcing needs. Compared with on-spot transactions, coordinated supply chains enable retailers and processors to obtain a certain level of control over the quality, safety,

### Box 15 Small Farms, Food Safety, Agricultural Health, and Competitiveness

Small family farms dominate much of the world's agricultural production. They provide income and employment for farming families, often functioning as economic safety nets as, in many cases, farm households earn part of their income from outside sources. In the process of economic development, some farmers improve technology, specialize, and increase their income: they commercialize. Other farm families draw an increasing part of their income from other opportunities, and if no successor steps in the farm will ultimately be given up and the land transferred to expanding commercial farmers.

Small farms are often efficient producers, but they are weak in applying new technology and marketing. They are also vulnerable to contagious pest and disease hazards. For many functions they are dependent on services provided by the private enterprises and by government. There is a general need for government monitoring, while taking into consideration characteristics of small farms, to detect potential hazards from plant pests, animal diseases, environmental pollution, and unsafe pesticides.

The type of support needed depends partly on the products grown and partly on the markets. Some fruit and vegetables and animal and fish products are sensitive to conditions affecting food safety and plant and

animal health, and require much care, whereas other products, such as grains, are not very sensitive. As explained in chapter 2 and illustrated in box 4, private companies play a relatively strong role in assisting small farms with technology, marketing, and safeguarding quality and safety in the export market segment. In the emerging urban market segment, their role is smaller, and in the traditional local markets it is usually insignificant. Government support for small farms should be differentiated by market segment and by product sensitivity. Government should encourage the private sector and farmer groups to use good agricultural practice with the aim of producing safe food and preventing pest and disease hazards, supplementing the private sector role in the three market segments, as described in box 4.

The experience of OECD countries and developing economies shows that with good government policies, an agricultural sector consisting of family farms has many opportunities for growth and for achieving sustainable production (World Bank 2007, forthcoming). Small farms can very well produce safe food of good quality while effectively safeguarding animal and plant health. What they require to do so are services tailored to the specific needs of the health hazards and quality risks faced by the different groups of farms.

Source: The authors.

quantity, consistency, and delivery schedule of products (Van der Meer 2006).

Transition economies in Europe and Central Asia have witnessed rapid supply-chain development in the agro-food sector since the collapse of the Soviet bloc. A recent World Bank study (World Bank 2005d) reveals relatively more complex vertical integration arrangements in the transition economies of Europe and Central Asia than in the industrial countries and low-income developing countries. At the end of the 1990s, 80 percent of the corporate farms that dominated commercial farm production in the Czech Republic, Slovakia, and Hungary sold crops on contract, and 60 to 85 percent sold animal products on contract.<sup>36</sup> A survey of food processors in five CIS countries (Armenia, Georgia, Moldova, the Russian Federation, and

Ukraine) found that the share of companies using contracts with suppliers grew from slightly over one-third of the total samples selected for the study in 1997 to almost three-fourths by 2003.

Food safety management is often integrated with general quality management throughout the coordinated supply chains. As part of a contract or arrangement with dairy farmers, for example, dairy processors sometimes aid food safety management by investing in milking equipment and milk cooling tanks. In other subsectors, processors might provide producers with agricultural inputs such as feed, veterinary drugs, fertilizers, and pesticides. Technical advice, including veterinary services, and monitoring and supervision of the production process can also be part of such arrangements. Box 17 illustrates how the establish-



## Box 16 The Private Sector in Armenia

### Facility improvement

Many fresh and processed food companies in Armenia lack the infrastructure and organization needed to meet the basic requirements for good manufacturing practices (GMP) as recognized in the European Union or the United States (World Bank 2007a). Many occupy obsolete buildings with poor layouts, insufficient water supplies, and inadequate toilet and sanitary facilities for workers; in general terms, these facilities were not designed with solid and liquid waste management as a fundamental criterion. A 2004 survey of food processing companies of all types found less than a handful that could meet ISO or HACCP certification requirements (Deeb and Graf 2004). Most of these firms use an incremental approach, however, improving their facilities, equipment, and practices as their business volumes grow. During visits to some of the same firms in early 2005, it was clear that a number of the export-oriented firms had improved their facilities and were accelerating their efforts to comply with public and private standards.

### Veterinary functions

The problem of a decline in the surveillance and intervention capacity of the government due to a major reduction in the number of veterinarians and veterinary technicians has been met by the private sector, which has hired its own veterinarians and veterinary techni-

cians. Private operators in the Armenian commercial poultry industry operate essentially independently of state veterinary services. They hire veterinarians and veterinary assistants, carry out their own monitoring programs using ELISA (enzyme-linked immunosorbent assays) in their own mini-labs, vaccinate their own animals, and engage international experts to solve production and disease management issues.

The dairy and cheese processors have greater interaction with the public veterinary service. They take advantage of public services (testing and vaccination) when available, but they do not rely on them, given the number of endemic diseases and the uncertainties in the amount and timing of public finance to support public services. The dairy processors and cooperatives have developed a program of intensive veterinary supervision to ensure the safety and quality of their raw milk supply. Larger processors hire their own veterinarians and assistants and provide weekly services to their suppliers on small farms and cooperatives. Most processors require their veterinary staff to work regularly with producers on inspection and milking hygiene. Some small-volume processors top up the salaries of local state veterinary inspectors to increase the number of farm visits from twice yearly to monthly. In addition, quality controls are enforced by formal and informal contracts with farmers that allow rejection of low-quality milk and premiums for higher quality.

Source: World Bank 2007a.

ment of a coordinated supply chain in Poland has led to improvements in milk quality.

Foreign direct investment plays an important and unique role in supply-chain development in CEE and CIS countries. The creation of coordinated supply chains requires financial resources, markets, and technology, for which, in many cases, foreign investors offer advantages. Foreign investors often bring with them advanced technology, equipment and quality management systems. Companies with strong export orientations will introduce foreign or international quality and safety standards, which cannot be readily introduced using domestic public and private support systems. Institutional innovation (such as contractual arrangements with farm-

ers and local cooperatives) has strong demonstrative and spillover effects, as the ICC-Paslek example in box 17 shows. This means that investment climate conditions can have important effects on agricultural modernization.

As experiences in the industrial countries and the fast-moving transition economies of Central and Eastern Europe have shown, coordinated supply chains provide an effective mechanism for food safety control; their development should therefore be encouraged and facilitated by appropriate government policies. For coordinated supply chains to function smoothly, one crucial investment climate factor, not yet available in most CIS countries, is effective contract enforcement. Gataulina et al. (2005)

### Box 17 Milk Quality and Safety Improvement in a Dairy Supply Chain in Poland

In 1994, Land O'Lakes, a U.S. company, entered into a 50–50 joint venture with a Polish dairy cooperative in Paslek, forming International Cheese Company–Paslek (ICC–Paslek). In the beginning, the milk supplied by the coop's farms—as everywhere in the region—was poor. Its shelf life was consequently very short, and the range of products it could be used for was constrained. ICC–Paslek developed a strategy to improve raw milk quality. The cooperatives supplying its milk were required to install cooling tanks at milk collection points, and the company invested in agricultural extension to raise farmers' awareness of the importance of milk quality and teach them basic milk handling hygiene. ICC–Paslek also required germ count and cell count tests in accordance with standards applied in the EU. Farmers

could have their milk tested for antibiotic residues free of charge in the company's laboratory, an especially important step to ensure no residues were left in the milk after the cows were given antibiotics for certain diseases.

The practices instituted by ICC–Paslek provided an example of an effective quality and safety improvement program. Very soon, other dairy companies in the region were copying these practices, and milk quality improved throughout the region in the following years. For most dairy companies in the region, the share of extra-class milk (the highest quality by EU standards) in total deliveries rose from less than 50 percent in the mid-1990s to over 80 percent in 2001.

*Source:* Dries and Noev 2005.

observe, for example, that vertical integration in the Russian Federation's agricultural sector has taken place mainly through the creation of agro-holdings and agro-firms supported by the authorities, while integration based on contractual arrangements are not widespread due to poor legislation and the high transaction costs of contract execution.

One concern raised by researchers and policy-makers regarding the development of modern supply chains is the ability of small producers to participate. For supply-chain leaders, dealing with small-scale producers often involves higher transaction costs than does dealing with a small number of large farms. Moreover, small producers often have difficulty meeting quality, consistency, and safety standards. As a result, they are more likely to be excluded from such supply chains. Even if they have no problem meeting requirements and do participate, small producers have very little bargaining power when dealing with large buyers, and their benefit from participation may be small. In the experience of the Central and Eastern European and former Soviet Union countries, however, no strong empirical evidence has emerged to corroborate this argument, partly because it is still a supplier's market for quality agro-food products in this region and in some cases processors have no choice but to work with small producers, who represent the vast ma-

jority of the supply base (Csaki, Frogacs, and Kovacs 2004; World Bank 2005d). This does not mean that all or most small producers can and do participate in such supply chains, however. Many smallholder farms, created as a result of land privatization programs, operate for subsistence purposes, and commercial farming through investment and adoption of new technology is not a priority for many smallholders. Nonetheless, many dairy factories, wineries, food processors, and vegetable exporters have successfully established coordinated supply chains with small-scale producers and make good use of their production efficiency (World Bank 2005d).

## REGIONAL COOPERATION

Regional cooperation and coordination is important to effective food safety and agricultural health management. This is true not only for the CIS, but also for countries in other parts of the world. In Southeast Asia, for example, many efforts are made to address SPS problems at the regional level (see box 18). This approach works because countries in the same region, with similar agro-ecosystems and products and agricultural practices, often experience similar animal and plant health and food safety problems.



The CIS countries have an additional incentive to seek regional coordination: they share the legacy of the GOST system and currently face the common challenge of reform; all will benefit from a timely exchange of information and experiences. Coordination will also give them a stronger voice in the WTO and the international standards setting bodies, Codex, IPPC, and OIE.

Given the massive investment and high technical capacity requirement for effectively managing food safety and agricultural health, a regional approach should be considered wherever appropriate. It could be cost-effective to design and implement some projects and activities at the regional or subregional level (such as for the Caucasian and Central Asia regions).

Potential areas in which regional resource sharing might be beneficial include the following:

- *Harmonization of standards* At present CIS countries share many standards, which facili-

tates trade. This could be maintained by harmonization of the adoption of international standards.

- *Border control and quarantine measures* Cooperation in this area could increase effectiveness and reduce costs.
- *Monitoring, surveillance, and contingency plans* Control of animal and plant diseases with cross-boundary spread requires cooperation in surveillance and control measures. For instance, it would be highly desirable to have regional contingency plans for possible disease outbreaks or a regional rapid-alert system for certain food safety hazards.
- *Risk assessment* While capacity for science-based risk assessment should be built up in CIS countries, it is not necessary for each country to have its own strong risk assessment capacity. The smaller, poorer countries could rely on regional resources for risk assessment needs or pool resources.

### Box 18 Regional Cooperation in Southeast Asia

The Southeast Asian countries share similar agro-climatic conditions and SPS challenges. With support from bilateral and multilateral donors, they have significantly strengthened regional cooperation and coordination in the SPS field in recent years, with most of this effort carried out through the Association of the Southeast Asian Nations (ASEAN).

The *ASEAN Cooperation in Food, Agriculture and Forestry* seeks to improve the effectiveness of pest and animal disease control and to facilitate agricultural trade. Its activities include harmonization of quarantine procedures and MRLs for pesticides residues; development of a shared pest database; creation of regional protocols for pest surveys; establishment of regional FMD-free zones; development of equivalent animal disease diagnostic technique among member countries; formulation of common positions in Codex; and harmonization of ASEAN regulatory standards using Codex standards when appropriate.

The *ASEAN Cooperation on Health Development* prepared an ASEAN Food Safety Plan to map out activities for regional cooperation, including developing a model food legislative framework and farm-to-table

guidelines; sharing technical expertise; establishing a laboratory network; harmonizing diagnostic techniques; developing training programs for food inspectors and handlers; and promoting HACCP in small businesses, among other efforts.

The *ASEAN Consultative Committee on Standards and Quality* is involved with metrology, conformity assessment, and mutual recognition arrangements. One of its ongoing projects is the development of mutual recognition arrangements in various areas and the compilation of accredited laboratories. A working group on accreditation and conformity assessment under this committee is also assisting in capacity building on accreditation and conformity assessment for the poorer countries of the region, such as Cambodia, Lao PDR, and Myanmar.

An *ASEAN Food Safety Network* was created to facilitate information sharing. The website ([www.asean-foodsafetynetwork.net](http://www.asean-foodsafetynetwork.net)) provides information on the SPS measures of major trading partners and on issues raised by international standards setting bodies, as well as on the work of various ASEAN bodies related to food safety.

- *Reference laboratories* While each country may feel tempted to upgrade its own food safety, veterinary, and plant health laboratory systems, modern, sophisticated lab equipment is extremely expensive, and the operation of such labs requires advanced technical and management skills. Furthermore, in the smaller countries the work load for such laboratories is likely to be quite limited. For a selective number of expensive tests and diseases, a better option might be to have a few labs to serve as regional or subregional reference labs. The Federal Center for Animal Health of the Russian Federation, for example, serves as the OIE Regional Reference Laboratory for foot and mouth disease for Eastern Europe, Central Asia, and Transcaucasia.

In addition, many food safety and quality management services for the private sector (producers, processors, and retailers), such as training, consulting, testing, and certification, could also be used by clients from other countries in the region. For instance, the International Institute for Food Safety and Quality in Kiev, established with USAID support in 2002, plays an active role in HACCP training not only in Ukraine, but also in other countries in the region, such as Azerbaijan, Georgia, and Moldova.

## COSTS AND BENEFITS

The benefits derived from improved food safety and agricultural health systems are numerous. Economic benefits include better market access, greater agricultural productivity due to mitigated damage from plant pests and animal diseases, and the improved well-being of the populace resulting from consumption of safer food. Improved food safety and agricultural health and improved market access contribute to reaching Millennium Development Goals 1, 4, and 5:

- MDG 1: “eradication of extreme poverty and hunger” through increased income growth for farmers and workers in the agro-food systems and safer food for consumers; and
- MDG 4 and 5: “reduce child mortality” and “improve maternal health” through safer food.

Losses in agricultural production and productivity will be reduced. Rejection and destruction of exported products and bans in export markets will

be averted or reduced due to the diminished likelihood of outbreaks of pests or diseases in livestock or crops. The risk will be reduced of bans on livestock and meat products due to animal disease outbreaks and the breakdown or failure of SPS control systems, including undetected prohibited levels of veterinary pharmaceuticals or pesticide residues; undetected insect pests in fresh flowers, fruits, and vegetables; and inaccurate or falsified veterinary or phytosanitary certificates. These benefits to well-being and of reduced or avoided losses, however, are not easily perceived or quantified; moreover, the benefits to health and productivity, in particular, are not realized at once but accrue (and are even compounded) over time. In contrast, costs are, more often, immediate and tangible.

Compliance with public and private food safety and SPS requirements in export markets poses a challenge, especially to small, low-income countries (World Bank 2005b). These countries often have constrained financial resources, technical skills, and institutional and legislative infrastructure that make it difficult for them to comply or prove conformity with these standards. Meeting the modern SPS requirements is made more difficult for low-income transition countries because of the necessity of maintaining dual capacities, at least in the interim. Instituting the entire range of food safety and SPS functions—surveillance and monitoring, diagnosis, risk management, legislation, and institution building—incurs significant costs.

The basic categories for public sector policy setting and investment may include the following:

- modifying or developing laws, regulations, standards, and enforcement procedures
- developing risk assessment or risk evaluation capacity
- developing or improving programs for monitoring, surveillance, and inspection
- consolidating laboratories and building up diagnostic capacity
- reinforcing border inspection posts by improving animal and plant quarantine facilities and practices
- improving emergency response capacity
- expanding capacity or services to treat, destroy, and dispose of infested or diseased food products, livestock, and plant materials
- improving communication and education programs
- addressing infrastructural deficiencies affecting food safety, such as deficiencies in water

and sanitation, poor transport, and lack of cold chains

- supporting the elimination of bottlenecks to private-sector compliance, such as developing GAP, introducing quality and safety management systems (ISO standards and HACCP), and improving supply chain coordination.

The public sector has a responsibility in these areas, but that does not mean it must cover all costs and carry out all activities. Many activities can be carried out by the private sector with public sector support, including, where relevant, oversight and co-funding.

The breadth and magnitude of the changes needed will determine the public-sector investment cost of regulatory and enforcement reform. Recent World Bank research on the costs of compliance has focused primarily on the adjustments made by developing countries to capture or maintain market share for specific higher-value products in high-value markets (World Bank 2005c). The research suggests that for selected export supply chains total (public and private) investments to comply with specific international SPS standards is on the order of 0.5 to 5 percent of the value of export trade, with subsequent annual maintenance costs of about 1 to 3 percent of annual export sales. Also, the World Bank has provided assistance for the preparation of national SPS strategies and costs for the short and medium terms (see box 19).

CIS countries, however, incur an additional set of costs from maintaining transposed GOST regu-

lations and procedures and adapting to the GOST-R regulatory requirements of the largest regional market, the Russian Federation. Also, they face different sectoral challenges as they converge toward WTO or EU standards on selected extraregional markets. With the exception of new investments, their industries' basic facilities do not meet international standards. And, many people in government and industry lack foreign language skills and the training in up-to-date technology needed to engage extra-regional partners and clients, leading to additional lags and costs in regulatory and enforcement upgrades. In light of these shortcomings, the public investment needed to shift to systems based on international standards for food safety and agricultural health may be higher in CIS states than in developing countries with market economy traditions. Yet, given the poor state of private sector facilities, private-sector investment costs may be many times greater than public investment costs. A study by Deeb and Graf (2004) in Armenia revealed major deficiencies even in leading food enterprises (see box 16). In many cases, buildings and equipment must be replaced to meet good manufacturing practices for hygiene.

### Cost-benefits assessments

Estimating the costs and benefits of investing in SPS capacity building is methodologically and empirically very complicated, especially at the national level (see appendix 6). Nevertheless, it is important to show under what conditions benefits will cover costs. A model was made using assumed

### Box 19 Cost of Capacity Building for SPS Management

Action plans to build SPS capacity have been prepared for Vietnam and Lao PDR and were adopted by their governments (see appendix 6). Action plans have also been recommended for Moldova and Armenia. Estimations have been made of the costs to the public sector, which include technical assistance, training or workshops, and equipment and supplies. The estimated costs for SPS capacity building are US\$9.7 million for Moldova, US\$7.7 million each for Armenia and Lao PDR, and US\$53.8 million for Vietnam, rep-

resenting 0.5 to 3 percent of their respective agricultural GDP. For Lao PDR and Armenia, the biggest share of the budget is allocated for technical assistance, followed by equipment and supplies for diagnostic capacity. Moldova's biggest allocation covers equipment and supplies for the laboratory system and border control. For Vietnam, the biggest shares go to diagnostics and surveillance. Funding for these recommendations would come from government resources and from donors and international agencies.

benefits to simulate rates of return. The model serves two purposes:

1. to encourage practitioners to make further efforts to estimate costs and benefits; and
2. to provide a framework for decision makers showing the benefits assumptions that will cover costs.

For Armenia and Moldova, modest assumptions about benefits result in rates of return to public investment ranging between 11 and 18 percent. In Lao PDR, where human health costs of unsafe food and water are relatively high, much higher returns are possible if the proposed investments have a proportionately equal impact on food- and water-borne diseases.

### Costs of institutional restructuring

The transition from GOST-based to WTO-compliant systems will require increased public investment because, at least initially, two food safety and regulatory systems will be operating and because investment will be needed to rewrite laws and standards, upgrade facilities and equipment, train staff, and adopt operating methods. CIS governments and the private sector can mobilize some savings by abolishing redundant and low priority inspections, retiring redundant capacities, and shifting to a system based on WTO principles. If the restructuring experience of high-income countries is an indicator, consolidation of food safety and agricultural health services can lead to substantial savings. Cost savings from institutional restructuring in Canada (as discussed in box 12), for example, were expected to amount to about US\$29 million (13 percent of its food safety budget) against start-up costs of about US\$17 million (about 7 percent) to support reorganization and consolidation (GAO 1999). A later review, however, showed annual savings were more in the 10 percent range during the transition years (GAO 2005). In OECD countries that have consolidated their food safety inspection institutions, government and industry stakeholders most frequently cited the following improvements as helping to save costs:

- Improved service delivery by providing a single contact for consumers and industry clients
- More consistent or timely enforcement of food safety laws and regulations
- Clearer responsibilities and reduced gaps in oversight

- Streamlined communications
- Increased coordination among entities involved in food safety
- Reduced overlap in inspections
- Frequency of inspections determined by risk
- Improved accountability and transparency
- Unified position for dealing with international organizations or trading partners
- Improved information systems. (GAO 2005)

While some of these benefits could accrue from consolidating food safety agencies in the CIS, they would not contribute substantially to the massive restructuring and upgrading needed to bring both government and private sector capacities up to par with international standards for food safety and agricultural health. Many CIS states have already reduced staff in their agriculture and health ministries in line with reductions in overall state budgets. None of the CIS countries, however, has undertaken fundamental reform or consolidation of its food safety and agricultural health institutions. Until fundamental reforms are made, jurisdictional authority and budget availability, not risk assessment or risk evaluation, will drive food safety regulation and enforcement.

Also, it seems likely that, until the Russian Federation is admitted as a WTO member, strong national incentives will lead the CIS countries to maintain GOST-based systems to maintain trade with the Russian Federation and with the other CIS states. This suggests that the public sector is unlikely to realize any net budgetary cost savings, compared to current expenditure, as long as they run parallel or mixed GOST-based and international systems.

Similar to the effect in OECD countries, but proportionately more important, the CIS states' efforts to streamline and rationalize public roles should also result in savings in operating costs to private firms. These savings would follow from abolishing redundant inspections and certifications, reducing the cost of communication by eliminating agencies with overlapping concerns, improving the consistency of communication from government on key regulatory issues, and reducing corruption through improved accountability and transparency.

### Sequencing reforms

The effectiveness of SPS investments depends heavily on the sequence of their introduction. Laws, regulations, training, laboratories, and



quarantine facilities are to some extent a precondition for guarding food safety, for conducting inspections, for achieving market access for certain products, and for making private efforts more profitable. Yet, investments in the more basic capacities may be wasted if private sector economic activity and public sector implementation efforts do not follow. The scope for disconnect between investments and needs is great, and some policy effort is required to avoid it. Action Plans should indicate, however provisionally, the necessary sequence of investments, but as plans are implemented, these sequences should be fine-tuned to reflect emerging needs and assessments of cost effectiveness.

### **Distribution of costs and benefits**

As would be expected, most inspection and surveillance costs are incurred by the public sector, primarily due to the public goods nature of most of the required interventions, and most investment and operational costs are incurred by the private sector. The agricultural production sector derives agricultural health benefits from both increased productivity and reduced disease control costs. The domestic populace gains from improved food safety, but it may encounter higher prices if producers and processors shift certain costs to consumers. More considerable benefits from market access accrue to the commercial subsector, justifying the need for the greater involvement of private enterprises, all the more so because of the limited resources of the public sector.

On a smaller scale, different parties will gain from different interventions. Incidence of foot and mouth disease adversely impacts trade, for example, and thus more greatly affects the commercial livestock sector, exports, and national economies; FMD is of lesser interest to smallholders, who are more concerned with diseases affecting productivity, such as caprine arthritic encephalitis. Improved delivery of livestock services will benefit both large and smallholders, but the focus of interventions depends on market access and the priorities of the national government.

### **Options, costs, and trade-offs**

Considering the substantial costs of the transition process, policy makers must take into account the direct or indirect impact of the changes on other sectors (including second-round effects, possibly on prices) and the opportunity costs of the funds

used, weighing the impacts of actions that may favor one sector while hurting another.

The national income levels of CIS countries are much lower than those of the European Union member states. Full adoption of EU food safety and agricultural health regulations, as proposed by some politicians in CIS countries, would force out of business a number of producers and processors unable to meet the higher requirements. This would increase the cost of food production, with major implications for consumers, particularly the poor. Any interventions requiring large investments by and imposing costs on smaller firms should be implemented only gradually, and smaller firms should be allowed longer periods for implementation.

- Gathering and analyzing relevant health information for surveillance and monitoring will provide input for government health strategies, but it is costly and must be weighed against investments in preventive and curative care, such as the purchase and administration of vaccines, drugs, and critical food supplements.
- The critical question for both public policy-makers and private investors is how to ensure that food safety and agricultural health investments are made in industries and products that confer a comparative advantage on domestic and export markets and that will yield substantial benefits over the near and medium terms. Countries must be selective in their investments. Moldova, for example, can only meet EU import requirements on meat products if it achieves CSF-free status, which would require a change in the management of swine, including increased surveillance of wild boars, better operating guidelines, and a financial plan to support disease surveillance, animal destruction, and slaughter. The country would also need strong controls on imported pork and viscera, raw material currently used by ham and sausage processors. The costs of these activities could well be too high for a relatively small domestic industry with limited export potential and for a disease with no risk to food safety and human health.
- Laboratories in CIS countries require substantial improvements in both facilities and equipment, but rebuilding and re-equipping all

laboratories is not practical. Expenses could be reduced by using a phased strategy for public laboratory modernization based on assessments of actual and projected diagnostic and analytic needs across the food safety and SPS areas and by outsourcing, consolidating, and rationalizing sampling, surveillance, and diagnostic capacity.

- Because of the huge costs of food safety and agricultural health programs and the limited availability of funds, decision making regarding program priorities should involve both risk assessment or risk evaluation and evaluation of costs and benefits. The use of formal risk assessment procedures, however, also entails costs, as it entails specific methodologies calling for specific skills, training, and data. In most countries, the capacity for risk assessment is small, but that should not deter policymakers from doing the risk evaluations that will make possible sensible, informed decisions on projects and priorities. Policymakers can take into account current (or emerging) risks to food safety (the food- and water-borne diseases having the most significant health and economic impacts) and agricultural health (the important plant pests or animal diseases requiring surveillance).

- A particular area of investment, with uncertain returns for CIS countries, is the introduction of animal registration and traceability systems similar to those used in the European Union (see box 20). The cost of such systems is high, and it is doubtful they could be sustained given the prevailing institutional and budgetary conditions of the CIS countries. The benefits to producers and consumers are probably very low, such that investment in alternative areas could have much more impact on human and animal health. Unless a country has considerable comparative advantage for exporting beef or pork products to the European Union, costs are likely to exceed benefits.

## INTERNATIONAL ASSISTANCE FOR FOOD SAFETY AND AGRICULTURAL HEALTH

Many international organizations and bilateral donors have provided assistance in this broad area, including support for the private sector, for agribusiness, and for rural development.

The Asian Development Bank is an important contributor to development in the eight CIS countries in Central Asia and the Caucasus: Armenia, Azerbaijan,

### Box 20 Economics of Animal Identification and Registration, Including Tracing Animals

Animal recording systems are not new, whether used for breeding, animal theft prevention, or disease control (Caja et al. 2004). Comprehensive national identification and registration (I&R) systems that include animal tracing are mandated in the European Union (EU Council Regulation 1760/2000 for cattle and EC 21/2004 for sheep and goats), in part also to administer their agricultural support systems. I&R systems are also used in Australia, Canada, Japan, New Zealand, and some Latin American countries (all meat exporters). The costs and benefits of these systems are not well documented, nor is the allocation of their costs and benefits.

Apart from better farm record keeping and reduced risks, the **benefits** of I&R for non-EU *farmers* derive mainly from a marketing advantage; farmers expect to

gain access to premium market segments and to receive better prices (especially niche producers). *Animal health officials* see the main benefit as better animal disease control and faster, more effective disease eradication. Mandatory I&R would enhance the roles of veterinary services, giving them better control over animal health; farmers, however, see this as akin to the dominant power given government services under the former state-planned system. The *processing and marketing sector* is ambivalent, depending on the market segments they serve and the competition they face, but exporters expect that I&R will enhance access to major export markets, such as the European Union and Japan. *Consumers* may see lower risk of food hazards but also higher prices. Consumers' views differ between countries in which food safety is

(Box continues on the following page.)



## Box 20 Economics of Animal Identification and Registration, Including Tracing Animals (continued)

mainly a consumer responsibility (that is, most low-income countries) and countries in which safeguarding food safety through oversight of production and markets is considered primarily a government responsibility (that is, Europe and North America). Finally, in the EU acceding countries, animal identification is the basis for the Common Agricultural Policy subsidy payments.

The **costs** of I&R to *farmers* are significant, varying widely according to the system used and herd size. Systems with radio frequency identification (RFID) are considerably more expensive than those using plastic ear tags. Development costs quoted vary, from US\$0.20 per head of cattle using plastic tags in Namibia (incremental costs only; Paskin 2004) to a reported US\$30 per animal using RFID in Botswana (Campher 2004). *Operating costs* can be as low as US\$0.30 per head, as in Namibia (Paskin 2004), or as high as US\$1.50 per head in Tunisia or US\$3 for sheep and goats in Spain (Saa et al. 2005). Costs could be higher for small herds. In Slovenia, for example, running costs for identifying cattle are estimated to be equivalent to 150 to 200 liters of milk (Klopčič, Krek, and Osterc 2002) or about US\$30–40 at farm-gate prices. RFID systems may be of greater benefit in large herds. Blasi et al. (2003) calculated the high-end costs of the latter at US\$4 per head for herds over 1000 heads and over US\$20 per head for herds less than 100 (beef) cattle. These costs may be reduced with the wider adoption of RFID tools and wider experience in I&R. The costs to the *processing and marketing sector* may also be significant, in terms of necessary improvements to infrastructure and in record keeping.

With such a wide variety of data, cost per kilogram of product clearly varies as well. Paskin (2004) indicates that the total cost in Namibia is 0.3 percent of total beef production. Schillhorn van Veen calculated costs varying between US\$0.004–0.008 per liter of milk and US\$0.15–0.31 per kilogram of beef (see appendix 7). Part of the total gross costs may be covered by increased efficiencies in the production and supply chain, but the remaining net costs in many cases will be paid by *consumers and taxpayers*. These costs exclude retracing systems managed by the state in most countries and, as such, charged to taxpayers.

The **major issues** and debates with respect to the economics of identification relate to the following:

- (i) For countries with poor infrastructure and poor veterinary skills and in which proper management of animal diseases would require a complete overhaul of veterinary education, diagnostic facilities, and livestock market structures, investment in I&R systems may be a misplaced priority.
- (ii) Countries with informal markets would find implementation difficult, and neither consumers nor producers would perceive a great benefit if I&R were to be required for local markets.
- (iii) Countries lacking competitiveness in export markets would benefit little from the trade perspective. Benefits will be highest in premium market segments for high-income consumers and lowest in countries with low levels of income.
- (iv) Countries with non-settled livestock systems would also find implementation difficult. Current identification and retracing systems were developed for European-type livestock systems, in which animals are generally confined in set pastures or are housed. Tagging and retracing are not easily adaptable to systems involving large mobile herds, migrating animals, or herds sharing housing or pastures, as is the case in many former Soviet Union and African countries.
- (v) I&R may not automatically render a country's herds acceptable in international trade. Having an I&R system in place cannot guarantee undisturbed international market access; in a recent bovine spongiform encephalopathy (BSE) episode in Canada, for example, producers lost US\$3–4 billion in exports after a single case was found, even though an I&R system was in place and the animal was rapidly traced (Le Roy, Klein, and Klvacek 2006).
- (vi) Cost of enforcement. Enforcement is fairly costly in developed countries and may be much higher in poor countries that lack infrastructure in animal health facilities, communication, or safe database management. Mandatory systems also tend to carry a greater risk of rent seeking and corruption, further complicating acceptance and enforcement.
- (vii) Significant technical and institutional deficiencies in design, implementation and market participation will lead foreign inspection services to dis-

**Box 20 Economics of Animal Identification and Registration, Including Tracing Animals (continued)**

trust the I&R system; the whole system will then be useless and not create benefits.

- (viii) Without farmer support, successful implementation will be difficult to achieve. If farmers don't see a benefit to I&R, they may try to evade its requirements, thus undermining the system's effectiveness.

Many developing countries, even those not involved in the meat trade, feel they may need to follow

the example of the large trading blocks, even though their herds are free of the diseases of concern (BSE, for example) or have diseases of limited economic importance (FMD, for example). Local consumers may not benefit from I&R if it diverts funds from the control of diseases of greater concern for public health (such as brucellosis, tuberculosis, and so on) or animal diseases of real economic importance (such as parasites, mastitis, and others).

*Source:* Prepared by T. W. Schillhorn van Veen for this report.

Georgia, Kazakhstan, Kyrgyz Republic, Tajikistan, Turkmenistan, and Uzbekistan. An initiative on regional cooperation focused on transport, trade, and energy, the Central Asia Regional Economic Cooperation, has as members Afghanistan, Azerbaijan, China, Kazakhstan, Kyrgyz Republic, Mongolia, Tajikistan, and Uzbekistan.

The European Commission has provided significant support for the transition countries (see box 21). Assistance intended to support access to EU markets invariably includes measures to improve food safety and the management of veterinary and phytosanitary standards. Aid agencies of EU member states have also been active in supporting the transition countries.

FAO, through its Technical Cooperation Program (TCP), has supported a number of projects seeking to improve food safety and agricultural health. Projects include assistance in preparing food safety strategy and action plans, drafting food safety legislation, and training food control staff for single countries (Azerbaijan) or multiple countries (Armenia, Georgia, and the South Eastern European group that includes Moldova). A project in Ukraine (TCP/UKR/3003) aims to upgrade food safety laboratory and to provide staff training.

USAID has focused on the promotion of private agribusiness development, giving considerable attention to product safety and quality improvement in the food industry, particularly in the western CIS countries of Azerbaijan, Georgia, Moldova, and Ukraine. Under the Partnership for Food Industry

Development Project, the International Institute of Food Safety and Quality has been established in Ukraine to serve as a regional center for food safety and quality management services, particularly HACCP training.

The World Bank over the past 10 years has carried out 40 studies and lending activities in the CIS covering aspects of SPS, including competitiveness (see appendix 5). The total amount of lending for SPS to CIS countries is close to US\$90 million. A relatively large part of these activities focused on Azerbaijan, Kazakhstan, and the four WTO member countries: Armenia, Georgia, Kyrgyz Republic, and Moldova. Most of the studies were on competitiveness (see table A5-1); others were on food safety, livestock sectors, and labs concerned with either food safety or livestock health. Most of the lending activities were components of larger projects on agriculture and competitiveness, sometimes with only small SPS components for which no separate cost is available (see table A5-2). A major undertaking of the World Bank, in coordination with WHO, FAO, and OIE, is the Global Program for Avian Influenza (GPAI). As of March 2007, investments totaling US\$35.35 million have been approved for six CIS countries; additional investments for Ukraine and Uzbekistan are in the pipeline. Four more SPS-related projects are currently being prepared (see table A5-3). The Ukraine project involves strengthening its food safety system and diagnostic capacity. A notable SPS project of older date (not listed in appendix 5) was the Standards

## Box 21 The European Union and the CIS Countries

The European Union has shown its support of the CIS countries in their political and economic transition in various forms of assistance. Bilateral relations between the European Union and individual partner countries are formalized in partnership and cooperation agreements (PCAs), which set out the political, economic, and trade relationships between the EU and its partner countries. Currently, EU PCAs are in force with CIS countries, except for Belarus, Tajikistan, and Turkmenistan.

TACIS (Technical Aid to the Commonwealth of Independent States), established by the EU in 1991, provides grants, primarily of financed technical assistance, to the twelve CIS countries to support their transition to market economies and democratic societies. Through TACIS, the European Union, together with its member states, is the largest provider of technical assistance to the CIS countries: €4.2 billion for 1991–99, and €3.1 billion for 2000–06. TACIS activities for 2000–06 focused on institutional, legal, and administrative reforms; social consequences of transition; the private sector; economic development; infrastructure networks; the rural economy; environmental protection and management of natural resources; and nuclear safety.

In May 2004, the European Commission introduced the European Neighborhood Policy (ENP) to reinforce relations with neighboring and partner countries through cooperation and assistance. The ENP applies to the EU's immediate neighbors, including six CIS countries: Armenia, Azerbaijan, Belarus, Georgia, Moldova, and Ukraine. For the Russian Federation, the EU established cooperation within four “common

spaces”—economic; freedom, security and justice; external security; and research and education and culture—under the EU-Russia PCA. As of 2007, financial support for ENP partner countries and Russia will be provided through the European Neighborhood and Partnership Instrument (ENPI) rather than TACIS. About €12 billion is budgeted for period 2007–13, with allocation of funds depending on the individual country's needs and absorption capacity as well as on implementation of agreed reforms. Of this amount, about €1.2 billion are earmarked for country programs benefiting the six CIS ENP partner countries and the Russian Federation.

The ENPI will concentrate on sustainable development, approximation to EU policies and standards, regulatory convergence, institution building, and cross-border cooperation through targeted expert assistance and twinning arrangements with EU states' administrations.

A progress report on the ENP in December 2006 describing its successes in supporting CIS partners' reforms included the following achievements related to food safety and SPS:

- Partners agreed on priority areas for legislative and regulatory approximation, particularly where this will stimulate trade and economic integration.
- EC FVO made an overall assessment visit to Ukraine resulting in a country profile to be used as basis for further cooperation.
- Moldova began to develop an animal identification and traceability system.
- Partners enhanced their preparedness for possible outbreaks of avian influenza.

Sources: [http://ec.europa.eu/comm/external\\_relations/ceeca/tacis/index.htm](http://ec.europa.eu/comm/external_relations/ceeca/tacis/index.htm); [http://ec.europa.eu/world/enp/welcome\\_en.htm](http://ec.europa.eu/world/enp/welcome_en.htm).

Notes: The other partner countries in ENP include Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Palestinian Authority, Syria, and Tunisia.

Development Project for the Russian Federation (started in 1995 and providing US\$24 million).<sup>37</sup> The project supported the Russian Federation's accession to the WTO by contributing to the establishment of the WTO TBT/SPS Enquiry Point, harmonizing more than 500 standards, and upgrading testing centers.

Most donor support seems to have gone to WTO accession countries—Armenia, Georgia, Kyrgyz

Republic, and Moldova—and to countries that have pursued economic reforms. The Russian Federation and Ukraine have requested relatively less support. The Russian Federation, in addition to the standards development project, only received some technical assistance. For some countries, political issues and lack of economic reform blocked external support (FAO 2005b). Currently most donor programs, projects, and activities are coun-

try-specific, since they are launched in response to requests made by individual governments.

### **Sustainability**

Capacity building for food safety and agricultural health in the context of the WTO SPS agreement is a relatively new area for foreign assistance. Capacity building, in general, is at the core of the development process, and sustainability depends on many factors, but the most important is ownership by the receiving countries (IEG 2005). The general experience in SPS capacity building for developing and transition economies alike is that sustainability of donor support is less than satisfactory.<sup>38</sup> Experiences in CIS countries suggest a few specific factors contributing to success or failure.

Experiences in EU accession countries show that strong and sustained guidance from the political level is an important factor for success. One of the weak elements in SPS capacity building in most CIS countries is that few decision makers fully realize the complexities, reforms, costs, and time required for the transition from their GOST-based systems to systems based on international standards. In general, understanding at the political level of the complexities of managing food safety and agricultural health is limited, guidance is insufficient, and ownership for improvements exists only at the level of services. In such cases, the effectiveness of improvements is diminished by unresolved legal and institutional constraints. Moreover, the ministries of finance may not provide the necessary follow-up support for funding

operational expenses. Support provided for investment in laboratories and staff training may have low impact if the conditions needed for effective use of these improvements are thwarted by lack of legal, regulatory, and institutional reform and sufficient operating budgets.

Most CIS countries lack a comprehensive strategy for transition and show little awareness of the requirements for WTO accession and the corresponding options vis-à-vis harmonization with the European Union for trading purposes. Since clear national strategies are lacking, political leadership is weak with ineffective coordination among agencies. Currently, there is much competition between ministries and agencies. Governments tend to request assistance without having formed a clear vision of what needs to be done and in what sequence, limiting the effectiveness and sustainability of outside support and often resulting in duplication and waste of resources and effort for both the donors and the aid recipients. Especially difficult are small projects with limited duration, which often ultimately contribute little. Projects targeting particular improvements may have limited impact if the broader factors affecting sustainability are not sufficiently addressed. In the absence of a strategy the possibility becomes greater that countries will receive conflicting advice for reform from donors. It is, therefore, important for donors and international organizations to assist the transition economies to develop a medium- to long-term comprehensive strategy to guide specific capacity building and investment programs (see box 22).

**Box 22 Developing Food Safety and Agricultural Health Action Plans for Lao PDR and Vietnam**

Lao People's Democratic Republic (Lao PDR) and Vietnam are two fast-growing developing economies in Southeast Asia. Both are faced with the challenge of strengthening SPS management capacities in their efforts to develop agricultural trade and improve domestic food safety and agricultural health. In the last few years, both countries received support from bilateral and multilateral donor agencies for SPS capacity building, but neither had a clear medium- to long-term strategy. In 2005 and 2006, the World Bank worked with a wide range of partners in these two countries and designed their food safety and agricultural health action

plans. The plans cover a comprehensive list of issues that include the public and private sectors, technical capacity needs and directions for institutional reform, and domestic food safety management and export-related SPS capacities. These actions plans were adopted by the respective governments and provide a roadmap for Lao PDR and Vietnam in their policy design efforts for managing food safety, agricultural health, and international trade. At the same time, the plans also provide useful information to external aid agencies and trading partners on the countries' capacity-building needs and priorities.

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*Source:* World Bank 2007c; World Bank 2006b.

## CONCLUSIONS

### Transition and WTO

1. After the demise of the Soviet Union, the newly independent countries all chose to replace central economic planning with market economy principles. The pace of transition has varied among countries according to their location, opportunities, and political situation. Change has been relatively rapid in the Baltic countries and relatively slow in several Central Asian countries and in Belarus. In all countries, institutions typical of the central planning system gradually became obsolete and are being replaced by the institutions required for market economies.
2. The countries' decisions to integrate into global or regional trade systems were basically politically motivated and grounded in a range of political and economic considerations. Accession to WTO involves many potential benefits, but it also entails a commitment to comply with WTO rules and obligations. Sanitary and phytosanitary requirements generally play only a minor role in decisions on WTO accession, but the benefits derived from accession can be significantly affected by government and private sector capacities to manage these requirements.
3. With the economic recovery and transition well underway, it is time for CIS countries to explore new sources of growth and new challenges in this rapidly changing region. It is also time to consider how best to modernize and upgrade the testing and quarantine infrastructure, which is generally worn out and in a poor state of maintenance.

### Current standards systems

4. CIS countries' current practice in the SPS field, largely based on the GOST system of the Soviet Union, is not compliant with the principles of the WTO SPS Agreement. A heritage of the central planning system, the GOST standards are not based on scientific risk analysis, lack transparency, and include mandatory quality parameters that according to WTO rules should be voluntary. Since they are not recognized by the OECD countries, they increasingly constrain the ability of the CIS countries to diversify trading relations.



5. Although the GOST system provided adequate health protection in the Soviet Union's planned economy, the standards systems as presently applied provide insufficient protection for human, plant, and animal health. The large number of detailed standards makes it difficult for the private sector to comply fully and for government authorities to supervise and enforce. The system's inflexibility makes prompt response to new and emerging food safety and agricultural health threats difficult. Government SPS agencies in small CIS countries cannot keep their skills and facilities up to date due to lack of funding. Moreover, rent seeking and corruption further reduce the effectiveness of control systems.
6. The standards system also constrains the competitiveness of the food industry in the CIS countries. The prescriptive nature of GOST standards stifles innovation; the multiple inspections sanctioned by the system result in high costs for the private sector as well as for the government.
9. Small family farms can meet these new challenges. The experiences of OECD, transition, and developing economies show that, with good policies, an agricultural sector consisting of small family farms has ample opportunities for growth, poverty reduction, and sustainable production (World Bank 2007, forthcoming). Small farms can very well produce safe food of good quality while effectively safeguarding animal and plant health, provided public and private services are adequate and closely tailored to the needs of different groups of farms.

### **Evolving trends and experiences**

7. The target for change of food safety and agricultural health systems is a moving one. Management of these systems in OECD countries is changing also. Changes respond in part to food scares and scandals, greater sensitivity of consumers and demand for more transparency and better protection, and, in part, to further adjustments in international requirements.
8. Rapid changes in consumer preferences in OECD countries and in high-income urban areas within CIS pose competitive challenges for traditional producers and processors that go far beyond the application of public food safety standards. Increasing numbers of modern food processors and retailers see food safety management as a crucial commercial risk. Competition focuses increasingly on improved safety and quality, consistency, sufficient volume, and scheduled delivery. Enterprises try to control their supply chains by combining food safety management with quality control and improved logistics, including application of good agricultural practice (GAP), good manufacturing practice (GMP), and, increasingly, independent certification.
10. Transition from GOST-based systems to WTO-compliant systems has proven to be more complex and difficult to achieve than expected. Most experts in food safety, plant health, and animal health under the former state planning systems have never been exposed to systems based on international standards. International systems are based on very different principles, and the expertise, work programs, and equipment needed to operate them differ widely from those of GOST. Therefore, a huge amount of difficult work is involved in making the transition. It requires assessing thousands of regulations; comparing them with the principles of Codex and the regulations of other countries, especially of the European Union, abandoning a large part of the regulations, and replacing the rest with rules and regulations compliant with international systems. At the same time, much of the lab infrastructure and equipment and the inspection and monitoring programs must be adjusted and the staff trained. In the cases of Armenia, Georgia, Moldova, and Kyrgyz Republic, the question of whether their regulatory framework was ready to benefit optimally from the WTO SPS agreement did not receive sufficient attention. Moreover, since the main markets of these countries continue to be CIS countries still operating under GOST-based standards with their mandatory inspections, they must for some time maintain two parallel systems.
11. The ability to make the necessary changes in quality and safety management for access to OECD markets differs widely across the CIS

### **Main conclusions of this study**

- countries. With the exception of the Russian Federation and, perhaps, Ukraine, CIS countries have insufficient human skills and financial resources to achieve a smooth transition within a five-year time span. In the private sector, the modernized processors and retailers in the Russian Federation and Ukraine are best prepared to meet requirements of modern consumer markets. The difficulty of making the transformation is clear from the experiences of Armenia, Georgia, Kyrgyz Republic, and Moldova. They have not gained any greater benefit in the SPS area than they could have achieved without WTO membership. They still largely lack the capacities necessary to benefit fully from WTO membership.
12. CIS countries have diverging opportunities for integrating into trade systems outside CIS. The Russian Federation's comparative advantage in agriculture is limited, making it a major importer. The natural markets for Central Asian countries are in neighboring areas, such as southern Siberia, China, and South Asia, and it is crucial that they meet the requirements of these markets. For them, the requirements of the demanding OECD countries hardly play a role, except for a few products. For countries bordering the European Union and in the Caucasus, the situation is different. Market diversification offers them real opportunities for access to better-paying market segments. Moreover, they face increasing competition in their domestic and traditional export markets in the Russian Federation and other CIS countries from countries that meet high international safety and quality standards.
  13. The Russian Federation's decision to join the WTO, and its timing, will be a dominant factor for all CIS countries, because Russia is their major export destination. After the Russian Federation joins the WTO it will need to replace GOST-based import requirements with those compliant with the WTO rules. It is important for non-WTO CIS countries to anticipate these changes and to draw lessons from the difficulties encountered by Armenia, Georgia, Kyrgyz Republic, and Moldova in making the transition to WTO membership. Consultation and coordination among countries in the region can contribute to a smooth transition, without disrupting trade.
  14. The principles and concepts of the international standards system are still new, if not alien, to the legislation and regulatory systems of CIS countries, which are far from embracing the concept that the private sector should have primary responsibility for food safety compliance. There is little knowledge about the risk analysis framework and, although a basic WTO principle, it is not applied even by the CIS WTO member countries. Traceability systems are slowly being introduced among leading food companies in CIS, but it will take at least 15 to 20 years before they are common in the smaller, poorer CIS countries. Overambitious plans for introducing HACCP and I&R may result in disappointment, indicating the need for a gradual process.
  15. A general weakness in most CIS countries is the lack of understanding among senior policymakers and public sector managers of the scope, timeframe, and size of the process required to change from GOST to international standards. Many people tend to believe the main tasks are writing a new law and adjusting laboratory capacities. Few realize the huge workload required to write the thousands of regulations needed to implement the laws, make related adjustments in inspection programs, and reorganize and realign institutions. Capacities available for this work are generally far short of what is needed.

## PRINCIPLES AND CONSIDERATIONS FOR SPS MANAGEMENT REFORM

### Tasks

CIS countries changing their standards system must address the following tasks:

- Overhauling laws and regulations completely. This requires many years of work for teams with thorough knowledge of food safety, plant health, and animal health regulation; international experience; legal skills; and language skills. Prioritization of legislative tasks will focus on market opportunities and major health and commercial risks. The rule of law will need to be strengthened and transparency increased to reduce the discretionary powers and rent-seeking opportunities of the implementing agencies.

- Reducing the number of institutions involved in SPS and quality management, realigning mandates, and abolishing overlaps of responsibility. Especially for the smaller countries, consolidating inspection services into a single agency—the model applied by Lithuania and Slovenia—is an important option, although not the only one (see chapter 4).
- Establishing risk assessment or risk evaluation as the basis for SPS policymaking. Formal risk assessment is demanding in terms of data and skills. Little expertise in these areas is available in the smaller CIS countries and building it up will require a long and sustained effort. Less formal “risk evaluation” of commodity and hazard combinations can be a good next-best solution, and, in applying it, risk managers will better understand the data needed to carry out more formal analysis.
- Overhauling work programs for inspection and monitoring thoroughly. These programs should be based on new regulations and prioritized on the basis of risks, costs, and benefits.
- Reorganizing and upgrading testing facilities. Laboratories in CIS countries were built up for the massive testing required for Soviet-era GOST conformity assessments and animal disease surveillance programs. In general, the number of facilities is too large; a major consolidation of infrastructure and functions is highly desirable and should proceed in parallel with major upgrading, modernization, and refocusing of staff on new tasks.
- Upgrading staff skills and adjusting staff approaches to new tasks in all policy units and services.
- Upgrading, in parallel with capacity building in public sector agencies, private enterprise capacities in GAP, GMP, quality and safety management, supply-chain management, sanitary practices, infrastructure, and marketing. Tailored support is needed for small family farms.
- Risk assessment and analysis of costs and benefits are the main building blocks for policymaking and for managing food safety and agricultural health, both in government and in private enterprises.
- Separation of public sector functions will promote transparency and help avoid conflicts of interest. Policy making should thus be separated from policy implementation, especially inspection, and independent public sector units should play roles in auditing and evaluation. Separation of risk management (mainly a policy role), risk assessment (mainly a scientific role), and risk communication (also mainly a policy role) will accomplish another important distinction in responsibilities.
- End-of-pipe control through conformity assessment by inspection services is, to a significant extent, being replaced by preventive controls throughout the supply chain, for which the private sector has the primary responsibility, and the basic responsibility for food safety has thus shifted to the private sector, with the government taking on oversight and advisory roles.

### Political leadership

A smooth and cost-effective transition from a GOST-based system to a WTO-compliant system requires guidance from strong political leadership from government. Guidance is needed for initiating consensus building with all stakeholders, for preparing a clear strategy and implementation plan, and for gaining support from donors and trading partners. The pending transition involves multiple government agencies, and streamlining and consolidation of these agencies is likely to be an inevitable part of reform. Individual agencies in many CIS countries devote considerable energy to strengthening their respective institutional mandates and to competing with other agencies, and many of those involved will resist any change that affects their personal or institutional interests. Since solutions will necessarily involve all institutions, the need is acute for leadership at a high level that provides an all-embracing perspective and vision.

### Consultation

Close cooperation among governments, the private sector, and civil society is a cornerstone for manag-

### International trends

In changing food safety, animal health, and plant health management from GOST-based systems to systems based on international principles, the following international trends deserve to be taken into consideration:

ing food safety and agricultural health. Most CIS countries require a rebalancing of public sector, private sector, and consumer responsibilities in managing food safety and agricultural health. The current dominance of public agencies is a legacy of the central planning system. In OECD countries, as noted above, primary responsibility for food safety management has shifted to the private sector, and the government assumes a role of oversight and final responsibility. The role of civil society has increased as well. Therefore, CIS should focus on public-private consultations and on enhancing civil society participation, giving these efforts a higher profile on the agenda for market development and strengthening SPS systems.

### **Convergence or harmonization with the EU**

Several of the CIS countries have expressed the desire to harmonize their standards with the EU. Some of them have even opted for EU accession, although chances for accession in the short and medium terms are limited. Understanding of the options and their consequences is limited as well. For the CIS countries, even those intending to join the EU, complete harmonization with EU food safety and agricultural health legislations is neither necessary nor, at present, realistic, considering the high costs involved. The new EU members received large-scale financial and technical support from the EU for their accession process. As appendix 8 shows, new EU member states received, over a seven-year period, accumulated SAPARD support for agro-processing and marketing of about 18 percent of their agricultural GDP in 2000, or €357 per person employed in agriculture in 2003, of which the EU paid more than one-third. Under PHARE they also received sizable EC support for their public sector for SPS-related expenses, with accumulated amounts in the range of one-third of the EC support under SAPARD.<sup>39</sup> For non-EU accession countries, implementing the required changes without such support would outstrip public and private capacities. Realistic options are selective convergence or obtaining third-country status to EU accession, each of which has different strategic and resource implications. Selective convergence can mean that selected parts of the relevant legislation and regulations are used as specimens for modernization or for harmonization for purposes of trade in particular products. Third-country status—used for livestock and fisheries

products—means that a country's regulations, inspection methods, and capabilities are considered equivalent to those of the EC. EU accession, on the other hand, requires full adoption of the *Acquis Communautaire* for domestic production, processing, and marketing. Experience of the new EU members during accession shows that, despite vast accession support from the EU, large parts of their food industry were forced out of business, since the upgrades needed to meet the EC requirements were not commercially feasible. Given the tremendous costs involved, it is therefore not realistic for CIS countries to pursue full adoption of EU standards.

### **A gradual and differentiated approach to transition**

Since the cost of transition is high and the benefits will only gradually emerge, CIS countries, while taking into account their longer-term preferences for economic integration, will be best served by carefully sequencing and prioritizing their efforts based on assessments of costs, benefits, trade opportunities, and health risks to their populations, crops, and livestock. A differentiated policy and strategy is needed for exports, imports, and domestic markets. As explained in chapter 2 and box 4, each market segment has different characteristics and requires different government roles and, at times, tailor-made interventions. Some market segments have high demands for safety and quality management, such as the EU markets or the high-end markets in Moscow and other Russian cities; some products, such as fresh fruit and vegetables, animal products, and fish, are perishable and thus have relatively high sanitary, phytosanitary, and quality requirements. Markets for perishable foods can be dynamic, with frequently changing requirements, requiring that SPS management systems respond rapidly to the new demands.

Access to foreign markets requires compliance with public regulations and private buyers' specifications. Some export markets and market segments have high quality and safety requirements and offer higher prices than others, and commercial strategies and competitive capacities will indicate which market outlets are most profitable. Government policies can play important roles in improving competitiveness. For imports, often the easiest approach for a country is to follow Codex and OIE standards. The approach for the domestic



market is more complicated because of major differences between traditional market segments for low-income buyers and emerging market segments in urban areas catering to middle-income buyers. Risks and possibilities for controlling health hazards differ significantly among market segments, requiring a differentiated approach. In local markets, priority should be on targeting pests, diseases, and contamination constituting direct threats to human, animal, and crop health. Health risks in informal border trade are often similar to those in domestic markets, and control efforts can be the same, with the exception of the threat of an influx of new pests and diseases from neighboring countries. In emerging urban segments, more emphasis is needed on implementing and enforcing Codex standards directly relevant to human health. In this market segment, the WTO SPS principle of nondiscrimination between domestic and foreign producers requires that equal controls be applied to both imports and domestic goods. This requirement usually directly affects only products and markets in which domestic and imported products compete.

## RECOMMENDATIONS FOR REFORM IMPLEMENTATION

### General approach

To prepare for the major decisions and work ahead of them, governments undertaking SPS transition are recommended to convene a high-level task force. Since a number of ministries will be involved in the changes, the task force will be more effective if mandated by the government with consent from the parliament. Important efforts to incorporate in this mandate include the following:

- Engage all stakeholders, including the private sector and civil society, in the change process.
- Design the architecture of the new system with roles and mandates for all institutions involved.
- Prepare an action plan and road map providing cost estimates, a time schedule, and a framework for coordination of the work ahead; this will provide transparent choices to government, parliament, stakeholders, and donors.
- Mobilize domestic and donor resources based on the action plan and roadmap. Most CIS

countries will need extensive support from OECD countries in the form of knowledge and information sharing, technical assistance, and funds for investment. It is undesirable to have individual agencies competing for donor resources.

- Change the way of thinking of the agencies' staffs from one suited to a GOST-based system to one suited to a market-based system.

Important implementation steps include the following:

- abolish incrementally inspections and certifications that burden enterprises without contributing meaningfully to health protection
- align and reform institutions
- begin the process of legislative and regulatory change
- devise a plan for consolidating laboratory infrastructure and mandates.

### Country group options

Big countries, such as the Russian Federation and Ukraine, have broad and diverse interests and therefore seek to change their SPS systems systematically and fully. Their public facilities and agencies serve multiple interests. These big countries also have significant amounts of resources available for making many of the changes themselves, with limited dependence on outside support. Small countries face potentially high costs relative to their limited resources and are likely to be more dependent on outside support. The need for selectivity and prioritization of investments is therefore more acute for smaller countries than for big ones. Risks of losing market access for major products and opportunities of gaining it are pervasive factors for priority setting in small countries. The food safety, plant and animal health situation and potential health risks a country faces are other important factors for priority setting.

As already noted, the Russian Federation and Ukraine have important programs underway to gradually harmonize their systems with international standards. It may make good tactical sense for the smaller CIS states to be late adopters of harmonized regulations and voluntary standards on products for which they have little comparative or competitive advantage in their new target EC or WTO markets or for regulations not important for protecting their domestic industries and consumers. Smaller states may reduce their transi-



tional regulatory investment costs by studying these regulations and integrating into their national laws only those that fit with their strategic trade priorities.

For individual CIS countries, the magnitude of the public investment needed to shift to a new system of food safety and agricultural health standards depends on which and how many international standards they elect to adopt and the extent to which they enforce them. While the WTO SPS Agreement indicates that acceptable standards are those based on *Codex Alimentarius* and OIE and IPPC standards, most of the world's larger, value-added markets have regulatory requirements that go beyond these requirements and that vary from country to country. Countries can be selective in the number of standards they adopt, depending on their export markets and their perceived risks for imports and domestic markets. For CIS countries, especially those with low income and low urbanization, it makes sense to be very selective in enforcing standards in local markets.

### Group I countries

Regardless of targeted markets and the standards systems to be adopted, Group I countries have the most resources and capacities for managing food safety and agricultural health (see table 14). They can initiate the creation of databases for monitoring and surveillance that will enable them to perform risk assessments to be used as the basis for policy-making. Their main challenge is to achieve greater efficiency in their systems through consolidation. Yet, the efficiency of their efforts and their speed of progress may be much enhanced by employing technical assistance from abroad, for example through twinning arrangements.

### Group II countries

Countries bordering the EU and those in the Caucasus have an interest in obtaining and maintaining access to the demanding EU and Russian Federation market segments, which pay better prices for goods. Export diversification is attractive, and a crucial element will be the ability to meet quality requirements in those markets and to compete with exporters from EU countries and Turkey in their traditional markets. Selectivity and priority setting here require focusing on products with the greatest export potential. It is advisable that at this stage Group II countries seek only what is called in EC terminology *regulatory convergence* and attempt

to meet EC import standards only for products for which they can identify good opportunities for export to EC markets. This requires targeted investment in the regulations, standards, and enforcement of procedures that can return substantial near-term benefits, as shown by experience with some niche products, such as Armenian crayfish (see box 16 and appendix 9).

From the perspective of protecting domestic food safety and agricultural health, it would be best to base policies on managing the primary health risks to humans and agriculture, using careful analysis of costs and benefits. Since a country's imports compete in its urban markets with its own domestic production, policies for domestic markets must be differentiated in ways that avoid complaints of discrimination between importers and domestic producers.

### Group III countries

The challenge for countries in Central Asia is to comply with their export markets' evolving SPS requirements. These export markets are generally not very sophisticated, and their product mix is limited. It is important for Group III countries not to be surprised by sudden changes in the requirements for their main exports in their main markets. This requires periodic consultation with authorities in those markets. For Group III countries, the transition from GOST- to WTO-based systems would best be guided by events in the Russian Federation and other markets in the region. Change can be gradual, with priorities based on trade interests and sanitary and phytosanitary risks. Efforts are warranted to address weaknesses in the domestic food safety situations of Central Asian countries.

For the poorer countries in their present state, consumer and agricultural health can be effectively protected by well-designed and functioning surveillance based on risks, which will almost certainly place far greater priority on management of infectious and parasitic food- and water-borne disease rather than on trying to meet the pesticide and veterinary pharmaceutical MRL standards of the EU or CODEX.

### Regional cooperation

Countries in the region share the same institutions and ecologies and use Russian as the primary language for communication and science. They face the same transition challenges and can benefit from one another's experiences. By cooperating, they can

Table 14 Country Group Capacities and Options

	Group I: Belarus, Kazakhstan, Russian Federation, and Ukraine	Group II: Armenia, Azerbaijan, Georgia, and Moldova	Group III: Kyrgyz Republic, Tajikistan, Turkmenistan, and Uzbekistan
<b>SPS Capacities</b>			
Available resource level (funds, human capital)	Moderate to high	Low	Low to very low
Present requirements on imports	Moderate to high	Moderate	Low
Capacity to handle SPS	Moderate to high	Low	Low to very low
<b>Strategic Options</b>			
Databases on food-borne disease incidence, plant pests, and animal diseases	Harmonize with recommendations of standards setting bodies and WTO	Selectively harmonize, with priority given to health problems with main economic and human impact	Selectively harmonize, with priority given to domestic health problems and main health risks in transborder trade
Risk and cost-benefit evaluation	Develop and introduce evaluation as basis for legal transformation and policy reform	Develop evaluation capacity selectively and apply progressively	Develop evaluation capacity and apply selectively; subcontract in other cases
WTO-compliant legislation, regulations, and standards	Progressively adopt full range	Selectively and gradually adopt, in line with requirements in main (potential) markets and for main health risks	Selectively and gradually adopt, with first priority to main health risks and second priority to development of potential markets
Testing	Consolidate labs and fully apply international standards	Consolidate labs and selectively apply international standards; try to share capacities with other countries	Consolidate labs and selectively apply international standards; subcontract expensive tests to others
Monitoring and inspection programs	Fully based on risk assessment	Selectively based on risk assessment and use of risk evaluation	Selectively based on risk assessment and use of risk evaluation

avoid unnecessary disruption of trade. In particular, with the Russian Federation's expected WTO accession, regional cooperation during transition seems of increased importance. It is, therefore, important that CIS countries seek synergies through communication and coordination.

## INTERNATIONAL SUPPORT FOR SPS REFORM IN CIS

Given the tremendous challenges CIS countries face in changing their SPS systems and their lack of capacities and resources, they will require exten-

sive support from their trade partners, donors, and international agencies.

- The effectiveness of external support for SPS capacity building could be improved by providing more support to governments for planning and strategizing their SPS transition. The resulting SPS action plans and roadmaps would also form a basis for more effective donor coordination.
- Donor support to simplify and consolidate food safety and SPS institutions in the smaller and lower income CIS states would help improve the sustainability of both donor and na-

- tional investments. In this effort, donors could put greater emphasis on the following:
- early support for risk analysis and cost-benefit assessments of policy, regulatory, and enforcement options; and
  - sequencing of investments to ensure that priority risks, whether domestic or trade-related, are considered first.
- Smooth transitions of food safety and agricultural health management systems in CIS countries could be enhanced by twinning institutions and exchanging staffs with donor and former transition countries.
  - Donors must improve communication and coordination among themselves to promote synergy, to practice division of labor in providing technical and financial assistance, and to avoid repetition and overlap.
  - The costs of adjustment to international standards are much higher in the private sector

than in the public sector. In lower income countries (Groups II and III), donors will need to work closely with national governments to identify the proper mix of business environment improvements, incentives, and subsidies needed to induce rapid change in the food and beverage value chains and to enable farms and firms to restructure and compete in domestic and international marketplaces.

Finally, most support offered by donors and international agencies is provided to meet formal requirements. By adhering to existing formal requirements, donors and international agencies may advise countries to establish systems and undertake investments that may not be optimal or the most cost-effective options available for their particular needs, circumstances, and goals. Ultimately, of course, the countries themselves must carefully assess their own best interests.



# Appendix 1. Russian Bans on Agro-Food Imports

Table A1-1 presents some examples of import bans imposed by the Russian Federation on agricultural and food products from neighboring countries.

**Table A1-1 The Russian Federation's Import Bans on Agricultural and Food Products**

Date of enforcement	Trade partner	Products	Reasons cited for imposing ban	Additional information
April 2005	Moldova	All meat and meat products	Suspicion of re-export of substandard products from third countries	Ban lifted in November 2006
May 2005	Moldova	Fruit and vegetables	Phytosanitary concerns: evidence of falsified phytosanitary certificates and the presence of soil on bare-root plants	The Russian Federation accounts for over 70% of Moldova's fruit and vegetables exports
September 2005	Lithuania	Animal products from two cold warehouses	Forgery of veterinary documents	Ongoing negotiations with increased role of the EU
November 2005	Poland	Meat products	Food safety; Polish-Russian border crossing in Bezledy	
December 2005	Georgia	Crop products, primarily mandarins, persimmons, pomegranates, and greens	Certificate forgeries and absence of phytosanitary control	
January 2006	Ukraine	All animal products (meat, eggs, fish, dairy, etc.)	Failure to comply with food safety standards	
March 2006	Armenia	Fruit and vegetables delivered via Georgia in transit	Forgery of phytosanitary certificates	
April 2006	Moldova, Georgia	Wine	Failure to meet Russian sanitary standards, particularly high level of pesticides and heavy metals	

*Note:* The information in this table was collected from various mass-media sources. It serves an illustrative purpose only and is not a complete list of Russian food import bans with independently verified information.





## Appendix 2. New Agricultural Health Challenge in Plant Health

### AVOIDING LOSSES FROM EXOTIC PEST INTRODUCTIONS: WESTERN CORN ROOTWORM

The western corn rootworm (WCR; *Diabrotica virgifera virgifera*) is known as the “billion dollar bug” in North America, because it can cause losses in corn (maize) production value of that magnitude in major outbreak years (GMO-Compass 2006). It causes an overall average of 10 percent or more yield loss in the American corn belt, with yield loss in some areas and years reaching 30 percent. It was first identified in Central Europe in 1991 after a suspected introduction via airplanes through the Belgrade airport and has since continued to spread

through much of Central and Western Europe (see figure A2-1). Economic levels of damage have occurred repeatedly in Serbia, Hungary, Romania, and Italy (IWGO 2004). It is not spread by seed or grain but by dirt, maize roots, or maize plants or plant parts. Adult beetles also spread by flying short distances, being wind-blown for longer distances, or being carried by airplanes to whose lights they seem to be naturally drawn during sunset or night loadings. Most initial findings in Europe are in the vicinity of airports. WCR has already found its way into CIS states (see Ukraine on the map) from its original entry point in the former Yugoslavia.

While control measures are being developed with FAO and the European and Mediterranean

Figure A2-1 Distribution of WCR in Europe after Introduction in 1991



Source: [www.iwgo.org](http://www.iwgo.org).

Plant Protection Organization (EPPO) assistance in CEE countries and Ukraine, it is likely that the WCR will easily establish itself wherever maize is grown intensively in Western, Central, and Eastern Europe (Furlan et al. 2001). Economic damage has been limited to a smaller area than its overall spread, but high population densities can build up rapidly in monocropped maize, whether in large or smallholdings.

CIS land privatization may have helped reduced the rate of WCR spread by reducing large monoculture fields to smallholder strip cultivation on small farms, with rotation among planted crops.<sup>40</sup> Recent consolidation of land holdings may reverse the trend and cause WCR spread to accelerate. In countries such as Ukraine, in which larger-scale maize production is practiced, the impact on maize production and value could be substantial. Using the results of FAO and EPPO coordinated field research in CEE countries and Ukraine, along with the accumulated experience of the United States,

where WCR has been established since the early twentieth century, one can crudely forecast the potential impact of the spread of this pest throughout the major maize-growing regions of Ukraine, if left unchecked.

Table A2-1 shows the projected economic impacts on the maize-growing industry in the Ukraine resulting from WCR spread with no national campaign to slow it. The total area over which WCR has been found has grown from 60 km<sup>2</sup> in 2001 to 3,000 km<sup>2</sup> in 2003. It takes about five years for WCR damage to reach economic damage thresholds. Assuming from North American experience that about 37 percent of the total maize area in the Ukraine would eventually be affected (Alston et al. 2003), the total present value of maize losses from WCR establishment in Ukraine range from a low (10 percent yield loss) of about US\$24 million to a high (30 percent yield loss) of about US\$72 million. Over the same period, the present value of chemical treatment costs to control these losses would be about

**Table A2-1 Estimated Average Annual Losses to the Maize-Growing Industry from WCR**

Year (1)	Maize infested area (ha) (2)	Maize area suffering yield losses (ha) (3)	Value of yield loss (\$'000)		Discount factor @3.0%	Discounted present value (\$,000)	
			Low, 10% (4)	High, 30% (5)		Low	High
1	1,200	0			0.9700		
2	11,500	0			0.9400		
3	60,000	0			0.9100		
4	122,113	0			0.8800		
5	128,219	0			0.8500		
6	243,188	654	19	56	0.8200	15	46
7	361,661	6,268	179	536	0.7900	141	423
8	504,532	32,700	932	2,796	0.7600	708	2,125
9	535,256	66,552	1,897	5,690	0.7300	1,385	4,154
10	551,553	69,879	1,992	5,975	0.7000	1,394	4,182
11	568,100	132,537	3,777	11,332	0.6700	2,531	7,592
12	585,143	197,105	5,617	16,852	0.6400	3,595	10,786
13	602,697	274,970	7,837	23,510	0.6100	4,780	14,341
14	620,778	291,714	8,314	24,942	0.5800	4,822	14,466
15	639,401	300,597	8,567	25,701	0.5500	4,712	14,136
						24,084	72,251

Sources: USDA/FAS, APK-Inform Information Agency (Ukraine), IWGO 2004, CSL 2004.

*Notes:*

1. Maize-infested area (column 2) is assumed to be 20 percent of actual and projected gross natural area.
2. Economic damage levels (column 3) start five years after infestations build up and reach 0.545 of infested area (from experience of Hungary). Thus, the damage in year 6 (654) is 0.545 of the infested area of year 1 (1,200).
3. The value (columns 4 and 5) is derived using a yield of 3.8 mt/ha (average for past four years) and a farm-gate price of US\$75/mt.

US\$34 million, indicating the benefits from early detection and control of this insidious insect pest. Smaller CIS states, such as Moldova, are involved in monitoring and surveillance programs, but they would find it difficult to mount a large-scale response to extension of the WCR range from Ukraine or Romania. State, donor, and private sector involvement to intensify trapping and to educate farmers on crop rotations, chemical treatments, and

biological control would be needed to manage the alien pest invasion. In the United States and Europe, active consideration is being given to the introduction of transgenic corn resistant to the WCR as a part of pest suppression strategy (Alston et al. 2003), as well as to biological control. This approach faces substantial challenge outside the United States and Canada, however, where extensive areas of transgenic corn are already grown.





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## Appendix 3. Zoonotic Disease and Socioeconomic Impacts: Integrating Human and Animal Health Measures

Schillhorn van Veen (2004) in his review of veterinary health in the transition economies of Eastern Europe and Central Asia indicated the rapid reemergence of three zoonotic diseases transmitted between animals and humans: rabies, brucellosis, and echinococcosis or hydatidosis. Some zoonotic diseases are associated with dogs (such as rabies), but others are related to contact with farm animals or consumption of animal products. Parasitological investigators in the region have sparked improvements in combined accounting of human and animal health impacts, joining food safety and agricultural health analyses in ways that should improve thinking about the cost-effectiveness of disease-control measures in CIS countries.

### INTERNAL PARASITES

The primary internal parasites causing disease in humans and animals are helminths (roundworms, tapeworms, and flukes) and protozoa. In the CIS, one of the more common helminth infections is from ascarid nematodes. Incidence is generally higher in children, who may contract it directly from worm-infested pets or indirectly from playing in dirt infested with the worms from animal sources. Poor personal hygiene, especially the lack of toilets or well-designed latrines, increases fecal-oral transmission of ascarid roundworms and hookworms. Deworming treatments that target children are effective in reducing roundworm and tapeworm loads, but failure to reduce environmental loading through better environmental hygiene, greater separation between livestock and

households, and deworming of domestic animals, often leads to high rates of reinfection.

It is claimed (World Bank 1993; WHO 1998) that deworming children can improve their growth rates and cognitive development. Some researchers, however, suggest that while some benefits, such as growth rates, are confirmed, others, such as improved cognitive development, remain to be proven (Dickson et al. 2000). The broad benefits of simple tablet treatments to control worm infections have led to a worldwide program to control soil-transmitted helminths and schistosomes (WHO 2002) through the Global Burden of Disease program, with a primary focus on children of school age. In tropical and subtropical settings, the cost effectiveness of community and school-based deworming is assigned benefit-to-cost ratios of up to 30:1, when combined with hygiene education and other school-based health programs (Hotez et al. 2006). Overall improvement in sanitary conditions is the key to long-term reduction in helminth disease, but the public and private infrastructure required is expensive and takes years to put in place in developing and transition economies. Annual public and private funding is needed to sustain operations and maintenance.

Unfortunately, similar studies on the effects of helminth disease levels and treatments across CIS states are not available. Data from public health agencies in CIS countries suggest that incidence rates are substantially higher than indicated in the Global Burden of Disease study, reflecting the broad problems of rural poverty and poor rural and urban environmental sanitation throughout the region.

## LINKS BETWEEN HUMAN AND LIVESTOCK HELMINTH INFECTIONS AND THEIR SOCIOECONOMIC COSTS: THE CASE OF ECHINOCOCCOSIS

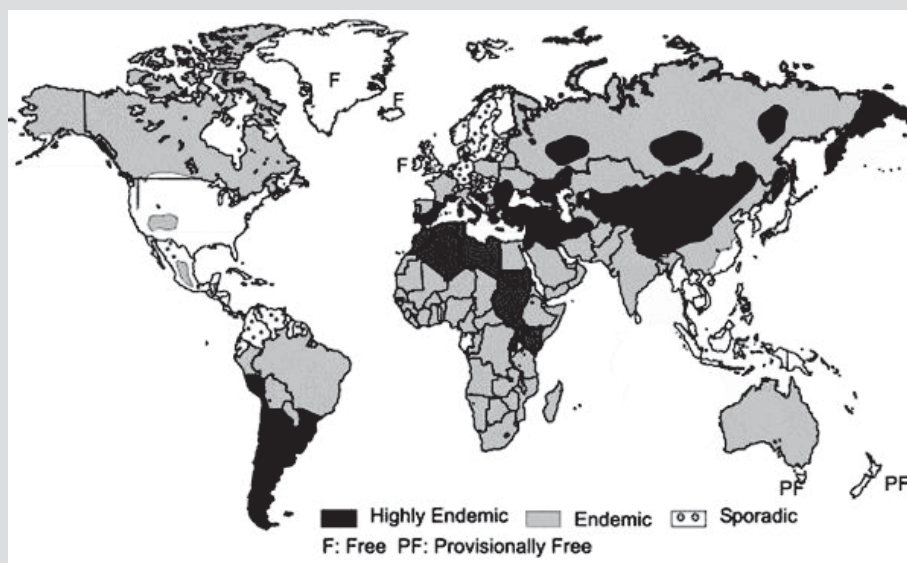
Until recently, few studies have combined the human and livestock burden of helminth disease to look at the costs and benefits of alternative management strategies. National and local sanitary and veterinary authorities often have difficulty justifying the costs of their programs when they cannot readily quantify the benefits or validate the losses that are avoided through public intervention. Methods are being developed to estimate the societal impact of zoonotic helminthiases. A number of recent studies have analyzed the economic costs to both human and animal health and productivity from echinococcosis (Schantz 2005).

The most common form of this disease is cystic echinococcosis (*Echinococcus granulosus*), which generally cycles between dogs and farm animals; a second species (*Echinococcus multilocularis*) causes alveolar hydatid disease, which cycles among wildlife. Both forms are widely distributed geographically (see Figure A3-1) and cycle among

wildlife, livestock, and dogs, with humans being a dead-end host. Both forms of the parasitic infection in humans are difficult to diagnose because symptoms may take years to develop. The cystic form affects children and adults. Farm animals may experience stunted growth as well as damage to internal organs leading to condemnation at slaughter of livers, lungs, and other edible offal.

A primary disease management approach has been promotion of hygiene through public and private investment in toilets and latrines, institution of meat and milk quality controls, construction of fenced facilities for slaughtering, and discouraging home and roadside slaughter. The latter two are especially important in the control of echinococcosis. These efforts are being combined with pharmaceutical deworming of companion animals and improved offal disposal following farm animal slaughter; in addition, initial tests are underway of livestock vaccines. Community approaches to deworming have generally been viewed as the most effective, but a prolonged use of anthelmintics (currently the most commonly used is albendazole) in broad-spectrum treatment does carry the risk of creating drug-resistant strains of *Echinococcus* and other helminth parasites (Carabin et al. 2005). While the linkages among wildlife, livestock, do-

Figure A3-1 The Global Extent of Echinococcus



Source: Budke, Deplazes, and Torgerson 2006.

mestic animals, and human disease are well-known, evaluation of the costs of echinococcosis to national economies has only recently been comprehensively undertaken (Budke, Deplazes, and Torgerson 2006). These still indicative studies show important impacts on the worldwide and national economies, as seen in table A3-1.

Yet these impacts may still be substantially underreported, as demonstrated by a comparison of nationally reported incidence levels of human echinococcosis using cumulative records of hospital visits in counties and districts throughout the CIS countries of Central Asia. The comparison showed levels of cyst removals at local surgeries to be three to four times those reported in national statistics. Human incidence levels during the Soviet period were from one to five cases per 100,000 people. The fragmentation of the livestock industry

into smaller herds; the increase in the farm dog (a definitive host) population and in backyard and roadside slaughtering; and the decline in veterinary public health capacity drive current incidence rates to well over 10 cases per 100,000. Rural herders and dog owners and their families are most at risk, with 50 percent or more of mature sheep infected (a 10-fold increase since the Soviet period; Bessonov 1974) and a 25 percent prevalence rate among herding dogs across the region (Torgerson et al. 2006).

While cost-effective control strategies exist, the lack of national estimates of the disease burden and its total economic impact hinders its evaluation as a priority for human infectious disease control efforts, not to mention the competing demands on public and private resources for control of zoonotic and epizootic (epidemic animal) diseases.

**Table A3-1 Echinococcosis Disease Burden**

	DALYs lost from Echinococcosis	Economic cost of human disease (US\$ million)	Economic cost in livestock production (US\$ million)	Total annual cost (US\$ million)
World	1,009,662	764	2,190	2,954
Formerly socialist economies of Europe and the Russian Federation	61,369	47	—	—
Western China, Tibetan plateau, Shiqu County	50,933	39	—	—
Tunisia	—	—	—	15
Jordan	—	—	—	4
Uruguay	—	—	—	3–22

Sources: Budke et al. 2004; Budke, Deplazes, and Torgerson 2006; Torgerson, Carmona, and Bonifacio 2000; Torgerson and Dowling 2001; Torgerson, Dowling, and Abo-Shehadeh 2001; Majarowski et al. 2001.



## Appendix 4. Identified Risks from CIS Food and Feed Exports to the EU Market

The Rapid Alert System for Food and Feed (RASFF)<sup>41</sup> is an information network operated by the EU member states. It provides *alert notifications* of risks identified in the EU markets that require immediate action and *information notifications* of food and feed shipments tested and rejected at the EU's external borders.

Table A4-1 shows the breakdown of notifications (of both types) involving shipments originating in CIS countries. The table leads to the following conclusions:

- the number of notifications from CIS is a small percentage of total notifications; and
- for 2005 and 2006, most notifications were for shipments from the Russian Federation, Ukraine, and Uzbekistan.

The RASFF weekly reports provide information on the identified risks behind the notifications.

Table A4-2 provides details on the hazards identified in 2005 and 2006.

Some countries have certain ongoing or recurrent problems. For both 2005 and 2006, hazelnuts from Azerbaijan were found to contain aflatoxin; in Ukraine, insects or mites were found in seeds and antibiotics in honey; and numerous food products from the Russian Federation have been found to contain illegal dyes. In 2005, Georgia had problems with its mineral water, while in 2006 ochratoxin A was found in raisins from Uzbekistan.

The primary SPS concerns were mycotoxins (ochratoxin A and aflatoxin) and residues of veterinary drugs, such as chloramphenicol, in honey. In 2005, 14 mycotoxin notifications occurred, mostly involving nuts, raisins, and cereals, and in 2006, there were 24. Antibiotics cases numbered seven in 2005 and four in 2006.

**Table A4-1 Notifications Involving CIS Consignments**

Originating CIS country	2002	2003	2004	2005	2006
The Russian Federation	8	3	10	34	25
Ukraine	14	—	6	20	17
Uzbekistan	1	1	2	7	19
Azerbaijan	—	—	—	11	6
Moldova	2	1	1	1	7
Georgia	—	—	—	5	3
Belarus	2	3	1	1	—
Armenia	1	—	—	—	—
Kazakhstan	—	—	—	—	—
Subtotal for CIS notifications	28	8	20	79	76
Total of all notifications	1,520	2,358	2,596	3,178	2,874

Sources: Data for 2002–05 come from RASFF annual reports. The Website did not yet include the 2006 annual report (as of June 2007), and 2006 figures were thus compiled from weekly reports.

Note: *Total notifications* refers to the total in the list of notifications classified by country of origin and thus may differ somewhat from total notifications for same year because products may originate from more than one country.



**Table A4-2 Hazards Identified from CIS Consignments**

2005	Hazards and number of cases
The Russian Federation	<ul style="list-style-type: none"> <li>• unauthorized color in spices, seasonings, sauces; 20</li> <li>• bad temperature control (rupture of the cold chain); 4</li> <li>• ochratoxin A in wheat; 1</li> <li>• high bacterial count in mayonnaise; 1</li> <li>• salmonella in feed yeast; 2</li> <li>• salmonella in fish; 1</li> <li>• mercury in fish; 1</li> <li>• polycyclic aromatic hydrocarbons in oil; 1</li> <li>• undeclared sulphites; 1</li> <li>• corrosion of bottle caps; 1</li> <li>• spoilage of preserved mushrooms; 1</li> <li>• damaged packaging of fish; 1</li> </ul>
Ukraine	<ul style="list-style-type: none"> <li>• insects/mites in seeds; 7</li> <li>• suspicion of antibiotics in honey; 4</li> <li>• chloramphenicol in honey; 2</li> <li>• sulphathiazole in honey; 1</li> <li>• salmonella in feed; 2</li> <li>• lead in walnuts; 2</li> <li>• benzo(a)pyrene in oil; 1</li> <li>• unauthorized color in food; 1</li> </ul>
Azerbaijan	<ul style="list-style-type: none"> <li>• aflatoxin in hazelnuts; 11</li> </ul>
Uzbekistan	<ul style="list-style-type: none"> <li>• unauthorized color in spices; 3</li> <li>• ochratoxin A in sultanas; 2</li> <li>• molds in raisins; 2</li> </ul>
Georgia	<ul style="list-style-type: none"> <li>• too high content of nitrite, fluoride, barium, or boron in mineral water; 5</li> </ul>
Belarus	<ul style="list-style-type: none"> <li>• too high content of sodium benzoate in white cola; 1</li> </ul>
Moldova	<ul style="list-style-type: none"> <li>• spoilage of dried prunes; 1</li> </ul>
2006	Hazards and number of cases
The Russian Federation	<ul style="list-style-type: none"> <li>• unauthorized color in spices, seasonings, sauces; 15</li> <li>• unauthorized substances in honey; 2</li> <li>• aflatoxin in hazelnuts; 1</li> <li>• ochratoxin A in wheat; 1</li> <li>• salmonella in feed yeast; 1</li> <li>• high content of iodine in canned salad; 1</li> <li>• too high content of benzoic and sorbic acid; 1</li> <li>• too high content of nitrite, barium in mineral water; 1</li> <li>• total basic volatile nitrogen in fish; 1</li> <li>• unauthorized establishment for butter; 1</li> </ul>
Ukraine	<ul style="list-style-type: none"> <li>• insects/mites in seeds; 5</li> <li>• unauthorized substance in honey; 2</li> <li>• aflatoxin in buckwheat; 1</li> <li>• unauthorized food additives in candy; 1</li> <li>• benzo(a)pyrene in oil; 1</li> <li>• lead in walnuts; 1</li> <li>• salmonella in meal pellets; 1</li> <li>• atropine and scopolamine in buckwheat flour; 1</li> <li>• too high level of radioactivity in frozen bilberries; 1</li> <li>• too high content of propylene glycol in cake; 1</li> <li>• methyl bromide in walnuts; 1</li> <li>• molds on walnuts; 1</li> </ul>

**Table A4-2 Hazards Identified from CIS Consignments (continued)**

2006	Hazards and number of cases
Azerbaijan	<ul style="list-style-type: none"> <li>• aflatoxin in hazelnuts; 5</li> <li>• unauthorized sorbic acid in fruit juices; 1</li> </ul>
Uzbekistan	<ul style="list-style-type: none"> <li>• ochratoxin A in raisins; 15</li> <li>• aflatoxin in walnuts; 1</li> <li>• cyanide in apricot kernel; 3</li> </ul>
Georgia	<ul style="list-style-type: none"> <li>• molds on hazelnut kernels; 2</li> <li>• abnormal smell of hazelnut kernels; 1</li> </ul>
Moldova	<ul style="list-style-type: none"> <li>• high content of sulphites in wine; 2</li> <li>• cadmium and lead in frozen strawberries; 1</li> <li>• sorbic acid in dried prunes; 3</li> <li>• unsuitable organoleptic characteristics of shelled walnuts; 1</li> </ul>

The weekly reports also provide useful information about the notifying country. In 2005, 39 of the 79 notifications originated in Eastern European countries that had recently acceded to the EU: Poland, Slovenia, Lithuania, Czech Republic, Estonia, and Slovakia; of these, 19 were from Poland. In 2006, 36 of the 76 notifications came from these countries, including 12 from Poland and 10 from the Czech Republic. All notifications from Poland (except one) concerned shipments from Ukraine and the Russian Federation; all notifications from the Czech Republic (except one) concerned consignments from Uzbekistan.

To be useful for comparisons, more complete information on notifications is required; for example, the numbers of notifications have not been adjusted to reflect the volume of trade in the specific items. Ababouch, Gandini, and Ryder (2005), for example, made use of the measure “cases/100,000 tonnes” to compare specific fish product rejections across orig-

inating countries. If the volume of affected shipments could be compared with total shipments to the EU, implications about the extent of the problem for each specific product could be drawn.

Consider the case of Azerbaijan hazelnuts: nine cases of border interceptions occurred in 2005 (all of which were information notifications). The total Azerbaijan exports of shelled hazelnuts to EU25 in 2005 were 7,235,600 kilograms, worth €50 million (US\$ 69 million).<sup>42</sup> Based on informal information, we assume that an average shipment weighs 20,000 kilograms, giving an estimated total of 180,000 kilograms for the nine shipments intercepted, representing about 2.5 percent of trade or about US\$ 1.7 million. It is to be noted, however, that intercepted shipments should not be assumed to be total losses. Depending on the products and SPS requirements, these products may undergo treatment and eventually be admitted into the EU markets, redirected to other markets, or sold at a discount.



## Appendix 5. World Bank Activities in CIS

The following tables summarize a number of World Bank studies and lending activities involving the CIS countries.

**Table A5-1 World Bank SPS-Related Studies, 1996 to the Present**

Country	Project name	Plant and animal health	Food safety	Labs	Competitiveness
CIS	The Agrarian Economies of CEE and CIS, 2005				x
The Russian Federation	Handbook of Trade Policy and WTO Accession, 2005				x
	Russian Economic Report, 2006				x
Ukraine	Improving Agricultural Fiscal Policy, 2006 (Working Paper)		x	x	x
Kazakhstan	Livestock Sector: Supporting its Revival, 2004	x	x	x	
	The Impact of Kazakhstan Accession to the WTO, 2007				x
Belarus	Window of Opportunity to Enhance Competitiveness and Sustain Economic Growth, 2005				x
Moldova	Opportunities for Accelerated Growth, 2005				x
	Economic Growth and Poverty Reduction Strategy Paper Annual Report, 2006				x
Armenia	Armenia's Rural Economy from Transition to Development, 2005			x	x
Georgia	Joint IDA-IMF Staff Advisory Note, Poverty Reduction Strategy Paper, second progress report, 2006		x		
Azerbaijan	Building Competitiveness, 2003				x
	Agricultural Markets Study, 2006			x	x
Kyrgyzstan	Agricultural Policy Update, 2004	x			
	Economic Memorandum, 2005				x

Note: X denotes topic included.

Table A5-2 World Bank SPS-Related Lending, 1996 to the present, US\$ million

	Project name	Plant and animal health	GPAI	Food safety	Labs	Competitiveness
<b>CIS</b>						
The Russian Federation						
Ukraine						
Kazakhstan	Agricultural Competitiveness Project, 2004					N/A
	Agricultural Competitiveness Project, 2005				N/A	
	Agricultural Competitiveness Project, 2006 (PAD)			6		
	Innovation and Competitiveness Development Project, 2006				N/A	
Belarus						
Moldova	Competitiveness Enhancement, 2005					4.9
	AIHP Project, 2006		8		0.5***	
	Poverty Reduction Support Credit, 2006					N/A
Armenia	Rural Enterprise and Small-Scale Commercial Agriculture Development Project, 2005 (PAD)	N/A**				
	Foreign Investment and Export Facilitation, 2006					1
	AIHP Project, 2006		6.25		0.5***	
Georgia	Rural Development Project, 2004			2.29		
	Rural Development Project, 2005 (PAD)					10
	AIHP Project, 2006		7	N/A	0.5*	
Azerbaijan	Agricultural Development and Credit, 2006	N/A			N/A	
	Second Agricultural Development and Credit Project, 2006 (PAD)	10*		N/A		
	Agricultural Development and Credit, 2006			N/A		
	AIHP Project, 2006		5.1		N/A	
Uzbekistan						
Tajikistan	Community Agriculture and Watershed Management Project, 2004 (PAD)	2.1				
	AIHP Project, 2006		5		N/A	
Kyrgyzstan	Agricultural Support Services Project, 1998 (PAD)				1*	
	Sheep and Wool Improvement Project, 2003	4*				
	Agribusiness and Marketing Project, 2004					8.1
	AIHP Project, 2006		4	N/A	N/A	
	Reducing Technical Barriers for Entrepreneurship and Trade, 2006				1.2*	1.2*
Turkmenistan	Crop Protection and Veterinary Services, 1999	N/A				
<b>Non-CIS Countries</b>						
Serbia						
Croatia	Farmer Support Services Project, 2003	4.52				
	Agricultural Acquis Cohesion Project, 2005 (EA, PAD)	19.55				
Bosnia and Herzegovina	Enterprise Export Facility, 2005					10

Notes: GPAI figures represent approved operations; AIHP stands for Avian Influenza Control and Human Pandemic Preparedness and Response Project; EA represents Environmental Assessment; PAD stands for Project Appraisal Document; N/A indicates no specific information or breakdowns are available.

\* Estimated amounts.

\*\* Animal health is one of the government objectives but not part of the project.

\*\*\* A part of the GPAI component.



Table A5-3 World Bank SPS-Related Lending, in Preparation, US\$ million

	Project name	Plant and animal health	GPAI	Food safety	Labs	Competitiveness
<b>CIS</b>						
The Russian Federation						
Ukraine	Agricultural Competitiveness and Food Safety Project, 2006 AIHP Project		N/A	50*		
Kazakhstan	Technology and Competitiveness Project, 2007				N/A	N/A
Belarus						
Moldova						
Armenia	Poverty Reduction Support Credit III, 2007			N/A		
Georgia						
Azerbaijan						
Uzbekistan	AIHP Project		N/A			
Tajikistan						
Kyrgyzstan	Agricultural Investments and Services Projects, 2007	N/A				N/A
Turkmenistan						
<b>Non-CIS Countries</b>						
Serbia	Transitional Agriculture Reform, 2006			N/A		
Croatia						
Bosnia and Herzegovina	AIHP, 2006 Agriculture and Rural Development Project, 2007		2.77	N/A	N/A	
		N/A		N/A	N/A	N/A
Macedonia	Agriculture Strengthening and Accession Project					

Notes: AIHP stands for Avian Influenza Control and Human Pandemic Preparedness and Response Project; N/A indicates no specific information or breakdowns are available.

\* Estimated amounts.



# Appendix 6. Estimating Costs and Benefits of SPS Management

## ESTIMATION OF COSTS OF COMPLIANCE WITH VARIOUS STANDARDS REGIMES FOR MOLDOVA

Table A6-2 demonstrates how a CIS country's costs of compliance might vary depending on the standards regime it adopts. Assumptions are made on the levels of investment and costs of operations (or maintenance costs) as percentages of export flows. In this exercise, Moldova is used as an example, and table A6-1 provides Moldova's 1998–2004 total and average annual food and beverage export values to key markets. The following assumptions are made on the rates of investment and annual maintenance costs.

- No additional investment and minor maintenance costs are needed to comply with the CIS-GOST regime.
- GOST-R regulations are changing at a moderate pace and should require modest investment and maintenance expense.

- WTO SPS and related OIE, Codex, and IPPC standards still require major adjustments to develop and apply regulations.
- Third-country certification as a supplier of higher-risk products to the EU requires profound changes in regulation, enforcement, and service provision of an entire sector, for example, livestock and livestock products, and these investment costs are likely to be very high.
- Based on recent accession experience, complete harmonization with the EU is assumed to require an order of magnitude leap in investment.
- Convergence toward U.S. processed food standards is less costly than convergence toward EU requirements because individual companies may qualify their processes and products with U.S. regulators even when moderate deficiencies exist in the source country's public food safety and agricultural health institutions.

These assumptions are the bases for the rates in columns 2 and 4 of table A6-2. These rates were then applied to the 1998–2004 total and mean export flows

**Table A6-1 Moldova Agro-food Exports**

	1998–2004 (US\$ 000)	Market Share (%)	Mean (US\$ 000)
Total food and agricultural exports	2,795,104		399,301
CIS countries	2,083,843	75	297,692
EU15	232,434	8	33,205
CEEC*	333,136	12	47,591

Source: WITS UN COMTRADE, accessed May 2006; World Bank 2007b.

\* CEEC (Central and Eastern European countries) here includes new EU members from the region—Czech Republic, Estonia, Hungary, Lithuania, Latvia, Poland, Slovakia, Slovenia, Bulgaria, and Romania.

in table A6-1 to provide a rough estimate of the total (public and private sector) costs of compliance (columns 3 and 5) with a range of regional (CIS), Russian Federation (GOST-R), and international standards regimes. Columns 6 and 7 break down total investment into public and private components.

It is clear that Moldova's public sector compliance investment needs for the *Acquis Communautaire* would be much greater than the estimated US\$1.018 million (for EU third-country certification) estimated in table A6-2. That estimate is based on general ranges found in World Bank research for countries with market economy food safety and agricultural health systems. These estimates clearly don't hold for transition economies, especially when compared to the US\$9.7 million (over nine times of the amount in table A6-2) estimated for public sector costs in the Moldova Action Plan for adopting international standards and the consistent acceptance by the EU of both low- and high-risk products.

## COSTS FOR CAPACITY BUILDING FOR SPS MANAGEMENT

The World Bank assisted in the preparation of strategies to build capacities for SPS management for Armenia, Lao PDR, Moldova, and Vietnam.

Costs were estimated for the recommended actions (see table A6-3 and table A6-4).

## AN EXERCISE ON COSTS AND BENEFITS

Cost and benefit computations were done based on the SPS Action Plans for Armenia, Lao PDR, and Moldova. Costs are estimated outlays of the recommended actions (see table A6-3). Economic benefits are assumed to be the result of improved market access (with possible increases in value that can stem from increased volume and price); reduced risks of rejections and bans in foreign markets (avoided losses); lower losses from pest damage and diseases in agricultural production; lower losses of productive days for workers due to food-borne health problems; and lower medical costs through better disease and food safety surveillance, control, and prevention. Benefits are also assumed from general efficiency improvements in inspection and prevention systems due to abolition of unnecessary or low effective inspections, vaccinations, certifications, and quarantine requirements. Benefits may also result from replacement of inefficient systems with more cost-effective ones.

Table A6-2 Estimation of Costs (US\$'000) with Various Standards Regimes for Moldova

(1) Standards Regime	Investment		Annual maintenance		Investment	
	(2) Assumed rates (%)	(3) US\$ '000	(4) Assumed rates (%)	(5) US\$ '000	(6) Public (6%) <sup>e</sup>	(7) Private (94%) <sup>e</sup>
CIS-GOST	0.00	0 <sup>a</sup>	0.5	1,518 <sup>c</sup>	0	0
GOST-R	0.10	2,084 <sup>a</sup>	1.0	2,977 <sup>c</sup>	125	1,959
WTO SPS Standards	1.00	5,656 <sup>b</sup>	1.5	1,212 <sup>d</sup>	339	5,316
EU acceptability (low to moderate-risk products)	1.50	8,484 <sup>b</sup>	1.5	1,212 <sup>d</sup>	509	7,975
EU third-Country certification (high-risk products)	3.00	16,967 <sup>b</sup>	2.0	1,616 <sup>d</sup>	1,018	15,949
EU harmonization ( <i>Acquis Communautaire</i> )	30.00	169,671 <sup>b</sup>	3.0	2,424 <sup>d</sup>	10,180	159,491
U.S. standards for processed products	1.00	5,656 <sup>b</sup>	0.5	404 <sup>d</sup>	339	5,316

Source: The authors' calculations, based on general ranges provided by the World Bank (2005c).

Notes: a. Assumed rates applied to CIS 1998–2004 export flows.

b. Assumed rates applied to EU15 and CEEC 1998–2004 export flows.

c. Assumed rates applied to CIS mean export flows.

d. Assumed rates applied on EU15 and CEEC mean export flows.

e. Percentage applied on computed investment.

Table A6-3 Estimated Costs for the Public Sector (US\$ 000)

Recommended actions	Technical assistance	Training and workshops	Equipment and supplies	Total
<b>Armenia</b>				
Coordination team	970	—	50	1,020
Market opportunities	61	2	—	63
Institutional realignment and legislative framework	690	299	350	1,339
Inspection, monitoring, and surveillance	384	30	15	429
Pesticide management	63	—	—	63
Diagnostic capacity	673	400	1,450	2,523
Border procedures	348	130	200	678
Risk assessment and economic analysis	332	260	460	1,052
Emergency response	66	10	—	76
Information and education	127	4	350	481
<b>Total</b>	<b>3,714</b>	<b>1,135</b>	<b>2,875</b>	<b>7,724</b>
<b>Lao PDR</b>				
Coordination team	1,040		100	1,140
Studies on markets and SPS requirements	189	3		192
Legislative and regulatory issues	1,032		44	1,076
Institutional issues	442	7.2	7	456
Surveillance; databases	527	4.8	200	731.8
Diagnostic capacity	796	2	1,000	1,798
Building human skills	77	927.2	100	1,104
Regional cooperation; bilateral consultations	647	150		797
Public information and education	113	202	100	415
<b>Total</b>	<b>4,863</b>	<b>1,296.2</b>	<b>1,551</b>	<b>7,710</b>
<b>Moldova</b>				
Establish coordination	920	—	100	1,020
Institutional restructuring	140	5	3	148
Economic analysis and risk assessment	189	154	6	349
Harmonization of the regulatory system	316	200	200	716
Certification	130	7	3	140
Accreditation	33	130		163
Laboratory system	295	195	1,200	1,690
Inspection, monitoring, and surveillance	313	302	900	1,515
Border control	454	360	1,350	2,164
Stamping out and emergency response	72	10	350	432
Reorganization of veterinary services	86	2		88
Pesticide management	130	52	100	282
Public information and awareness	191	8	800	999
<b>Total</b>	<b>3,269</b>	<b>1,425</b>	<b>5,012</b>	<b>9,706</b>

Table A6-6, table A6-7 and table A6-8 present simplified cost-benefit assessments on SPS capacity building. The aggregate benefits of improved plant and animal health are assumed to be approximated by growth in the value-added for agriculture: crops, for example, for plant health (assumed increase in value-added ranges from 0.2 percent to 0.3 percent) and livestock for animal health (assumed growth from 0.75 percent to 1 percent). Benefits accruing from improved food safety come

from savings caused by reduced incidence of human illnesses, using the DALY indicator and estimated annual wages in chapter 3 (see table 12). For Lao PDR, the 2002 DALY is 176,000,<sup>43</sup> and the estimated annual wage used was US\$300.<sup>44</sup> The exercise assumes a proportionately equal reduction in DALYs of 20 percent for all three countries. This means a reduction in Armenia of 800 DALYs, in Moldova of 400 DALYs, and in Lao PDR a reduction as high as 35,200 DALYs. Even at proportion-



**Table A6-4 Proposed Budget for Vietnam Action Plan (million US\$)**

	Food safety	Plant health	Terrestrial animal health	Aquatic animal health
WTO accession (MARD)	1			
Risk analysis, including data base	2	1.4	1.2	0.1
Training and capacity building	1.6	1	1	0.5
Diagnostic capacity	6	2	2	8
Surveillance and inspection systems (including pesticide monitoring)	6	4	5	1
Quarantine systems		1	1	
Disease and pest eradication and control systems		1	7	
Total	15.6	10.4	17.2	9.6

Source: World Bank 2006b.

ately much lower improvements in food safety, the absolute impact in Lao PDR would be much higher than in the other two countries.

### Cash flow

The following assumptions are made about the cash flow of investments and operational expenses. Investment costs are spread over the first six years of implementation, and an additional annual operating cost for materials and depreciation of US\$1 million is assumed. The full level of benefits is assumed to occur by the fifth year of implementation; 25 percent of full benefits is assumed for the third year, and 50 percent for the fourth year. The net present values were computed for 5, 10, and 15 percent discount rates.

### Scenarios

Deviations in net benefits were examined using both optimistic and pessimistic assumptions of results. The optimistic case assumes negative net benefits were lower by 5 percent and positive net benefits higher by 5 percent. Operating costs may have been lower or causal effects more positive. The pessimistic view is the opposite: higher negative net benefits and lower positive net benefits. The results show some sensitivity but basically approach the base case scenario.

### Results

The results are presented in table A6-5. The rates of return for Armenia and Moldova range from 11 percent to 18 percent. Given the modest assump-

tions for agricultural health, SPS investments can be profitable. For Armenia, the assumed returns to SPS is a flat one-time 0.3 percent (plant health) and 1 percent (animal health) increase in value-added only, a very small fraction of overall growth gains indeed considering that agriculture has been growing at sustained high rates of about 7 percent for the last seven years, which means a 100 percent increase of agricultural GDP in 10 years.

Lao PDR has the same modest assumptions on benefits to agriculture but has higher rates of return of 64–70 percent, due to the huge savings from public health benefits, specifically the 35,200 reduction in DALYs for an annual savings of US\$10.6 million. The assumed uniform rate of reduction (20 percent) would result in a significant discrepancy in results among the three countries because of differences in their current condition. Lao PDR has a poorer food safety situation but also lower capacities than do the two CIS countries, but the model shows that even at much lower proportional improvements in its food safety situation, Lao PDR's IRR is likely to be much higher.

The resulting numbers are not meant to be taken per se; rather, the exercise demonstrates that although SPS capacity entails major costs, benefits accrue over time in all three areas of food safety, animal health, and plant health and in both domestic markets and the export sector. These benefits, if carefully accounted for, will help determine if the costs of building capacity (often substantial) can be justified.

Finally, although the exercise focuses on agricultural and food products, countries that increase

Table A6-5 Results of Cost-Benefit Exercises

	Lao PDR				Armenia				Moldova			
	NPV (\$)			IRR (%)	NPV (\$)			IRR (%)	NPV (\$)			IRR (%)
	5%	10%	15%		5%	10%	15%		5%	10%	15%	
<b>I. Base case</b>												
	96.89	62.12	41.11	67	9.62	4.04	0.84	17	6.31	1.40	(1.35)	12
<b>II. Optimistic case</b>												
	102.19	65.67	43.60	70	10.81	4.91	1.51	18	7.47	2.27	(0.67)	14
<b>III. Pessimistic case</b>												
	91.59	58.57	38.62	64	8.43	3.18	0.17	15	5.14	0.54	(2.03)	11

capacity to the point of achieving WTO accession and greater participation in global trade, will find spillover benefits extend to all industries in their the economies.

## METHODOLOGICAL ISSUES IN THE ESTIMATION OF COSTS AND BENEFITS

Cost-benefit analysis is a useful tool for gauging proposed projects and has been incorporated into many World Bank studies. The use of cost-benefit analysis to look at SPS capacity building, however, is a new approach. The exercise above is meant to provide general transparency about the returns needed to make SPS capacity building (in a narrow sense) a good investment. They allow specialists to assess how returns would change under different assumptions. Yet, the wide-ranging scope of activities included in an SPS system and the positive spillovers from the measures add complexities to the estimation process. A number of issues should be taken into consideration.

### Appropriate measurements

Measuring costs and benefits in food safety and agricultural health is difficult, given the wide-ranging impacts of illnesses and diseases on livelihood, production, productivity, and expenditures (public and private), which may also include social and environmental consequences. The WHO's DALY (Disability-Adjusted Life Year; see chapter 3), an indicator of the consequent costs of diseases, may be used to estimate economic costs by using appropriate wage estimates, although it covers only the most

important diseases and excludes treatment costs. In determining the costs of food safety, attributing the consequent losses of morbidity and mortality for certain diseases—whether food-borne, water-borne, or from plant and animal sources—can also be difficult (see chapter 3). Another complicated issue concerns zoonotic diseases that affect both humans and animals. Evaluation of the costs should account for impacts on both populations (see appendix 3).

It is also very difficult to disaggregate and properly attribute cost savings among different causes, for example, investments made by the public and private sectors in improved water supply and sanitation; reform of regulatory and enforcement systems; changes in agricultural and value-chain structures and management practices; changes in knowledge, attitudes, and practices at the household level; and cycles and trends in the natural environment that shape the year-to-year population dynamics, evolution, and the geographical spread of pests and disease. This complexity leads national and international institutions to simplify their analyses by focusing on the domestic food safety situation; on the domestic agricultural health situation on a sector-by-sector, pest, or disease basis; or on system performance as it affects trade at import and export market borders.

### Levels of aggregation

The various levels of aggregation at which SPS interventions occur may lead to problems of scope and the appropriate attribution of costs and benefits. Three levels should be considered: (i) the firm and group level, (ii) the subsector level, and (iii) the level of encompassing the entire agriculture and food system.

Improving market access for a *firm* or for a *group of related producers* can begin with a list of SPS constraints in the public and private domains and then proceed to a search for solutions and calculations of the costs and benefits of possible interventions. This looks relatively simple from an SPS perspective, but from a commercial and counterfactual perspective it becomes much more complex. For private investors, the complexity lies in their need to consider simultaneously scaling up production to cover fixed costs, improving overall quality management, and adjusting their commercial strategy to product-market combinations more demanding than those to which their firms are already familiar with. These adaptations are basically private sector responsibilities, and different companies may make different choices, given their resources and their assessments of potential profitability. The public sector can broaden the choices available to investors and facilitate ongoing efforts by providing necessary services, reducing transaction costs, and co-funding investments having a public goods aspect. For costs and benefits at the firm and group level, many costs and benefits must be taken into account, and attribution of parts of net present values to SPS and commercial investments is highly arbitrary. Generally, the additional cost of SPS may be a small part of overall additional investment, making attribution of all benefits to SPS anomalous in many cases.

In mitigating SPS constraints for a *subsector*, for example, vegetable exports in a country with a range of players having quite different resources, product-market combinations, and commercial strategies, attribution *ex ante* and *ex post* of the net impact of SPS investments will be difficult, given that a range of the commercial investment decisions made on that basis might have been made

anyway to address other concerns. Experimental design for assessing differential outcomes can be perceived as a theoretical solution, but it will not work in real situations. In projects for boosting agricultural production and income, cost-benefit calculations are usually made on the basis of assumed standardized additional inputs and outputs for a homogeneous sector. This approach is more difficult to follow and to calibrate in an export environment with a range of profiles and product-market combinations. In addition, benefits from SPS improvements in agricultural subsectors can provide important spillover benefits to domestic sectors as well.

Considering the *agriculture and food sector* as a whole will reveal several subsectors for which the additional costs and benefits induced by SPS efforts will be extremely difficult to isolate from the effects of private commercial decisions. Moreover, controls for imported and domestic food safety and plant and animal health are intrinsically important, and significant common use of generic capacities will naturally occur. The cost of laws and regulations, the cost of their enforcement and of the rule of law in general, and the cost of human and institutional capital cannot simply be allocated to consumer health, agricultural health, or services to groups and subsectors. These services represent various degrees of public good. In other words, isolating SPS benefits and attributing them to sector-specific investments is exceedingly difficult because SPS investments are only a small part of total investment in the agro-food sector. Lastly, subsectors tend to compete for resources and thus to have an interest in downplaying their costs and exaggerating their benefits, further complicating cost-benefit assessments for subsectors within the overall framework.

Table A6-6 Cost-Benefit Assessment for Lao PDR

**Assumptions:**

1. Agriculture value added (VA) for 2005 is US\$1.1B (WB SIMA).
2. Data from Bank of Lao PDR annual reports: livestock (35% of agriculture value added), crops (59%).
3. Public health: Assuming improved food safety measures will reduce DALYs by 20%, or 35,200 (DALY in 2002 was 176,000); at an estimated annual wage of US\$300, the annual benefit is US\$10.6 million.
4. Computation of estimated benefits: Estimated benefits are assumed to be some percentage (second column) of estimated value added (est. VA).

	Year 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Estimated VA contributed (\$M)				Estimated benefits (\$M)												
Rate applied																
Animal health	385	0.008		3.08												
Plant health	649	0.0025		1.6225												
Public health				10.6												
5. Total costs, \$M	-7.7															
<b>I. Base case</b>																
Costs (US\$M)																
Investment cost	-1.386	-1.386	-1.386	-1.386	-1.386	-0.77										
Operating costs		-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
Benefits (US\$M)																
Animal health				0.77	1.54	3.08	3.08	3.08	3.08	3.08	3.08	3.08	3.08	3.08	3.08	3.08
Plant health				0.41	0.81	1.62	1.62	1.62	1.62	1.62	1.62	1.62	1.62	1.62	1.62	1.62
Public health				2.65	5.30	10.60	10.60	10.60	10.60	10.60	10.60	10.60	10.60	10.60	10.60	10.60
Net benefits		-1.386	-2.386	1.44	5.27	13.53	14.30	14.30	14.30	14.30	14.30	14.30	14.30	14.30	14.30	14.30
Discount rate	5%	10%	15%													
NPV	\$96.89	\$62.12	\$41.11													
IRR	67%															
<b>II. Optimistic case</b>																
Net benefits	-1.32	-2.27	-2.27	1.37	5.53	14.21	15.02	15.02	15.02	15.02	15.02	15.02	15.02	15.02	15.02	15.02
Discount rate	5%	10%	15%													
NPV	\$102.19	\$65.67	\$43.60													
IRR	70%															
<b>III. Pessimistic case</b>																
Net benefits	-1.46	-2.51	-2.51	1.51	5.00	12.86	13.59	13.59	13.59	13.59	13.59	13.59	13.59	13.59	13.59	13.59
Discount rate	5%	10%	15%													
NPV	\$91.59	\$58.57	\$38.62													
IRR	64%															

Note: This cost-benefit table differs from the cost-benefit table in the Lao PDR Action Plan because of different assumptions used.

### Assumptions:

1. Agriculture value added (VA) for 2004 is US\$546M (WB SIMA).
2. Data from the 2005 Statistical Yearbook of Armenia: plant growing (56% of agricultural production), animal husbandry (44%).
3. Public health: Assuming improved food safety measures will reduce DALYs by 20%, or 800 (DALY of 4000; see Table 12); at an estimated annual wage of US\$360, the annual benefit is US\$0.288 million.
4. Computation of estimated benefits: Estimated benefits are assumed to be some percentage (second column) of estimated value added (est. VA).

[illegible]







# Appendix 7. Cost Estimates for Animal Identification and Registration

Table A7-1 presents the derivation of costs estimates on animal identification and registration discussed in box 20 in chapter 4.

**Table A7-1 Derivation of Cost Estimates**

	Tags	RFID	Costs/hd (\$)	
			Low end	High end
<b>Farm costs</b>				
Tags	1-2/hd @ \$1	1/hd @ \$3-\$5	1	4
Weight loss	up to 1%	up to 1%	2	2
Mortality increase	0.10%	0.10%	2	2
Tagging equipment	\$20/100	\$50-\$500/500	0.2	0.5
Fuel and electricity	\$0.1-0.4/hd	\$0.1-0.4/hd	0.1	0.5
Farmers' time				
Tagging	10 min/hd @\$12		2	2
Monitoring	10 min/hd @\$12		2	2
Recordkeeping	5 min/hd @\$24		4	4
Farm facilities	Amort \$5000		1	10
<b>Subtotal</b>			14.3	27
<b>Monitoring:</b> Inspector	\$50-\$200/visit		5	10
<b>Central database:</b> Equipment	\$1M/1M hd	At taxpayer costs	0.5	1
Staffing	1-2 fte/1M hd	At taxpayer costs	0.8	1.5
<b>Subtotal</b>			1.3	2.5
<b>Transport and processing cost:</b>				
Improvements to transport	Amort> US\$1M		0.5	1
Separation of milk processing	no data		1	5
Modification of abattoirs	Amort > US\$5M		5	10
Extra holding time	up to 1%	up to 1%	2	5
Record keeping			0.25	1
<b>Subtotal</b>			8.75	22
<b>Total</b>			<b>29.35</b>	<b>61.5</b>
<b>Cost allocation to end product:</b>				
Pigs: Slaughter wt/hd estimated average of 75 kg			\$0.196	\$0.410
Dairy: Milk yield estimated average of 8,000 liters			\$0.004	\$0.008
Beef/veal: Slaughter wt/hd estimated average for beef and veal of 200 kg			\$0.147	\$0.308

**Notes:**

1. The costs for farmers' time vary considerably between confined and grazing animals, including replacement of lost tags; for large farms, this category may include computer costs.
2. FTE, or full-time equivalent, translates as one staff person working a full-time schedule for one year.
3. Transport requires tracing individual animals.
4. Processing may require tracing batches.
5. Extra holding is required when records are inconsistent.
6. Pig costs are divided by two to account for the herd approach.
7. Dairy costs are per liter of milk.



## Appendix 8. Spending on SPS under EU Accession Programs

### SAPARD Expenditure 2000–2006

Country	Total EU contribution		SAPARD investment in agro-processing and marketing									
	Total SAPARD (million euro)	SAPARD to (million euro)	Total costs (million euro)	Total public expenditure (million euro)	of which EU contribution (million euro)	Private contribution (million euro)	Total (7 yrs) as % of ag GDP	Annual avg as % of ag GDP	Total (7 yrs) per farm labor (euro)	Annual avg per farm labor (euro)	Total SAPARD as % of ag GDP	Total SAPARD per farm labor (euro)
Czech Republic	324	154	105	52	39	52	12.2%	1.7%	491	70	37.9%	1518
Estonia	243	86	42	21	16	21	27.2%	3.9%	1107	158	159.1%	6466
Hungary	703	266	182	73	55	109	9.7%	1.4%	822	117	37.5%	3177
Latvia	387	153	106	53	40	53	48.7%	7.0%	755	108	178.1%	2763
Lithuania	542	212	129	58	44	71	31.8%	4.5%	503	72	132.9%	2108
Poland	2659	1201	1196	598	448	598	25.6%	3.7%	465	66	57.0%	1035
Slovak Republic	294	128	90	45	34	45	26.0%	3.7%	700	100	85.4%	2298
Slovenia	156	45	76	27	18	49	17.7%	2.5%	1004	143	36.5%	2069
Bulgaria	808	121	230	115	86	115	14.1%	2.0%	789	113	49.5%	2777
Romania	2083	1073	468	234	176	234	11.1%	1.6%	137	20	49.4%	611
Total	8200	3439	2622	1275	954	1347	17.7%	2.5%	357	51	55.4%	1117

Source: Country SAPARD programs; Eurostat; World Bank Development Data Platform Time Series.

Note: The SAPARD program is used mainly to prepare the agricultural sector and rural areas in candidate countries for EU membership. It runs from 2000 to 2006. The national SPARD programs vary from country to country, but typically funds are allocated to the following priorities:

- Investment in agricultural holdings;
- Improving agro-processing and marketing;
- Diversifying economic activities in rural areas;
- Rural infrastructure, agri-environment, and so on.

## PHARE Expenditure on Agriculture in Lithuania and Poland, 2000–2006

Country	Total PHARE funds for agriculture (million euro)	of which EU contribution (million euro)	Funds for SPS		Total PHARE funds for agriculture as % of ag GDP	EU contribution to PHARE agriculture funds per farm labor (euro)	EU Funds for SPS	
			Total funds for SPS-related projects	of which EU contribution			as % of ag GDP	per farm labor (euro)
Lithuania	53	40		24	13.0%	206	5.9%	93
Poland	306	179	204	115	6.6%	119	2.5%	45

Source: PHARE project lists were provided by the Poland and Lithuania Ministry of Agriculture; Eurostat; World Bank Development Data Platform Time Series.

Note: The PHARE program is mainly for public sector institution building. Funds for SPS under PHARE include projects on veterinary and phytosanitary control, veterinary and phytosanitary border control, enforcement of the EU food control system, development of animal tracing and epidemiological surveillance systems, strengthening food control laboratories, and others.

## Appendix 9. Armenia's Live Crayfish Exports to the EU

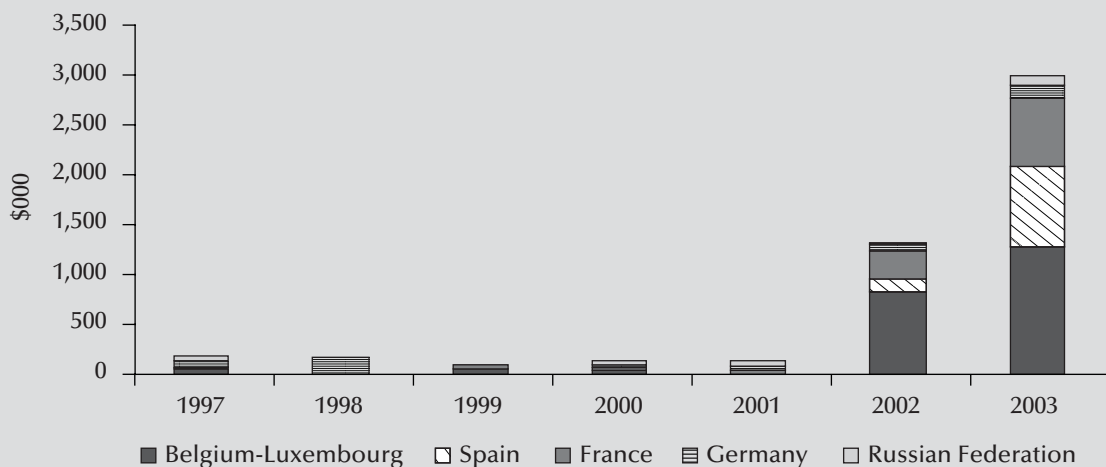
The European Union is one of the three major export markets for Armenia's fisheries products; Japan and the United States are the other two (World Bank 2007a). Armenian exporters occupy a niche in the EU for live crayfish that allows them to compete in a market dominated by low-priced (cooked and frozen) crayfish from China. In 2001, Armenia did not yet have an agreement with the EU with respect to fisheries products. It was listed as a List II country with clearance for imports given on a firm-by-firm basis. The Ministry of Foreign Affairs started to negotiate an agreement in 2000. Although several Armenian shipments of crayfish had entered the EU in 1998 and 1999, two sample shipments of live crayfish were refused entry.<sup>45</sup> Armenian exporters received assistance through a project supported by the United States and resumed exporting to Europe, triggering an inspection visit by the EC.

The European Commission's Food and Veterinary Office mission to Armenia in 2003 resulted in the des-

ignation of an Armenian Competent Authority—the State Hygienic and Epidemiological Inspection—to certify that only live, wild-capture crayfish would be exported and to regulate approved establishments according to Council Directive 91/493/30.<sup>46</sup> Also, two establishments were de-listed and denied export certificates. The Ministry of Health received donor assistance to upgrade its regulations and certification processes. Individual crayfish firms received assistance from other donor projects to upgrade their facilities and practices. By August 2004, four firms were approved for export of live crayfish to the EU under EC List II procedures.

The figure below shows the rapid progression of live crayfish exports from Armenia to EU destinations following the EC authorization of export procedures. While Russia and other CIS destinations represent the historic center of these exports, their importance is dwarfed by the rapid expansion of export to Western Europe.

Figure A9-1 Live Crayfish Exports from Armenia



Source: Armenia National Statistical Service.





**accreditation, laboratory**

*also accreditation bodies* Formal recognition that a laboratory is competent to perform specified tests or measurements. An accreditation body is an organization that performs the accreditation service. (UNIDO)

**Acquis Communautaire (EU)** The entire body of laws, policies, and practices that have evolved up to the present in the European Union. This includes all treaties, regulations, and directives passed by the European Union and affiliate institutions. The expression made its first official appearance in the 1992 Maastricht Treaty, under which it became an explicit objective of the Union “to maintain the *acquis communautaire* and build on it.”

**agricultural health** Animal and plant health; *see* **animal health** and **plant health**.

**animal health** Issues pertaining to diseases of fish, bees, and livestock and the prevention thereof.

**border post** A port, airport, railway station, or road checkpoint open to international trade of commodities at which veterinary or plant inspections may be performed (OIE).

**conformity assessment** A comprehensive process that includes testing, calibration, inspection, and certification to determine whether products, processes, systems, and people meet specified requirements (UNIDO).

**equivalence** Condition in which the sanitary and phytosanitary measures of one country, though not identical to those of another country, have the same effect or achieve the same level of sanitary or phytosanitary protection (WTO).

**GAP, Good Agricultural Practice** GAP refers to the application of recommendations and available knowledge to address environmental, economic, and social sustainability for on-farm production and post-production processes re-

sulting in safe and healthy food and non-food agricultural products (FAO).

**GOST** [*gosudarstvennyy standart*] The system of technical standards maintained by the Euro-Asian Council for Standardization, Metrology, and Certification (EASC), a regional standards organization operating under the auspices of the Commonwealth of Independent States (CIS).

**HACCP, hazard analysis and critical control point**

A widely accepted food safety management system that favors monitoring critical points in food chains to prevent food safety problems by identifying specific hazards and measures for their mitigation (FAO Food Quality and Safety Systems Manual, 1998).

**harmonization (of standards)** The establishment, recognition, and application by different countries of sanitary and phytosanitary measures based on common or uniform standards.

**international standards** Standards developed by international organizations. For sanitary and phytosanitary measures, the relevant organizations are the joint FAO/WHO Codex Alimentarius Commission (Codex) for food safety; the World Organization for Animal Health (OIE) for animal health; and the International Plant Protection Convention (IPPC) for plant health.

**ISO, International Organization for Standardization** ISO is a nongovernmental organization consisting of a network of national standards institutes from different countries that seek to achieve a consensus among these countries on specifications and criteria to be applied consistently in the classification of materials, in the manufacture and supply of products, in testing and analysis, in terminology, and in the provision of services. ISO 9000 provides a framework for quality management throughout the

processes of producing and delivering products and services. In June 1997, Codex recommended that laboratories responsible for control of export and import foods comply with ISO/IEC Standard 17025 "General Requirements for the Competence of Calibration and Testing Laboratories." (ISO)

**maximum residue level (MRL)** The maximum concentration of a pesticide, veterinary drug, or other chemical substance residue (expressed as mg/kg) recommended by the Codex Alimentarius Commission to be legally permitted in or on food commodities and animal feed. Foods derived from commodities that comply with the applicable MRLs are intended to be toxicologically acceptable and safe for human consumption. (FAO)

Food regulators can use MRLs other than those recommended by Codex Alimentarius or can choose their own MRLs for substances and food products for which no Codex Alimentarius advice has been formulated.

**monitoring** Continuous investigation of an infected population or subpopulation and its environment to detect changes in the prevalence or incidence of a disease, often to chart progress of a disease-control program to assess its effectiveness (OIE, FAO EMPRES).

See **surveillance**.

**morbidity rate** Incidence or prevalence of disease (FAO EMPRES).

**mortality rate** Proportion of death in a population (FAO EMPRES).

**mutual recognition arrangements** Mechanisms by which a user or acceptance authority in one country can have sufficient confidence in the validity of test reports and calibration certificates from laboratories in foreign countries without needing to make individual evaluations of the competence of those laboratories (UNIDO).

**nondiscrimination** in trade Circumstance in which a country treats its trading partners equally (giving them equally most-favored-nation or MFN status). Some exceptions are free-trade areas in which special arrangements apply to goods traded among countries within the free-trade area. Also, imported and locally produced goods are treated equally, at least after the foreign goods have entered the market. This treatment of foreign and domestic goods, services, trademarks, copyrights, and patents

is known as *national treatment*, that is, the practice of according foreign producers the same treatment as is given to national producers. (WTO)

**notifiable disease** A disease listed by law that must be brought to the attention of veterinary authorities as soon as it is detected or suspected (OIE).

**OIE listed diseases** Transmissible diseases as established by the OIE International Committee (chapter 2.1.1 of the Terrestrial Animal Health Code 2005). In May 2004, OIE member countries approved the creation of a single list of diseases notifiable to the OIE. A new list was approved in May 2005 by the International Committee and became effective in 2006. *Note that before 2006 diseases notifiable to the OIE were classified in two lists, List A and List B.* (OIE)

**outbreak** Occurrence of disease in an identifiable group of animals (for example, animals in a pen or animals within a village) at a level greater than that normally expected (FAO EMPRES).

**pest** biotic agent capable of causing injury to plants or animals or to plant and animal products.

**pesticide residue** Any specified substance in food, agricultural commodities, the environment, or animal feed resulting from the use of a pesticide. The term includes any derivatives of a pesticide considered to be of toxicological significance. (FAO)

**phytosanitary** Pertaining to plant quarantine (FAO).

**phytosanitary certificate**

*also* **phytosanitary certification** A phytosanitary certificate is an official document attesting to the phytosanitary status of any consignment affected by phytosanitary regulations (FAO).

**phytosanitary legislation** Basic laws granting legal authority to the relevant ministry or agencies to draft phytosanitary regulations (FAO).

**phytosanitary measure** Any legislation, regulation, or official procedure intended to prevent the introduction and/or spread of quarantine pests (FAO).

**plant health** Issues pertaining to pests and diseases affecting plants and the control or prevention thereof.

**plant quarantine** All activities designed to prevent the introduction and/or spread of quarantine pests or to ensure their official control (FAO).

**quarantine** For plants, official confinement of plants or plant products subject to phytosani-

tary regulations for observation and research or for further inspection, testing, and/or treatment (FAO).

For animals, isolating a group of animals in such a way that it precludes contact with other animals and prevents spread of disease. During quarantine an animal may undergo observation for a specified length of time and, if appropriate, testing and treatment. (OIE)

**quarantine pest** A pest of potential economic importance to the area endangered thereby and not yet present there or present but not widely distributed and being officially controlled (FAO).

**risk** Likelihood in an importing country of the occurrence and likely magnitude of an event adverse to human, plant, or animal health resulting from a hazard (OIE).

**risk analysis** Process composed of hazard identification, risk assessment, risk management, and risk communication (FAO).

*Risk assessment* is the evaluation of the likelihood and the biological and economic consequences of entry, establishment, or spread of a pathogenic agent within the territory of an importing country. *Risk management* is the process of weighing policy alternatives in light of the results of the risk assessment and, if required, selecting and implementing appropriate control options, including regulatory measures. *Risk communication* is the interactive exchange of information on risk among risk assessors, risk managers, and other interested parties.

In plant health, a pest risk analysis (PRA) combines pest risk assessment and pest risk management. Pest risk assessment is the determination of whether a pest is a quarantine pest and evaluation of the potential effects of its introduction. Pest risk management is the decision-making process aimed at reducing the risk of introduction of a quarantine pest. (FAO)

**sanitary and phytosanitary (SPS) measures** Any measure applied to protect human, animal, and plant health or life from risk arising from the entry, establishment, or spread of a hazard (OIE).

*SPS management* includes capacities to enact a proper regulatory framework for control of pests, diseases, and harmful substances in food and agricultural products; enforcement; prevention; detection; monitoring; sur-

veillance; inspection; control of outbreaks; sharing of information with trading partners; and risk assessment.

**science-based** Based on scientific justification or as a consequence of consistent risk decisions based on an appropriate risk assessment (WTO).

**stamping out** Method of eradicating disease by killing all animals in a herd or defined region infected with and/or exposed to pathogens (OIE).

**surveillance**

also **active surveillance, passive surveillance**

Observation and investigation of a susceptible (uninfected) population or subpopulation aimed at the early detection of cases of a particular disease so control actions can be quickly instituted (OIE, FAO EMPRES).

Surveillance is often subdivided into two categories, passive and active. *Passive surveillance* is the secondary use of routinely collected data generated for another purpose, such as a diagnostic service. *Active surveillance* is the routine collection of data the primary purpose of which is surveillance. (FAO EMPRES)

See **monitoring**.

**traceability** Ability to follow the movement of a food through specified stage(s) of its production, processing, and distribution chain (Codex Alimentarius Commission).

**transition economies** Former state-planned economies that have opted to develop market economies and are in the process of changing their laws, institutions, trade regimes, and enterprise ownership to those of a market economy. In new EU member states this process is largely complete, and these countries are no longer considered transition economies. Current transition economies include the CIS countries, Mongolia, and several countries in the Balkans, but several countries in Asia and Africa share some of these characteristics as well.

**transboundary animal disease** Diseases of significant economic, trade, and/or food security importance for a considerable number of countries that can easily spread to other countries and reach epidemic proportions and the control and/or management of which includes exclusion and requires cooperation among several countries (FAO EMPRES).

**transparency** The principle of making available, at the international level, information on sanitary

and phytosanitary measures and their rationale (OIE, FAO).

**zoonosis** Disease or infection naturally transmissible from animals to humans (OIE).

### Sources:

**EU** European Commission, Justice and Home Affairs. Glossary. [http://ec.europa.eu/justice\\_home/glossary/glossary\\_a\\_en.htm](http://ec.europa.eu/justice_home/glossary/glossary_a_en.htm).

**FAO** Glossary of phytosanitary items. <http://www.fao.org/docrep/W3587E/w3587e01.htm>.

**FAO EMPRES** Emergency Prevention System (EMPRES) for Transboundary Animals and Plant Pests and Diseases. <http://www.fao.org/live/stock/AGAH/EMPRES/GEMP/resources/resources.html>.

**IPPC** International Plant Protection Convention.

**OIE** Terrestrial Animal Health Code (2005). General definitions. [http://www.oie.int/eng/normes/mcode/en\\_chapitre\\_1.1.1.htm](http://www.oie.int/eng/normes/mcode/en_chapitre_1.1.1.htm).

**UNIDO** Working Paper No. 2, Trade Capacity Building Series, "Laboratory Accreditation in Developing Economies." 2003.

**WB** "Food Safety and Agricultural Health Standards: Challenges and Opportunities for Developing Country Exports." Report No. 31207. World Bank. 2005.

**WTO** [http://www.wto.org/english/thewto\\_e/whatis\\_e/tif\\_e/fact2\\_e.htm](http://www.wto.org/english/thewto_e/whatis_e/tif_e/fact2_e.htm).

## EXECUTIVE SUMMARY

- 1 The agreements referred to are the 1994 WTO Agreement on the Application of Sanitary and Phytosanitary (SPS) Measures and the 1994 WTO Agreement on Technical Barriers to Trade (TBT).

## CHAPTER 1

- 2 The transition economies in Central and Eastern Europe (CEE) that have joined the EU have all become members of the WTO: Czech Republic (1995), Hungary (1995), Poland (1995), Slovak Republic (1995), Slovenia (1995), Romania (1995), Bulgaria (1996), Estonia (1999), Latvia (1999), and Lithuania (2001).

## CHAPTER 2

- 3 World Bank Development Data Platform Time Series.
- 4 During the Soviet period, government policies directed production decisions, including levels of production, types of commodities, and others.
- 5 Fiber crops (cotton and flax) are not covered by this report
- 6 Modern retail channels in CEE and CIS countries include hypermarket, supermarket, "cash and carry," discount, and convenience stores. For simplicity, the word supermarket is sometimes used to refer to all of these channels.
- 7 Problems persist in recording trade statistics for CIS countries. Some countries have weak border controls, and corruption in border agencies may also affect the quality of trade data. For a few countries, central governments may lack control over secessionist territories (Frienkman, Polyakov, and Ravenco 2004).
- 8 The value of Moldova's agro-food exports (table 4) is bigger than its agriculture value added (table 2). This is because wine and spirit making are not included in agriculture value-added, whereas wine and spirits form a major part of agro-exports.
- 9 The former Soviet Union used to import coarse grain in large quantities for animal feed to sustain the high level of live-stock production and consumption. Following the economic transition (with its price and trade liberalization), Russia and some other CIS countries now export grains and import live-stock products, suggesting a comparative advantage for grain rather than for livestock production; see Liefert and Swinnen (2002).
- 10 For example, 80 to 90 percent of Moldova and Georgia's wine exports went to the Russian market. Moldova's monthly wine sales to Russia stood at US\$20 million before the ban. After the ban, Moldova significantly increased wine exports

to Belarus, Romania, Ukraine, the Baltic countries, Poland, and other countries. Georgia's wine exports dropped from US\$21.5 million in the first quarter of 2006 to US\$5.6 million in the second quarter. From April to June, Georgia primarily exported wine to Belarus, Kazakhstan (US\$1.3 million), and Ukraine (US\$3 million).

## CHAPTER 3

- 11 This is not to say that no research was done on standards in the former Soviet Union. A significant amount of research was done, but it resulted in a detailed, rigid system of standards suited to the planned economy.
- 12 WHO 2003; World Bank 2007a; World Bank 2007b.
- 13 No universally accepted measure for food safety exists at the international level. Substantial difficulties and high costs arise in efforts to separate food-borne causes of morbidity and mortality (infectious disease, environmental toxins and allergens, and chemical additives) from water-borne, animal-to-human, and plant-to-human causes of disease and mortality.
- 14 This measure results from the WHO Global Burden of Disease studies published in 1993 and since codified for use in projecting and measuring global and national human disease and mortality burdens. DALYs for a disease or health condition are calculated as the sum of the years of life lost due to premature mortality in the population and the years lost due to disability for incident cases of the health condition. It is a measure of the health gap between existing conditions and an ideal state in which every person born in a country lives without disease to the age indicated by his or her life expectancy.
- 15 WHO DALYs don't provide comprehensive coverage of zoonotic diseases.
- 16 It should be noted that the use of the proxy measure understates the costs to these economies of food- and water-borne diseases because it excludes many food- and water-borne diseases occurring in the country; noninfectious diseases, such as cancers, caused in part by food- or water-borne diseases; and treatment costs. Use of DALYs for policy purposes in a country context requires correcting for significant diseases not covered in WHO figures, attributing reported DALYs in other categories to the specific disease or class of diseases of concern, and accurately assessing costs of methods for disease reduction to evaluate their cost-effectiveness. It should be noted that DALYs cover death as well as workers' loss of productive time and inactive persons' loss of time due to illness; the use of lost wages is a rough proxy that does not cover costs of treatment and indirect loss of productive time in the household, nor is it, of course, a justifiable valuation of loss of human life.
- 17 Similar introductions occurred in Kenya.



- 18 UN TRAINS (Trade Analysis and Information Systems) data, accessed January 2007.
- 19 This program gives the Least Developed Countries export duty-free access to all products except weapons.
- 20 [http://forum.europa.eu.int/irc/sanco/vets/info/data/listes/list\\_all.html](http://forum.europa.eu.int/irc/sanco/vets/info/data/listes/list_all.html), accessed December 2006.
- 21 This refers to joint efforts by the European Bank for Reconstruction and Development (EBRD) and the World Bank Business Environment and Enterprise Performance Survey (BEEPS).

## CHAPTER 4

- 22 FAO 2003 and FAO 2006b.
- 23 In Canada, food control and phytosanitary controls are under one authority, whereas in Lithuania only food and veterinary inspections were consolidated.
- 24 The first study (GAO 1999) covered four countries and the second (GAO 2005) covered seven countries.
- 25 SAPARD stands for "Special Accession Program for Agriculture and Rural Development." PHARE is the acronym for "Poland and Hungary: Assistance for Restructuring Their Economies," initially established for Poland and Hungary in 1989. ISPA is the acronym for "Instrument for Structural Policies for Pre-Accession," and CARDS is the acronym for "Community Assistance for Reconstruction, Development, and Stabilization."  
Sources: [http://ec.europa.eu/enlargement/financial\\_assistance/index\\_en.htm](http://ec.europa.eu/enlargement/financial_assistance/index_en.htm)
- 26 This information derives from interviews with Lithuanian food safety and agricultural health authorities.
- 27 The projects were cofinanced with the national budget of Lithuania. The amounts listed here are those from EU funding only.
- 28 Regulation on Food Hygiene (EC 852/2004), Regulation on Specific Hygiene Rules for Food of Animal Origin (EC 853/2004), Regulation on Official Controls on Foods of Animal Origin (EC 854/2004), Regulation on Animal Health (Council Directive 2002/00), and Council Directive 2004/41, which repealed certain directives on food hygiene. Other pertinent regulations amend, implement, and provide for the transition of the basic laws.
- 29 Regulation (EC) No. 178/2002.
- 30 For most imported products, the importer need only indicate the exporter from whom the product was obtained.
- 31 Hazard analysis and the identification, validation, and verification by the producer or third-party auditor at critical control points in food or feed production eliminate, in principle, all or most of the need for end-product testing to ensure products conform to food safety requirements.
- 32 Codex is preparing a translation in Russian of all its standards, to be finished in 2007. The OIE has also made available Russian translations of some of its main reference documents and standards.

- 33 [http://www.wto.org/english/tratop\\_e/sps\\_e/sps\\_e.htm](http://www.wto.org/english/tratop_e/sps_e/sps_e.htm), accessed December 18, 2006.
- 34 WHO 2003, from [http://www.euro.who.int/foodsafety/Surveillance/20020903\\_3](http://www.euro.who.int/foodsafety/Surveillance/20020903_3).
- 35 Except in Poland, government officials responsible for food safety often looked lost during interviews when asked about civil society organizations.
- 36 In Hungary, 8,382 corporate farms (0.87 percent of total holdings) cultivate 40 percent of the agricultural area, while nearly one million private holdings with an average size of 4 hectares cultivate the remaining 60 percent of the land. In the Slovak Republic, cooperatives and commercial companies cultivate 76 percent of total agricultural land.
- 37 World Bank 2002.
- 38 The Standards and Trade Development Facility (STDF), a cooperative partnership of FAO, OIE, WHO, WTO and the World Bank for SPS capacity building, is making joint analytical efforts to analyze and recommend ways for improving sustainability. <http://www.standardsfacility.org/>

## CHAPTER 5

- 39 Available data from field work indicate that Lithuania received EC support for SPS of 5.9 percent of agricultural GDP, or €93 per person employed in agriculture, and Poland 2.5 percent, or €45 per person (see appendix 8).

## APPENDIX 2

- 40 Crop rotation is the basic control tool used in the United States.

## APPENDIX 4

- 41 [http://ec.europa.eu/food/food/rapidalert/index\\_en.htm](http://ec.europa.eu/food/food/rapidalert/index_en.htm).
- 42 Eurostat; accessed May 2007.

## APPENDIX 6

- 43 [http://www.who.int/healthinfo/statistics/bodgbddeath\\_dalyestimates.xls](http://www.who.int/healthinfo/statistics/bodgbddeath_dalyestimates.xls).
- 44 Minimum monthly wage for labors: US\$ 25/month (Kip 250,000) [http://www.business-in-asia.com/laos\\_economic\\_review.html](http://www.business-in-asia.com/laos_economic_review.html).

## APPENDIX 9

- 45 Rackowe 2001.
- 46 DG SANCO 2003.

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## RELATED WEBSITES

*Codex Alimentarius*, FAO/WHO  
<http://www.codexalimentarius.net>  
 EU, European Neighbourhood Policy  
[http://ec.europa.eu/world/enp/welcome\\_en.htm](http://ec.europa.eu/world/enp/welcome_en.htm)  
 EU, Financial Assistance  
[http://ec.europa.eu/enlargement/financial\\_assistance/index\\_en.htm](http://ec.europa.eu/enlargement/financial_assistance/index_en.htm)  
 EU, Third-Country Establishments Lists  
[http://forum.europa.eu.int/irc/sanco/vets/info/data/listes/list\\_all.html](http://forum.europa.eu.int/irc/sanco/vets/info/data/listes/list_all.html)  
 FAO, Regional Office for Europe and Central Asia  
[http://www.fao.org/world/regional/REU/field\\_programme/field\\_default\\_en.html](http://www.fao.org/world/regional/REU/field_programme/field_default_en.html)  
 FAOSTAT [FAO statistics]  
<http://faostat.fao.org/>  
 IPPC (International Plant Protection Convention)  
<http://www.ippc.int/IPP/En/default.jsp>  
 IWGO (International Working Group of Ostrinia and Other Maize Pests)  
<http://www.iwgo.org>  
 LABORSTA (ILO labor statistics)  
<http://laborsta.ilo.org>  
 TACIS, EU and Eastern Europe and Central Asia  
[http://ec.europa.eu/comm/external\\_relations/ceeca/tacis/index.htm](http://ec.europa.eu/comm/external_relations/ceeca/tacis/index.htm)  
 Ukraine, State Statistics Committee  
<http://www.dss.gov.ua/control/en/index>  
 UN Comtrade (United Nations Commodity Trade Statistics Database)  
<http://comtrade.un.org/>  
 WHO, Burden of Disease Statistics  
<http://www.who.int/healthinfo/bod/en/index.html>  
 WHO, Surveillance Program for Control of Food-borne Infections and Intoxications in Europe  
[http://www.euro.who.int/foodsafety/Surveillance/20020903\\_3](http://www.euro.who.int/foodsafety/Surveillance/20020903_3)  
 World Integrated Trade Solution (WITS)  
<http://wits.worldbank.org/witsweb/>  
 World Organization for Animal Health  
<http://www.oie.int>  
 WTO  
<http://www.wto.org>  
 WTO, Documents  
<http://docsonline.wto.org>  
 WTO, Sanitary and Phytosanitary Measures  
[http://www.wto.org/english/tratop\\_e/sps\\_e/sps\\_e.htm](http://www.wto.org/english/tratop_e/sps_e/sps_e.htm)

## PEOPLE INTERVIEWED DURING FIELD VISITS TO LITHUANIA AND POLAND

### Lithuania

Mr. Albertas Barzda Director, National Nutrition Centre  
 Ms. Edita Bishop, Member, National Consumer Rights Protection Board

Ms. Irena Endriuskiene, Chief Specialist, Department of Economics and Finance, Trade Policy Division  
 Ms. Zivile Kazakeviciene, Head, Division of Foodstuff and Recreational Services  
 Dr. Almantas Kranauskas, Deputy Director, National Nutrition Centre  
 Ms. Angele Liubeckiene, Head, Quality Division, Food Safety and Quality Department  
 Mr. Edmundas Morkevicius, Head, State Plant Protection Service  
 Mr. Vidmantas Paulaskas, Deputy Director, State Food and Veterinary Service, National Veterinary Laboratory (NVL)  
 Mr. Feliksas Petrauskas, Chairman, National Consumer Rights Protection Board  
 Ms. Irma Pilipiene, Administrative Director, Lithuanian Dairy Association  
 Mr. Darius Remeika, First Deputy Director, State Food and Veterinary Service  
 Ms. Rima Zivatkauskaitė, International Affairs Department  
 Mr. Mindaugas Zobialev, Head, International Relations and Legal Division

### Poland

Ms. Maria Boratyn-Laudanska, Director, Food Safety and Veterinary Department  
 Ms. Anna Galica, Director, General Veterinary Inspectorate  
 Mr. Antoni Gibowicz, Board Member, Quality and Assurance Department, "Sokolów" (a private meat company)  
 Ms. Daniela Gressani, Country Director, World Bank  
 Mr. Adam Jarecki, Head of Unit, Food Safety and Veterinary Department  
 Ms. Monika Jarzębska, Specialist, Department of Food, Nutrition and Consumer's Objects Hygiene, Chief Sanitary Inspectorate, Ministry of Health  
 Ms. Marta Jasińska-Kielek, Specialist, Department of Plant Breeding and Protection  
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