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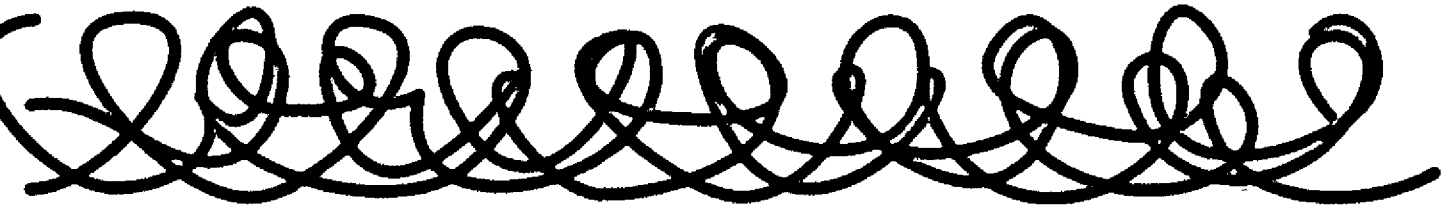
Industrial Development Report 2005
Background Paper Series

Food Safety Capacity-Building Needs: The Argentine Food Industry



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Industrial Development Report 2005 Background Paper Series

Food safety capacity-building needs:
the Argentine food industry

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Office of the Director-General

This series includes the background papers commissioned to cover specific aspects addressed in the Industrial Development Report 2005 "Capability building for catching-up – Historical, empirical and policy dimensions". The digital versions are available, together with the full report, on the IDR 2005's website at www.unido.org/idr.

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Contents

Executive Summary

Over the last decade the demands of safety standards visibly increased. Leading countries upgraded their legislation on control agencies, as well as their requirements. Codex standards, agreed by a large number of governments, still are the main reference, but stringent standards set by unilateral decisions also became a trade reference.

The social costs of unsafe food soared. The 2000/2001 foot-and-mouth disease outbreak in Argentina cost US$ 1.2 billion in terms of exports lost as markets refused to receive Argentine products. One case of BSE cost the Canadian beef industry at least US$ 2.5 billion .

Safe food became the threshold requirement to remain competitive in the international markets.

The Argentine food control agency, SENASA, was responsible in 2003 for certifying US$ 14.2 billion of food exports and US$ 600 million of food imports. Also controls US$ 15 billion of food for domestic use.

Created as a sanitary agency, in 1996 SENASA became the food safety agency. It is part of the National Food Commission, that also includes provincial health ministries and another national agency (INAL), all of them devoted to controlling food for domestic consumption.

SENASA's traditional practice was to approve the inspections, satisfying claims and preventing outbreaks of disease.

The increasing demands coming from the international trade became a new challenge for SENASA's safety-certification capabilities. The agency became critical to keeping Argentina in the global food market.

Several signs were perceived that the resources of the agency were not enough to assure the maintenance of its market share. Institutional and organizational changes in SENASA have been under study in the last year, indicating the need for quantitative as well as qualitative shifts in the underlying legislation, sources of funding, technical capabilities, information technologies and other aspects.

To maintain Argentina's share of the international food trade two scenarios were analyzed: the reactive and the proactive. Investment estimates were based on these two hypothetical strategies.

The **reactive** strategy was based on current practices. To comply with the increasing requirements of importing countries, the agency would require an important investment in the next years to avoid failing to meet them.

Under the reactive strategy, the organizational capabilities would scarcely avoid the detention and rejection of the food exported, and the agency would be operating near the borderline. If the strategy failed to provide adequate control, Argentina would lose share in the world market.

The **proactive** strategy assumed that SENASA would have to answer not only to the inspections and claims, but also to anticipate requirements (to provide information before the questions are issued) and to improve control and audit systems to prevent incidents. Standard equivalence and harmonization may become critical capabilities to be increased. Additionally, presence and participation in the CODEX and other international negotiations will be essential.

Placing SENASA several steps beyond the borderline could enhance trade sustainability. A proactive strategy would bring foreseeable and unforeseeable benefits, positioning Argentina as an *intelligent follower* of the leading countries.

The investments required in the case of the **reactive** scenario would reach US$ 53.4 million in five years; in the **proactive** scenario, US$ 133.6 million.

The annual averages would be US$ 10.7 million and US$ 26.8 million, respectively. SENASA's 2003 budget was US$ 33.5 million and the proposed investment would mean increases of 32 percent and 80 percent, maintaining current expenditures unchanged.

The need for an important increase of SENASA's investments for the catch-up stage (the first two years) and to maintain the subsequent performance indicates that the agency needs an budget increase even to remain **reactive**.

The composition of the investments brings some additional explanations. In the **reactive** scenario the most important item is *hardware and software* (51 percent). In the **proactive** scenario the relevant item is *inputs and services* (55 percent) which includes R&D and larger provision of inputs and services for the technical departments.

The institutional and organizational changes involved in the **proactive** strategy entail increasing professionalization by training the staff, and financing R&D both to support risk assessment and to provide the knowledge SENASA needs for negotiations and decision-making.

Food safety is a public-private issue: relevant for the food business and for the national policies. Co-operation based on transparency, clear division of responsibilities and enforcement of the regulations may create a trustworthy relationship, and will contribute to the prestige of Argentine food.

Introduction

The purpose of this document is to provide background information for the Industrial Development Report 2005, addressing the role of capacity-building to maintain a growing export performance.

Food safety has received increased attention over the past ten years, as a result of several changes in the food control systems. Regulations are evolving from the traditional practices of control and recall to an approach of prevention and security, through the chain of activities from the farm to the consumer's fork.

This report focus on the need of capacity-building to provide public goods to the Argentine food industry in order to maintain its export performance in the complex environment of food trade operations.

Taking into account current export needs and upcoming food security requirements, a detailed investment estimate has been included.

The dynamics of food safety requirements

Ten years ago the Uruguay Round Agreements began to come into effect, lowering tariffs and attempting to halt the use of standards and regulations as unfair barriers to trade.

Nowadays many food exporters complain that standards are used as barriers to trade. Examples plague the food reports on the we billion with news like this: " (a country) unilaterally categorized 16 food products as *high risk* without citing evidence" (Field, 2005).

Ten years ago the Sanitary and Phytosanitary Agreement (SPS) seemed satisfactory as a framework based on science and principles on food safety regulations.

In the environment where regulations operate, in the last decade there has been an increased scientific understanding of foodborne diseases, a growing international food trade and also some changes in food preparation.

In developed countries public health agencies realized the importance of non-transmissible diseases, such as those caused by unsafe food. Scientists also identified new pathogens and other hazards. Public concern was aroused. Consumers requested higher levels of safety and the health agencies took larger political responsibility for food safety.

New approaches to food safety regulation emerged[1]: a) the growing use of risk analysis; b) establishing public health as the primary goal of food safety regulation; c) farm-to-fork approach[2]; d) adopting Hazard Analysis and Critical Control Points (HACCP); e) increasing the stringency of the standards for many hazards; f) adding new and more extensive regulation; g) improving market performance through provision of information.

For the developing nations these trends may create a gap between the requirements of the international markets and those of domestic demand — focused, in many cases, on the security of the food supply and low prices.

For food exporter countries, like Argentina, the demand for safer food impacts on the trade operators and on the food control agencies. Firms and regulators had to react through catching-up efforts to maintain export performance. Food safety in the domestic market became a consequence of the interaction of external demand and the local trends.

The international framework

The SPS Agreement identifies three organizations as promoters of the adoption of international standards: the Codex Alimentarius Commission (Codex) for human food and animal feed, the International Office of Epizootics and the International Plant Protection Convention. WTO members have been asked to base their domestic legislation on standards developed by these international organizations. Firms and control agencies have relied on the standards of these organizations to facilitate international trade, as their role became more important after the Uruguay Round.

The package of measures to foster trade agreed at the Uruguay Round was bypassed through changes in the agricultural policies[3], and increased technical and food security barriers. The results of the agreements were far less beneficial to trade than expected and exporters have not perceived a significant increase in terms of market access.

At the Codex Committees several countries introduced the idea that food safety legislation would take into account not only sound science but also the "caution" or "precautionary approach" and other considerations. That means a major change in the principles of the Codex. Discussions and negotiations are under way in this institution and also at the WHO and other organizations.

Traders think that the use of the precautionary approach is a justification of trade barriers (Field 2005). Regulations, when they do not identify and characterize risks, may be more influenced by protectionism rather than by food safety requirements.

New legislation

Leading countries continuously upgrade their legislation. After 1995 food safety regulatory agencies were reorganized in several of the most important nations in the food trade, such as New Zealand and Australia in 1996, Canada and Denmark (1997), Ireland and Japan (1998), France (1999), United Kingdom, Netherlands and the European Union (2002).

The new legislation focused the control systems on: better public health by comprehensive control of foodborne diseases; consumer protection from unhealthy, unsafe, mislabeled or adulterated food; and contributing to economic development by maintaining the consumer's confidence in the food supply.

Food importer countries, as well as some exporter nations, adopted the farm-to-fork approach.

This movement toward improved safety creates the potential for convergence around higher standards. But the effect of the rapid changes and higher standards creates a challenge for developing countries[4].

Codex and the most restrictive standards

Up to now Codex standards have been the reference for trade and provided a common language, as well as the framework to solve disputes, but the new food safety approach pursued by developed countries brought stricter rules.

The leader in stringent regulations has been the European Union. The main decisions were established by the Regulation 178/2002. That norm was complemented by several others and few months ago by the Regulation 882/2004 of the European Parliament and the Council on the official controls of foods and feeds, that set up several conditions to the national control

agency of the non-European exporters. This will come into effect for imported products on January 1st, 2006[5].

In the future the most stringent standards of food safety adopted by a country will not only be a condition for trade with this country, but could turn into a second reference that may be used by the rest of the governments in negotiations and also by traders in private bargaining.

While the Codex intends to provide rules agreed by a large number of governments, the stringent standards are frequently unilateral decisions of the importers for their benefit.

Private firms and government negotiators will require greater support from the food safety control agencies to preserve access to foreign markets. Capacity-building in the official agency will be as critical as the firms' adaptations to introduce adjustments in their food chains.

The impact of increasing requirements was studied by Otsuki, Wilson and Sewadeh (quoted in Maskus, Otsuki and Wilson, 2004). Their conclusion was that changes in the EU maximum aflatoxins levels reduced African exports of cereals, dried nuts and nuts to Europe in US$ 670 million between 1989 and 1998. Otsuki and Wilson also studied the pesticide standards in the banana trade. The results show that a 10 percent increase in regulatory stringency would lead to a 15 percent decrease in banana imports.

The new requirements and the developing countries

Developing countries that export food and feeds face the challenge of improving their control systems to remain competitive. That means:

- New legislation on food control systems based on the approach adopted by importing countries.
- Strengthening the food control agencies, through investments to upgrade their capacities, laboratory process certification, information and communication technology, training, research and development and the organizational changes that would enable better performance.
- Private firms' investments in assurance, such as HACCP certification, the control infrastructure, the information systems (traceability, labeling and others).

Food control agencies and private investments, as well as the institutional support, are conditions to maintain competitive advantages.

FAO has summarized the availability of international support for capacity-building (FAO, WHO 2004; FAO 2004, billion and FAO 2004,c). Developed countries and international organizations are engaged in a great effort to support developing countries to build capacity in food safety.

The international support may be a good catalyst but each country needs a plan and local efforts to revamp their control system as required by the increasing requirements.

The cost of unsafe food and the benefits of safe food

The food scares and sanitary outbreaks impact on the demand and the consumers react immediately.

In 2000/1 outbreaks of foot-and-mouth disease were discovered in Argentina, but the information to governments and clients was delayed until the epidemic went beyond control and created an immediate reaction of the foreign buyers. In the following two years Argentina's

exports of beef fell by US$ 600 million and those of other commodities were affected by delays or cancellations. The total loss of export earnings was estimated at US$ 1.2 billion .

The Citric Scientific Council, based in Florida, reported to the USDA that the agency that failed to inform about the outbreaks has been also responsible for the safety control of the fruits exported to the USA[6]. The doubts on its credibility were analyzed and the US government tightened its controls. One year later, as a consequence of a phytosanitary outbreak affecting lemons (and informed in due time), trade stopped. The exports decreased by US$ 17 million the following year and the average price fell by 26 percent.

Canada in 2002 registered one BSE case. The losses for its beef industry were estimated at US$ 2.5 billion (Deloitte, Touche and Tohmatsu, 2004).

Journalists used to say that, real or imagined, bad food is big news (and good for their business). Therefore no-one in the food chain or food policy wishes to be related to a scandal.

Safe food has become the threshold requirement in international trade.

The need to remain competitive is an incentive for the firms to adopt new technology and management systems and for control agencies to improve their capacity and professional qualifications. In both cases the investments in human capital become as critical as those in hardware.

Safety beyond food safety

In the last few years several sources of trade barriers in food trade have appeared:

a) The Cartagena Protocol

The Cartagena Biosafety Protocol, which came into effect in September 2003, may affect agricultural trade and induce mandatory labeling for living genetically modified organisms traded (mostly corn and soybean).

Compliance costs are significant and unevenly distributed, both across the production chain and across commodities. Commercial risks and compliance costs are no static and may increase as the market conditions change.

Trading firms expected some requirements from importer countries, but the requests received in 2004 were based on national or regional (EU) legislation, not on the Protocol.

Currently this agreement is another threat as a source of barriers to food trade and increasing costs, insofar as governments are willing to enforce it.

b) Other Food Safety institutions

In May 2004 the assembly of the World Health Organization approved a Strategy on Diet, Fitness and Health, aimed at preventing obesity and the consequences of unbalanced diets or lack of exercise.

The Strategy's initial draft included a list of *unhealthy foods*, and a proposal for extra duties on them as well as incentives for the *healthy foods*. The proposal did not include those concepts in the final presentation

WHO and the regional international organizations (as the Pan American Health Organization) may become new sources of trade barriers as far as they support initiatives that may distort international commerce.

c) Private standards

Firms have moved to address safety risks, and this has resulted in a proliferation of private codes of practices and importer standards (Jaffee and Henson, 2004). Examples are those of the fruit juice importers, some supermarkets, and meat from cattle grown with hormones. In all those mentioned the standards applied are more stringent that those approved by the Codex.

Several retailers in Europe use the EUREPGAP, standards for fruits, vegetables, beef and fish products that require private certification.

d) Bioterrorism

The USA Bioterrorism Act, enforced in December 2003, requires information on exporters and on each one of the shipments to USA ports. There was an incident with Argentine lemons, originated by an anonymous mail. The authorities stopped a ship and a cargo valued at US$ 70.000, suspecting the content of five containers. Finally nothing wrong was found, the fruit was burned and the small exporter's commercial reputation fell as most clients shifted to more secure suppliers.

US Customs promoted an agreement several years ago, the Customs-Trade Partnership Against Terrorism. Nearly 3,500 firms (mainly US-based) are certified members and implement safety plans that are complementary and not covered by assurance systems such as HACCP.

Similar initiatives and regulations have been launched regarding containers, transport and energy.

e) Demand for safety

A report by Deloitte, Touche and Tohmatsu (2004) summarizes several examples that illustrate the increasing importance of safety as a global concept. Prospering in this environment requires a partnership between the control agencies and the private firms to succeed in fulfilling the safety measures and to render harm less probable.

The "secure economy" (including persons, organizations, communication and information infrastructure and the like) has expanded and become a source of trade barriers

Increasing public-private cooperation may contribute to greater efficiency and the avoidance of surprises.

Argentine regulatory agencies

SENASA

The food export control agency SENASA was responsible in 2003 for certifying US$ 14.2 billion of food exports and US$ 600 million of food imports. It also controlled US$ 15 billion of food for domestic use.

Created in 1904 as an animal sanitary inspection agency, became in 1996 the National Sanitary and Food Quality Service. The background legislation (Law 23899, of 1991) does not provide adequate support to SENASA as a food safety agency in current times.

Compared with the new legislation the developed countries have enforced in the last ten years, the law that supports SENASA, regimented by more than 100 decrees and resolutions, has several gaps, such as:

- The mission is based on sanitary purposes and production, not on foodborne diseases prevention and consumer safety.
- The authority's structure and organization, that fitted the sanitary requirements of the early 1990s, needs a redesign according to modern food safety practices.
- The funding through fees paid by private firms instead of a government contribution, as is usual in other countries for the provision of public goods.

SENASA needs modernization to provide satisfactory answers to the challenges of the international requirements, the changes in the references (Codex and also the most stringent legislation) and the new sources of barriers to trade.

SENASA is part of the Food Control System. Also members of the system are the provincial ministries of health and another national agency (INAL), devoted mainly to processed foods that are not responsibility of SENASA. Provincial ministries and INAL control the foods consumed domestically.

The main challenge for SENASA is to transform itself into an efficient and prestigious institution and become the control agency that Argentina needs to maintain its share in the global food market (approximately 2 percent).

For this purpose it may learn lessons from the international food safety situation, to implement a modernization strategy. The main weaknesses seem to be[7]:

- The current organization needs changes to base the activity on risk analysis; this includes programs by main production chains, risk assessment committees, different departments of risk management and communication.
- Greater transparency is needed.
- Funding, scarce to accomplish the mission, comes mainly from fees and charges to the farmers and economic operators, while the government's contribution is less than 3 percent of the total.
- The structure of the top management, designed for sanitary purposes, is not appropriate to a food safety agency.
- Staff needs training and a number of professionals need to be hired.
- The norms are not coherent and accessible enough.

The budget of SENASA up to 2003 was approximately Arg$ 100 million (until 2001 that amount of Argentine currency was equivalent to the same value in US dollars), but in the last three years (because of the devaluation) it has fallen to US$ 30-35 million. The budget for 2005[8] is to be increased to Arg$ 160 million (approximately US$ 53 million) but still supported by fees and charges.

Leading countries finance their food safety agencies with government funds. International Agencies, such as FAO and WHO, have also recommended government funding (see FAO / WHO, 2002).

Food and requirements evolution

Food trade in the past was based on commodities that evolved along with the best practices to stay in the market; when they did not, they became uncompetitive and ended up

being driven out of the market. A brief comparison of some products exported by Argentine firms in the 1950s and in 2004 illustrates the differences.

Beef was usually traded in the 1950s was in the form of carcasses, with veterinary controls and inspection of the slaughterhouse. Nowadays it is traded in cuts and portions, warranted by HACCP, traceability and labeling. The relevant risks in the 1950 were sanitary. Currently the main risks of the international beef trade are BSE, residues of veterinary drugs and also sanitary.

Milk in the 1950s was sold in small quantities fresh (to adjacent countries) or condensed; now it is sold mainly as powder, warranted also through HACCP and traceability.

In both industries controls were based on official veterinary inspections. Now the responsibility for quality assurance lies with the firm and the official controls audit the systems.

When commodities do not adapt to the safety requirements, as the case of honey, that did not control the residues, or the fruits that still have sanitary problems, the exports cannot maintain their market share. In both activities small and medium firms are leading some of production chains and are responsible for most of the exports.

The examples show that the commodities are traded in different forms and use appropriate safety tools. Through time they have changed and have been adapted to the requirements of the markets. The old forms of trade have given place to new ones that meet the safety standards.

A comparison of expenditures in food safety.

The following table includes data from USA, Chile and Argentina related to food activity and expenditures in food safety.

The three countries have differences in diets, income levels and in domestic consumption perceptions that influence peoples' tolerance to risks[9].

Table 1
Expenditures in food safety (US$ millions)

	United States	*Chile*	*Argentina*	
	1999	*2000*	*2001*	*2003*
Food Activity[10]				
- Production or shipments	515000		42100	29200
- Exports (food and beverages)	42142	4648	11359	14588
- Imports (food and beverages)	35451	1128	1091	501
- Trade (food & beverage)	77593	5776	12450	15089
- Annual cost of foodborne diseases	37000			
Food Safety Expenditures	1300	66.5	100.5	33.5

	United States	*Chile*	*Argentina*	
	1999	*2000*	*2001*	*2003*
Ratios				
FS Expenditures / Exports	3.08%	1.43%	0.88%	0.25%
FS Expenditures / Trade	1.67%	1.15%	0.81%	0.22%
FS Expenditures / Production	0.25%		0.24%	0.12%
FS Expenditures / C F Diseases	3.51%			

Sources: GAO (2001), USDA-ERS
SAG (2001) and ODEPA
SENASA, INDEC and COPAL

While trade standards and controls tend to a convergence, the position of the three countries differs.

US domestic food consumption absorbs approximately 90 percent of the country's production. The citizens are well aware of risks and trust in their official controls. Food safety agencies are recognized as leaders among developed countries and the most efficient. In domestic market and in trade, US strategy has been that of leadership in safety.

The national agencies (Food and Drug Administration, FDA, and Food Safety and Inspection Service, FSIS) receive 77 percent of the national budget for food safety and the state government agencies, 23 percent.

The SAG (Agricultural and Livestock Service) in Chile is mostly devoted to supporting the development, competitiveness, sustainability and social fairness of agricultural activity, and to improving food quality. It seems to be pursuing the "intelligent follower" strategy, being proactive in trade as part of a comprehensive effort to increase exports.

The Argentine data only include the budget of SENASA. Other agencies of the national Food Control System did not provide information on their expenditures[11].

SENASA's traditional practice was to approve the inspections with minimum effort, satisfy claims, improving controls and operations, and to avoid sanitary outbreaks.

The table indicates that Argentina's expenditure on food safety deserves a detailed estimate in relation to the needs, because it seems to be low in comparison with the other two countries.

To maintain the market share in world markets, according to the new standards environment, would require larger resources.

Proposed institutional and organizational change[12]

The main drivers of the institutional change would be:

- Technical and methodological modernization.
- Institutional redesign based on risk analysis.

The former should be oriented to quality assurance through the certification of products, processes and persons, operations standardization, audits and validated lab tests.

The institutional redesign would promote public-private partnerships to ensure food safety. The firms would be encouraged to use quality assurance practices and SENASA would need to devote less attention to inspection and concentrate its resources on auditing, risk assessment, operations of risk management and communication, substantial improvements in anticipation capacity, standards harmonization, equivalence and transparency

This strategy may be instrumented through:

- New legislation on the mission, resources, and structure of SENASA to obtain greater operational efficiency, changes in the funding, adequate top management structure, auditing bodies, and other major improvements.
- Substantial improvement in the internal procedures in order to use quality assurance management practices, internal standards, operation manuals, defined programs by production chain and support activities.
- The regulation on food safety would be revised and set in order.
- Technical modernization.
- A new policy on human resources: redesigning the functions and capabilities required in each position, continuous and obligatory training, performance evaluation, salary according to results and responsibility.
- ICT resources: acquire a new and complete information and communication system for SENASA that may be also accessed by farmers, managers of the production chains, NGOs and public agencies.
- Technological resources: a food safety regulator needs R&D to keep up to date and anticipate surprises. Knowledge is the main input for risk assessment and is also needed to improve the operational management and to support international negotiations. Technological efforts would achieve international recognition of SENASA as a reliable and professional agency. R&D would be contracted with specialized institutions
- Laboratory facilities: safety requires multiple test facilities, large quantities of tests, trained personnel, and continuous modernization.
- Financial resources: general-interest activities that generate public goods must be funded by the government, while activities requested to satisfy particular interests may be charged with fees (to be set taking into account the costs and the impact on competitiveness).
- A strategic technical and economic department reporting to the top management would be created as responsible for multi-annual plans and technological surveillance.
- An advisory council integrated by business representatives would replace the current administration council.
- The organizational chart of the agency would follow the risk analysis: assessment committees, management operations following different food chains and communications.
- Contingency plans would be continuously updated.
- Knowledge management for the skilful treatment of the risk assessment and the research and development contracts would need to be improved.

SENASA needs to change its current practices and this must go far beyond the installation of information technology hardware and laboratory equipment. It implies increasing professionalization by providing training to all levels of the personnel (and hiring PhDs and university graduates in subjects related to food safety), multiplying the tests (and the inputs needed), exchanging specialists with other agencies for short spells, etc.

Leadership is essential for an institutional and organizational strategy. The leader must convince government and all segments of the food chain about the benefits that may be obtained and the need for broad support. To succeed the leader would need a strong co-operative effort between government and private firms.

SENASA'S capacity-building needs: two scenarios

Based on the proposed institutional and organizational changes, two hypothetic scenarios to maintain the share of Argentine exports in food trade were analyzed.

The reactive strategy

SENASA has been quite successful in securing approval of the food industry in sanitary and phytosanitary inspections of the EU, USA and other countries. Some years ago inspections used to be 8 to 10 per year, but last year 15 inspections were made.

The agency has followed a mainly **reactive** strategy, based on providing answers to the specific questions raised in the inspections, claims raised by the controls in the destination country, and to avoid sanitary outbreaks and food scares.

In the lasts year SENASA has reinforced some critical points:

- In 2004 the number of lab tests (more than 200,000) rose by 15 percent in relation to the previous year.
- Twenty-four analytical methods have already been certified and 24 more are undergoing the process of certification.
- The lab issued a plan to improve methods, manuals and systems in order to maintain the markets open to Argentine foods.

SENASA has also maintained a control system based on Codex to manage the risks associated with the food trade, but has not set up either the large capacities or the organization required for anticipation.

The reactive strategy means that the organizational strengths barely avoid the detention and rejection of the food exported. After receiving the claims, controls are increased and food chain operators are instructed on the practices needed to avoid commercial problems[13].

Lack of resources has prevented SENASA staff from attending the Codex Committee on Fats and Oils (Argentina's main food exports) and some surprises emerged from this absence.

SENASA is operating near the borderline.

The food industry has identified some signals about the situation and sent a document to the SENASA authorities (COPAL, 2004).

Unexpected increases in standards stringency may drop SENASA's performance below the borderline and significant national social costs may be the consequence (mainly expressed in the volume and price of the commodities exported).

Faced with the new requirements of the importing countries, the current strategy (get the inspections approved and provide answers to the claims) would require an important investment over the next two years to avoid falling short of meeting the increasing requirements described previously.

Should the current strategy fail to provide adequate answers to the increasing requirements, the national food trade would lose share in the world market.

The proactive strategy

In the future SENASA will have to answer not only to the inspections and claims, but also to the private consultations and certifications that may be requested by governments and importers. Standards equivalence and harmonization may become critical capabilities to be increased. Additionally, it will be essential to ensure a presence and participation in the Codex and other international negotiations, in which standards and stringent requirements are discussed.

As an exercise, a shift in SENASA towards a **proactive** strategy will be analyzed. This will help to estimate the investments needed as a way of showing some differences between the current situation and a desired future.

Proactive means:

- To anticipate the requirements and provide information before the questions are asked.
- To improve control and audit systems to prevent incidents, as those cited earlier.
- To attend Codex committees and events where standards are agreed.

To reach this position, a strategy for SENASA may be to increase its food-safety capability to provide adequate support to maintaining the national share in food trade in spite of surprises and unexpected increasing standards.

Keeping SENASA several steps beyond the borderline may enhance trade sustainability. The modernization of official controls would help firms improve their competitive position.

A proactive capacity would bring foreseeable and unforeseeable benefits that might arise from the technologies adopted and the improvements in human capital. Argentina is not a leading country in food safety, but may be an "intelligent follower" like Chile.

In the last year SENASA hired a group or experts that prepared a strategic plan (SENASA 2004,a) and discussed it internally (results of the meeting in SENASA, 2004,b).

As their reports mention, a major organizational change would be required, aimed at anticipating the safety requirements and the improvements in standards and methods, to continuously upgrade the efficiency of safety controls from farm to the country of destination and to inspire respect as a trustworthy agency.

A proactive strategy means:

- A clear position in the mission statement that the main commitments are the prevention of foodborne diseases, guaranteeing safe food to the consumers and supporting food production and trade, as suggested by FAO / WHO (2002 and 2004) and WHO (2001).
- Technical organization focused on risk analysis, anticipation and control from farm to fork.
- Strategic decisions guided on risk assessment elaborated by scientific committees covering the main food chains and subjects that are common to several food chains.
- Separating risk assessment from risk management and risk communication, and defining programs following the main food chains.
- Preparing a pluri-annual plan for food safety, and an annual plan and budget with details of the programs for the main food chains.
- Improving the internal and external auditing and the communication.
- Professional management, independent from political or interest pressures
- Government funding for obligatory controls; fees and charges for voluntary certifications.
- Priorities set as a function of risks.
- Co-operation with the private sector on strategic management, auditing and on improvement, especially in risk management and communication.

This scenario needs to be based on a new legal framework as a major government contribution to the agency's modernization.

Investment to improve capacity: five-year estimates

The estimates included *investments*, such as equipment, installations and software and also *current expenditures*, such as personnel, inputs and services. The first group includes the non-current expenditures that require a purchase decision on each item. The later category would be repeated yearly and eventually increased[14].

To appreciate the difference between the scenarios, the estimate was made for five years, which allows the identification of several effects that may not be perceived taking only the first year.

The data shown in this chapter is based on information obtained in interviews with several experts. They may be considered as an initial estimate just for a first view of the approximate amount and distribution among different items.

The list of the items and the values were discussed with the experts. Data reported in the tables do not include SENASA's current budget.

The laboratory

SENASA's main facility is the reference laboratory, located near Buenos Aires, a complex of installations specialized in sanitary, phytosanitary and food security analytical controls. This lab also certifies product quality, agricultural chemicals and veterinary drugs. The reference laboratory is the core of a national network of regional laboratories.

In 2004 it received 15 inspections by foreign countries that audited several sanitary and safety risks, paying attention to the equipment, personnel, procedures, performance and relevant management skills. In the last few years, the laboratory management team perceived the growing analytical requirements and the need to improve their services in order to provide in the future adequate answers to the demands of foreign countries.

Table 2
Investments needed by the laboratory. Estimate for 5 years
US$ millions

Scenario / *Items*	*Reactive*	*Proactive*
Personnel	2.2	8.7
Inputs	13.6	31.5
Services	6.1	11.7
Equipment, installations and software	10.8	20.3
TOTAL	32.7	72.3

The data were estimated on the base of information provided by the laboratory director.

As may be noted, the larger differences between the two strategies are in *inputs* and *equipment, installations and software*, both needed to increase laboratory performance.

The reactive scenario shows a substantial increase with respect to the current budget. To maintain a technical performance that provides a trade support equivalent to that of the past, it will be necessary to increase the current level of expenditures of the reference laboratory from US$ 4 million per year to US$ 10.5 millions. That means an addition of US$ 6.5 million, as the table shows (US$ 32.7 million in five years).

The effort to reach the performance required by the increased standards indicates the need for a clear jump on the expenditures of the last years.

The proactive scenario would allow SENASA to maintain a capacity large enough not only to answer all the requirements expected from the most stringent standards, but to anticipate future changes. Larger capacity may strengthen the regional laboratory network, multiplying the number of tests and integrating results with other departments to improve the performance of the whole organization. Such a strategy would provide support to a sustainable food trade. The annual investment for this purpose would be US$ 18 million, in addition to the current US$ 4 million (US$ 72,3 million in five years).

Research and development

Currently SENASA does not conduct nor contract R&D in food safety. This practice was maintained in the reactive scenario, under the assumption that the knowledge needed to improve performance, especially in risk assessment, would be provided by the professional staff and by local R&D organizations.

Table 3
Investments needed in R&D. Estimate for 5 years
US$ millions

Scenario / *Items*	*Reactive*	*Proactive*
Personnel	0	1.3
Inputs	0	1.0
Services	0	24.9
Equipment, installations and software		
TOTAL	0	27.2

The proactive scenario requires organized risk assessment. Local R&D capacity would be the natural way to participate in the international scientific community that deals with subjects that, eventually, will inspire legislation, policies and private decisions in the future.

Those subjects may refer to specific food chains or to methods and problems across the food chains. The estimate of investments considered both categories and added a third one, the R&D efforts required to improve SENASA's decision-making.

The first two categories may be contracted with appropriate national institutes and universities, in order to maintain SENASA's activities inside their mission framework.

A modern food control agency needs several committees to assess risks related to production chains and also to "horizontal" risks that may affect several chains. The members of the committees should be top scientists, internationally recognized, acquainted with the state of the art, which may identify the practices adequate to local requirements. In addition they would have the capacity to develop the complementary knowledge and use the locally available knowledge.

Why does Argentina need R&D, if is it available in other countries? This is a common question, especially among practical people.

First, the available technology may not fit the local conditions of the production chain and may require adaptation. A deep understanding of the existing technology allows a better selection, full implementation, efficient use and increasing yields in the future based on learning and de-bottlenecking through complementary investments.

Second, local problems may not find solution in the knowledge developed to be used in other environments, and require local R&D.

Third, the scientists exchange critical information with their colleagues on new risks, new methods, different approaches and other subjects. This knowledge, useful for risk assessment and for decision-making, is obtained, among other sources, from scientists that belong to the circle of the best practitioners in a field of science.

The prestige of a control agency depends on the quality of the knowledge currently used. High-quality knowledge, needed for updating and anticipation, requires constant research.

Fourth, SENASA will need qualified professionals for risk analysis. Some of the scientists, after several years of solid R&D activity, change successfully to operational

activities. This leaking process is frequent in knowledge-based activities such as the official food control.

Taking those considerations as a background, a budget for a typical R&D team was estimated. It includes a team leader, a senior scientist, three junior scientists, and a lump sum for inputs, services (training was not included), hardware and software.

Afterwards the number of teams was estimated for the abovementioned three categories of R&D.

Three selection criteria were used in the food chain groups: importance of current and future exports, risks identified by the food chain and impact or relevance of the risks.

Using those criteria the food chains were grouped in: beef, poultry, other meat, dairy, honey, fish products, vegetables, fruits, cereals, oilseeds and derivates, other foods, forestry and woods. Taking into account that some activities would require several teams, the total number of R&D units estimated was 16.

Biotechnology, organic production and veterinary products and chemicals used in agriculture were included as "horizontal" groups. The need of resources for the three teams was estimated lower than for the previous category because of the availability of the equipment needed.

The last category includes international legislation, international negotiations, harmonization of the local food security regulation and technological surveillance of risks and appropriate technologies. These R&D teams relate to capacities to be built inside SENASA.

The estimate includes the personnel needed by SENASA for the activities mentioned and the services needed by the four teams. As a services item, it includes the amount of the contracts for the 19 teams (food chains and horizontal).

The National Institute of Agricultural Technology (INTA) has R&D teams working on some of the subjects related to food chains and "horizontal matters".

The estimate of R&D investments was focused on the amount and justification of the resources needed and did not enter into sources of financing or other considerations that will be necessary in following steps.

Information Technology

The management of a modern food control agency requires an unified system to process data on sanitary and phytosanitary activities, food manufacturing and transportation, as well as the administrative process.

A network would connect the central office with all the branches (currently more than 300), enabling them to operate specific processes. The organizational communication would guarantee a quick and reliable exchange of information.

The home page would be substantially improved too.

External users (such as other public agencies, farmers, economic operators and organizations that represent different groups) would have the possibility to obtain a password to operate some systems, especially those that request SENASA operations.

In both scenarios one of the top priorities would be the investment in a modern information and communication system for an efficient SENASA performance.

The estimate was made in general terms, as the diagnosis of the available databases, the design of the system and the list of expected outputs have not been completed.

Table 4
Investments needed in information technology. Estimate for 5 years
US$ millions

Scenario / *Items*	*Reactive*	*Proactive*
Personnel		
Inputs	0.8	0.8
Services	3.6	3.6
Equipment, installations and software	11.2	11.2
TOTAL	15.6	15.6

Training

A large organizational change requires a training component. In the reactive scenario the current training activities may need improvement, but the proactive scenario deserves special consideration.

The R&D effort requires an improvement in technology management. SENASA does not have enough specialists in R&D contracts, project follow-up and intellectual property to protect the results.

For this purpose local courses would be organized for the members of the teams and the representatives of SENASA that would control the projects. Some external assistantship in foreign organizations would also be programmed. Attendance to international conferences and to the meetings of Codex, OIE, IPPC, WHO and others, as part of the national delegation, would be necessary.

Travel expenditures to international negotiations and meetings also have to be considered.

SENASA personnel, at all levels, would improve their capabilities in information technology, as well becoming acquainted with the management tools related to annual plans and program budgets.

General training would be part of the investments of the next years. Devoting 1 percent of the working hours to training would help the efficient use of new technology and methods.

Professional staff need more extensive training, estimated at 5 percent of their working hours. Such an upgrade of capabilities would require hiring 5 percent of the professionals to maintain the operational capability of the agency, as well as the costs of the training.

Table 5
Investments needed in Training. Estimate for 5 years
US$ millions

Scenario / *Items*	*Reactive*	*Proactive*
Personnel	0	6.2
Inputs	0	0.6
Services		
Equipment, installations and software		
TOTAL	0	6.8

Training is a common activity in organizations that are in continuous learning and would be a component to maintain SENASA as a reliable agency[15].

Vehicles and facilities

Several SENASA services require the officers to travel to a farm or to manufacturing facilities. The periodical replacement of vehicles is part of the agency's investments, as shown in Table 6.

Table 6
Investments needed for vehicles and installations. Estimate for 5 years
US$ millions

Scenario / *Items*	*Reactive*	*Proactive*
Personnel		
Inputs		
Services		
Equipment, installations and software	5.1	11.9
TOTAL	5.1	11.9

Summary of the estimates

The following table includes the estimates for both scenarios[16]. Figures reflect the increase of expenditures over the current situation

Table 6.7
Summary of the investment needs. Total for five years
US$ millions

Scenario / *Items*	*Reactive*	*Proactive*
Laboratories	**32.7**	**72.3**
- Personnel	2.2	8.7
- Inputs	13.6	31.5
- Services	6.1	11.7
- Hardware and software	10.8	20.3
Information technologies	**15.6**	**15.6**
- Inputs and Services	4.4	4.4
- Hardware and software	11.2	11.2
R & D	0	**27.2**
- Personnel		1.3
- Inputs and Services		25.9
Training	0	**6.8**
- Personnel		6.2
- Services		0.6
Vehicles and other facilities	**5.1**	**11.9**
TOTAL	**53.4**	**133.6**

The investments in the case of the reactive scenario would require US$ 53.4 millions over five years; in the proactive scenario, US$ 133.6 millions.

The annual averages would be US$ 10.7 millions and US$ 26.8 millions, respectively. The 2003 SENASA budget was US$ 33.5 million and the proposed investment would mean increases of 32 percent and 80 percent, respectively, maintaining other expenditures unchanged.

Table 8 presents the distribution of the total investment for each year and the composition in human capital, current expenditures and contracts and capital goods.

Table 8
Summary of the investment needs. Annual totals
US$ millions

Year / *Scenarios and Items*	*1*	*2*	*3*	*4*	*5*	*TOTAL*	*Annual average*
REACTIVE Scenario Total	**15.7**	**14.8**	**8.1**	**7.4**	**7.4**	**53.4**	**10.7**
Human capital	0.4	0.4	0.4	0.4	0.4	2.2	0.4
Inputs and services	5.4	5.4	4.4	4.4	4.4	24.1	4.8
Hardware and software	9.8	9.0	3.2	2.5	2.5	27.1	5.4
PROACTIVE Scenario Total	**28.0**	**26.8**	**23.4**	**26.2**	**29.3**	**133.8**	**26.8**
Human capital	2.5	2.9	3.2	3.6	4.0	16.2	3.2
Inputs and services	11.6	13.3	14.3	16.3	18.7	74.2	14.8
Hardware and software	13.9	10.7	5.9	6.3	6.6	43.4	8.7

It may be observed in the proactive scenario that the annual amount of the investments does not differ significantly from the average, while in the reactive scenario the amount of the first two years doubles the expenditures of the rest.

The reactive scenario indicates a large effort in the first two years, the catch-up period, and then a return to an investment equivalent to 50 percent of the amount of the initial years, but quite larger than the budget devoted to investments in the past few years.

The need for an important increase of SENASA's investments in the catch-up stage and to maintain performance may be another warning. At the current budget level and composition, the agency has been close to originating detentions and rejections of Argentine exported foods as well as inability to conform with the inspections of the importers.

The composition of the investments demands some additional explanations. In the reactive scenario the most important item would be *hardware and software* (51 percent). In the second scenario the relevant item would be *Inputs and services* (55 percent) which includes the R&D contracts and larger provision of inputs and services for the technical departments. This item would grow according to the operational needs and compensate the decreasing needs on *hardware and software*.

As in the example referred by Jaffe and Henson (2003) some of the investments for the catch-up effort focus on upgrading the capacity but, beyond that stage, the attention shifts to the maintenance of capacity for the new standards requirements.

Technological and organizational changes involve an increase in operating costs and shifts in its structure.

Benefits of the initial catch-up stage are easier to identify than those coming from capacity maintenance, that are frequently intangible and indirect. Examples of the latter are the losses avoided by greater efforts in prevention, the reduction of redundant work because of better trained personnel, savings in time through defined procedures, and the like.

A prestigious SENASA will simplify requirements by harmonization or equivalence negotiations with other governments. In many cases the certificates issued by a reliable control

agency facilitates simplification (in terms of time and resources) in trade operations. This kind of prestige may be attained following a proactive strategy.

Private costs

The global costs

In several years SENASA's expenditure was 97 percent funded by fees and charges paid by private operators, and 3 percent by the national government. The Argentine firms paid the full costs of compliance: their own costs plus the official controls. In other countries the governments fund their food control agencies[17] as they provide public goods, and firms pay only the adjustments made in their own production facilities.

The firms' expenditure to comply with food standards may be considered marketing costs, some of them to adapt the product to the market and some to conform to the standards. This expenditure would be part of the investment needed to remain competitive. The fees and charges for SENASA's service results in a reduction of competitiveness, becoming a tax on exports.

The transparency of the safety system is one of the main requirements of the importers. For that purpose the controlled firm that pays the controlling agency for a certificate appears, at least, as following an ambiguous procedure. For this reason the Argentine food industry has proposed that the government fund the obligatory controls, keeping fees and charges for voluntary certifications[18].

In general terms, private capacities complement official controls. Both are necessary and need to work together to preserve the current share of Argentine food products in the world market. This is a matter of national as well as of particular interest.

Small firms

There is some concern about the participation in trade of the small and medium-sized firms. The investment needed to comply with rising standards tends to be easier to afford by larger exporters than by small and medium-sized ones. Economies of scale and scope may be significant.

Maskus, Otsuki and Wilson (2004) in a survey of 159 firms (some of them food exporters) found that the average cost of compliance was US$ 1.4 million (minimum and maximum values were US$ 0.4 and 12.3 million).

Trade is difficult for S&M firms specially when trade barriers are raised, not only because of the safety regulations.

Improving SENASA- private sector co-operation

Food safety is a public-private issue, relevant to the food business and to national goals.

Private firms know what is practical and achievable and have operational expertise in trade.

The safety attributes demanded by consumers, and their changes, are perceived soon by the firms because they are sensitive to the potential damage.

Government regulation is necessary to ensure food safety and to certify that the products traded meet the norms agreed internationally (Codex) and, eventually, the requirements of the importers.

Co-operation based on transparency, clear division of responsibilities and enforcement of the regulations may create a trustworthy relationship, as observed in leading countries.

The main joint activities would be the discussion of strategic issues and the collaboration in risk assessment and information (preserving the respective roles).

The private firms may help the strategic management of SENASA through the review of planning documents and audit reports, and by providing complementary information.

A partnership between SENASA and the food chains may help to succeed in safety measures, in obtain increasing efficiency, as well as in avoiding surprises.

Subjects for additional research

Sector analysis

The estimates of the investment needed by the SENASA cover only part of the total costs of compliance with the safety standards.

The analysis of the private costs for the entire food activity may present two difficulties. First, compliance costs may not be separated from other investments and, second, each firm may select its own way to achieve compliance among a variety of technological and administrative possibilities.

The difficulties diminish in estimates by sectors of food activity, as shown by Jaffee and Henson (2004). In the Argentine food industry several sectors must be analyzed: a) oilseeds, oils and byproducts, b) dairy, c) poultry and d) fruits. In those activities the private and official costs of compliance would be estimated.

Sector analysis may concentrate on: relevant risks, requirements of the legislation, benefit sand cost of compliance. Some subjects that may be addressed are:

- The impact of risks.
- The path of the exigencies of the legislation (Codex and most stringent).
- The private costs of compliance: investments and current expenditures. Catch-up and maintenance. Reactive and proactive.
- The public cost of compliance.
- The benefits of the official controls: the value of the official certifications.

Comparison between SENASA and SAG (Chile)

SENASA's 2003 budget with the addition of the investments estimated for the proactive scenario provide a global amount and an expenditure structure that resembles the information on the SAG.

A comparison of the capacities and performance of both institutions may bring some insights on the ways used, the costs and the benefits obtained.

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Notes

[1] Roberts, D. and Unnevehr (2003)

[2] Expression used to express the safety control of all the activities of the food chain, from the farm to the consumer's fork.

[3] Such as the shift to less distorted internal support that did not mean less subsidies.

[4] In the following Section of this Report, SENASA's situation will be analyzed and contrasted with the efforts of the developed countries that gave themselves new legislation.

[5] Some relevant aspects, such as the national control plans, will come into effect in January 2007.

[6] U.S. Citrus Science Council, Just-Food, April 03, 2001

[7] Based on SENASA (2004,a)

[8] According to the draft national budget.

[9] Ageing, foods away from home, information on food composition and higher incomes stimulates people to be more conscious on their diets and on the safety risks.

[10] Includes food industry plus exports of unprocessed agricultural products.

[11] The budgets of INAL and the provincial agencies may be estimated, jointly, at u$s 8-10 million.

[12] The recent report of the Experts Group (SENASA, 2004,a) provided a guide for this section.

[13] The newspaper La Nación (Buenos Aires, Jan. 21, 2005; Sección Economía "Manejo de Semillas curadas. Advierten el riesgo de contaminación") informs about a claim from China's agriculture ministry related to the presence of contaminants in a cargo of soybeans. It also describes the increasing controls of SENASA on next shipments and the recommendations to the involved farmers and firms to improve their storage practices.

[14] Unless specified, in this chapter the concept of "investments" will be used in the broad sense, including both categories.

[15] Training for farmers, manufacturers and other operators was not considered in the estimates.

[16] The estimates provided are preliminary

[17] WHO (2001)

[18] COPAL (2004).

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About the cover illustration:
The graph on the cover, generated by means of fractal geometry model, simulates a pattern formed by three ring vortices playing catch up with one another (also called 'chaotic leapfrogging').

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