IMPROVING FOOD SAFETY AND QUALITY ALONG THE CHAIN
to protect public health, support fair food trade and contribute to food security and economic development
Ensuring food safety is a public health priority, and an essential step to achieving food security. Effective food safety and quality management systems are key not only to safeguarding the health and well-being of people but also to fostering economic development and improving livelihoods by promoting access to domestic, regional and international markets.

What do we do?

**FAO’s food safety and quality programme:**
- provides independent scientific advice on food safety and nutrition which serves as the basis for food standards at national, regional and international levels;
- supports development of institutional and individual capacities for food control and food safety management, including the management of food safety emergencies;
- supports processes for the development of food safety policy frameworks;
- facilitates global access to information and promotes the development of food safety/quality networks.

Our approach

FAO is a leader in the development of global food safety initiatives and translating these into country level action. The Food Safety and Quality Programme supports an integrated and multidisciplinary approach to food safety management and holistic and feasible “food chain” solutions to specific food safety problems. The foundations for this approach are based on science.
Safe food benefits everyone.
The Codex Alimentarius is a collection of food standards, guidelines and codes of practice recognized by the World Trade Organization since 1995 as the “benchmark” standards for national food safety regulations and the basis for international food trade – they are science-based standards, adopted through global consensus. The legitimacy and universality of Codex standards depend on the effective participation of all Codex membership. FAO’s Food safety capacity development activities support the ability of developing countries and countries in transition to participate more effectively in Codex.

What are the Capacities required for effective participation in Codex?

**ROBUST NATIONAL CODEX POSITIONS & EFFECTIVE PARTICIPATION IN CODEX**

**“Codex-specific” Capacities**
- knowledge of Codex rules and procedures;
- well-functioning national Codex Contact Point;
- effective negotiation skills and strategic interventions.

**National expertise in food safety and its regulation**
- understanding of and ability to apply the risk analysis framework;
- experience of implementing food control activities within a well-managed food control system;
- technical/scientific expertise in different food safety related disciplines;
- access to adequate and reliable national food safety data;
- mechanisms that assure effective communication with food industry and with consumers on food safety issues;
- mechanisms that optimize the involvement of the academic and research communities in food safety.

Developing capacities

- FAO supports capacity development through a wide range of activities both upstream and downstream of standard-setting:
- developing capacities of countries to contribute with data and expertise to the development of scientific opinions that underpin Codex discussions;
- supporting improved national consultation on Codex issues;
- supporting national capacities for implementing and enforcing food standards harmonized with Codex.
Impacts of recent Projects – Selected examples

- **Strengthened national Codex Committees** – As a result of FAO support during 2010-2011, actions have been taken in Angola, Benin, Cameroon, Cape Verde, Guinea, Ivory Coast, Laos, Mongolia, Republic of Moldova and Partner States of the East African Community to improve the organization of Codex work at national level thus allowing them to better develop national positions on Codex issues and to effectively handle national standardization issues.

Many training programmes have been implemented using FAO/WHO training packages to strengthen knowledge of Codex rules and procedures and improve national planning for Codex participation and preparedness of Codex delegations.

- **National standards harmonized with Codex and enhanced national food safety standard-setting** – Through FAO assistance, over the period 2010-2011, national authorities in Fiji, Vanuatu and Solomon Islands have reviewed national food standards and harmonized with Codex.

- **Evidence-based positions on food safety issues** – FAO and WHO are conducting a project to assess types and levels of mycotoxin contamination in sorghum in four major sorghum producing/exporting African countries (Ethiopia, Sudan, Mali and Burkina Faso). The project will inform ongoing discussions in the Codex Committee on Contaminants in Foods (CCCF) on the need for a Codex maximum level for mycotoxins in sorghum.

The **FAO/WHO Codex Trust Fund**, operational since March 2004, complements FAO’s capacity development efforts mainly by providing direct support to delegates’ attendance at Codex meetings and also providing some funding for FAO/WHO training aimed at enhancing the quality of participation.

Essential References:

- **FAO/WHO training package** in English, Spanish, French, and Russian.
- **FAO/WHO e-learning course** “Enhancing participation in Codex activities”, a self-paced course available on line and in CD-ROM in En, Fr, Sp.

“**FAO food safety projects and training have been very important in helping build our national food control system. Our improved understanding of food safety and food regulation allows us to participate more fully in Codex and to benefit more from it”**.

Ousmane Touré  
Director General the ANSSA, Mali
Food safety threats cause an enormous burden on economies globally due to frequent disruptions or restrictions of global and regional agri-food trade, loss of food and associated income, increased cost of health care, and also contribute to food insecurity and the poverty cycle affecting the most vulnerable populations.

To prevent some of their adverse impacts, FAO assists countries in building food safety emergencies prevention and management systems, thus contributing to strengthen country resilience to food chain crises.

**Need for well co-ordinated surveillance throughout the food chain**

Food can become contaminated with biological, chemical or physical hazards at any point in the food chain. Therefore, prevention and control must be implemented at every step of the continuum. Food safety is rarely the responsibility of a single authority. Several countries with well-developed food control systems have operational protocols in place that clearly outline the roles, responsibilities and process for early detection, prevention and control of food safety incidents. However, many countries with less-developed food control systems still need to develop, implement and evaluate similar plans and protocols.

1 WHO Factsheet No. 237. Accessible at: http://www.who.int/mediacentre/factsheets/fs237/en

**SAFE FOOD BENEFITS EVERYONE.**
Strengthening prevention and response to food safety emergencies

It is difficult to estimate the burden of foodborne diseases; only a small fraction is recognized by concerned authorities. The ultimate goal of food safety and public health officials is to prevent such outbreaks. Surveillance systems allow authorities to better understand major food safety risks and to refocus prevention efforts. It also allows early detection of adverse food safety events and prompt and effective response. FAO collaborates with WHO in a number of activities aimed at prevention and management of food safety emergencies.

Joint FAO/WHO International Food Safety Authorities Network (INFOSAN) promotes rapid information exchange on important food safety events and assists countries in strengthening their capacity to manage food safety emergencies.

Importance of prevention of foodborne outbreaks

- FAO is directly assisting countries in developing or enhancing their national food safety emergency plans. The FAO/WHO framework for developing national food safety emergency plans outlines key organizational aspects and general and country-specific considerations that should be taken into account when developing such plans. A well-co-ordinated, multi-agency response and collaboration among various stakeholders is necessary to ensure effective control of food safety emergencies.

Strengthening resilience to food safety emergencies at the country level

- The Framework and Guide documents were presented and discussed at interactive FAO/WHO regional workshops reaching over 50 member-countries. FAO, in collaboration with WHO, has directly assisted Laos, Fiji, Thailand, Panama and Bangladesh to develop their national food safety emergency response plans through the implementation of interactive country-level and regional workshops. The format allows the participants to learn about their roles and responsibilities in food safety preparedness, to share unique insights and experiences, and to develop or enhance their existing plans.

Impacts of recent projects and looking forward

- A recently completed FAO/WHO Guide for developing and improving national food recall systems is being published in 2012. These documents should be mainly used for general guidance in the development of country-specific plans and protocols.

A group of the workshop participants work on the development of their plan, Bangladesh - March, 2012
Inspection and monitoring programmes are at the heart of the enforcement in food safety regulatory systems. The shift of the modern food safety conception from “reactive” to “preventive”, has led governments world-wide moving towards risk-based approaches to food control and requiring all operators in the food supply chain to share responsibility for food safety. This in particular requires food inspection programmes to prioritize controls based on risks posed by the food or food operator practices. In many countries, the shift to risk-based food inspection may require significant changes to food inspection policy, legislation as well as changes to inspector training programmes; and new education and information programmes targeting the private sector. FAO delivers a range of activities to support member countries implement or strengthen risk-based food inspection systems and related food safety and quality management systems. These activities include specific in-country capacity development projects, and the provision of broad policy and technical advice through the publication of a number of manuals, guidelines and training materials.

KEY FEATURES AND BENEFITS OF RISK-BASED FOOD INSPECTION

- Focuses on points of the food chain or processes that pose highest risk
- Minimises costs to food operators by reducing unnecessary inspection and testing costs
- Promotes preventive rather than reactive approach to food control
- Optimizes the efficiency of food control and use of inspection resources

Strengthening risk-based inspection systems at country and regional level

- Supporting national food control agencies to improve and harmonize their food inspection activities through a series of training programs focusing on cross-agency inspection policy, planning capacity and operational frameworks (e.g. project in Cape Verde). Assisting countries to strengthen food inspection systems including food legislation and operational frameworks to facilitate transition to risk-based food inspection systems and enable compliance with international standards and guidelines (e.g. projects in Lao and Vietnam, ASEAN regional project)
Guidelines for risk-based food inspection

The Risk-Based Food Inspection Manual¹ (FAO, 2008) was developed with the needs of developing countries in mind to help orient food inspection to a risk-based approach. The manual provides food inspectors and food safety risk managers with practical guidance for conducting modern risk-based inspections across the chain, and includes specific advice on procedures and on the knowledge/skills needed by food inspectors.

The Guidelines for Risk Based Fish Inspection¹ (FAO, 2009) was developed to assist developing countries upgrade inspection systems to meet the food safety requirements of major fish importing countries. The guidelines integrate the risk-based inspection principles in the above manual, with additional guidance on developing and implementing risk-based fish inspection regulatory frameworks and fish inspection systems.

Looking forward

Globalization of the food supply can expose populations worldwide to food hazards. This needs careful consideration, particularly in the context of countries that heavily rely on food imports for their food security. Risk based imported food inspection helps minimizing exposure to food hazards in food trade, while making more efficient use of the available resources, that may be scarce for many developing or transition countries.

FAO is currently finalizing an imported food control manual for the use of Governments and food control agencies, aiming at: (i) providing guidance for assessing and reviewing imported food control programmes; (ii) understanding the different options available for these programmes and balancing them according to specific situations, needs and resources. This includes also due regard to the variety of legal and institutional frameworks, as well as the different support services that may be needed. The development of this guidance has been consistently supported by field research and testing at each stage, complemented by international peer review processes, to maximize its focus and utility prior to being finalized. The manual is expected to be released in 2012.

FAO combines expertise in a range of food production and food safety disciplines to identify sources of food safety risk and to develop measures to prevent or minimize these risks at the most appropriate stages of the chain. FAO works with concerned stakeholders at national and local levels from both public and private sectors in identifying weaknesses in the management of food safety in specific sectors and in formulating strategies that promote the application of Good Hygienic Practices and ensure compliance with national and international food safety requirements.

Focus on Fresh Produce

Effective food safety systems are based on prevention

FAO teams involving Food safety and Plant Production specialists work with national institutions to develop guidelines/codes of practice integrating food safety considerations into Good Agricultural Practices. Long-term impact is ensured by careful selection of local/national/regional partners who continue adapting and implementing training as required.

Chemical residues and microbiological contamination continue to pose public health risks and lead to trade disruptions with substantial economic and social cost. Recent contamination of sprouts with E coli in Europe caused outbreaks of illness with more than 3900 reported cases and hundreds millions of USD lost in the EU vegetable market.

Farmer Field schools (FFS) have been shown to be an effective vehicle for enabling farmers to understand and adhere to good practices. FFS are developed to fully integrate food hygiene issues with production issues such as integrated pest management techniques.

FAO works with national institutions to build their capacities to design and implement programmes to improve food safety in the primary production of fruit and vegetables. This includes programmes focusing on good practices on farm as well as on pesticide and other contaminants monitoring.
Focus on Fish and Fishery Products

Improving fish safety and quality requires interventions at various stages of the value chain. Many countries call on FAO Fisheries and Food safety experts to assist in developing the capacities for fish inspection and for promoting the application of good practices by all operators in the Fisheries sector: fisher folk, fish farmers, fish handlers and processors. FAO uses participatory approaches to assess training needs and to design and implement Training of Trainer programmes which ensure sustainable delivery of effective training beyond the FAO intervention.

Focus on Livestock

FAO recognises the importance of utilising both regulatory and non-regulatory measures to improve food safety practices at all stages of the food chain. Through participative processes, the nature of problems is better understood and opportunities for achieving better food safety management through non-regulatory measures such as technical support/training programmes, public education are optimized. Improving the safety of foods of animal origin involves guidance on good practices in animal feeding, animal husbandry, slaughter and handling and processing of animal products. FAO teams from Animal production, Animal health and Food safety unit work together to ensure a science-based and integrated approach to managing food safety risks related to foods of animal origin, including Antimicrobial Resistance (AMR).

ANTIMICROBIAL RESISTANCE (AMR)

Antimicrobial drugs play a critical role in the treatment of diseases of food producing animals and their use is essential for both animal and human health. While their availability is critical in livestock and aquaculture sectors, contributing to the livelihoods of farmers and economic development, inappropriate use of antimicrobials also constitutes an important risk factor for selection and dissemination of AMR microorganisms to humans via food. FAO, together with WHO and local institutions, designed whole food chain studies to assess microbial contamination and AMR, in order to identify the critical stages at which prevention and control measures could be implemented most effectively. These studies illustrate the importance of locally-led research to generate data to inform and influence national/regional policy to address AMR.
Throughout the world, social expectations and consumer demand are leading to the development of agricultural and food products of specific quality, such as those produced by organic farming, fair trade, or having a geographical indication. This context represents an opportunity in terms of rural development and food security, by providing producers with increased income, contributing to the preservation of local resources or encouraging social equity. This is particularly the case when a voluntary standard guarantees the sustainability of production practices through credible monitoring, and when the consumer is informed by labelling. However, the implementation of specific quality initiatives requires a certain level of capacity at both institutional and production sectors, it is therefore important to realize careful benefit-cost evaluation. In addition, it is important to strengthen the capacity of small-scale producers to meet the standard requirements if they need. From a consumer point of view, a credible information and guarantees system must be established to enable consumers to make informed choices so to contribute to sustainable production and consumption systems. It is therefore vital to have mechanisms that ensure the effectiveness of voluntary standard systems from a public goods point of view.

Generic vs specific quality

- **Generic (or basic) quality** corresponds to the minimal requirements to be respected in order to market a product, in terms of consumer protection and respect for relevant market regulation.

- **Specific quality** corresponds to the combination of features that – once requirements in terms of generic quality have been met – allow a product to create added value and be differentiated on the market on the basis of a voluntary approach by the economic stakeholders.

**Examples of public goods affected by food voluntary standards:**
- food security;
- protection of consumers and their health;
- environment;
- conservation of heritage and culture;
- local development;
- social equity etc.

**SPECIFIC QUALITY AND SUSTAINABILITY**
What are FAO’s messages?

Inasmuch as voluntary standards have an impact on public goods, public stakeholders have a role to play in the standards functioning in order to assure preservation of public goods concerned.

There are two approaches here:
› implementation of voluntary public standards by governments as tools to support promising processes and encourage good practices;
› interaction of public stakeholders with the economic stakeholders or civil society.

Example of a public voluntary standard
The Argentinean food label (Sello alimento Argentino, una elección natural) is a public voluntary standard developed in the context of a national food differentiation strategy promoted by the country’s Ministry of Agriculture. The label was established legally by Resolution 392/05 and is intended to facilitate identification of Argentinean food products and their specific features, thus allowing a better placement on the national and international markets. Apart from presenting specific features, the product must, where applicable, respect standards connected with good agricultural practices, good processing practices and HACCP.

Examples of actions that public stakeholders can take to assure preservation of public goods, according to the standard function

| STANDARD SETTING | E.g. participation in round table meetings where public stakeholders can influence the content of voluntary standards |
| ENFORCEMENT | E.g. regulations with an impact on the sector in question |
| CONFORMITY ASSESSMENT | E.g. public control built into the accreditation system |
| IMPLEMENTATION | E.g. public support and incentives that are conditioned by sustainability aspects |

How does FAO build capacities in this connection?

For some decades now, FAO has been developing knowledge and providing technical support to member States in response to requests for various specific quality and voluntary standard processes.

Currently, FAO is elaborating a document on the role of public stakeholders in defining and implementing of national approaches to use food voluntary standards to support public goals.
Risk analysis is a structured approach to assessing food safety risks and consists of three interactive processes – risk assessment, risk management and risk communication. Risk analysis provides national food safety authorities with a systematic and disciplined approach for making evidence-based food safety decisions. It provides particular value in addressing complex, persistent and evolving hazards in different parts of the food supply chain. Risk analysis is used to develop an estimate of the risks to human health, to identify and implement appropriate measures to control the risks, and to communicate with stakeholders about the risks and measures applied.

**Food Safety Risk Analysis: Features and Benefits**

- **Internationally recognized**
  Adopted by Codex; thus supports international food safety harmonization and thereby trade

- **Based on science**
  Risk assessment and science-based food safety measures are recognised and promoted by WTO

- **Consumer protection focus**
  Provides a scientific evaluation of where in the food chain to take the most effective control steps

- **Adaptable**
  Can be applied to address a range of food safety concerns including emerging food pathogens

- **Inclusive**
  Promotes stakeholder participation; facilitating balanced decision-making and compliance

- **Enables tailored decisions**
  Supports informed decision making and allows consideration of available resources and local situations
Implementing Food Safety Risk Analysis in food control systems

Applying risk analysis principles in developing modern national food safety systems requires investment of effort and resources by national governments. However, this investment more than pays off by ensuring that food safety programmes are focused on addressing priority problems and by building public confidence in the national food control system.

The FAO/WHO Food Safety Risk Analysis: A guide for national food safety authorities- based on the risk analysis principles adopted by Codex - aims to assist food safety control authorities understand and apply risk analysis in food control. Through training and other capacity development activities, FAO works with key stakeholders in countries to promote application of risk analysis approaches to support decision-making on how to improve the food safety situation in the country. FAO also engages at sub-regional and regional levels to encourage collaboration among countries that may have common problems and common interests. The main emphasis of FAO’s risk analysis training and related capacity development efforts is to enhance food safety professionals’ ability to:

› understand risk analysis and how it can be applied to support national-level decision-making related to food safety management;
› understand internationally-accepted approaches applied to chemical and microbiological risk assessments as a basis for evaluation of domestic food safety risks;
› be aware of national data required to support risk assessment and the importance of risk assessor-risk manager interaction;
› promote transparency, stakeholder involvement and better coordination among government agencies involved in food safety issues at the national level.

Looking forward

FAO is collaborating with WHO in the development of resource materials and tools to make the risk analysis approach more accessible. These include: a risk analysis toolkit, which will provide a range of practical tools, training materials tailored to specific audiences and information on the application of risk analysis to strengthen existing food control systems; more focussed web-based tools to support risk management decisions, for example, to assess the performance of microbiological sampling plans, and the management options for the control of specific pathogens in chicken meat.

These risk analysis programmes, guidelines and tools have been progressively contributing to enhanced understanding and implementation of risk analysis to improve consumer protection and trade outcomes both nationally and globally.
Science is central to the FAO work on food safety and quality along the chain. For over 50 years, FAO in collaboration with WHO has provided neutral and independent scientific advice as the essential basis for the international food safety standards, guidelines and codes of practice established by the Codex Alimentarius Commission, and for supporting the development of modern food control systems by national authorities. In developing high quality globally relevant scientific advice, consideration is given to the entire food production chain as appropriate as well as all relevant and accessible data and regular updates are made to the methods and approaches used to ensure consistency with the most recent developments.

Framework for the provision of scientific advice

This documents the *modus operandi* for the provision of scientific advice and facilitates transparency, crucial for establishing trust in this advice. At its heart are the core principles, a fundamental foundation for the provision of sound scientific advice.

- **Soundness**: scientific excellence, both of the experts and the process.
- **Responsibility**: accountability, safeguarding the integrity of the process.
- **Objectivity**: includes neutrality of the experts and to the advice provided.
- **Fairness**: of the process, and respect for all participants and their scientific views.
- **Transparency**: of both the process and the scientific advice
- **Inclusiveness**: balance of skills and expertise, minority scientific opinion, geographical and socioeconomic balance without compromising excellence.

Advisory mechanisms

- FAO provides scientific advice on food safety through:
  - expert panels and committees, including, JECFA (Joint FAO/WHO Expert Committee on Food Additives), JEMRA (Joint FAO/WHO Expert
  - Meetings on Microbiological Risk Assessment) and JMPR (Joint FAO/WHO Meeting on Pesticide Residues);
  - expert consultations on topics as required, including, foods derived from biotechnology, nanotechnologies, risks and benefits of fish consumption and of chlorine based disinfectants, among others.
The Global Initiative for Food-related Scientific Advice

GIFSA was established in 2007 to ensure sustainable funding to meet the ongoing demand for high quality and timely scientific advice. Contributions are accepted from governments, organizations and foundations in accordance with FAO and WHO rules. Support through collaborative work or in-kind contributions is also sought. For more information or to make a contribution, please contact: GIFSA@fao.org.

JECAF – meeting since 1956, it provides scientific advice on food additives, contaminants and residues of veterinary drugs in foods as well as principles and guidance for safety assessment of chemicals in foods.

JEMRA – meeting since 2000, it provides scientific advice on microbiological hazards in foods and the impact of potential interventions and guidelines on microbiological risk assessment.

Scientific advice in Action

Scientific advice is generated on prioritized food safety issues on request of Codex and member countries. The advice underpins the establishment of a diverse range of Codex standards and guidelines such as:

- establishment of microbiological criteria for emerging hazards e.g. Cronobacter spp. and limits for new contaminants e.g. melamine, in infant formula;
- development of guidelines for the control of specific pathogens e.g. Campylobacter and Salmonella spp in chicken meat;
- principles for the Risk Analysis of Foods Derived from Modern Biotechnology.

It also feeds into field activities at national/regional level to support food chain stakeholders in their efforts to address specific food safety issues.

Food Safety and Quality Programme

Food control has evolved from a focus on end-product testing to preventative approach through adequate process controls along the chain. Nonetheless, testing remains an important component of any system which aims to produce safe food. Carefully planned programmes of sampling and testing provide us with the assurance that hygiene controls applied by food chain operators result in safe food products that comply with national regulations and meet international food safety requirements. Well-functioning laboratory services also assure the availability of reliable food contamination data contributing to the ability of national authorities to determine food safety priorities and orient food control programmes accordingly. FAO rarely works on laboratory services in isolation, but rather supports the more effective involvement of laboratory services within the overall national system of food control. This involves different levels of intervention: sensitising policy makers on the role of labs and issues linked to their sustainability; supporting national institutions to design, effectively manage and implement food analysis programmes; and ensuring that laboratory staff have the knowledge and skills required to carry out their functions.

Sustainability of Laboratory Services

*It is not rare to find in many developing countries’ laboratories sophisticated analytical equipment standing idle due to poor maintenance or lack of staff able to use them.*

*There is too often a focus just on equipping laboratories without adequate planning for running costs or for human resource development. FAO seeks to ensure sustainability of laboratory services by promoting a *long term* vision that takes full consideration of analytical needs as well as of existing national capacities and resources.*
Aligning Testing Programmes with Food Safety Priorities

Food control laboratories are only useful insofar as they contribute to a better understanding of the food safety/quality issues affecting public health and trade and they help solve these problems. However, in many countries the services provided by food control laboratories do not correspond to the needs expressed by key stakeholders. We promote inter-ministerial collaboration and effective engagement with the private sector to jointly define the analytical capacities most needed to protect public health and to support access to markets.

Strengthening laboratory management

Good laboratory management is a key factor in working towards sustainability of lab services. In developing capacities of laboratory services, we work with laboratory managers:

- to improve the efficiency of their work processes and administrative procedures;
- to establish and monitor programme targets;
- to plan for laboratory upgrading including human resource development; and
- to communicate more effectively with decision-makers who determine annual budgets for the laboratory services.

Effective training

Our laboratory projects include significant effort aimed at enabling laboratory staff to correctly carry out their functions. Learning objectives are carefully determined in partnership with the national counterparts and the training approach is tailored to the situation. Typically training covers the establishment of Laboratory Quality Management programmes involving a mixture of theoretical and hands-on work. Training events are often designed to encourage networking, for example, with national universities/research centres or with regional/international laboratories. These informal networks have in many cases proven to be of great value in helping laboratory staff meet ongoing challenges and in supporting further staff development.

**Monitoring impacts:** our long-term relationships and contacts within countries allow us to monitor how laboratory function improves and how this contributes to more effective food safety programmes.
Safe food benefits everyone.