

Annex 3

WORKING PAPER

on

Assessment of the Capacity of Food Safety and Quality in Zambia

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**Prepared
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Table of contents

	Contents	Page
	Preface	4
1	Executive summary	5
2.	Food Control System & major components and strategic elements of the National Food Control System	11
2.1	Integrated food control system and institutional arrangement for effective food safety management	11
2.2	Comprehensive food safety policy and strategy	12
2.3	Comprehensive food law, updated food safety regulations and enforcements mechanisms	12
2.4	Food safety inspection system from top to the grass root level	12
2.5	Competent analytical capacity & monitoring capability	13
2.6	Organized epidemiological system	13
2.7	Food safety information-education-communication-training (IECT) system that address regulatory bodies/inspection authorities, producers and consumers	13
2.8	Sound science based risk assessment from farm to fork	14
2.9	Food safety fund	14
2.10	Harmonization of the national food safety system with international requirements & Liaison with national, regional and international institutions	14
3	The food control system of Zambia & the food control authorities/regulatory bodies	15
3.1	The Food Control System under the Health Sector, the Ministry of Health and its statutory bodies	15
3.2	The food control system under the Agriculture Sector and the Ministry of Agriculture and Cooperatives	27
3.3	The Food Control System under the Industry Sector and the Ministry of Commerce, Industry and Trade	30
3.4	The food control system under the Ministry of Tourism, Environment, Natural Resources	36
4	The contribution of main supporting authorities/regulatory bodies to the food control system	36
4.1	The contribution of Ministry of Science, Technology and Vocational Training to the food control system	37
4.2	The contribution of Ministry of Education to the food control system	38
4.3	The contribution of Ministry of Information and Broadcasting Services to the food control system	38
4.4	The contribution of Ministry of Legal Affairs & Attorney	39
5	The contribution of Associations and Cooperatives to the food control system	39
6.	The food processing industries and food establishment	40
6.1	Dairy and Dairy Processing Industries	40
6.2	Poultry Industries	41
6.3	Meat and Meat Processing Industries	42
6.4	Cereals Products Processing Industries	42
6.5	Fruit and Vegetables Processing Industries	43
6.6	Beverage Industries	43

Contents	Page
6. Hotels and restaurants	43
7	
6.8 Supermarkets and Fast Food Restaurant and Services	43
6.9 Open Markets and Street Vendors	44
6.10 Conclusion	44
7 Recommendations and proposed assistance	46
7.1 General recommendations, the relevance of food safety as a priority public health and economic development issue	46
7.1.1 Public Health Importance	46
7.1.2 Enhancing labor productivity	48
7.1.3 Reducing production loss	48
7.1.4 Enhancing Tourism	49
7.1.5 Enhancing fair food trade, import and export inspections	49
7.2 Specific recommendations and proposed assistance	50
7.2.1 Establishing & strengthening model food industries for GMP and HACCP Implementation	50
7.2.2 Strengthening Information, Education, Communication and Training capacity	51
7.2.3 Establishing & strengthening model inspection operations	51
7.2.4 Strengthening standards development activities	52
7.2.5 Establishing National Coordination System	53
8. References	58
Annex 1. Proposed budget for two years duration	60
Annex 2. List of organization visited and persons contacted	61

List of Tables

Contents	Page
Table 1 People and environment indicators of Zambia	5
Table 2 Evaluation of the overall status of the Food Control System in Zambia	8
Table 3 Proportion of persons reporting illness by Type of illness reported, Zambia, 20002-2003	22
Table 4 Ten major causes of visitation of Health Facilities, Zamia 2002	23
Table 5 Evaluation of the overall status of the Food Control System in the Health Sector	24
Table 6 Evaluation of the overall status of the Zambia Bureau of Standards in support of the Food Control System	33
Table 7 Dairy Production by Producer Type	40
Table 8 Evaluation of the overall status of Visited Food Industries in Zambia	45

List of Figures

Contents	Page
Fig. 1 Organizational Structure of the Food Control System under the Health Sector	16

Fig. 2	Organizational Structure of the Food Control System under city councils	18
Fig. 3	Organizational Structure of the Food Control System under the Agricultural Sector	29
Fig. 4	Proposed Structure for Establishment of an Integrated Food Control System	56
Fig. 5	Proposed Structure for Technical Committees that report to the Secretariat Office or Food Safety Agency for Establishment of an Integrated Food Control System	57

Abbreviations and Acronyms

ARSO	African Regional Standardization Organization
CBoH	Central Board of Health
CBPP	Bovine Pleuropneumonia
CODEX	Codex Alimentarius Commission
COLEACP	Liaison Committee for Europe Africa Caribbean Pacific
COMESA	Common Market for Eastern and Southern Africa
DVLD	Department of Veterinary and Livestock Development Services
FAO	Food and Agricultural Organization of the United Nations
FDCL	Food and Drug Control Laboratories
GAP	Good Agricultural Practices
GHP	Good Hygiene Practice
GMP	Good Manufacturing Practice
HMIS	Health Management Information System
HACCP	Hazard Analysis of Critical Control Points
IEC	International Electro-Technical Commission
IPPC	International Plant Protection Convention
ISO	International Standards Organization
LCC	Lusaka City Council
MCTI	Ministry of Commerce Trade and Industry
MoH	Ministry of Health
NALEIC	National Livestock Epidemiology & Information Centre
NISIR	National Institute for Scientific and Industrial Research
NORAD	Norwegian Agency for Development Cooperation
NRDC	Natural Resource Development College
NZTT	NRDC-ZEGA Training Trust
OECD	Organization of Economic Co-operation and Development
OIE	Office International Des Epizooties
OIML	International Organization of Legal Metrology
PQPS	Plant Quarantine and Phytosanitary Service
SADC	Southern Africa Development Community
SADCMEL	Southern African Development Community Legal Metrology
SIDA	Swedish Industrial Development Agency
SPS	Sanitary and Phytosanitary
TBT	Technical Barriers to Trade
UNDP	United Nations Development Program
UNEP	United Nation Environmental Programme
UNIDO	United Nations Industrial Development Organization
USAID	United States Agency for International Development
WFP	World Food Programme
WTO	World Trade Organization
ZABS	Zambia Bureau of Standards
ZEGA	Zambia Export Growers Association
ZNFU	Zambia National Farmers Union

Preface

This report is based on the assessment findings of the Zambian food safety and quality capacity, as part of the World Bank mission in Zambia conducted from 14 – 30 May 2006. The food control system in Zambia, including the food control regulatory bodies/authorities, support institutes, food industries and establishments was assessed. The assessment is based on the relevant criteria and requirements of food safety and quality, and food control systems established by international organizations. The experiences of food control authorities and food industries in the developed world and developing countries have been referred to. Based on the available data and information, the status of food control regulatory bodies and food industries have been evaluated, which is followed by proposed actions.

The assessment findings and the proposed actions are compiled under seven main sections. The first section is an executive summary of the assessment findings and the food control system of Zambia. Section two addresses the basic strategic elements of the food control system. Section three and four mainly deal with the food control authorities, regulatory bodies and support institutes. The role of these regulatory bodies and support institutes to food and safety and quality, potentials, challenges and major drawbacks have been assessed in line with the FAO/WHO and related documents^{1, 2} that are stated under section 2. Following the assessment findings, proposed actions have been forwarded.

Under section five the role of producers and consumers associations to food safety and quality, the status of the food-processing sector in Zambia, the capacity, knowledge and demand for food safety and quality, and the status of visited industries against the GMP requirements/recommendations have been assessed and compiled.

Section seven mainly focuses on proposed assistance and recommendation for future improvement based on the assessment findings.

1. Executive Summary

The food control system of Zambia has been assessed inline with the major strategic components of the food control system described in section 2. The capacity of food control authorities, regulatory bodies, support institutes, food establishments, food industries, associations, cooperatives and the status and the demand for food safety have been evaluated.

The assessment findings indicate that the food control system in Zambia is little developed. It is not able to support the production, supply and distribution of safe food to the local community and to the export market. It is also unable to protect the public at large from possible sources of food borne diseases that could occur even in a failure to apply the well-known principles of food safety, for instance, basic hygiene and sanitation practices. The health indicators for Zambia did not show positive progress since the last 15 years; rather in most cases, a declining trend has been recorded (see table below 1).

Table 1. People and environment indicators of Zambia

Indicators	1990	2002	2003
Life expectancy at birth	49	37	36
Infant mortality (per 1000 live births)	102	102	102
Under five mortality (per 1000)	180	182	182
Child Malnutrition, under weight (% of under age 5)	25	28	
HIV prevalence rate (% of ages 15-49)		16.7	15.6
Access to improved water source (% of total population)	50	55	
Access to improved sanitation (% of urban population)	64	68	

Source: Quick reference to the world development indicators, 05 little Data Book, 2005, the World Bank³

Moreover, communicable diseases continue to be the leading cause of morbidity and mortality in Zambia. They contribute approximately 80% of all health problems seen in health facilities⁴. The common communicable diseases include respiratory infections, parasitic infestations and diarrhea diseases. There are also notifiable diseases that include acute flaccid paralysis (suspected poliomyelitis), neonatal tetanus, cholera, typhoid, meningitis, dysentery, measles, rabies, plague and anthrax. The Annual Statistics Bulletin of the Central Board of Health described the top five causes of visitations to health facilities in 2002 in the order of magnitude: Malaria, Respiratory Infection (non-pneumonia), Diarrhea (non bloody), Respiratory Infection (pneumonia) and Eye infection⁵. Some reports indicated the prevalence of widespread cholera epidemics, for instance in 1991 (13,154 cases), 1992 (11,659 cases), 1999 (11,615 cases and 337 deaths), 2002 (587 cases and 15 deaths) and from 28 November 2003 to 4 January 2004 only in Lusaka (2,529 cases and 128 deaths)^{5,6}. Limited access to improved water source and improved sanitation facilities accompanied by urbanization has aggravated the prevalence of communicable diseases. Zambia is the largest urbanized country in Sub-Saharan Africa; about 40% of the population lives in urban areas.

The food control system in Zambia is relatively well structured from grass roots to national level (see section 3). However, the food safety authorities/regulatory bodies and support institutes are under developed, under staffed and under equipped to control and

provide the necessary support to food establishments and industries, local community and export market.

The multifaceted problems that contributed to the low level of food control system in Zambia include, among others, the following:

Major Challenges that encountered the food control system of Zambia

- ✓ Lack of competent staff, facilities, and infrastructure;
- ✓ Reactive responses and crisis management rather than proactive responses and preventive actions;
- ✓ Insufficient numbers of inspection and satellite laboratories at regional and zonal level, inspection tools and mini laboratories and transportation;
- ✓ Lack of a single central and accredited food safety analytical laboratory to support regulatory activities; the food and drug laboratories established to support the food control activities in the health sector and the Veterinary and Livestock Research Laboratories established to support the animal health in the Agricultural Sector are understaffed in terms of technically competent personnel, and under equipped in terms of infrastructure, laboratory facilities, equipment, reagents and chemicals. Most equipments and facilities are outmoded and the laboratory practices are not in a position to produce credible results to support the food control activities. The Plant Quarantine and Phytosanitary Service laboratories are also under staffed and under equipped at regional and district levels to support the plant health of the agricultural sector.
- ✓ More priorities have been given by the government to curative measures and clinical measures (purchase of drugs, clinical facilities, treatments) than to preventive measures (food safety);
- ✓ Lack of attitudinal change at policy implementation level to provide priority for preventive actions;
- ✓ Insufficient funds allocated by the government for food inspection and control activities;
- ✓ Inadequate enforcement mechanisms for existing laws;
- ✓ Lack of social awareness on food safety issues;
- ✓ Lack of organized consumer demand for food safety;
- ✓ Low level legal, policy, administrative and financial support to establish and strengthen the integration, collaboration and cooperation among inspection authorities/regulatory bodies, support institutes, regional offices, etc;
- ✓ Low level food safety inspection, control and certification system;
- ✓ Low level health and hygiene awareness in most food processing plants, and lack of information and awareness on HACCP, GHP, GMP, GAP, GLP;
- ✓ Lack of trained manpower, training, knowledge, practices and commitment to food safety and quality in food industries and establishments, for instance, to major problems related to physical structures, equipment, facilities, personal hygiene, food handling practices, quality assurance and management control, documentation and record keeping practices, testing and calibration services, rehabilitation, renovation, good maintenance practices, etc.;
- ✓ Inadequately defined, demarcated and streamlined responsibilities and mandate given to regulatory bodies and inspection authorities;

The status of the food control system of Zambia has been evaluated against the basic strategic elements of the food control system include the following:

- ✓ Integrated food control system and institutional arrangement for effective food safety management
- ✓ Comprehensive food safety policy and strategy
- ✓ Comprehensive food law, updated food safety regulations and enforcements mechanisms
- ✓ Food safety inspection system from top to the grass root level
- ✓ Competent analytical capacity & monitoring capability
- ✓ Organized epidemiological system
- ✓ Food safety information-education-communication-training (IECT) system that address regulatory bodies/inspection authorities, producers and consumers
- ✓ Sound science based risk assessment from farm to fork
- ✓ Food safety fund
- ✓ Harmonization of the national food safety system with international requirements & Liaison with national, regional and international institutions

The relevance of the basic strategic elements to the food control system is discussed under section 2. The evaluation results based on the basic strategic elements to the food control system, the status and major drawbacks, and the proposed actions are summarized in table 2. Table 2 summarizes the food control system of Zambia & the food control authorities/regulatory bodies (section 3), the contribution of support regulatory bodies and institutes (section 4), and associations and cooperatives (section 5), and the status of the food processing industries and establishment (section 6). The low-level evaluation points for each basic strategic element in table 2, clearly indicate that the food control system in Zambia is at low-level development.

In addition to the proposed actions forwarded after identifying the major drawbacks in sections 3, 4, 5, and 6, general recommendations (for long term) and the relevance of food safety to health and economic development, and specific recommendations (for short term) and the proposed assistance have been summarized in section 7.

The general recommendations addresses the role of food safety to the development of the public health and the national economy by safe guarding the health of the nation, enhancing tourism, reducing production loses, enhancing labor productivity, facilitating national and international trade. The situation in Zambia and the necessary measures to implement food safety are discussed.

Specific recommendations (for short term) and the proposed assistance Establishing & are mainly focused on the basic strategic element which could implemented within the next 2-3 years, which include, strengthening model food industries for GMP and HACCP implementation, strengthening Information, Education, Communication and Training capacity, establishing & strengthening model inspection operations, strengthening standards development activities and establishing National Coordination System

Table 2. Evaluation of the overall status of the Food Control System in Zambia
Evaluation points: 0 (minimum) to 5 (maximum) average points

Major components of the food control system	Average point	Status & major drawbacks	Proposed action
1. Integrated food control system and institutional arrangement from top to the grass roots level and among different institutions for effective food safety management	2	Well structured food control system both at the health and agriculture sectors from top to the grass root level with decentralized decision making bodies (See section 3). However the structures are understaffed in terms of technically competent personnel and under equipped in terms of facilities and infrastructures. Though there are several committees and task forces to integrate and coordinate the food control activities, none of them have legal background and authority to make decisions; they are advisory committees. Except for the import & export permit committee most of them reported to be inefficient.	<ul style="list-style-type: none"> ✓ Strengthen the structure with trained, competent and motivated staff, facilities & infrastructure. ✓ Establish a national coordination system with the necessary legal support and authority. ✓ Provide policy, financial, and administrative support with defined responsibility & authority.
2. Comprehensive food safety policy and strategy	1	Absence of explicitly defined food safety policy and strategy. The five-year health strategic plan (2001-2005) & draft environmental health policy had included some components of food safety, which were not implemented efficiently.	<ul style="list-style-type: none"> ✓ Establish clearly defined food safety policy and strategy in line with the public health and food security policies & strategies. ✓ Follow up the implementation & evaluate the impact.
3. Comprehensive food law, updated food safety regulations, standards, enforcement mechanisms	2	Food and Drug Act 303: 2001 with policy, defined authority & procedures, generic and specific food standards. Several supportive food safety related acts enacted by different ministries (section 3). However due to lack of enforcement, monitoring and follow up mechanisms and capacities the existing food laws, policies & strategies were not effectively implemented.	<ul style="list-style-type: none"> ✓ Establish efficient enforcement, monitoring and follow up mechanisms. ✓ Evaluate the effectiveness and relevance of the food law, regulations and standards.

Notes about evaluation points: 0 = Absence of system or capacity 1 = Minimal system/capacity/process in place, yet clearly inadequate or dysfunctional,
 2 = System/capacity/process has some functionality and some demonstrated competence, 3 = System/capacity/process has good functionality,
 4 = Systems/capacity/process functions very well demonstrated & meets international standards, 5 = Approaches international better/best practice

Major components of the food control system	Average point	Status & major drawbacks	Proposed action
4. Food safety inspection system from top to the grass roots level.	1.5	Well structured food safety inspection system to the grass root levels (see section 3), but under resourced in terms of technically competent personnel, inspection tools, inspection manuals and guidelines, transportation facilities and infrastructures.	<ul style="list-style-type: none"> ✓ Strengthen the technical capacity of inspectors. ✓ Provide inspection tools & transportation facilities as required. ✓ Establish inspection manuals & guidelines.
5. Competent analytical capacity & monitoring capability.	1.5	Absence of a single accredited food laboratory. Existing government laboratories understaffed in terms of technically competent personnel, equipment and facilities. Absence of strong demand for testing, which in effect could not attract private food laboratories. For instance, the private laboratories like Cheetah, which have the capacity for microbiological & chemical analysis (mycotoxin analysis) could not operate efficiently because of lack of demand for testing.	<ul style="list-style-type: none"> ✓ Strengthen the technical capacity and motivation of laboratory staff. ✓ Business plan for food laboratories to sustain with their services. ✓ Establish specialized accredited laboratories. ✓ Strengthen the regulatory inspection & enforcement mechanisms to create demand for testing & monitoring.
6. Organized epidemiological system.	2	Diseases burden & service delivery data in Annual Health Statistical Bulletin based on hospital & clinic reports and during epidemics. Statistical Authority of Zambia issues annual Living Conditions Monitoring Survey Report. These data do not indicate specific pathogenic microorganism. Animal health status and disease report system under the Agricultural sector, however, because of lack of staff and follow up, the reporting system could not be properly monitored and reported.	<ul style="list-style-type: none"> ✓ Establish a well organized epidemiological and reporting system both in the health and agricultural sector, with a close follow up and monitoring. ✓ Equip the epidemiological and reporting system with the required staff and facilities.

Major components of the food control system	Average point	Status & major drawbacks	Proposed action
7. Food safety information-education-communication-training (IECT) system that addresses regulatory bodies/inspection authorities, producers and consumers.	1	Except for the very few workshops conducted for street food vendors, awareness workshops on HACCP, probably one, and very few university and college teaching practices, there is not as such, any national training or awareness program conducted on food safety issues. There is a limited capacity to provide programmed and planned information-education-communication- training (IECT) activities on food safety.	<ul style="list-style-type: none"> ✓ Establish the capacity for training through training trainers and university education. ✓ Organize extensive and intensive training and awareness programs through all available communication means including workshops, radio and TV programs, flyers, brochures, posters, etc. ✓ Organize national food safety weeks and days. ✓ Strengthen the educational system to include food safety, basic hygiene, and sanitation starting from the primary education, and specialized education at higher educational levels.
8. Sound, science based risk assessment from farm to fork.	1	There is limited capacity and experience to conduct risk assessment	<ul style="list-style-type: none"> ✓ Strengthen the capacity of the research institutes and laboratories under the health, agriculture, industrial, educational sectors and the National Institute for Scientific and Industrial Research to participate in risk assessment activities.
9. Allocation of food safety fund.	1	Absence of streamlined budget by the government on food safety except for the water and sanitation fund. Limited assistance by donors on food safety.	<ul style="list-style-type: none"> ✓ Establish streamlined food safety fund as part of the government regular budget in line with the health sector policy which is preventive and promotive.
10. Harmonization of the national food safety system with international requirements & liaison with other similar national, regional and international institutions.	2	Members of a number of regional and international institutions, including WTO, FAO, WHO, Codex, SADEC, SADC MEL, COMESA, OIML, and observer member of ARSO, ISO & IEC.	<ul style="list-style-type: none"> ✓ Establish attachment programs with credible institutes and participate in regional integration programs on food safety and food control system.

2. Food Control System

Food Control is defined as the mandatory regulatory activity of enforcement by national or local authorities to provide consumer protection and to ensure that all foods during production, handling, storage, processing, and distribution are safe, wholesome and fit for human consumption; conform to the quality and safety requirements; and are honestly and accurately represented by labeling as prescribed by law¹.

Major components and strategic elements of the National Food Control System

The establishment of an effective and internationally recognized food control system requires an integrated multisectoral, interdisciplinary approach and the participation of producers, consumers and the public at large. The major components of an effective and integrated National Food Control System include, among others, the following^{1,2}:

2.1 An integrated food control system and institutional arrangement for effective food safety management

The food control system requires an integrated, multi sectoral, and multi disciplinary approach, decentralized decision-making bodies, and the participation of different stakeholders including food control authorities, producers and consumers.

An integrated and effective food control system should be established mainly to:

- ✓ adequately define, demarcate and streamline responsibilities and mandate given to regulatory bodies/inspection authorities on food safety;
- ✓ strengthen the integration, collaboration and cooperation among inspection authorities/regulatory bodies, support institutes, regional offices, producers, consumers, etc.;
- ✓ minimize defragmented activities and duplication of efforts among regulatory bodies/inspection authorities;
- ✓ create central and responsible food safety authority to coordinate the national food control activities and represent the country as a single responsible authority and there by enhance international food trade and science based risk assessment activities

The three types of organizational arrangements, namely:

- a) Multiple agency system,
- b) Single Agency System and
- c) Integrated System have been explained¹.

The integrated system it because encompassing an independent food safety authority that plays the leading and coordinating role, and the multiple agencies and decentralized decision making bodies that involved in the food control, inspection and enforcement activities, could be the most appropriate choice of a food control system for developing countries^{1,2}.

2.2 Comprehensive food safety policy and strategy

A clearly defined written policy and strategy for food safety is required in recognition of the protection of consumers from the consumption of unsafe and fraud food, and the true extent of the health and economic consequences of food borne diseases. It is recommended that the food safety policy and strategy should be established in line with the national public health and food security policies and strategies to safeguard the health of the nation, to alleviate food security challenges, to meet the millennium development goals (MDGs) and to fulfill international requirements and to participate in the global trade. The implementation of the food safety policy and strategy and its impact should be periodically monitored, evaluated and reviewed as required.

The Rome Declaration on World Food Security and the World Food Summit Plan of Action for the millennium development goals, adopted by 180 countries in 1996 in Rome, define Food Security as composed of the following three major components⁷:

- ✓ Adequacy, which refers to quantity and sufficiency
- ✓ Nutritional quality and
- ✓ Food Safety

This declaration strongly recommends an integrated food security policy and strategy, including food safety. However, in most developing countries, food security is considered mainly as related to food adequacy. The nutritional quality and food safety are mostly overlooked by the food security policy and strategy of developing countries⁸.

2.3 A comprehensive food law, updated food safety regulations, and enforcement mechanisms

Food legislation provides the foundation for national food safety programs. It plays a pivotal role in directing the food control efforts of food inspectors. It informs producers and processors of requirements regarding production, processing methods and product standards and provides the consumer expectations of a given food. The food law and regulation should be enforceable and supportable by a code of practices, standards, guidelines, procedures, efficient and effective enforcement and monitoring mechanisms. The relevance and effectiveness of the food safety law and regulation should be periodically evaluated.

2.4 Food safety inspection system from the top to the grass root level

The food inspection system must verify that all foods are produced, handled, processed, packed, stored and distributed in compliance with the food law and regulation.

The food inspection system should be:

- ✓ grossly resourced in terms of trained and competent personnel, both in quality and quantity, facility and equipment;
- ✓ branched out from top to the grass root level with wide area coverage. The participation of decentralized decision making bodies, regional, local and municipal authorities is strongly recommended;
- ✓ supported by adequate number of up dated regulations, guidelines, code of practices and enforcement mechanisms.

2.5 Competent analytical capacity & monitoring capability

Food control programs require basic analytical capacity to monitor the quality and safety of the food supply. A broad range of analytical capabilities are required for detecting food contaminants such as pesticides, pathogenic bacteria, food borne viruses and parasites, environmental chemicals, biotoxins, etc. The analytical capability should include accredited, central, regional, and satellite, research and industry based laboratories.

2.6 Organized epidemiological system

A national epidemiological service with the capacity to establish surveillance and investigation procedures in order to increase the availability of information to plan, implement and assess disease control activities related to food borne diseases, is essential. This will assist developing countries to conduct risk analysis and to undertake the necessary preventive and curative measures. The epidemiological system should generate the necessary consolidated and analyzed data related to food borne diseases.

2.7 Food safety information-education-communication-training (IECT) system that address regulatory bodies, inspection authorities, producers and consumers

Food safety is a public health and economic development issue, and safe food is a right and everybody's concern. Everybody in the food chain, from farm to fork, has to get the necessary information, education, communication and training on prevention and control of hazards that could cause food borne diseases. It is through education and training that food control authorities, industry and consumers will get the necessary knowledge and information to make decisions upon sound scientific basis for prevention of food borne diseases.

The food safety information-education-communication-training (IECT) system should be strengthened whereby:

- ✓ regulatory bodies/inspection authority discharge their responsibility by providing competent, effective and efficient inspection, monitoring and certification services to assure the safety of food;
- ✓ food processing industries/establishment, food service providers and retailers (street food vendors) can be assisted to assure the safety of food in all of their products; and the process based food standards and food safety management systems are implemented;
- ✓ consumers are assisted to become aware of the importance of access to safe and nutritious food and to participate in national efforts to assure the safety and nutritious nature of food for the community.

2.8 Sound science based risk assessment from farm to fork

Sound science based risk assessment from farm to fork is essential. It can provide the necessary information and data on the extent and costs of food borne diseases, their causes and sources of contamination. It can also enhance government, industry and community commitment and interaction to develop, implement, and evaluate food safety policies, and risk management and programs. The necessary capacities and appropriate institutions should be established to conduct risk assessment.

2.9 Food safety fund

Food safety activities are multifaceted and multisectoral. They require a substantial amount of funds. Sufficient food safety funds should be allocated to execute activities related to inspection, monitoring, analytical services, certification, accreditation, risk analysis (risk assessment, risk communication and risk management), institution building, legislation and standards development, awareness and manpower development, internal and international communication, etc.

2.10 Harmonization of the national food safety system with international requirements & liaison with national, regional and international institutions

The issue of food safety has already received great attention and recognition by international, multilateral and unilateral organizations. Several agreements and standards have been developed by international organizations, such as Codex, OIE, IPPC, ISO, FAO, WHO and WTO to harmonize and facilitate world food trade. In recent days, in recognition of this harmonization and integral approach, global trade, regional cooperation and regional authorities are emerging. The European Union has established a European Food Safety Agency. The Nordic countries and Austria-New Zealand have also similar structures. The regional WHO cooperation of the Eastern Mediterranean Region and the South-East Asia Region have developed regional food safety plans and strategies to integrate their food safety efforts. FAO and UNIDO have initiated regional projects to harmonize and integrate the food control system at regional level.

In line with the regional and global harmonization trends the National Food Control System has to be strengthened and streamlined to harmonize the national food safety system with regional and international requirements and to liaise national, regional and international organizations involved in food safety activities, to protect the health of the society and facilitate and support global food trade.

3 Food control authorities and regulatory bodies

The main responsible authorities and regulatory bodies that have direct responsibilities in food value chain analysis for the control and monitoring of safe food production, distribution, trade and consumption include the following:

- ✓ Ministry of Health
- ✓ Ministry of Local Governments and Housing
- ✓ Ministry of Agriculture and Cooperatives
- ✓ Ministry of Commerce, Industry and Trade and Ministry
- ✓ Ministry of Tourism, Environment, Natural Resources

All these include respective statutory bodies operating under the umbrella of the above authorities/regulatory bodies.

The main supporting authorities/regulatory bodies include, among others, the following:

- ✓ Ministry of Education
- ✓ Ministry of Information and Broadcasting Services
- ✓ Ministry of Science, Technology and Vocational Training
- ✓ Ministry of Legal Affairs & Attorney

3.1 The Food Control System under the Health Sector, the Ministry of Health and its statutory bodies

In line with its mandate the Ministry of Health has enacted the Public Health Act Cap 295, and the Food and Drug Act Cap 303. The laws include general requirements for production, distribution and consumption of safe food and food standards. Based on these Acts, foods, merchandise, or goods to be exported or imported or marketed can only be exported or imported or marketed if they are fit for human consumption.

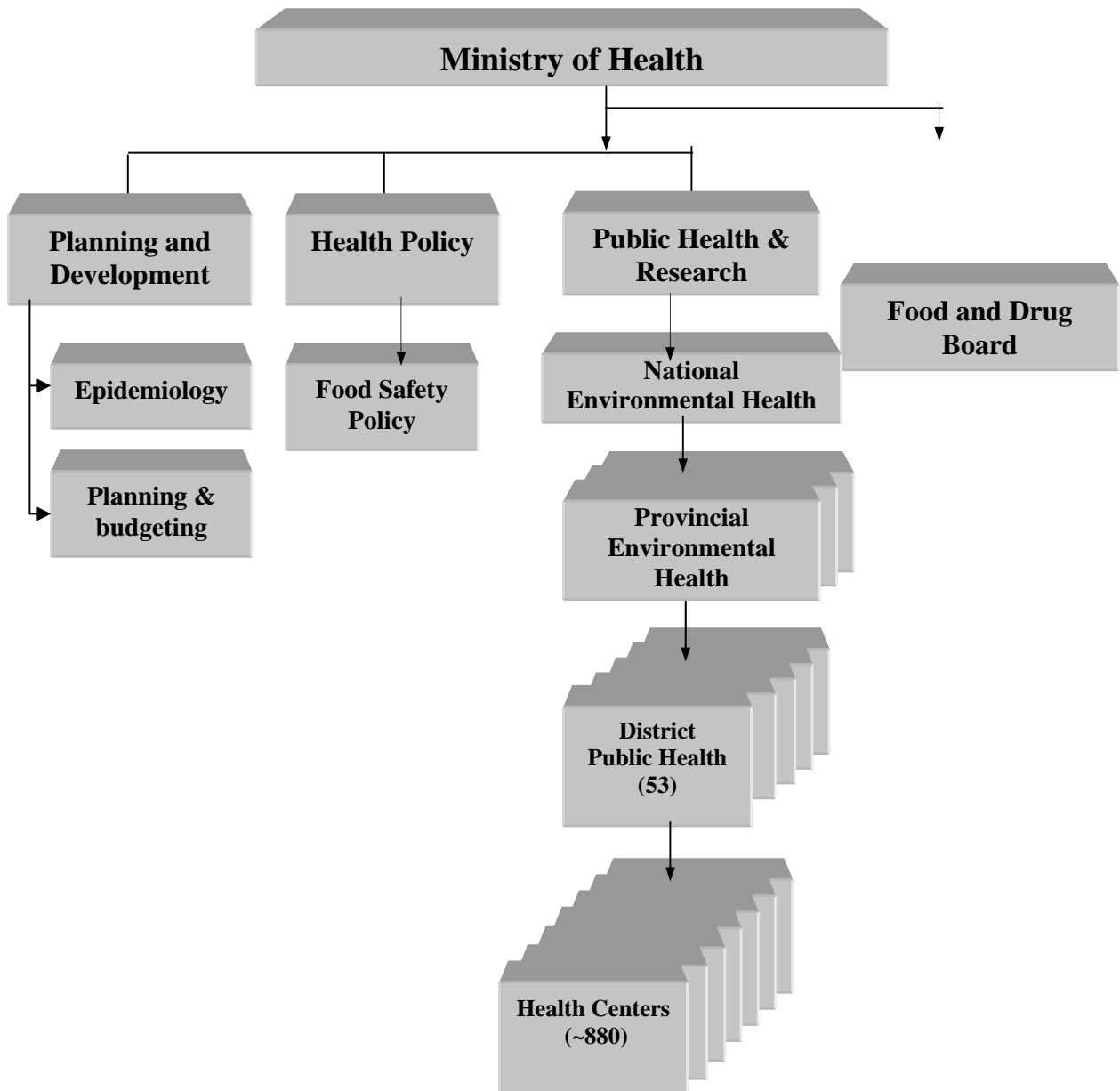
Based on the National Health Services Act (NHS) of 1995, the health sector is restructured and decentralized into two parallel but complementary arrangements, the popular, and the technical and management structures. The popular structure, which is structured from the grass roots level to the national level, includes Neighborhood Health Committees and

Health Centre Committees at the community level, District Health Boards at the district level, Hospital/Provincial Management Boards at provincial level, and the Central Board of Health at the national level. Similarly, the technical and management structures include the District Health Management Teams at the district level, Hospital or Provincial Management Teams at provincial level, the Management teams at the Central Board of Health and the Ministry of Health. The main departments/units that participate in the planning, controlling and monitoring of food safety under the health sector include the following (Fig 1):

Public Health & Research

As part of the restructuring public health Act 1995, the environmental or public health representatives are responsible for monitoring and controlling of hygiene, sanitation, and food safety related issues. The representatives are assigned from the grass roots to the national level with different capacities as shown in Fig. 1.

Fig. 1 Organizational Structure of the Food Control System under the Health Sector



In addition there are Federation of Health Boards, Professional Councils and other Regulatory Boards that provide technical and managerial advice to the health sector.

Based on this structure (Fig. 1), at least one environmental technician should be assigned at the grass roots level (health center) to monitor and control environmental hygiene, sanitation, occupational health and safety, environmental pollution and waste management and others, including food safety. The number of health centers in Zambia, excluding the main cities, is estimated to be about 880.

Depending on the size of the population and the nature of the activities, environmental health technicians, technologists, inspectors and/or environmental health specialists are expected to be assigned at health center, district, provisional and national levels.

According to the Ministry of Health, the range of population at different levels is estimated as follows:

- ✓ Urban health centers serve a catchment population of 30,000 to 50,000 people; and
- ✓ Rural health centers, serve a catchment area of 29 km radius, or a population of 10,000.
- ✓ District levels serve a population of 80,000 – 200,000.
- ✓ Provincial levels are intended to cater for a catchment area between 200,000 – 800,000 people

Planning and programming

The Ministry of Health has a Directorate for planning and development for strategic planning and co-ordination of the overall health sector financing, budgeting frameworks, plans and policies, including food safety policy. It also coordinates the strategic development of monitoring and evaluation of health sector performance at all levels of care, including epidemiological data, and maintains health management information Systems for the health sector and conducts performance audits through monitoring and evaluation of public health programs.

Health Policy Directorate

The core functions of the Directorate is to formulate, review, analyse, coordinate, the monitoring and evaluation of health policies and legislation. The Directorate has the chief food safety policy mainly responsible for food safety policy and legislation. The chief food safety policy is also a National Codex Contact Point, but currently it is vacant position.

Food and Drug Board

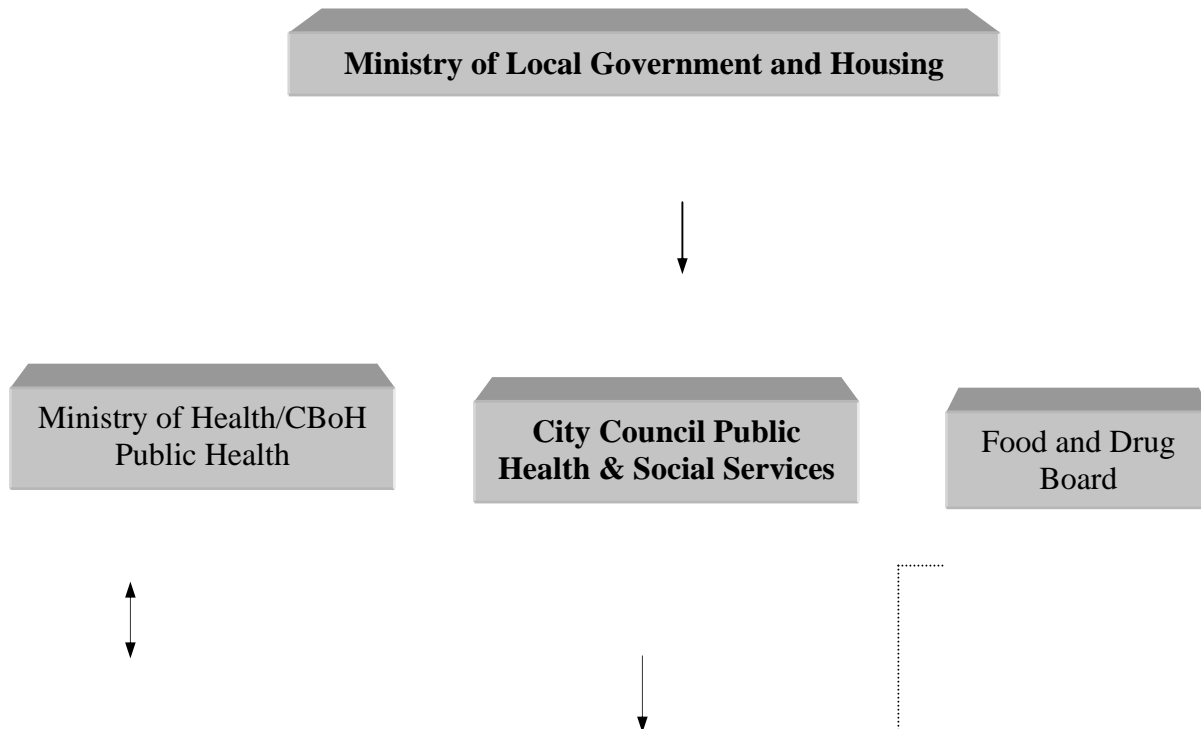
The Food and Drug Board is the responsible authority for providing analytical services to support the food control activities in the country. The laboratory has facilities and

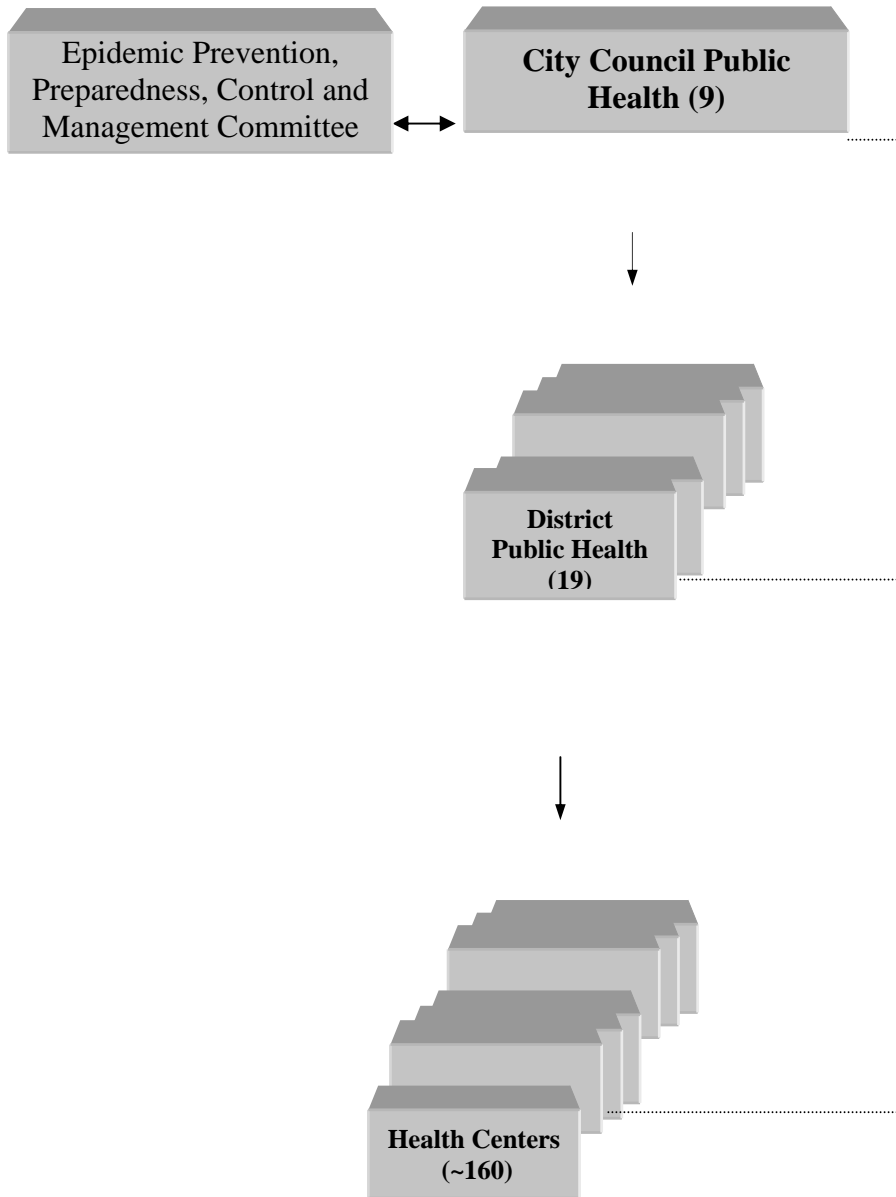
equipment for chemical, microbiological, instrumental, water, and forensic laboratories with fourteen technical staff (2 MSc, 3 BSc and 9 technicians). The laboratories provide analytical services annually for about 1500 samples for chemical and microbiological analysis and about 2000 samples for forensic analysis. The board has a limited capacity in terms technically competent staff, laboratory facilities, equipment, reagents, chemicals, and other consumables.

Environmental Public Health under the Ministry of Local Governments and Housing

The Environmental Public health under the Ministry of Local Governments and Housing is responsible for food control activities in about nine main cities of Zambia. Each city has a city council and the respective public health authority, which is responsible for control and monitoring of safe food production, distribution, trade and consumption in major cities. The respective inspectors, environmental health technologists and technicians are responsible for controlling, monitoring and inspecting food industries and establishments based on public health and food and drug acts of the Ministry of Health from the city council to health center level as indicated in Fig. 2. The food and drug board laboratories provide analytical services to support the inspection activities of city councils. The Epidemic Prevention, Preparedness, Control and Management Committee established at the national level coordinates the food control activities between the environmental public health of the CBoH and the public health city council to minimize duplication of efforts.

Fig. 2 Organizational Structure of the Food Control System under city councils





Policies and strategies:

The National environmental health policy

At the end of 2001, a national environmental health policy was drafted by the Ministry of Health⁹. The main content of the draft includes among others, policy objectives and measures, institutional arrangements, legal frameworks, implementation framework, financing the policy implementation, monitoring and evaluation. The food safety issues were explicitly addressed in this policy document, together with other environmental health issues.

National Health Strategic Plan, 2001-2005

The Ministry of Health had established a five-year National Health Strategic Plan, 2001-2005 based on the following Public Health Priorities⁶:

1. **Malaria:** within the framework of Roll Back Malaria initiative.
2. **HIV/AIDS, TB and STI:** through the National HIV/AIDS Strategic Framework
3. **Integrated Reproductive Health:** includes family planning, safe motherhood, adolescent health, abortion and post-abortion care, infertility and (sexual) violence against women.
4. **Child health:** aim at reducing morbidity and mortality due to childhood diseases.
5. **Mental and oral health:** creating the appropriate framework and mechanisms for the strengthening of mental and oral health activities and programs.
6. **Epidemics:** improved public health surveillance and control of epidemics.
7. **Hygiene, sanitation and safe water:** Promotion of personal hygiene, proper refuse disposal and access to safe water and implementation of other critical aspects of environmental health.

Though the food safety issues were not explicitly included as a priority issue, some major components were addressed under priority No. 6 and No. 7. Food safety could also play a substantial role for priorities No. 1, No. 2 and No. 4, and for the most specific Health Goals of the National Health Strategic Plan of 2001-2005, including, among others, the following:

- ✓ provision and intensification of integrated services to vulnerable groups and underserved areas;
- ✓ effective prevention programs for both communicable and non-communicable diseases;
- ✓ effective programs against common causes of morbidity and mortality;
- ✓ ensuring safe working and physical environments and health supportive habitats;
- ✓ review and enact all pieces of legislation and regulations for health;
- ✓ encourage lifestyles that support health through promoting individual hygienic practices and improved food habits;
- ✓ encouraging increased physical, and healthy social, activities;
- ✓ manpower development that responds directly to pressing needs, for instance, opening a postgraduate public health program and strengthening the functioning of community based health agents;

- ✓ creating an environment conducive to the retention of trained health personnel;
- ✓ ensuring availability of drugs and other medical supplies at all health care delivery points.

Food laws and standards

The Ministry of Health has enacted several laws and regulations to monitor, control and assure the production and distribution of safe food for human consumption, which include, among others, the following:

- ✓ Public Health Act Cap. 295
- ✓ Dairy and Dairy Produce Act Cap. 342
- ✓ Food and Drugs Act 303
- ✓ Control of Goods Act Cap. 421
- ✓ Liquor Licensing Act
- ✓ Traditional Beers Act Cap 168
- ✓ The National Health Services Act
- ✓ The Ionizing Radiation Act
- ✓ The National Food and Nutrition Act

Other laws with direct relevance to environmental health include:

- ✓ The Local Government Act
- ✓ The Town and Country Planning Act
- ✓ The Mines and Minerals Act
- ✓ The Water Supply and Sanitation Act
- ✓ The Environmental Protection and Pollution Control Act
- ✓ The Factories Act
- ✓ The Water Act
- ✓ Education Act
- ✓ Exchange Control Act
- ✓ Customs and Excise Act
- ✓ Export Processing Zones Act

Among the above food safety related acts, the Public Health Act CAP 295 mainly deals with the prevention and suppression of diseases. It generally regulates all matters connected with public health. For instance, it has regulations for meat, abattoir and butcheries, which deal with issues such as transport of meat, butcheries, management of abattoir, personnel and infrastructures, etc. The Food & Drugs Act mainly protects the public against health hazards and frauds in the sale and use of food. This Act empowers Inspectors to inspect and certify food processing facilities. The contents of the Food and Drug Act could be categorized into three major components, such as the general requirement which addresses

policy, procedural and generic standards; food additives and agents, and specific product standards.

Major components of the Food and Drugs Act CAP 303: 2001

General Requirements

- ✓ Policy
- ✓ Licenses
- ✓ Labeling
- ✓ Food Hygiene

Food additives and agents

- ✓ Special dietary foods
- ✓ Flavoring preparation
- ✓ Food Colors
- ✓ Gelling agents
- ✓ Irradiated foods
- ✓ Poisonous substances in food
- ✓ Food additives
- ✓ Vitamins, minerals, nutrients, and amino acids in food

Specific food standards

- ✓ Alcoholic beverages
- ✓ Baking powder
- ✓ Cacao products
- ✓ Coffee and Chicory
- ✓ Spices, dressings and seasoning
- ✓ Milk products
- ✓ Fats and oils
- ✓ Vegetables and their products
- ✓ Cereal, grain and their products
- ✓ Legume and their products
- ✓ Meat, its preparations and products
- ✓ Game meat and its preparations
- ✓ Salt
- ✓ Sweetening agents
- ✓ Vinegar
- ✓ Tea
- ✓ Marine and fresh water animal products
- ✓ Poultry, poultry meat, their preparation and products
- ✓ Soft drinks

Food safety Inspection and Enforcement Mechanisms

The Public Health Act and Food & Drugs Act and their regulations are enforced by the Ministry of Health (MoH)/Central Board of Health (CBoH) and the City Councils Environmental Health Departments through the Health Inspectors and Environmental Health technologists and technicians. The Ministry of Health has also Environmental Health Technicians stationed at all border posts, responsible to monitor and control import and export

of processed food products whether to fulfill requirements based on the Food and Drug Act or to verify the documentation accompanying import/export food produces.

Epidemiological system & data

The Statistical Authority of Zambia compile living conditions monitoring data based on two weeks periods illness/injury report or survey, proceeding each annual survey. For instance, the year 2002 – 2003 Living Conditions Monitoring Survey Report for proportion of persons reporting illness are summarized in table 3.

Table 3 Proportion of persons reporting illness by Type of illness reported, Zambia, 2002-2003

Type of illness reported	Proportion %
Fever/Malaria	36.9
Cough/cold chest infection	21.1
Tuberculosis	1.3
Asthma	1.0
Bronchitis	0.4
Pneumonia	1.4
Diarrhea without blood	4.9
Diarrhea with blood	0.9
Diarrhea and vomiting	1.1
Vomiting	0.5
Abdominal pains	4.8
Eye infection	3.3
Tooth ache/mouth infection	1.9
Headache	6.3
Skin rash	1.5
Hypertension	0.7
Ear infection	0.7
Constipation	0.6
Boils	0.6
Lack of blood	0.4
Measles	0.4
Paralysis	0.3
Liver infection	0.2
Piles hemorrhoids	0.2
Stroke	0.2
Jaundice	0.2
Shingles	0.1
Diabetes	0.1
Others	8.2
Total	100

Source: Statistical Authority of Zambia, Living Conditions Monitoring Survey Report, 2002 - 2003

Moreover, the Central Board of Health/Ministry of Health compiles data based on the reports of health facilities. This data issued in Annual Health Statistical Bulletin. For instance, the Annual Statistics Bulletin of the Central Board of Health/Ministry of Health compiled the ten major causes of visitations to health facilities in 2002 as indicated in table 4.

Table 4 Ten major causes of visitation of Health Facilities, Zamia 2002

Disease Name	Incident rate per 1000 population		
	Under 5	5 and over	Total
Malaria	1,333.4	191.1	377.1
Respiratory Infection (non-pneumonia)	409.8	78.5	143.9
Diarrhea (non bloody),	265.8	31.6	77.8
Respiratory Infection (pneumonia)	137.9	20.7	43.8
Eye infection	147.7	15.4	41.5
Trauma	55.8	37.5	41.1
Skin infections	88.3	23.4	36.2
Ear/Nose/Throat infections	59.4	15.2	23.9
Intestinal Worms	64.1	10.3	20.9
Digestive system (not infectious)	22.1	15.9	17.1

Source: CBoH, Health Management Information System (HMIS) 2002

Food Safety Fund/Budget

The health sector financing accounts 13 - 15% of the total government budget. Except the budget associated with water and sanitation & salaries for environmental health staff, there is no food safety fund explicitly allocated as part of the government regular budget.

Institutional coordination and integration

Based on the health reform Act, 1995, which targeted the creation of a strong and sustainable partnership with all key stakeholders, efforts have been made to establish these partnerships at all service levels between boards of management, health centre committees, communities, the traditional health sector, NGOs, other sectoral ministries, the private sector and donors. The formation of these partnerships would allow key stakeholders to work together to analyze the health problems in their respective areas, identify possible solutions, develop joint work plans, and implement and evaluate progress together. Inter-sectoral collaborations are also established at provincial and district levels. At a community level, Neighborhood Health committees and Health Centre Committees have been established.

Various inter-sectorial committees at the national level have been established in which several key Ministries are represented such as the:

- ✓ HIV/AIDS Council;
- ✓ Epidemic Prevention, Preparedness, Control and Management Committee;
- ✓ Food Safety Committee;
- ✓ SPS Committee;
- ✓ Import and Export Permit Committee;
- ✓ Health Care Cost Scheme for the vulnerable; and others.

Unfortunately the Codex National Committee, which could benefit from codex trust fund and contribute to overall food safety issues, including the development of food standards at the national level, and participate in codex committee meetings, has not yet been established.

Table 5 Evaluation of the overall status of the Food Control System in the Health Sector
Evaluation points: 1 (minimum) to 5 (maximum) average points

Major components of the food control system	Average point	Status & major drawbacks	Proposed action
Institutional arrangements	2	Well-established institutional arrangements from grass roots to top level decentralized decision making bodies, several health committees at different levels and with community participation. However there are duplications of efforts among MoH, CBoH, city council, and provincial health committees and other responsible authorities, for instance, from the agricultural sector & standards. Most established committees did not perform efficiently mainly because of shortage of funds staff, communication & management problems.	<ul style="list-style-type: none"> ✓ Provide legal, administrative, policy and financial support to the existing institutional arrangements and coordination mechanisms. ✓ Streamline fragmented responsibilities and authorities given to different authorities and committees within the health sector and other sectors. ✓ Establish efficient communication and management systems. ✓ Establish fund to follow up and monitor the activities of committees.
Policy & strategy	1	Absence of clearly defined approved policy and strategy. Some components of the food safety issues that were addressed in the draft environmental health policy & health sector strategy (2001–2005) were not properly implemented.	<ul style="list-style-type: none"> ✓ Establish clearly defined food safety policy and strategy in line with the national public health act, food and drug act, environmental public health and food security strategies. ✓ Follow up the implementation and review the impact.
Laws, regulations and standards	3	Food and Drug Act Cap 303: 2001 and Public health Act Cap 295. Several supportive food safety related acts enacted by the Ministry of Health and different ministries.	<ul style="list-style-type: none"> ✓ Develop generic guidelines GMPs, HACCP, inspection manuals & sectoral food standards. ✓ Evaluate the effectiveness & impact of the Acts.
Enforcement mechanisms	1	Low level or absence of enforcement mechanisms and legal support.	<ul style="list-style-type: none"> ✓ Provide training to acquire the necessary legal support. ✓ Establish efficient enforcement, monitoring and follow up mechanisms.

Notes about evaluation points: 0 = Absence of system or capacity 1 = Minimal system/capacity/process in place, yet clearly inadequate or dysfunctional,
 2 = System/capacity/process has some functionality and some demonstrated competence, 3 = System/capacity/process has good functionality,
 4 = Systems/capacity/process functions very well demonstrated & meets international standards, 5 = Approaches international better/best practice

Major components of the food control system	Average point	Status & major drawbacks	Proposed action
Food safety Inspection and sampling	1	Well-structured food safety inspection system to the grass roots level, however, lack resources in terms of technically competent personnel, inspection tools, inspection manuals, guidelines, transportation facilities and infrastructures.	<ul style="list-style-type: none"> ✓ Strengthen the technical capacity of inspectors. ✓ Provide inspection tools & transportation facilities as required. ✓ Establish inspection manuals & guidelines with record formats.
Food Safety Fund/Budget	1	Absence of streamlined budget by the government on food safety except for the water and sanitation fund & salaries of environmental health employees. Limited assistance by donors on food safety.	<ul style="list-style-type: none"> ✓ Establish streamlined food safety fund as part of the government regular budget. ✓ Acquire possible food safety fund from donors.
Testing and monitoring	1.5	Absence of a single accredited food laboratory. Existing government laboratories are understaffed by technically competent personnel, and under equipped in terms of laboratory equipment, consumables, facilities and infrastructures. Absence of a strong demand for testing which, in effect, could not able to attract private food laboratories.	<ul style="list-style-type: none"> ✓ Strengthen the technical capacity and motivation of laboratory staff. ✓ Business plan for food laboratories to sustain their services. ✓ Establish specialized accredited laboratories. ✓ Strengthen the regulatory inspection & enforcement mechanisms to create demand for testing & monitoring.
Food safety information-education-communication-training (IECT)	1	Except for few workshops conducted for street food vendors, very few awareness workshops on HACCP, very few university and college teaching practices, there is no as such any national training or awareness program conducted on food safety issues. There is limited capacity to provide programmed and planned information-education-communication-training (IECT) activity on food safety.	<ul style="list-style-type: none"> ✓ Establish the capacity for training through training of trainers and university education. ✓ Organize massive and intensive training and awareness programs through all available communication means including workshops, radio & TV programs, flyers, posters, etc. ✓ Organize national food safety weeks/days. ✓ Strengthen the educational system to include food safety, sanitation and hygiene starting from primary school education.

Major components of the food control system	Average point	Status & major drawbacks	Proposed action
Organized epidemiological system	2	Diseases burden & service delivery data in Annual Health Statistical Bulletin based on hospital & clinic reports & during epidemics, which do not indicate specific pathogenic microorganism. Statistical Authority of Zambia issues annual Living Conditions Monitoring Survey Report.	<ul style="list-style-type: none"> ✓ Establish well organized epidemiological and reporting system. ✓ Strengthen the technical capacity in terms of trained manpower, facilities & infrastructures

3.2 The food control system under the Agriculture Sector and the Ministry of Agriculture and Cooperatives

The Agricultural Sector

In the food value chain analysis the agricultural sector is responsible for the production and supply of raw materials at the primary level to food processing industries and food establishments. The Agriculture sector in Zambia supplies raw materials to agro processing industries, which account for about 84 percent of manufacturing value-added in the country. This sector has a considerable potential for economic growth and poverty reduction. From the land suitable for agricultural production only less than 4%, about 1.5 million hectares are cultivated every year. Together with agro-processing, it accounts for more than 40 percent of Zambia's GDP. The sector provides employment to about 67 percent of the labor force. The agriculture sector contributes about 11-16% of the GDP.

The livestock sector provides meat, milk, and eggs. It generates employment opportunities and income among rural people. The livestock sector contributes 35% to the agricultural GDP excluding the benefits from use of animal draft power and manure. The sector comprises about 85% small-scale farmers (about 850,000 rural households) and 15 % commercial farmers.

The diversity of Animal Genetic Resources in Zambia comprise of about 2.8 million cattle, 1.2 million goats, 0.5 million pigs, 80,000 sheep, and over 20 million poultry. The annual fish harvest is estimated at about 70,000 tons. The livestock population has been drastically reduced due to high mortalities caused by different types of animal diseases, including tick borne diseases, Bovine Pleuropneumonia (CBPP), and African swine fever.

Organized cooperatives in Zambia play a prominent role in the supply of raw materials to the industrial sector. For instance, organized cooperatives have a significant share in the supply of fresh milk, poultry products, fruit and vegetables, oil seeds, and raw materials to food processing industries and food establishments. During the last 3-4 years, the poultry and dairy sub-sectors and the supply of raw materials from cooperatives have shown substantial progress.

The Ministry of Agriculture and Cooperatives

The Ministry of Agriculture and Cooperatives is responsible for control and monitoring of animal and plant health at the primary level in the production, distribution and supply of raw materials to the food-processing sector. The Ministry has the Zambia Agriculture Research Institute (ZARI) and the Veterinary and Livestock Development and other several related statutory bodies, departments and the respective divisions, services and branches to the grass root level for monitoring and control of the plant and animal health.

The Department of the Veterinary and Livestock Development is the main responsible department for the control of animal diseases and the safety of livestock products. Department of Veterinary and Livestock Development Services (DVLD) is responsible for the

development of policies and regulations on animal diseases, the development of veterinary inspection procedures, and the inspection and certification of imports and exports of animal products. It has three technical units; Livestock Development Branch, Veterinary Services Branch and the Veterinary and Livestock Research Center. The National Epidemiology and Information Center is responsible for monitoring and gathering animal health and prevalent animal disease data in the country.

The Department of the Veterinary and Livestock Development has about five regional veterinary laboratories that conduct tests on diseases and cooperates with the National Livestock Epidemiology and Information Center, which gathers and processes data on animal health production and disease status and control. DVLD also operates a network of provincial district and livestock veterinary camps. There are about 700 veterinary camps for animal health and husbandry extension (see Fig. 3).

The Central Veterinary Research Institute has the following sections, Acaricides, Bacteriology, Biochemistry and Toxicology, Parasitology, Pathology, Virology, Vaccine production and epidemiology units. In addition to the engagement of the center in animal health and development research activities, the center provides services such as laboratory diagnosis of livestock diseases, epidemiological surveillance and diseases investigations, and vaccine productions.

The Zambia Agriculture Research Institute is the responsible authority (under the umbrella of the Ministry of Agriculture and Cooperatives) for implementing, monitoring and controlling the plant health issues. It has four divisions/branches, Crop Improvement and Agronomy, Plant Quarantine and Phytosanitary Service, Soils and Water Management, and Farming Systems and Social Sciences. These organizations work hand in hand with provincial, district and sub-district animal and plant health experts and technicians to the grass root level.

Based the Plant Pests and Diseases Act, the Plant Quarantine and Phytosanitary Service (PQPS) is responsible for carrying out the functions specified in the International Plant Protection Convention (IPPC), and for overseeing the agricultural plant safeguarding system, including surveillance, inspection, the issuing of phytosanitary certificates associated to imports and exports and the conduct of pest risk analysis.

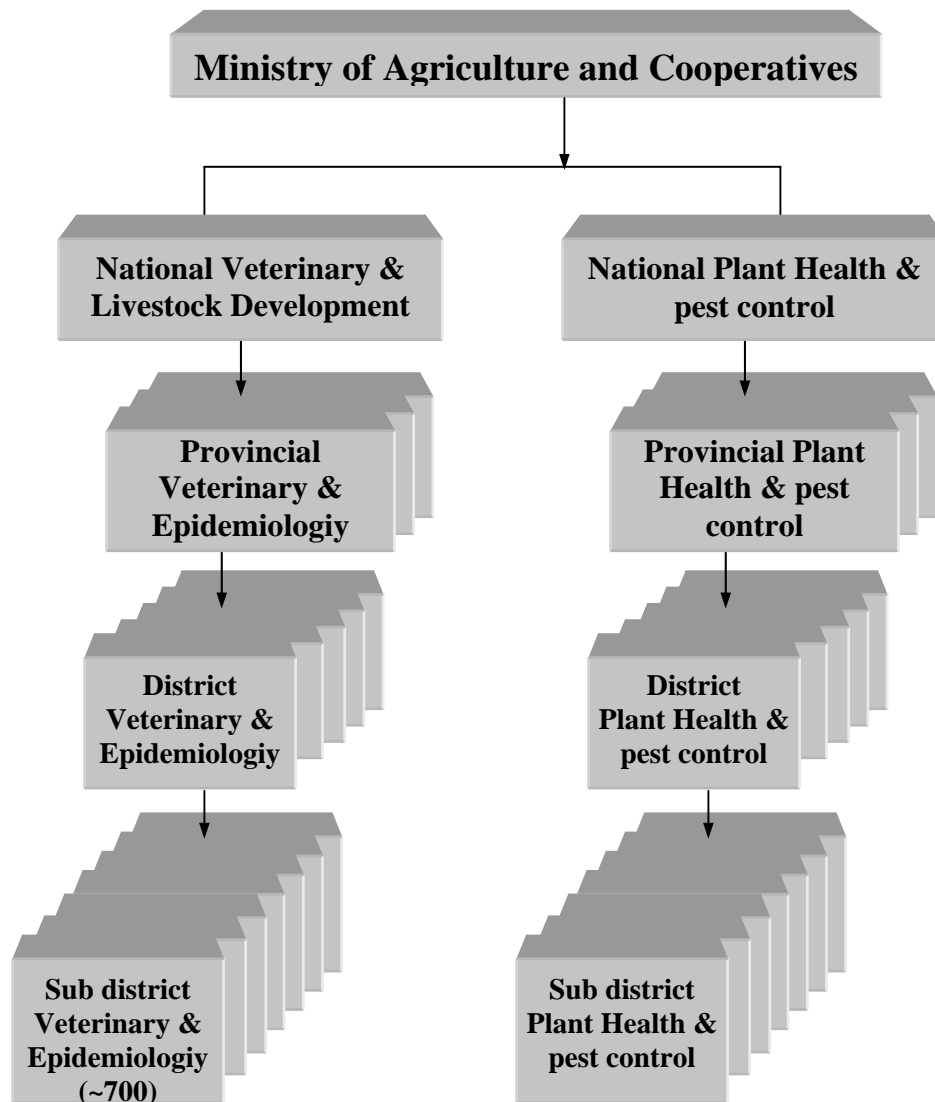
Animal and Plant health regulation related to food safety issues

The plant and animal health laws and regulations in Zambia that are relevant to the regulation of SPS and Food Safety of animal and animal products, and to plant and plant products include, among others, the following:

- ✓ Stock Diseases Act Cap. 252

- ✓ Pig Industry Act Cap. 251
- ✓ Export of Pigs Act Cap. 246
- ✓ Cattle Slaughter (Control) Act Cap. 250
- ✓ Cattle Cleansing Act Cap. 248
- ✓ Plant Pests and Diseases Act Cap. 233
- ✓ Noxious Weeds Act Cap. 231
- ✓ Plant Variety and Seeds Act Cap. 236
- ✓ Standards Act 416
- ✓ Environmental Protection and Pollution Control Act 204

Fig 3. Organizational Structure of the Food Control System under the Agricultural Sector



Note: The structure for plant health & pest control subject to conformation

3.3 The Food Control System under the Industry Sector and the Ministry of Commerce, Industry and Trade

The Ministry of Commerce, Trade and Industry (MCTI) is responsible for administering national policy for the private sector development, coordinating industrial, commercial and trade matters and liaises with various public and private sector organizations to facilitate the implementation of government sector policies. It has two core departments, the Department of Commerce and Trade and the Department of Industry. The Ministry has about eight statutory bodies which closely collaborate within the implementation of commercial, trade and industrial sector policies, among which the Zambia Bureau of Standards and Zambia Weights and Measures Agency are responsible in setting food safety standards and maintaining the traceability of the measurement system.

The Standards Act No. 416 of 1994 gives provisions to protect the consumer against defective or dangerous commodities. Under this part of Act, the Minister of Commerce, Trade and Industry is empowered to prohibit or restrict the use of any commodity in the interest of public, health or safety if found to be defective or dangerous. The commodity so declared as defective or dangerous shall be withdrawn from distribution and recalled by the supplier at the suppliers cost and the affected customer (s) compensated.

Zambia Bureau of Standards (ZABS)

The Zambia Bureau of Standards was established in 1982 by an Act No 22, which was later repealed and replaced in 1994 by the standards Act 416. The Act 416 redefined the functions, responsibilities and powers of the bureau and established broad stakeholder participation, with delegates from government, research centers, universities, industry, professional associations and consumers. The Standards Council of Zambia was also created to oversee the operations of the organization.

Based on the Act CAP 416, the functions of ZABS include the following:

- ✓ prepare Zambian Standards and promote their use;
- ✓ make arrangements or provide facilities for the examination and testing commodities, materials and substances from which commodities may be manufactured, processed, treated or finished;
- ✓ provide schemes of pre-export inspection of export commodities;
- ✓ provide training and consultancy in standardization, quality management and quality assurance; and
- ✓ establish metrological laboratories and other testing laboratories.

The Zambia Bureau of Standards formulates national standards, which serve as minimum requirements in the country. The standards include basic standards, product standards, terminology standards, testing standards, process standards, services standards and method standards that are developed by Technical Committees and approved by the Standards Council.

The Zambia Bureau of Standards Technical committees and the Council

1. **Technical committees:** These are ad hoc committees created to develop a specific standard. Membership is drawn from a wide spectrum of interest groups, including consumers. Participating groups are free to appoint the delegate of their choice.
2. **Technical advisory committees to the board:** These review the work of the technical committees and make recommendations to the standards council.
3. **Standards Council:** This approves voluntary standards, and the members are drawn from government, trade unions, professional and business associations, the University of Zambia, the NFDCL and other groups, including consumer associations. Delegates must be approved by the Minister of Commerce and the Cabinet.

ZABS is the selling agent in Zambia to foreign and international standards, such as the International Organization for Standardization (ISO), the African Regional Organization for Standardization (ARSO), and the national standards of many countries in the world. ZABS is not a full member but an observer member of ISO, ARSO and IEC.

The Zambia Bureau of Standards Metrology Laboratory (ZABSML) provides calibration services linked to National Primary Standards maintained by the Zambia Bureau of Standards for mass, length and force, which are limited to a certain range to maintain the traceability of the measurement system.

ZABS implements standards through a certification mark scheme whereby products conforming to Zambian Standards are given a mark. It operates a voluntary product certification scheme, in which some local companies, mostly producers of processed food and bottled water participate and also it plays a role in the enforcement of standards. The Bureau attempts to inspect imported consignments of various products, mostly processed foods, by having 12 inspectors at border posts. The Bureau staff conducts about 50 to 60 outsourced tests a year on imported foods when they suspect that the imports do not meet quality for food safety standards. The Bureau has 55 employees, 35 of whom are technical staff.

Zambia Weights and Measures Agency (Formerly ASSIZE)

Based on the Weights and Measures Act Cap 403 of the Laws of Zambia, the Zambia Weights and Measures Agency is the responsible authority for trade and legal metrology. The functions of the agency include the following:

- ✓ assessment and certification of weighing and measuring instruments used in trade and the verification of prepackaged commodities to ensure conformity to legislated standards;
- ✓ enforcement of the legal units of measurement in the country thus ensuring the existence of a unitary system of measurement;
- ✓ custody and maintenance of trade measurement standards;

- ✓ defining the technical and metrological requirements of commercial measuring devices;
- ✓ control of net-weight or volume of prepackaged commodities thus ensuring consumer protection;
- ✓ prosecution of offenders who breach the Act;
- ✓ collection of assize fees.

The Agency is affiliated to regional and international organizations through which it harmonizes its operations with that of similar institutions at the regional and international levels. These affiliates also ensure that the Agency benefits from new developments that are taking place within the legal metrology sector regionally and internationally. Regionally, the Agency is affiliated to the Southern African Development Community Legal Metrology (SADC MEL) which was formed in 1996 with all SADC partners as members. The aims of SADC MEL are to harmonize Legal Metrology requirements within the region. Internationally, Zambia is a member of the International Organization of Legal Metrology (OIML) in 1991.

Table 6. Evaluation of the overall status of the Zambia Bureau of Standards in support of the Food Control System
Evaluation points: 1 (minimum) to 5 (maximum) average points

Major components of the food control system	Average point	Status & major drawbacks	Proposed action
Standards Services			
✓ Standards development procedures	2	Standards are developed by adoption or adaptations of international and/or foreign standards through the consultation of the technical committee, sometimes through public enquiry for comments. New standards are developed through the consultation of the technical committees.	<ul style="list-style-type: none"> ✓ Develop matrix criteria for prioritizing and selection of development of national standards. ✓ Develop appropriate standards development procedure for new or standards to be adopted or adapted from foreign & international standards.
✓ Technical committees, sub committee and working group compositions	3	Several number of technical committees are drawn from different stakeholders, including producers, consumers, universities, trade and professional associations, services providers, etc.	<ul style="list-style-type: none"> ✓ Following the ISO procedures or the experience of other country standards bodies, restructure the existing several number of technical committees, into technical committees, sub committees & working groups.
✓ Standards approval procedures and composition of the council	3	The standards council is composed of representatives of different stakeholders including associations, government bodies, research institutes, universities, industries, etc. The council approves standards as voluntary standards.	<ul style="list-style-type: none"> ✓ Strengthen the composition and technical capacity of the council with sufficient knowledge on standards development and conformity assessment structures. ✓ Develop appropriate procedure and matrix criteria for voluntary standards and for standards to be enacted by law as technical regulation/mandatory standards.
✓ Standards document formats	1	Lack of proper format and quality of the standards document.	<ul style="list-style-type: none"> ✓ Establish proper format and maintain the quality of ZABS standard documents

Notes about evaluation points: 0 = Absence of system or capacity 1 = Minimal system/capacity/process in place, yet clearly inadequate or dysfunctional,
 2 = System/capacity/process has some functionality and some demonstrated competence, 3 = System/capacity/process has good functionality,
 4 = Systems/capacity/process functions very well demonstrated & meets international standards,
 5 = Approaches international better/best practice, audited and certified/accredited

Major components of the food control system	Average point	Status & major drawbacks	Proposed action
✓ Available standards documents	2	Compilation of some standards of ISO, British, Kenyan, South Africa, Codex, etc. Lack of sufficient numbers of standards and unable to retrieve/download standards in electronic format	✓ Strength electronic mail exchange capacity, communication among international and foreign standards bodies to receive and house several numbers of standards.
✓ Information and library services	1	A small room housing some standards. The composition and number of standards, the facilities and the nature of the room are not in a position to provide information and library services.	✓ Improve the number and composition of standards, facilities, room conditions, etc. to serve stakeholders as national information & library housing standards document.
✓ Promotion of association and company standards	1	Lack of association and company standards	✓ ZABS should provide all the necessary support to promote and strengthen association standards development capacities. Zambia has a significant number of associations & cooperatives that have the capacity to develop their own associations and cooperative standards.
Metrology and calibration services			
✓ Maintaining available primary measurement standards	2	There are primary standards for mass, length, and force which are purchased by the UNIDO assistance in 1993. The primary standards are kept in under protected rooms where by temperature & dusts are monitored, but not humidity. The traceability of the measurement system is sometimes maintained through periodical calibration by the National Metrology Laboratory of South Africa. There are no primary standards at least for volume, temperature, pressure, and flow.	<ul style="list-style-type: none"> ✓ Maintain the available primary measurement standards through periodical monitoring of the room condition and the required parameters, and periodical calibration. ✓ Strengthen the capacity to acquire at least primary standards for volume, temperature, pressure, and flow. ✓ Strengthen the technical & managerial capacity for laboratory accreditation

Assessment of the Capacity of Food safety and Quality in Zambia

Major components of the food control system	Average point	Status & major drawbacks	Proposed action
✓ Working measurement standards & calibration services	1	There are limited number of secondary & working standards to provide calibration services to industries and service providers. The existing metrology laboratory is not accredited.	✓ Acquire sufficient number of working standards and staff to provide the necessary calibration services.
Testing and analytical services	0	No capacity to provide testing and analytical service in terms of manpower, experience, equipment and facility. There are renovated rooms to house some laboratory facilities.	No comment
Certification services			
✓ Promotion of quality mark	1	Lack of promotion and recognition of the quality mark	No comment
✓ Voluntary certification	1	Limited number of voluntary certification activities	No comment
✓ Mandatory certification	1.5	Involved in some mandatory certification activities to regulate about eleven mandatory standards	No comment
✓ Inspection and sampling	1.5	Involved in inspection and sampling for mandatory certification activities and at border posts	No comment
Consultancy Services and Training	1	Limited capacity and staff to provide training and consultancy services	No comment

3.4 The food control system under the Ministry of Tourism, Environment, Natural Resources

Among the number of statutory bodies operating under the Ministry of Tourism, Environment and Natural Resources, the Environmental Council of Zambia and The Zambia National Tourist Board have shared responsibilities in the Zambian Food Control System.

The Environmental Council of Zambia

The Environmental Council of Zambia (ECZ) is a statutory body created by the Environmental Protection and Pollution Control Act of 1990, Cap 204 of the Laws of Zambia. The Council was established in 1992 and mandated to protect the environment and control pollution so as to provide for the health and welfare of persons, and the environment. The Ministry of Tourism, Environment, Natural Resources, by statutory order and in consultation with the Council, can ban or severely restrict the use of any pesticide or toxic substance specified as part of this Act. The Environmental Council of Zambia is therefore responsible for pesticide registration, application and monitoring including, in the agriculture and food processing sectors. The council should work in a coordinated manner with the food control authorities of the health and agriculture sectors.

The Zambia National Tourist Board

The Zambia National Tourist Board is a quasi Government body charged with the responsibility of promoting tourism. The main activities of the board include trade and media familiarization tours, compilation of tour operators and media database and tourism intelligence.

Tourism is the most important economic activity for Zambia with the annual revenue of more than US\$ 100 million and about 600,000 international tourist arrivals. The Tourism Sector employs more than 11,000 people, with several numbers of hotels, lodges, motels, guesthouses and camps and with about 4,500 accommodation rooms. The sector significantly contributes to the development of several hotels, food catering and supermarkets, which in turn are expected to prepare and provide safe food to tourists and consumers.

The Zambia National Tourist Board should, therefore, collaborate with the food control authority, mainly with the Ministry of Health, Central Board of Health and City Councils for the production and supply of safe food in all tourist accommodation areas. These institutes should work hand in hand to promote, monitor and supervise the implementation of the necessary food safety standards in food catering, hotels, lodges and related tourist accommodation areas.

4 The contribution of main supporting authorities/regulatory bodies to the food control system

Food safety is every body's concern and every body is required to contribute to food safety. However, the following have been identified as the most important supporting authorities/regulatory bodies that have considerable contribution in the implementation of the food control system in line with the international food safety requirements.

4.1 The contribution of Ministry of Science, Technology and Vocational Training to the food control system

The Ministry of Science, Technology and Vocational Training has the mandate to manage the country's policies on Science and Technology and the practice of vocational and technical education. The National Institute for Scientific and Industrial Research (NISIR) administered under the umbrella of the Ministry is mandated to conduct Research & Development in Agricultural and Natural Resources, including food science and technology.

National Institute for Scientific and Industrial Research (NISIR)

The National Institute for Scientific and Industrial Research (NISIR) has a food technology research unit which is engaged in food safety and quality related activities. The research unit has pilot facilities for food technology which are old and currently not functional. It has microbiology and chemistry laboratories to support the food research activities. The food unit also provides analytical service to food industries about 5-10 samples per month.

Recently, the microbiological laboratory of the food unit has received new facilities and equipment supported by different donors, including UNIDO, DFID, IAEA, etc. New chemical equipment such as GC, HPLC and AAS have arrived at the institute to equip the chemical laboratory with updated equipment. The support for the chemical laboratory is obtained from Valid International. The research institute is highly equipped with a sufficient number of rooms to accommodate several numbers of laboratories and pilot facilities. However, the food technology unit is understaffed to efficiently utilize all acquired equipment and facilities. The unit has only five graduates and two technicians, including the head of the unit.

The main engagement and contribution of the research institute to food safety and quality include the following:-

- ✓ advisory services and technical support on food science and technology to food processing industries;
- ✓ participate in the formulation of Zambian Standards as chair person in some of the technical committees, and as vice chair for the standards council;
- ✓ participate in the development of food laws and regulations;
- ✓ contribute in the fortification of vitamin A in sugar, maize and cassava products;
- ✓ conduct research on nutritional contents of some food produces;
- ✓ contribute in the National Nutrition Programme;

- ✓ serve as the coordinator of street vendors a food safety project which is supported by the Natural Resources and DFID;
- ✓ provide microbiological and chemical analytical services to food industries and establishments.

The institute has analytical capacity to participate in risk assessment activities if the research institute and the food unit are equipped with technically competent staff. The institute, which depends on donor funding, will face serious challenges to purchase and acquire consumables periodically as required. A proper business plan should be developed to sustain its service and capacity.

4.2 The contribution of the Ministry of Education to the food control system

Food safety and quality requires competent personnel to multi disciplinary fields and organized and informed producer and consumer on food safety. The educational system plays a prominent role to produce competent personnel in different fields through college and university education and informed and organized producer and consumer on food safety through massive and intensive food safety education that could be offered starting from the primary education.

The education curricula should, therefore, include food safety, basic hygiene and sanitation courses starting from primary education. Specialized higher education program in food safety and quality and related subjects at the university and college levels should be established. In Zambia the University of Zambia and Evelyn Hone College of Applied Science provide the following food safety and quality related training programs:

- ✓ School of Agricultural Sciences of University of Zambia: training and research on Animal Science, Food Science, Soil Sciences, Crop Science. The food science department laboratories provide chemical and microbiological analytical services to food industries and food establishments, about 10-15 samples per month. It has a microbiology laboratory confined in one room and chemical laboratory with equipments such as GC, HPLC, AAS, UV and others;
- ✓ School of veterinary medicine of University of Zambia: training and research in Veterinary fields;
- ✓ School of natural science of University of Zambia: training and research in chemistry and biology, analytical capacity for microbiological and chemical analysis in food;
- ✓ Evelyn Hone College of Applied Science, Arts and Commerce: training of Environmental Health technologies and technicians at Diploma level.

The University of Zambia is planning to establish department and provide training in environmental public health and food safety and quality at BSc level. The curriculum has been developed with involvement and participation of different stakeholders.

4.3 The contribution of Ministry of Information and Broadcasting Services to the food control system

The Ministry of Information and Broadcasting Services will contribute to food safety awareness programs to consumers, producers, and largely to the public through all available public media, including news letters, magazines, radio and TV programs. The Ministry should work in cooperation with all stakeholders and the food control regulatory bodies/authorities.

4.4 The contribution of the Ministry of Legal Affairs & Attorney to the food control system

The Ministry of Legal Affairs and Attorney should play a substantial role in the implementation of efficient enforcement mechanisms of the Food and Drug, the Public Health and related food safety and control acts. The respective food control regulatory bodies/authorities should provide periodical training and information on food safety and control to the respective responsible officers of the Ministry of Legal Affairs & Attorney.

5 The contribution of Associations and Cooperatives to the food control system

The three main and leading actors in the production, distribution and consumption of safe and wholesome food are producers, consumers and government. Producers and consumers would play a significant role in food safety and quality if they are organized and informed through trade, manufacturing and consumer associations and cooperatives. In Zambia, there are several numbers of producers, associations, and cooperatives which could play a substantial role to food safety and quality. Some of the most important associations are the following:-

- ✓ Grain and Feed Trade Association
- ✓ Organic Producers and Processors Association of Zambia
- ✓ Poultry Association of Zambia
- ✓ Zambian Association of Manufacturers
- ✓ Zambian High-Value Crops Association
- ✓ Zambia Coffee Growers Association
- ✓ Zambia Export Growers Association
- ✓ Zambia National Farmers Union
- ✓ Zambia Seed Trade Association

These and related associations should get the necessary knowledge and information on food safety to discharge their shared responsibility for the quality and safety of food.

Similar to the well-organized and established trade and producers associations, Zambia strongly requires well-organized and informed consumer associations. Consumer Protection Association and Zambia Consumer Association should work massively and intensively to acquire recognition and acceptance by consumers in Zambia.

6. Food Industries and Establishments

6.1 Dairy and Dairy Processing Industries

The Dairy sector in Zambia has shown a steady growth since the last 10 years and is becoming one of the most important food processing industries in Zambia. The main factors that have contributed to the steady growth of the dairy sector include, among others, the following:

- ✓ Privatization of the parastatal dairy industries and the emergence and development of privately owned international and national dairy industries (Parmalat, Finta, Zammilk, Daimondale) with more than 80% of the market share of processed milk products;
- ✓ The emergence and development of big international supermarkets (Shoprite, Spar and others);
- ✓ The crisis of neighboring country dairy farms and processing industries;
- ✓ The growth registered in the mining sector and the high demand for milk products in the mining industries;
- ✓ The emergence and development of about 70 large commercial dairy farms;
- ✓ The emergence and development of small and medium dairy farms cooperatives and the supply chain to the milk processing industries and the support given by donors to cooperatives, for instance, Land O' Lakes, Inc, technical and material support.

The dairy supply chain and its growth has been recently studied¹⁰. The number of dairy producers, yield and the main supply chain has been compiled (see table 7).

Table 7. Dairy Production by Producer Type

Characteristics	Traditional Smallholder Livestock Farms	Emerging Smallholder Dairy Farms	Large Commercial Dairy Farms
Number of farms	30,000	260	50-70
Average herd size (heads)	30	50	550
Most common breed	Traditional Zebu	Mixed breed	Pure dairy breed
Yield (liter/cow, day)	2-5	8-15	25-30

Compiled by David Neven, etal¹⁰

The contribution of regulatory bodies/food control authorities to support the dairy industries in terms of inspection, monitoring, GMP and HACCP implementation practices are very minimal. The city council inspectors/public health technicians may visit the dairy industry once or twice in a year as part of the license renewal formalities and occasionally if there is a complaint from consumers. There is no regular visit and demand for safety and quality from the clients of dairy processing industries, such as super markets, caterers, distributors, etc. The export of dairy products is very minimal. A very small quantity about 20 tons per month are exported to Malawi by Paramalat. A small amount of milk is also exported to DRC through the informal market.

The main products of the dairy processing industries include pasteurized milk, Ultra-High Temperature (UHT) pasteurized milk, flavored milk, flavored yogurt, energy drink, mix of fruit drinks and milk, cheese, butter, etc. The daily production of milk in processing industries is estimated at 130,000 - 150,000 liters per day.

The demand for food safety in the dairy processing industries of Zambia is generally very low as compared to the nature and the food safety requirements of the products. There are laws, regulations and standards in Zambia for dairy products, but are not implemented.

6.2 Poultry Industries

The poultry sector is one of the leading sectors, which has shown significant growth since the last three years with an annual growth rate of from 20-30% almost every year in almost all sub-sectors, hatcheries, layers, broilers, and aligned industries, including feed processing plants, slaughterhouses (abattoirs), veterinary drug supply, veterinary services, etc. The total production from hatcheries in 2005 was estimated about 18 million chicks (40% for small scale and 60% commercial farmers), and 1.2 million layers (60% for small scale and 40% for commercial farmers). Zambia was exporting a day old chicken to DRC, Tanzania and Mozambique and Hatcheries to Malawi. However, the export of poultry to the neighboring countries has been banned since the end of 2005 related to the global Avian Influenza problem, though Zambia so far does not have reported Avian Influenza prevalence.

The poultry sector receives the necessary assistance and support through its association, the Poultry Association of Zambia, for production, marketing, animal disease information and control, veterinary service, veterinary drug supply and others with well established follow up and monitoring mechanisms. The poultry association has five major sub-committees, namely, Hatcheries, Layers, Broilers, Allied industries and exotic birds; each of them chaired by sub-committee chairman. The association has permanent offices with technical committees for Hatcheries, Layers and Broilers to provide the necessary technical support.

The support given from the government to the poultry sector includes some veterinary services near and around the main cities, vaccination and drug supply (few quantities), anti mortem and post mortem inspections, and analytical services by the Veterinary and Livestock Research Laboratories, mainly for salmonella testing. No further assistance is given in the follow up and monitoring on GHP, GMP, HACCP, etc. mainly due to limited technical capacity and knowledge.

There is not a single company in Zambia certified to HACCP and ISO 9001 quality management system. There is limited knowledge and awareness on HACCP and ISO 9001 quality management system. A strong interest has been witnessed from the poultry association for the implementation of the food safety management system.

Poultry is a highly perishable product. HACCP is a mandatory requirement in the USA; in the other developed countries like the EU, Canada, Australia-New Zealand, and

another implementation of HACCP in the poultry industries is strongly recommend as part of the food law. In Zambia, there is no strong demand by regulatory bodies and the client of the poultry industries for implementation of the food safety management system (HACCP) in poultry products.

6.3 Meat and Meat Processing Industries

The Meat and Meat Processing Industries in Zambia are not well developed. There is no import and export of meat products in Zambia. It is mainly associated to the prevalence of animal diseases in Zambia and the border countries. The capacity of the livestock sector to supply cattle, pigs, sheep and goats has been declining since the last 10 years because of the heavy loss of the cattle population as the result of animal disease problems. Currently, the cattle population in Zambia is estimated about at 2.8 million cattle, 1.2 million goats, 0.5 million pigs, and 80,000 sheep.

The support given by the Agriculture Sector to alleviate the associated problems is limited because of lack of competent and trained staff, infrastructures and facilities, administrative and follows up problems.

There are a number of meat processing industries (Zambeef, Real Meat, Mojoru PLC, etc.). They produce and supply fresh meat products, bacon products, vacuum packed rolls, sausage products, and other smoked and cured products to super markets, hotels & restaurants, fast food services, and distributors. There is a very small quantity of export of meat products to DRC.

Like the dairy and poultry sector, there is no as such a strong demand by regulatory bodies and the client of the meat-processing industries for food safety management system (HACCP) implementation, mainly due to lack of consumer awareness on food safety and lack of capacity of the regulatory bodies.

6.4 Cereal Product Processing Industries

Cereal product processing industries are not well developed in Zambia. Cereal products like biscuits, pasta, snack and pre-cooked foods and other packed foods are imported. There are few companies engaged in the production of precooked and snack cereal products in the country.

The most dominating cereal processing industries in the Zambia are the milling industries. They produce and supply animal feeds, mainly for poultry farms, and also some quantity to cattle, pig and fish farms.

There is not a single HACCP certified Cereal Product Processing Company in Zambia.

6.5 Fruit and Vegetables Processing Industries

Most of packed and processed fruit and vegetable products in Zambia are imported. There are few small-scale industries involved in the production and supply of fruit and vegetables products. Recently, Freshpikt Limited Company has purchased the parastatal fruit and vegetables processing plant, which has a capacity to produce 100,000 canned fruit and vegetables products per day. If this company starts operating at its full capacity, it will satisfy the local market demand estimated at about 20,000 cans per day. The rest, about 80% of canned products, according to the company plan, will be exported to the neighboring country and the Middle East. Targeted raw material suppliers to the company are cooperatives and commercial farms in Zambia. This would contribute to the development of fruit and vegetables farms in Zambia.

6.6 Beverage Industries

The largest beverage industry in Zambia is Zambian Breweries PLC. It is a subsidiary of SABMiller PLC, the third largest brewing company in the world. The Zambian Breweries has acquired the Northern Breweries in Ndola, Copperbelt Bottling in Kitwe, Zambia Bottlers and Zambian Breweries in Lusaka. The main products of the breweries include four types of lager beer and five types of soft drinks of coca-cola. The company has the capacity to produce 550,000 hectoliters of beer and 550,000 hectoliters of soft drinks per annum. The company is currently working on GMPs and HACCP implementation practices to be HACCP certified by the beginning of 2007.

6.7 Hotels and restaurants

Because of the large potential and the increasing trend of tourism industries in Zambia, there are several numbers of restaurants, lodges, hotels, guesthouses, camps, etc. International Hotels and Restaurants with the international chain are maintaining the necessary standards, hygienic and sanitation practices, documentations, training, complaint handling practices, follow up and monitoring mechanism, etc. They have got the necessary technical support, training and operational manuals from the international chain of hotels. These hotels have shown strong interest to implement and be certified to HACCP and ISO 9001 System (ISO 22000 food safety management system).

6.8 Supermarkets and Fast Food Restaurant and Services

Super markets and Fast Food Restaurant and Services in Zambia are relatively well developed with international chain of super markets like Shoprite (the largest super market in Zambia) followed by Spar, Melissas and others. There is little support and follow up by the government regulatory bodies health inspectors/technicians to follow up and monitor personal hygiene, sanitation, temperature monitoring and calibration, labeling, etc. in Super markets and Fast Food Restaurant and Services.

6.9 Open Markets and Street Vendors

Though some assistance and support were provided to the street vendors in selected markets through the project “Improving Food safety of Informally Vended Foods” assisted by DFID and Natural Resources Institute and the participation of Zambian food control authorities and support institutes (NISIR, MoH, MoCTI, CBoH, FDCL and LCC) the problem remains very critical. In addition to the most observed problems in Open Markets and Street Vendors, for instance, personal hygiene, sanitations, working environment, etc., the most serious problem observed in Zambia is absence of segregation of food products with non-food materials and live animals like chicken with animal carcasses.

6.10 Conclusion

Except sugar, beverage, poultry and dairy industries, the food industries in Zambia are little developed. The food establishments such as hotels, super markets and fast food restaurants/services with the international market chain are relatively well developed. The open markets and street vendors, markets for the majority of the Zambian population are under developed and poorly organized.

There is no as such strong demand for food safety by producers, consumers and the government. As the result food products are produced, stored, distributed and sold, specifically in open markets by street vendors, and some industries, without the consideration of the basic hygiene and sanitation conditions. As the consequence of such practices, communicable diseases are becoming the major causes of health problems in Zambia. The main factors that contributed to the low level of food safety demand and implementation include, among others, the following:

- ✓ Low level consumer and producer awareness;
- ✓ Low level food safety inspection, control, monitoring, follow up & certification;
- ✓ Low level health and hygiene awareness in most food processing plants, and lack of information and awareness on HACCP, GHP, GMP, GAP, GLP;
- ✓ Lack of trained manpower, training, knowledge, practices and commitment on food safety and quality in food industries and establishments.

About 15 food industries and establishments were visited. Except the international hotels and few food industries, the food safety standards in most of food industries were unsatisfactory. The physical structures, equipment, facilities, personal hygiene, food handling practices, quality assurance and management control, documentation and record keeping practices, testing and calibration service, rehabilitation, renovation, good maintenance practices, etc. are not properly implemented in most of food industries. Evaluations were made based on the basic requirements of the Good Manufacturing Practices (GMP). The results are summarized in table 8 for visited companies A-O (code letter given for companies).

Table 8. Evaluation of the overall status of Visited Food Industries in Zambia
Evaluation points: 0 (minimum) to 5 (maximum) average points

	Basic Requirements of GMP	Visited companies/Average points														
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Structure and Fabrication	4	4	4	2	3	3	2	3	2	1	1	1	1	1	1
2	Storage Facilities				2	3	3	2	3	3	2	2	2	1	1	1
3	Raw Material	2	2	2	3	3	2	3	3	3	2	2	2	2	2	2
4	Process Equipment/Machinery				3	3	4	3	2	2	2	2	2	2	1	1
5	Personnel Standards	3	3	3	3	3	2	3	3	2	2	2	2	1	2	1
6	Food Handling Practices				3	3	2	3	2	2	1	1	1	1	1	1
7	Quality Assurance	3	3	3	4	3	2	3	1	1	1	1	1	2	2	1
8	Pest Prevention	4	4	4	2	2	2	2	2	2	2	2	2	1	1	1
9	Cleaning Systems	4	4	4	2	3	3	2	2	1	2	2	2	1	1	1
10	Management Control	3	3	3	4	3	3	3	2	2	2	2	2	2	1	1
11	Capacity to implement HACCP	3	3	3	3	3	3	2.5	2	2	1	1	1	1	1	1

Notes about evaluation points: 0 = Absence of system or capacity 1 = Minimal system/capacity/process in place, yet clearly inadequate or dysfunctional,
 2 = System/capacity/process has some functionality and some demonstrated competence, 3 = System/capacity/process has good functionality,
 4 = Systems/capacity/process functions very well demonstrated & meets international standards,
 5 = Approaches international better/best practice, audited and certified/accredited

7. Recommendations and proposed assistance

7.1 General recommendations, the relevance of food safety as a priority public health and economic development issue

Food safety plays substantial role to the development of the public health and the national economy by safe guarding the health of the nation, enhancing tourism, reducing production loses, enhancing labor productivity, facilitating national and international trade, conserving natural resources, etc.

7.1.1 Public Health Importance

The issue of food safety is primarily a public health issue and to obtain safe food is a human right. Public health problems associated with consumption of unsafe food are serious health threats. Specifically, with an increase in the number of vulnerable people including HIV/AIDS patients the importance of food safety has received significant importance. Opportunistic infections result in significant morbidity and mortality for people living with HIV/AIDS. Food-borne illness or food poisoning can be devastating to highly vulnerable persons, such as malaria and HIV patients. Studies indicate that HIV-1 is a firmly established infectious agent and the potential to interact with parasitic, viral, fungal, and bacterial infectious agents is very high. If HIV/AIDS and Malaria patients get food poisoning and diarrheal disease, it leads to loss of water and minerals from the body, causes dehydration, poor absorption of food, significant weight loss and malnutrition, resulting in weakness and further illness.

A review paper¹¹ has compiled several studies conducted on the impact of food borne diseases to HIV/AIDS. Some of these compiled studies indicate that diarrhea in immunocompromised patients is a challenge for the treatment and prevention of wasting. Fifty percent to 90% of persons with AIDS have serious episodes of diarrhea that can be life threatening¹². Salmonellosis is estimated to be nearly 20 times more common and 5 times more often bacteremic in AIDS patients than in patients without AIDS¹³, campylobacteriosis can also cause bacteremia and can be difficult to cure in AIDS patients^{14,15}.

The review paper strongly emphasized on the importance of food safety to HIV/AIDS, and summarized the food and water safety precautions for preventing or minimizing food- or waterborne diseases that are recommended in the fifth edition of Nutrition and Your Health: Dietary Guidelines for Americans¹⁶.

Reports of FAO and WHO indicate that protein-energy malnutrition, micronutrient deficiencies and diarrheal diseases are major causes of morbidity and mortality in developing countries. Many hundreds of millions of diarrheal disease cases are reported annually and many more individuals are exposed to diarrheal disease but do not report their suffering. Of the reported, WHO/FAO estimate that approximately 30% die from diarrheal diseases resulted mainly from poor sanitation and consumption of unsafe food. WHO estimates that 1500 people die each hour from infectious diseases, of which half of deaths occur in children under five.

The problem of food borne diseases is more aggravated by the rapid population increases both in the rural and the urban environment. The majority of the urban populations living in major cities in developing countries including Zambia live in conditions of poverty, filth, overcrowding and poor sanitation. With increasing urbanization the food service premises are increasing and are becoming an essential part of the food supply system. However, because of the low level of the food inspection system the food service premises are growing without strict control of food preparation, storage and display practices, and they are becoming a major source of food borne disease.

The situation in Zambia based on the reports of the Ministry of Health/Central Board of Health is very alarming

- ✓ Communicable diseases are the major problems, estimated 80% of diseases burden
- ✓ High prevalence of Malaria (38% incidence, 377 cases per 1000 population) and HIV/AIDS (~16%). These patients are highly vulnerable to opportunistic infectious diseases, including food borne diseases resulted from poor hygiene and sanitation practices
- ✓ The reoccurrence evidence of cholera
- ✓ The largest urbanized country in Sub-Saharan Countries; about 40% lives in cities; most of them with poor hygienic and sanitation conditions

With high prevalence of Malaria, HIV/AIDS, TB, Cholera, and other diarrheal diseases, curative measures are major priorities and essential to save the life of these patients. However, the preventive actions based on food safety including the basic hygiene and sanitation practices have significant importance to protect the patients against potential food borne diseases. A sound and properly implementable preventive strategy will reduce significantly the prevalence of communicable diseases including Malaria, HIV/AIDS, and food borne diseases, etc.

The Zambian Government health policy is preventive, promotive and curative. However, in practice preventive and promotive actions are not the government priorities of Zambia. The impacts of curative measures are relatively measurable than the preventive measures. This could possibly mislead the policy makers to provide more priorities for curative measures, which overshadowed the importance of preventive measures.

Attitudinal change and awareness programs will be required to balance the current Government focus and implementation practices between curative and preventive measures.

Zambia being a country with high prevalence of malaria and HIV/AIDS patients, and with about 80% communicable diseases, a sound and implementable preventive public health strategy including food safety should be the Government priority. Proper planning, allocation of the required budget, manpower, facilities, and infrastructures are necessary to implement and follow up the implementation of the preventive and promotive health strategies.

7.1.2 Enhancing labor productivity

People who consume unsafe food and/or suffer from food-borne diseases are less productive. This means lower production, lower incomes, less access to food and increased food insecurity. Food-borne diseases are a worldwide problem of great magnitude in terms both of the human suffering caused and the associated economic costs.

In Zambia about 80% of the people suffered from communicable diseases including food borne. As the result labor productivity would be significantly reduced, which has significant economic consequence.

The Zambian Government should take the necessary preventive measures including food safety to enhance labor productivity, and to achieve food security and economic development.

7.1.3 Reducing production loss

Estimation of the economic consequences of unsafe or contaminated food is a complex one which is most difficult to measure. Unsafe food is probably the single largest element in terms of cost in our globe¹⁷. The costs of food borne illnesses include medical care, absenteeism, investigation, containment and legal loss of output or earnings resulting from morbidity, disability or premature death. The cost includes also the value of crops and animal products spoiled or destroyed as a result of contamination, the value of rejections/detentions in the export trade. Studies conducted in the developed world estimate the economic consequences of food borne diseases^{18,19}. For instance, in USA the costs for loss in productivity due to seven specific pathogens have been estimated to range between US\$ 6.5 billion to US\$ 13.3 billion annually, in Germany a 1977 study shows the total annual loss of DM 240 million attributable to a single specific pathogen which causes *Salmonellosis*.

The application of good agricultural, manufacturing and hygienic practices in food production, processing and distribution improves food safety and at the same time reduces food losses, thereby increasing food availability and food security at the national and international level.

In Zambia there is no strong demand for food safety, good agricultural practice (GAP), good manufacturing practice (GMP), good hygienic practices (GHP), etc., by the government, producers and consumers. This is probably due to lack of awareness on food safety, lack of inspection and monitoring capacity by the inspection bodies, absence of organized and informed consumers, lack of market demand and drive for food safety, etc. The low-level demand and practice on food safety, GAP, GMP and GHP, would contribute to higher failure costs and production loss to food industries and establishment in Zambia. The health of consumers in Zambia would also be affected as a result of consuming unsafe and unwholesome processed food products.

Periodical awareness program and training for the government regulatory bodies, producer and consumers will be required to improve the current lower demand for food safety, GAP, GMP and GHP.

7.1.4 Enhancing tourism

The movement of people and the tourism industry will be significantly affected in the presence of reported food safety problems. The recent publicity related to Bovine Spongiform Encephalopathy (BSE) or mad-cow disease in Europe, the discovery of dioxin and other chemical contaminants in chicken and some fish, the current Avian Influenza problem, the use of antibiotics in animal husbandry, the presence of bacteria and the advent of genetically modified organisms, outbreak of cholera and related food borne diseases heightened consumer awareness and concerns about food safety. Specifically, the level of awareness and the information flow on food borne diseases is much higher in the developed countries than in the developing countries. Tourist strongly request to know about the status of food borne related diseases of countries with tourism potentials before deciding to travel for the purpose of tourism.

Zambia is one of the countries with immense tourism potentials. The tourism industry in Zambia has shown steady growth since the last decade. Tourism in Zambia is hundreds million dollar business with more than 600,000 tourist arrival per year. The number of hotels, restaurants, guesthouses, loges, etc. have shown steady growth associated with the development of the tourism industry. This industry could easily paralyze if any major outbreak or associated food borne diseases reported in Zambia. This will automatically reduce the number of incoming tourists.

A collective effort will be required among the responsible organizations, such as Zambian Tourism Council, the Ministry of Health/Central Board of Health, the City Councils, and the respective provincial and district health offices, associations related to the tourism industry, service providers for the tourism industry, etc. to maintain the necessary food safety standards for the development of the tourism sector. The effort should include, among others, periodical awareness program, standards, inspection and monitoring.

7.1.5 Enhancing fair food trade/import and export inspection

Countries that are able to ensure safe food can take advantage of international trade opportunities, thereby increasing income levels and household food security. The food safety standards and other sanitary and phytosanitary measures can have a major impact on trade in agricultural and food products. Such measures can, even unintentionally, act as trade barriers, particularly for developing countries, which in many cases lack the capacity to comply with the standards and face serious challenges on export markets.

According to data compiled by US-FDA in 1996/97 for some imported products from developing countries excluding meat and poultry products the majority of detentions and rejections of foods, estimated for USD 11,116,000, are not related to highly technical or sophisticated requirements^{18,19}. In the order of significance the food hygiene problems

represented by contamination of food with insects and rodent filth took the lead (31.5%), microbiological contamination (12.8%) comes next, followed by failure to comply with US low acid canned food registration requirements (12.5%), labeling (9.8%), and others. Over 50% of the rejections are attributable to lack of basic food hygiene and failure to meet labeling requirements. Dealing with these types of problems is well within the means and capacity of most developing countries.

On the other hand countries, which could not demonstrate the capacity required for import inspection activities, unsafe and unwholesome food could easily flow to such countries. Imported unsafe and unwholesome foods are also major public health problems.

The Zambian import and export inspection activities are understaffed in terms of technically competent personnel, under equipped in terms facilities and infrastructure. It could not efficiently support import and export trade of Zambia, both in terms of health and trade benefits.

A step-by-step approach is strongly required to strengthen the import and export trade, inspection, monitoring and controlling activities in Zambia

7.2 Specific Recommendations and Proposed Assistance

7.2.1 Establish & strengthen model food industries for GMP and HACCP Implementation

As indicated in section 2, the food industries and establishments in Zambia are not well developed, except the sugar, poultry, dairy and beverage industries and international hotels. The demand for food safety by consumers, government food authority and producers is not as such encouraging. There is not a single food industry or establishment certified to the HACCP or ISO 9001 management system. The average evaluation points compiled for visited food industries (Table 8) indicate that the level of good manufacturing practice in most of food processing industries is not satisfactory. The major causes for a low level performance of food industries and establishments have been discussed in section 3 and 6.

The proposed assistances to improve food safety and quality management performance of food industries are the following:

- ✓ Conduct gap analysis of selected food industries and establishments from selected priority sectors;
- ✓ Develop matrix criteria to select model food industries and establishment for GMP and HACCP (ISO 22000) implementation;
- ✓ Assist selected model food industries and establishment for GMP and HACCP (ISO 22000) implementation;
- ✓ Provide extensive and intensive training, and training of trainers for food industries and establishment on GMP, HACCP (ISO 22000) implementation;
- ✓ Follow up the implementation of GMP and HACCP (ISO 22000) in selected industries

7.2.2 Strengthen Information, Education, Communication and Training capacity

The low level of food safety awareness and demand and the consequence of food safety issues have been discussed in section 3 and 6.

One of the best mechanisms and modalities to achieve good performance in food safety and quality is to create informed and organized consumers and producers, and a competent food control authority through education, training, communication and information.

The proposed assistances to strengthen the food safety education, training, communication and information are the following:

- ✓ Acquire the participation of the education system to provide training, starting from the primary school on to the basic food hygiene and sanitation issues and specialized fields in food safety at higher education level (college and universities);
- ✓ Acquire the participation of the media to disseminate food safety awareness programs through official newsletters, magazines, Radio and TV programs;
- ✓ Conduct national food safety weeks/days and prepare special programs and campaign on food safety through banners, flyers, posters, brochures, panel discussions, workshops, TV and Radio programs;
- ✓ Establish and strengthen consumer associations/food safety associations.

7.2.3 Establish & strengthen model inspection operations

The food inspection system of Zambia is understaffed in terms of technically competent personnel, under equipped in terms of facilities, inspection tools, inspection manuals, etc. to undertake inspection, follow up and monitoring activities. The support given from the inspection system to food industries and food establishment is insufficient. It is based on crisis management to resolve complaints. There is no planned inspection activity as such, except the inspection activities conducted as part of licensing and license renewal activities.

The major problems accounted for such a weak performance of the inspection system, include, among others, the following:

- ✓ Lack of transportation facilities
- ✓ Lack of inspection tools
- ✓ Lack of inspection manuals
- ✓ Lack of competent staff (quality and quantity)
- ✓ Lack of efficient enforcement mechanism, analytical capacity and monitoring
- ✓ Lack of planned activities, follow up and efficient management system
- ✓ Lack of consumer awareness and absence of well organized consumers
- ✓ Low level demand for food safety
- ✓ Low level government support and priority

- ✓ Luck of fund and budget
- ✓ and others

A step-by-step approach is recommended to alleviate the multifaceted problems and challenges of the food inspection system.

- ✓ Provide intensive and extensive training, and training of trainers in courses for food inspectors;
- ✓ Establish model inspection operations and furnish the model inspections with the necessary trained and competent staff, inspection manuals, inspection tools, facilities, transportation systems by selected major cities like Lusaka;
- ✓ Develop an efficient management system and detailed and planned activities of inspections in the model inspection operations; follow up the implementation and evaluate the impact and relevance;
- ✓ Duplicate the model inspection operation as required;
- ✓ Establish a business plan for sustainable service of the inspection system;
- ✓ Conduct a periodical sensitization program at top management and policy level to acquire the necessary support and budget from the government.

7.2.4 Strengthen standards development activities

The Zambian Bureau of Standards is the sole government body for the development of national standards and for housing foreign nationals, regional and international standards. Standards are very important technical documents for consumers, producers and the food control authorities and should be available as easy and as required, through ZABS. The standards collection activities and standards should be updated periodically. The status of the national standards development activities, information and library services has been discussed under section 3.3 and Table 6.

The following assistances are proposed to strengthen the Zambian Bureau of Standards and standards development and information services:

For the development of national standards:

- ✓ Develop matrix criteria for the prioritizing and selection of development of national standards;
- ✓ Develop appropriate standards development procedures for new standards to be developed, adopted or adapted from foreign & international standards;
- ✓ Following the ISO procedures or the experience of other country standards bodies, restructure the existing several numbers of technical committees into technical committees, sub committees & working groups;
- ✓ Strengthen the composition and technical capacity of the council with sufficient knowledge on standards development and conformity assessment structures;
- ✓ Develop appropriate procedure and matrix criteria for voluntary standards and for standards to be enacted by law as technical regulation/mandatory standards;
- ✓ Establish proper format and maintain the quality of ZABS standard documents;

- ✓ Update and increase the number of national standards.

For housing foreign, regional and international standards and provision of standards information:

- ✓ Strengthen the electronic mail exchange capacity, communication among international and foreign standards bodies to receive and house several numbers of standards;
- ✓ Improve the number and composition of standards, facilities, room condition, etc. to provide stakeholders with the necessary information & library services.

For Promoting Association Standards Development Activities:

- ✓ Promote and strengthen association standards development capacities through ZABS technical support and participation.

7.2.5 Establishing a National Coordination System

The food control responsibilities in Zambia are shared among five main ministries, the Ministry of Health, the Ministry of Local Governments and Housing, the Ministry of Agriculture and Cooperatives, the Ministry of Commerce, Industry and Trade, and the Ministry of Tourism, Environment, Natural Resources (See section 3). Though this arrangement encourages multisectoral participation, it will suffer from problems such as:-

- ✓ duplication of regulatory activities,
- ✓ increased bureaucracy,
- ✓ fragmentation among different ministries, national, state and local bodies,
- ✓ lack of coordination among different bodies involved in food policy, monitoring, and control of food safety.

In recognition of the multisectoral and multidisciplinary nature of the food control system, the establishment of an integrated food control system has been recommended^{1, 2}. An integrated food control system warrants consideration where there is a desire and determination to achieve effective collaboration and coordination between agencies across the farm-to-table continuum. The advantages of such a system include:

- ✓ Provisions of coherence in the national food control system;
- ✓ Politically more acceptability as it does not disturb the day to day inspection and enforcement role of other agencies;
- ✓ Promotion of uniform application of control measures across the whole food chain throughout the country;
- ✓ Separation of risk assessment and risk management functions, resulting in objective consumer protection measures with resultant confidence among domestic consumers and credibility with foreign buyers;
- ✓ Being better equipped to deal with international dimensions of food control such as participation in work of Codex, follow-up on SPS/TBT Agreements, etc;

- ✓ Encouragement of transparency in decision-making processes, and accountability in implementation; and;
- ✓ Being more cost-effective in the long term.

The establishment of a national coordination system for food safety activities is very well recognized by international organizations such as WHO, FAO, Codex, EU, and by developed and developing countries. In the developed world this coordination system has been established through coordinating committees/council/board, memorandum of understandings, technical agreements, etc. Recently the EU countries, Canada, and Australia have adopted a strategy for the establishment of autonomous food safety agency/authorities/administrations, mainly to coordinate the activities of food control authorities, to conduct risk analysis and to represent the country as a responsible food safety authority¹¹. The coordination system in the USA and for most of the developing countries is still conducted through coordination committees/councils and different types of agreements. Uganda and Ethiopia, through the assistance of the UNIDO project, are working to establish the coordination system through a National Food safety Council. In Ethiopia, a proposal for the establishment of the council has been prepared, and adopted by workshop²⁰ and is awaiting the approval of the council of ministers to be enacted as part of the food law.

Zambia could follow the same approach, i.e. establish a council or follow a leapfrog approach to establish an independent food safety agency. The advantages of the food safety council at the transition stage as compared to the leapfrog approach are the following:-

- ✓ It will create good understanding and willingness among different regulatory bodies/authorities;
- ✓ The concept of food control system and the importance of integration will be well recognized and accepted;
- ✓ Less resource is required in terms of manpower, staff and facility in the council than in an independent agency;
- ✓ It will create a very good foundation, strategic direction, organizational structure, and support for the establishment of the food safety agency;
- ✓ It will reduce unnecessary restructuring of the independent agency from time to time as observed in some developed countries, specifically in Europe.

The Role and Responsibilities of the National Food Safety Council or Independent Agency following the leapfrog approach will be based on the ten basic strategic elements described in section 1.1. These are mainly the establishment and strengthening of:

- ✓ Comprehensive food safety policy and strategy;
- ✓ Comprehensive food law, updated food safety regulations and enforcement mechanisms;
- ✓ Food safety inspection system from top to the grass roots level;
- ✓ Competent analytical capacity & monitoring capability;
- ✓ Organized epidemiological system;
- ✓ Food safety information-education-communication-training (IECT) system that address regulatory bodies/inspection authorities, producers and consumers;
- ✓ Sound science based risk assessment from farm to fork;
- ✓ Allocation of food safety fund;
- ✓ Harmonization of the national food safety system with international requirements & Liaison with national, regional and international institutions.

Objectives of the National Food Safety Council

The main objectives of the National Food Safety Council will be:

- ✓ To establish good understanding among food inspection authorities/regulatory bodies, support institutes, producers, distributors and consumers on the subject of food safety, their roles and responsibilities;
- ✓ To promote, initiate and establish a National Food Safety coordination, collaboration and integration system among food inspection authorities/regulatory bodies and support institutes to minimize duplication of efforts and to coordinate de-fragmented activities and streamline role and responsibilities related to food inspection and control;
- ✓ To promote, initiate and establish a mechanism for efficient and optimum use of the available limited resources;

- ✓ To recommend institutional arrangement for effective food safety management system based on good understanding and recognition by inspection authorities/regulatory bodies, support institutes, producers and consumers.

The proposed structure of the National Food Safety Council

The proposed structure of the National Food Safety Council or food safety agency, following the leapfrog, is indicated in Fig. 4. The council will have members of Ministers/Vice Ministers of the proposed members of Ministries and Heads of the authorities and support institutes and associations, chairpersons of consumers & producers. The council will have the main executive body, i.e the chairman and the secretariat office. The secretariat office will have several technical committees to coordinate the overall food control system (Fig. 5).

The secretariat office will be part of one of the leading ministries in the food control system. It has to be established with a designated role, responsibility and authority. It will have its own staff, facilities and budget.

Detailed procedures and proposals have to be worked out, including the authorities, roles, responsibilities, the representation of the council and number of meetings, the staff of the secretariat and its budget, the leading authority/Ministry, etc. with the consultation of the main regulatory bodies and different stakeholders. The proposal should be adopted by the stakeholders' workshop and approved and enacted by law.

Fig 4. Proposed Structure for Establishment of an Integrated Food Control System

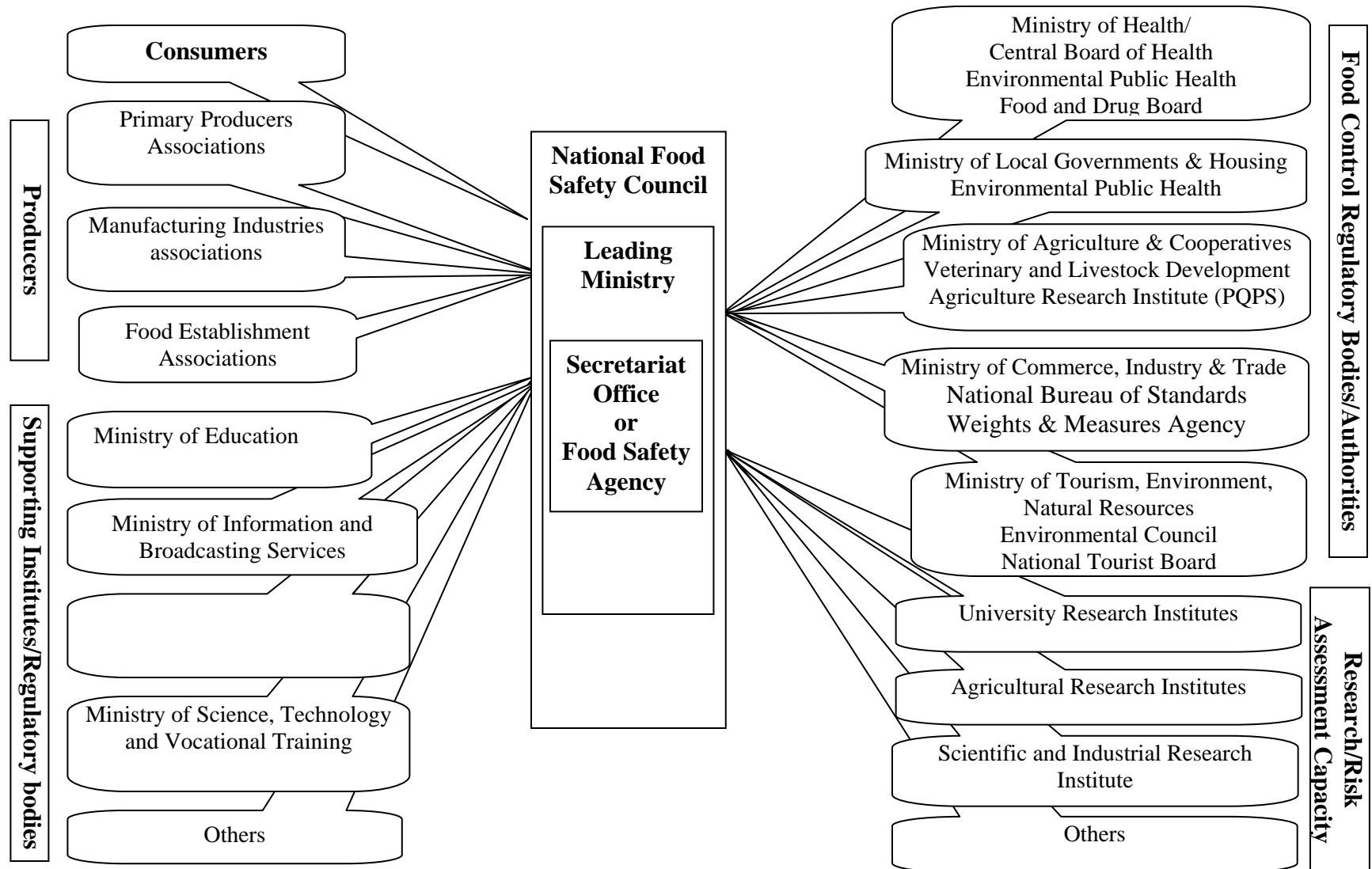
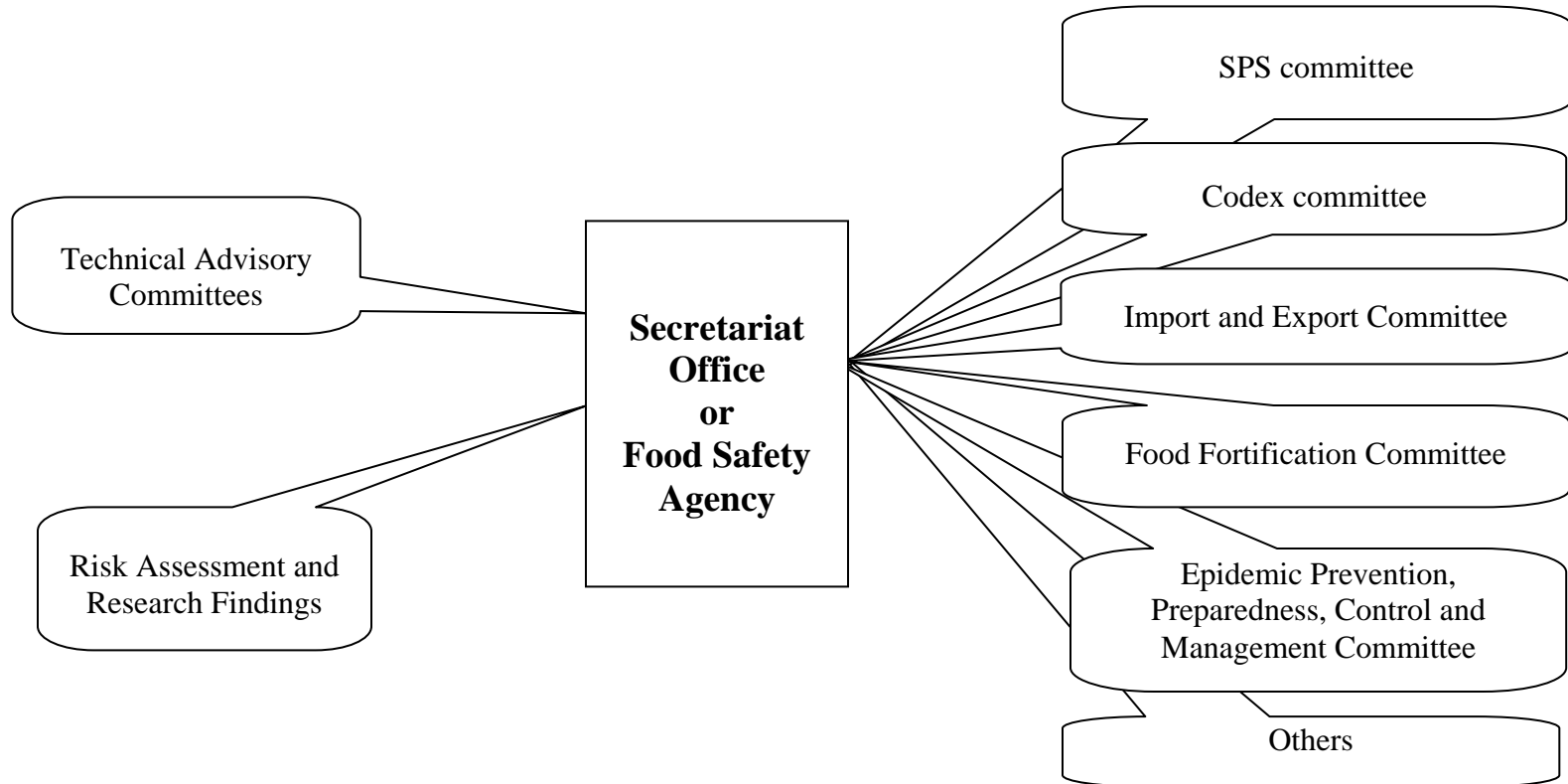


Fig 5. Proposed Structure for Technical Committees that report and support the Secretariat Office or Food Safety Agency for Establishment of an Integrated Food Control System



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Annex 1. Proposed budget for two years duration

Major Activities/Budget line	Estimated budge in USD
3.1 Establish & strengthen model food industries for GMP and HACCP Implementation	100,000
Training and workshops	30,000
National consultant	30,000
International consultant	40,000
3.2 Strengthen Information, Education, Communication and Training capacity	100,000
Training and workshops	50,000
National consultant	30,000
International consultant	20,000
3.3 Establish & strengthen model inspection operations	150,000
Inspection tools	20,000
Transport facilities (two pick up cars)	40,000
Training and workshops	30,000
National consultant	20,000
International consultant	40,000
3.4 Strengthen standards development activities	85,000
Internet and computer facilities with printers	20,000
Books and standard documents	20,000
Library (reading room) facilities	15,000
Training and workshops	10,000
International consultant	20,000
3.5 Establishing National Coordination System	70,000
Facilities the secretariat office	20,000
National consultant	20,000
International consultant	20,000
Workshop	10,000
Total	505,000

Annex 2. List of organization visited and persons contacted

Organisation	Contact	Address
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Bureau of Standards	Mr. Mataa Mukelebai Executive Director	mataam@zamnet.zm 260 1 227182, 260 97 755948

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Verino Agro Industries, Country Choice Chicken	Ackom, Managing Director	verino@zamnet.zm + 260 1 213158
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