

ZAMBIA: FOOD SAFETY CAPACITY DEVELOPMENT NEEDS ASSESSMENT AND ACTION PLAN

PART II: VALUE CHAINS AND STRUCTURE OF INDUSTRY



Lusaka

July 2014

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Acknowledgements

This report was prepared by Artavazd Hakobyan, Food Safety Specialist at the Global Food Safety Partnership (GFSP) Secretariat. Throughout the process of preparation, the author benefited from excellent cooperation from government agencies, the private sector, and other stakeholders in Zambia. In particular, excellent cooperation and leadership of Dr. Maputa Kamulete, Focal Point for Food Safety in the Ministry of Agriculture and Livestock was essential. Dr. Kamulete provided critical insights and advise for understanding key food safety issues in Zambia. Mr. Mulonda Mate and Ms. Florence Ngala of the Ministry of Health of Zambia helped understand important public health implications of food safety issues in Zambia. The feedback from the workshop with stakeholders in October 2013 in Lusaka was very helpful. The author received additional valuable support from Francois Le Gall, Livestock Advisor and Manager of the Global Food Safety Partnership and Amy Evans, Head of the Global Food Safety Partnership Secretariat. Rehana Vally provided guidance throughout the preparation and helped launch the consultation process in Zambia. Alex Mwanakasale was helpful in identifying stakeholders and supporting the missions. Inputs from the FAO team, including Catherine Bessy and Oumou Barry were essential for understanding the food safety regulatory framework in Zambia. Kutemba Kambole and Liseli Simaku helped with logistics.

The GFSP Secretariat team is grateful to members of the GFSP working groups for their guidance and comments on this report. A peer review discussion of the report was organized after the first draft of the report was presented at the GFSP Technical Working Group meeting in Montreal in 14-16 August, 2014. Valuable comments and suggestions were received from the members of the Food Safety Technical Working Group and other GFSP partners. The report was funded by the Global Food Safety Partnership Multi-donor Trust Fund.

The contribution of counterparts from government agencies (see **Annex II**), who participated in a two-day discussion in June 2015, is gratefully acknowledged. The author benefited from valuable comments and insights received during this discussion. This version of the report is revised according to the inputs received from this discussion.

Abbreviations

COMESA	Common Market for Eastern and Sothern Africa
FAO	Food and Agriculture Organization of United Nations
FBO	Food Business Operator
GAP	Good Agricultural Practices
GFSI	Global Food Safety Initiative
GFSP	Global Food Safety Partnership
GMP	Global Markets Program
GOZ	Government of Zambia
HACCP	Hazard Analysis and Critical Control Points
IAPRI	Indaba Agricultural Policy Research Institute
MOA	Ministry of Agriculture and Livestock of Zambia
MOH	Ministry of Health of Zambia
OIE	World Organization for Animal Health
SME	Small and Medium Enterprise
STDF	Standards and Trade Development Facility
UNCTAD	United Nations Conference on Trade and Development
UNIDO	United Nations Industrial Development Organization
USAID	United States Agency for International Development
WHO	World Health Organization
WTO	World Trade Organization
ZABS	Zambian Bureau of Standards
ZARI	Zambia Agriculture Research Institute
ZUFoST	Zambia Union of Food Science and Technology

1. Introduction

1.1. Background

Food Safety is becoming an important priority in Zambia. The government is revising its food safety strategy and is preparing new legislation to improve and modernize food safety governance. In the private sector, a number of food enterprises are upgrading their food safety practices to meet international standards, and to be able to cater for the increasing demand.

These improvements are timely and appropriate. While the extent of foodborne risks in Zambia is not fully known, recurrent cholera and typhoid outbreaks, which occur due to contaminated food and water, are common in Zambia and result in significant human and economic costs¹. Also, microbial contamination of food may be one of the major causes of diarrheal diseases, with a high prevalence of around 60 percent of diarrhea among children under age of five². According to the data provided by the Ministry of Health of Zambia, national incidence rate of diarrhea (non-bloody) increased from 79 per 1,000 population in 2010 to 86 per 1,000 population in 2011 and remained constant at 86 per 1,000 population in 2012³.

This report is part of the process initiated at the Global Food Safety Partnership First Annual Conference in Paris in December 2012, when Zambian Ministries of Agriculture and Health approached the World Bank and the Global Food Safety Partnership requesting assistance for assessing Zambia's capacity development needs for improving food safety. A joint FAO and GFSP team worked closely with Zambian counterparts over the period of October 2013-June 2014 to assess the food safety capacity development needs. The final assessment outcome is comprised of two parts. Part I is the National Food Control Systems Assessment using a newly developed FAO toolkit and methodology. This detailed assessment of the food control system has been prepared by the FAO team and Zambian counterparts, outlining the current status of the food safety regulatory framework, and providing recommendations for advancement to next levels to meet internationally recognized frameworks for food safety governance. Part II is the value chains assessment to provide background information for the food value chains and industry structure, and to lay out an action plan for improving food safety for better health outcomes and market access, which is the content of this report.

To this end, this report provides contextual intelligence to the food control systems assessment, by analyzing the value chains and the structure of the food industry, and providing recommendations for targeting selective actions to result in improved food safety governance for the public sector, and improved food safety practices for the food production, manufacturing and retail sectors as well as for consumers.

This report is based on a review of available background materials (**Table 1**) and on discussions with food sector stakeholders in Zambia (see Section 2 for the Methodology). A comprehensive discussion on food

¹ WHO. Food safety and health: a strategy for the WHO African Region (AFR/RC57/4). World Health Organization Regional Office for Africa, Brazzaville, 2008.

² World Bank World Development Indicators.

³ MOH, The 2012 Annual Health Statistical Bulletin

safety issues was kicked off in Zambia in October 2013 during the National Stakeholder Workshop, with participation of a broad range of representatives from government agencies, private sector and consumer and industry associations. Subsequently, the GFSP and FAO teams conducted interviews with partners in Zambia, reviewed the existing legislation and regulatory framework. Follow up visits took place in May 2014, when the FAO team discussed with Zambian counterparts the findings of the food control systems assessment, and in June, when the GFSP team followed up to discuss with counterparts the proposed actions and test the pertinence of these proposals.

After a broad peer review of this report facilitated by the GFSP, the teams intend to launch a final workshop in Zambia to present and adopt the findings and recommendations. In the interim, a consultation took place in Lusaka in June 2015, which involved representatives of various government agencies with the responsibility of food safety control (the list of participants is presented in **Annex II**). During this discussion the report was revised, including revisions in the proposed action plan. It is expected that the report and the action plan could serve as a platform to help guide programmatic inputs of the existing and forthcoming food sector related national budget allocation, private sector investments and donor assistance programs. To this end, the revised report contains a detailed action plan in **Chapter 8** which has indicative costs associated with specific proposed actions. This action plan together with the recommendations from the Part I Food Control Systems Assessment would constitute the broad action plan for food safety system in Zambia. **Annex I** contains a summary table with the proposed actions for easy reference.

1.2. Food Safety in Zambia

Despite the increasing attention by government agencies on food safety, in Zambia general awareness of the population, food businesses and policy makers remains significantly low. Lack of data on foodborne illnesses shifts the urgency of addressing food safety issues as other development priorities put resource pressure on government budget and human resources. This results in unrealized opportunities to improve public health and access to new export markets (**Figure 1**). However, the lack of data on foodborne illnesses is not unique to Zambia. Only a few countries have advanced systems to monitor and report data on foodborne illnesses.

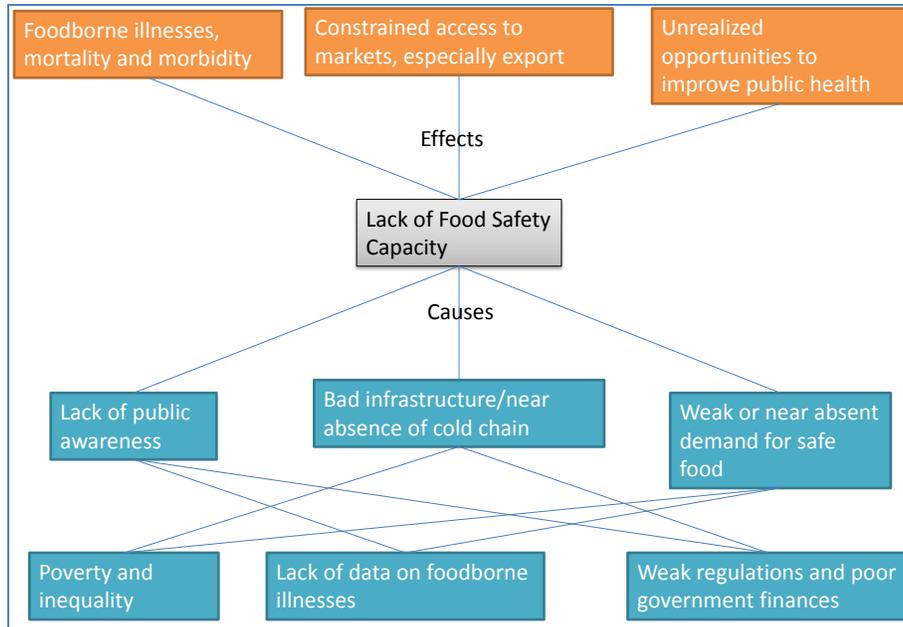


Figure 1. Food Safety Problem Tree for Zambia.

While the overall economic situation in Zambia is improving, with the economy growing at an average of 7% per year in past five years⁴, the persistent poverty and high level of inequality constrain the demand for safe food. Although foodborne illnesses are generally observed in both wealthy and poor societies, the poor tend to suffer more because of the lack of access to basic hygiene and sanitation services⁵. Processing and manufacturing sector in Zambia is not adequately prepared to produce safe food, partly because of lack of awareness, and partly because of lack of good food production practices resulting from lack of skills as well as lack of suitable production equipment. There could also be food safety risks due to the traditions around how food is sold, whereby large segments of population buy food in local markets or small kiosks that generally lack suitable hygiene and sanitation conditions.

Improving overall public awareness of food safety issues would be important milestone for promoting access to safe food. This could be done through advocacy and public communication campaigns, based on realistic assessment of risks caused by foodborne pathogens as well as implementation of good agricultural and manufacturing practices. As such, it is essential to understand the extent to which the foodborne risks play role in the public health. It is a formidable task to attribute foodborne infections to diseases and conditions such as diarrhea, typhoid and cholera. Only few developed countries have spent significant resources to estimate the impact of foodborne illnesses on populations' health and economic development. Nevertheless, improved public awareness supported by data and cost/benefit analyses, can help structure effective government policies and business approaches for improved food safety.

⁴ Economist Intelligence Unit.

⁵ Käferstein, F., and M. Abdussalam. "Food safety in the 21st century." Bulletin of the World Health Organization 77.4 (1999): 347.

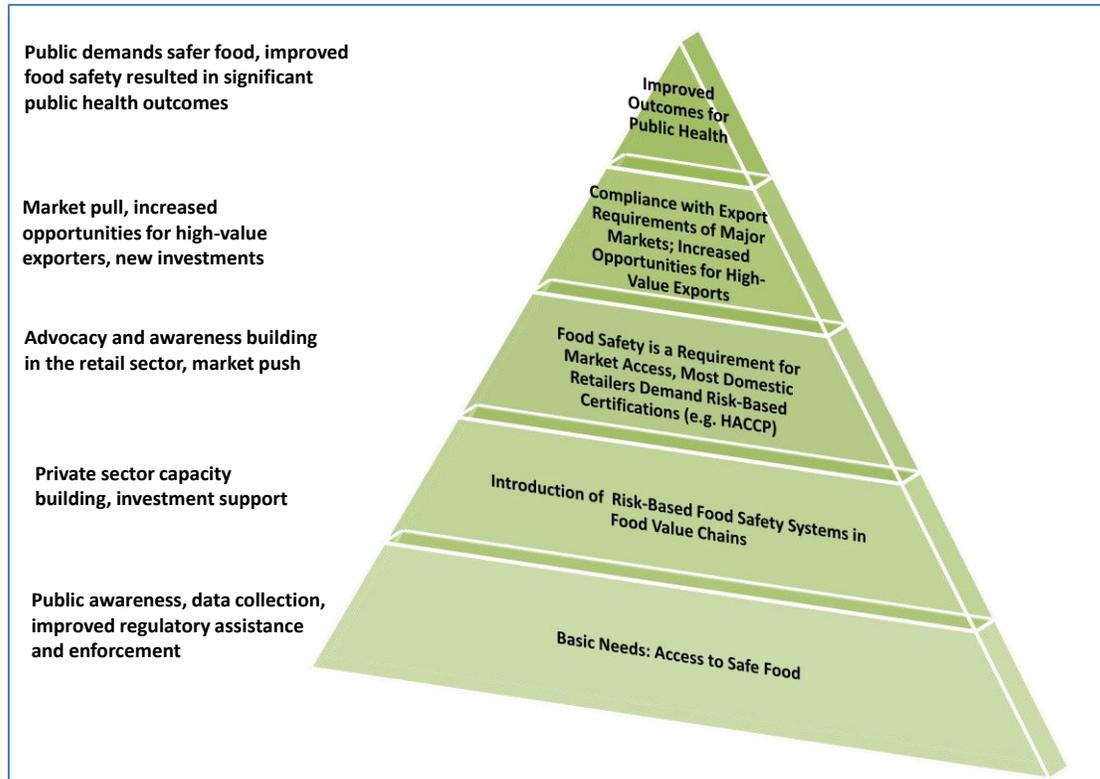


Figure 2. Proposed Hierarchy of Food Safety Objectives for the Government, Consumers and Food Industry in Zambia.

The food safety capacity building process should be based on a hierarchy of objectives⁶ both for the private and for the public sectors (**Figure 2**). This would help develop structured step-by-step approach to food safety capacity building. The first step is to support the public's access to safe food. Unsafe food would worsen the impact of hunger, and exacerbate the consequences of poverty. Food safety is the intrinsic element of food security, and access to safe food is a basic human need required to achieve food security. According to FAO, food security exists when all people, at all times, have physical and economic access to sufficient, safe⁷ and nutritious food that meets their dietary needs and food preferences for an active and healthy life. There are many opportunities for supporting this in Zambia if there is more public awareness of what constitute food safety issues, and how they could be overcome.

There are only few adequate surveillance programs in Zambia that can help estimate the extent of foodborne illnesses, and their impact on public health and economic development. Nevertheless, such surveillance programs are challenging even for developed countries, and not always are able to provide precise estimates of diseases and their impacts. This is partly due to a significant number of cases of foodborne infections that remain unreported. For example, there is not a broad consensus as to whether an episode of diarrhea is considered as foodborne illness or attributed to foodborne factors.

⁶ The analysis here emphasizes food safety only with recognition that other factors, such as food security, nutrition, cultural aspects are very important for promoting public health.

⁷ Underlined by the author

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Therefore, the action plan presented in **Chapter 8** highlights the importance of public awareness as an essential element for promoting food safety in Zambia. However, public awareness alone would not help improve food safety in agri-food value chains, and strengthen the enforcement of public regulations and policies. There needs to be specific and effective activities that could help enhance food safety capacity both at the regulatory and at the value-chain levels. This report and the action plan aim at offering such quick-win ideas, which are results of extensive discussions with counterparts in Zambia. The list of officials, who contributed to this report during a two-day consultations in Lusaka in June 2015, is presented in **Annex II**.

2. Methodology

The report aims to provide contextual intelligence to the food safety capacity development process for Zambia. Assurance of food safety is public-private endeavor depending on the (i) government regulatory framework, monitoring and inspection, (ii) private sector responsibility to ensure safe food for domestic demand and exports, and (iii) consumer awareness of and responsibility for food safety. The philosophy of this approach is to address public and private sector capacity building needs, including producers/farmers, that could help countries improve their competitiveness in the local and global food supply chains and at the same time, ensure the health and safety of their consumers.

The objective of the needs assessment is to use market-oriented approaches for identifying the key food safety capacity development gaps in Zambia, and provide a framework for addressing these gaps, including an implementable action plan and budget. When prepared and agreed with key private and public sector counterparts, this framework can be financed both through government and donor programs and private sector investments. The framework will focus on identifying both public sector and private sector capacity gaps for the agri-food value chains in Zambia, and addressing the questions of how the improved capacity will benefit the public health outcomes in Zambia and improve the market opportunities for its agribusiness companies and farmers.

The assessment of National Food Control Systems was undertaken using the new FAO methodology, and a separate report – Part I – was prepared presenting the results of that assessment. This report – Part II – complements the FAO Assessment report by focusing on the value chains and the structure of the food industry. Figure 3 below describes the step-by-step process for the assessment.

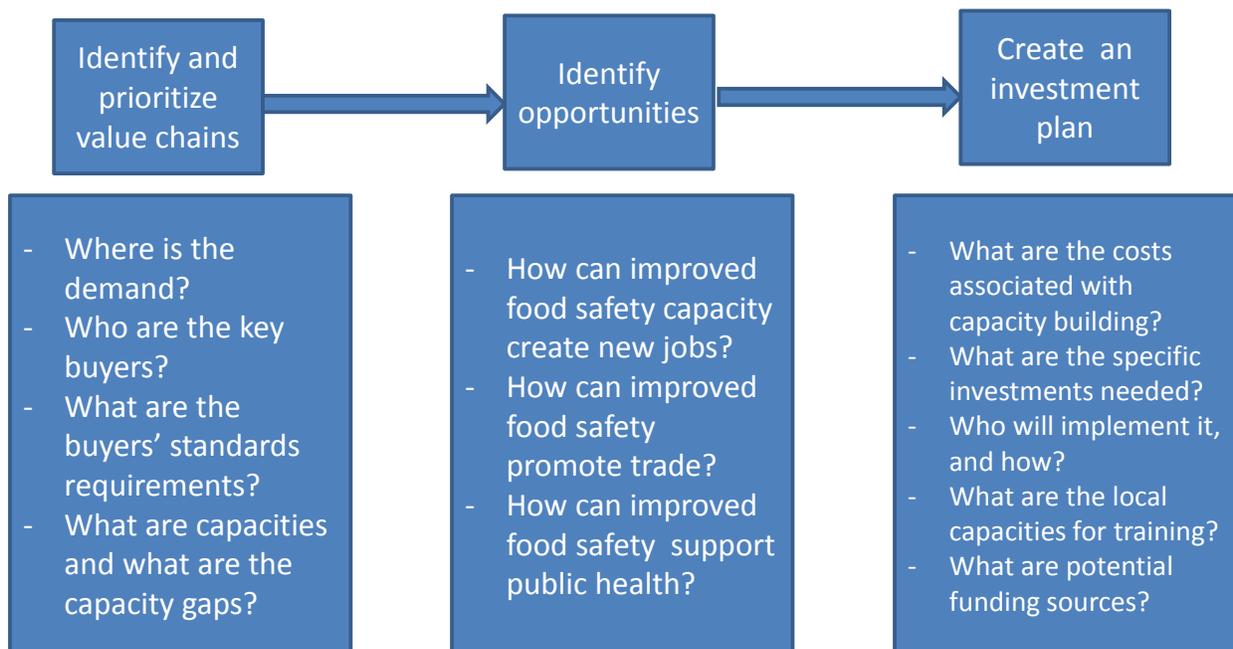


Figure 3. Food Safety Capacity Development Assessment Framework.

The report is the product of extensive discussions and consultations with Zambian food processors and producers, and other stakeholders over a period of two missions in October 2013 and in June 2014. The report has also taken into account a number of previous assessments conducted through various international donor programs over the past several years. The summary of these assessments is provided in **Table 1**.

The main focus of the report is to identify critical actions and recommendations that could result in high impact for improving food safety in Zambia. Food safety is an important development entry point for supporting multiple public health, economic development and better livelihood objectives.

The approach taken for proposed actions is that they should be simple, implementable and should result in quick but comprehensive and measurable impacts. The actions are broken down into short- and medium-term in terms of their viability and implementation, as well as into high and medium priority actions in terms of their importance for contributing to the overall objectives. **Chapter 8** describes the proposed action plan, with a summary of actions presented in **Table 5**. An attempt was made to map the proposed actions with potential funding sources as well, but these are indicative as there are no specific commitments as yet. A detailed mapping of actions is presented in **Annex I**. This action plan has been extensively discussed during the 2-day consultative workshop in Lusaka in June 2015. As presented in the **Annex I**, the action plan captures the results of the discussions and agreements reached within the working group of officials representing various government agencies and academia. The action plan intends to complement the regulatory capacity development action plan produced for the Part I of the assessment, namely the Food Control Systems Assessment Report by FAO.

Throughout the text, the report contains “grey boxes” that represent a more detailed breakdown of selected proposed actions. Not all proposed actions were specified this way mostly due to unavailability of technical information as well as the need for more consultation with stakeholders and counterparts. Going forward, it is expected that detailed specifications would be developed for each action that *inter alia* would include detailed cost estimates.

The structure of the assessment follows the critical elements of the food value chain (**Figure 4**). The arrows in the Figure 4 present the direction of market signals. As presented, the market conditions, including the availability and quality of regulation, determine how food safety is implemented in the food value chain. Sections are organized such that they map the food value chain from “farm to fork”. However, the report starts off with the analysis of the “fork” in **Chapter 3**, namely the market first to open up a discussion on consumption patterns and characteristics that determine the demand for safe food. This sets the stage for understanding the key food safety issues in Zambia, and discussing how overall food safety is perceived by consumers and policy makers.



Figure 4. The Structure of the Value Chain Approach.

Subsequently in **Chapter 4**, the report discusses the structure of the retail industry. Retail outlets are the primary interface between food and consumers, especially in urban markets. This section helps understand specific issues at the retail level. Next, **Chapter 5** focuses on the structure of processing enterprises. The food processing sector is not large for a country the size of Zambia; some processing enterprises are just being established, and overall the food processing sector is not complex and interconnected. **Chapter 6** focuses on transportation and cold storage to describe the structure of this industry. **Chapter 7** focuses on the farming or primary production, analyzing food safety issues at the farm level.

At the end of each section, there is an outlook of future trends discussing how the future developments would be impacting the industry and the food safety issues. This is helpful to keep the report forward looking, especially since most of the proposed actions are expected to be implemented over a period of several years, and on a continuous basis. Each section concludes with a brief summary.

It was originally envisaged that the assessment would focus on selected value chains, and would identify food safety issues at a selected value-chain level. However, after the initial diagnosis of the food industry in Zambia, it appeared that there are no specific issues of food safety that are unique to one or another sector. In fact, at current the food safety challenges are broad and widespread and are common to the entire food industry. Therefore, it was decided that this report would rather focus on the structure of the food industry. Preserving the value chain assessment format was nevertheless useful, and helped identify key challenges at each level of the value chain.

The methodology included open ended unstructured interviews with selected stakeholders in Zambia. The list of stakeholders consulted is presented in **Annex III**. In addition, extensive background research was done through reviewing existing relevant reports on value chains, food safety issues, and broader economic situation. Given the considerable background information available for larger food enterprises, the interviews were selectively conducted with small and medium-scale food enterprises. This helped understand the key constraints faced by this emerging food processing sector. While the regulatory environment is critical in supporting improved food safety practices, it was observed that many small and medium food enterprises face specific issues, such as lack of skills and lack of critical equipment needed to be able to produce safe food. These issues are not direct result of lack of financial resources or access to finance per se, but rather of lack of suitable educational and training programs. Although constraints

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also include lack of investment funds for SMEs to upgrade their food processing infrastructure, as such funds are not widely offered in Zambia.

Table 1. Summary of most recent food safety capacity needs assessments in Zambia.

Organization	Date	Title	Focus	Main objectives	Methodology	Output	Action Plan (Yes/NO)	Cost estimates (Yes/No)
World Bank	2006	SPS Management: Recommendations of a Joint World Bank/USAID Assessment Team	Trade-related matters pertaining to plant health and food safety	Respond to GOZ request to upgrade SPS capacity	Food safety and agricultural health Food Safety and Agricultural Health Assessments and Action Plans	Summary Report and Detailed Annexes	Yes	Yes
OIE	2008	PVS Evaluation and PVS Gap Analysis Report	Animal health and food safety		PVS Toolkit	Report	Yes	Yes
UNCTAD	2006	Investment Policy Review	Trade and Investments	Respond to GOZ request for investment	UNCTAD's Investment Policy review	Report	No	No
FAO	2013	Assessment of the Food Control System of Zambia	Food Safety	Food Control System Assessment	FAO Toolkit	Report	Yes	No
WTO/STDF	2011	Multi-criteria Decision Analysis to Prioritize SPS Capacity Building	Capacity development	Provide structured approach to establishing priorities between alternative SPS capacity-	Multi-criteria analysis toolkit	Report	Yes	
UNIDO		National Survey of Food Inspection Sector Capacity in Zambia	Food Inspection, food control capacity, legislations and enforcement	The report identifies the legal foundation of the Food Inspection and Enforcement system and describes the current food inspection arrangement and analyses its performance in the country including on imports and exports.	Survey and interviews, review of legislation	Report	Yes	No
USAID	2011	Zambia Feed the Future Strategy	Assistance Strategy	Guide FTF country assistance strategy	Strategic document	Report	No	No
RAISE SPS Diagnostic report	2008	Food Sector Transformation and Standards in Zambia: Smallholder Farmer Participation in the Tomato	Research on the food sector transformation in its impact on smallholder farmers, SPS		Interviews, secondary data analysis	Report	No	No
Compete	2009	Staple Foods Value Chain Analysis: Country Report - Zambia	Increasing competitiveness in delivery of staple foods to consumers	The analysis reviews the economic and socio-political framework of agriculture with specific reference to the main crops, but excluding soya, and including pulses and millet with little significance to Zambia.	Review of documents and by distribution of questionnaires with follow-up interviews with farmers, traders, millers, processors and their organisations, NGOs line ministries and regulatory bodies in	Report	Yes	No
Southern Africa Trade Hub	2011	Assessment of Aflatoxin Testing Facilities in Zambia and Malawi	Laboratory capacity assessment	To assess the status of the aflatoxin testing facilities in Zambia and Malawi and their ability to provide commercially acceptable	Laboratory Assessment using assessment checklist	Report	Yes	No
IAPRI (local think-tank)	2013	Value Chain Analysis of the Groundnuts Sector in the Eastern Province of Zambia	Investments in groundnut market development	Primary stages in the groundnut value chain and the constraints limiting the full functioning of the chain	The study is primarily based on a qualitative survey conducted among key actors in the groundnuts value chain in Eastern Province.	Report	No	No
Technoserve	2011	Southern Africa Soy Roadmap – Zambia value chain analysis	Investments in soy market development	N/A	Market analysis, value chain analysis	Report	No	No

3. Market Demand

3.1. Economic Situation

Zambia's per capita income is equivalent to that of lower-middle income countries, however its high level of income inequality (among top 20 in the world), places it at the level of the poorest countries. The rural poverty is around 78%, urban poverty is 27.5%, and income inequality measured by the Gini coefficient is 57.5⁸. The majority of Zambia's population is concentrated in urban areas, because of mining and processing industries that serve as the main source of employment. Nevertheless, unemployment rates are significantly high at 50%⁹. Despite having a vast land and water resources, and considerable production of staple crops, Zambia is very prone to famine outbreaks.

3.2. Food Consumption

According to Hichaambwa et al. cereal staples and livestock products constitute around half of the food expenditures of urban consumers in Zambia¹⁰. While data on the rural consumption patterns are not available, key informant interviews suggest that rural population consumes more cereal staples mostly produced on-farm. The urban population purchases its food in various retail outlets, whereas the rural population mostly consumes own production. Rural population mostly relies on subsistence agriculture for the source of food. Rural households buy a limited quantity of food products, mostly those that cannot be produced on the farm (e.g. vegetable oil). Urban population has obviously more food choices, which are available at the variety of retail outlets. Zambia's main staple food is maize, which combined with groundnuts, milk, poultry or red meats and fish, tomatoes and onions make the majority of diet for Zambians.

Table 2. Food Items Budget Shares by City. Percent of Total Monthly Food Expenditure.

Food Items	Lusaka	Kitwe	Mansa	Kasama
Cereals and Staples	24.0	27.2	27.9	27.1
Livestock/Fish Products	29.5	27.3	26.7	28.8
Fruits/Vegetables	17.2	18.9	15.1	18.2
Total	70.7	73.4	69.7	74.1

Source: Hichaambwa, Munguzwe. *Where Do Urban Households in Zambia Buy their Livestock Products?* No. 132363. Michigan State University, Department of Agricultural, Food, and Resource Economics, 2012.

⁸ World Bank, World Development Indicators

⁹ Need reference

¹⁰ Hichaambwa, Munguzwe, et al. "Patterns Of Urban Food Consumption And Expenditure In Zambia: An Overview Report Based On The CSO/MACO/FSRP Food Consumption Survey In Urban Areas Of Lusaka, Kitwe, Mansa And Kasama, 2007-2008." (2009).

The diet of the majority of Zambia's population is not diversified and has limited options for high nutritional foods. According to FAOStat, maize accounts for 57% of caloric intake on a daily basis. The main national staple food is corn-based meal – nshima. Stunting remains the most common nutritional disorder affecting under five years children in Zambia, above the Sub-Saharan Africa average of 42%.¹¹

3.3. Foodborne Diseases

Currently the data on foodborne illnesses in Zambia is limited, and at times not available. Surveillance programs, if any, are for only those diseases that have significant recurring impact on public health, such as cholera and typhoid, which have by far been the major problem in Zambia with several outbreaks in recent years and high levels of mortality. However, the Ministry of Health investigations to the causes of outbreaks normally and understandably lead to water supply and poor sanitation conditions.

Some intermittent records for food-related contamination exist from environmental health inspectors' surveillance files in restaurants, shops and canteens. However, these records contain information on bacterial counts, which according to interviewees are usually high. The interviewees did not specify what is considered "high" and against which risks these bacterial counts are being measured.

Lack of data on foodborne illnesses is not typical to Zambia. Only few countries, predominantly the advanced economies, have working systems to monitor and report data on foodborne illnesses. A major factor why foodborne illness surveillance has not been as high priority, is that there are a number of other diseases in Zambia that constitute significant public health concern, such as HIV/AIDS, cholera and typhoid. As such, it is possible that the public health sector in Zambia is overwhelmed by the resource pressure these diseases cause, and there are no additional resource and capacity to monitor foodborne diseases. Poor infrastructure, especially water and sanitation conditions, rightly direct most of the government attention to water-borne issues. That is why most diarrhea cases are attributed to water. While the awareness of foodborne illnesses has been increasing in recent years, especially among the affluent urban middle class, there continues to be a general lack of concern that some of the diseases (e.g. diarrhea) may also be a result of unsafe food.

These all point out to the need to understand the extent of impact of foodborne infections on public health. Setting up extensive surveillance programs, when there are resource pressures from other priority public health issues (such as malaria), may not be feasible and advisable in the near term. However, what could work is a system of public-private consultation, when working groups could be tasked to identifying key sources of foodborne illnesses based on consumption patterns of population, perceived exposure rates, information gathered from a variety formal and informal sources. A small commission with expertise in food safety risk profiling could be established, to provide science-based advice to government agencies responsible for food safety management. The commission's expertise could be shared by food safety and plant and animal health services, and it would consist of both public and private sector

¹¹ Sitko, Nicholas, et al. "Technical Compendium: Descriptive Agricultural Statistics and Analysis for Zambia in Support of the USAID Mission's Feed the Future Strategic Review." (2011).

representatives. **Box 1** below summarizes a proposed action point for establishing a public-private consultative commission with expertise in food safety risk profiling.

Box 1. Action 1.1.

Establish a small commission with expertise in food safety risk profiling to provide science-based advice to government agencies responsible for food safety management.

Objectives

Develop approaches to profile or assess food safety risks

Serve as the platform for discussing food safety issues in Zambia and advising the government about public policy options to reduce the risks of foodborne illnesses

Develop food safety capacity building strategies for public sector

Serve as the communications focal point in times of foodborne emergencies

Activities

Discussion of food safety hazards and risks

Authoritative and possibly scientific advice on major food safety risks

Contribution to food safety policy development

Public awareness strategy development

3.4. Risks and Risk Assessment

Research at the International Livestock Resources Institute (ILRI)¹² suggests that there needs to be differentiation between hazards and risks when it comes to food safety. For example, a lot of food sold in open markets in Zambia may contain hazards (bacteria, viruses, parasites, chemicals, and fungal toxins, etc.), which can be observed through basic analysis (e.g. bacterial counts). However the extent to which these hazards transform to risks for human health has not been identified through any research, because of absence of methodologies, data, skills and resources. It is widely acknowledged that cooking methods, for example, may eliminate some microbial hazards as high temperature cooking would kill the bacteria. Nevertheless, not all hazards can be eliminated through cooking, and therefore there needs to be a system of understanding how typical food safety hazards can transform to risks for human health.

In recent years, some risk assessment capacity has been developed in Zambia through donor-supported programs targeting trade and competitiveness. For example, an EU EDES-funded project through COMESA helped establish risk assessment capacity at ZARI to monitor fruit flies for avocados, mangos and grapes,

¹² Grace, Delia. "Agriculture-associated diseases research at ILRI: Safe foods in informal markets." (2011).

targeting potential export markets in South Africa. However, there haven't been initiatives that would look at profiling key foodborne risks for public health because data are not fully available to properly identify the key risks. Data that exist are not attributed to foodborne infections and largely consist of general aggregates.

The fact that data are not disaggregated may point to overall capacity problem in the public institutions to identify and address food safety risks. Nevertheless, a number of other indicators indirectly reveal the extent of the food safety problems in the country and as a starting point, may be useful for developing public policy on food safety. The first such indicator is the prevalence of diarrhea among all age groups. Official figures suggest that the national incidence rate of diarrhea (non-bloody) increased from 79 per 1,000 population in 2010 to 86 per 1,000 population in 2011 and remained constant at 86 per 1,000 population in 2012¹³. Other indicators include life expectancy at birth, which is very low at 57 years¹⁴. Most of the available indicators are connected with the level of economic development of Zambia, and one would expect that with more economic growth these indicators would improve. While there has been some improvement in the indicators over the past years, it is not obvious whether there has been improvement in the food safety.

One way to address risks in the public policy context, is to identify them through a consultative process whereby risks would be characterized based on the diets, population exposure rates, cooking methods, known cases of infections and diseases, and potentially some prioritization exercise. Such consultative process, though not science based, would help highlight key known risks and achieve a broad agreement in a public-private space on how to address these risks. **Box 2** below summarizes a proposed action point for capacity building for risk profiling.

Box 2. Action 1.2.

Build capacity for risk profiling, including risk assessment, management and communication.

Objectives

Develop innovative and cost-effective methods for risk assessment for foodborne illnesses

Understand risks associated with various contaminants

Help reduce risks without jeopardizing sustainable food supply

Carry out risk management and communication campaigns

Activities

Development of a qualitative risk assessment methodology

¹³ MOH, The 2012 Annual Health Statistical Bulletin

¹⁴ World Bank World Development Indicators

Capacity building for risk assessment, including pilot activities

Public awareness and communication campaigns focused on reducing the level of risks in food (e.g. wash vegetables with boiled and chilled water)

3.5. Market Outlook

Economic growth, including growth in population incomes in Zambia does not seem to translate into the demand for safer and higher quality food mostly because of the inadequate public awareness about foodborne illnesses. Zambia has experienced considerable economic growth over the past several years, fuelled by the investments in mining and services sectors. Overall GDP growth forecast is expected to be around 8% over the period of 2014-2016, winding down to around 5% after 2017¹⁵. The population growth is around 2.9%, and unemployment is expected to decrease. It is expected that these developments would lead to increasing demand for food and widening of diet options, especially for the urban population.

Removal of subsidies on major commodities (such as corn) would not probably affect the competition for major commodities as the government's preferential policies would ensure that imports cause limited competitive threat to domestic production. Nevertheless, the growing investments in agribusiness may influence the government's position on exports of corn and other commodities, and may lead to more supportive export policies. Strongly organized domestic constituents, such as industry organizations, put significant pressure on the government to limit imports of key commodities. On one hand, this would help strengthen domestic industries, specifically dairy, poultry and milling, and help address the growing demand for food through domestic production. On the other hand, this would not foster much needed competition to boost the quality and safety of processed food products. In the meantime, the vast agricultural and natural resources, i.e. land and water, and growing investments in agriculture would help improve Zambia's export of food, predominantly staple exports to neighboring countries – Malawi, DRC, Botswana, and Zimbabwe. Expected partial trade and investment liberalization would help expand the supermarket growth.

Since Zambia's main food exports are commodities, and its main export markets are those countries that have food safety enforcement systems similar to Zambia, there is little chance that Zambian exporters would face considerable constraints with exporting maize and other commodities. The main SPS issue would continue to remain mycotoxin/aflatoxin contamination in maize, which is controlled by large milling companies. It is quite likely that the aflatoxin risk would remain due to lack of proper facilities and skills.

Lack of enforcement of generally accepted food safety practices would not probably cause market access issues for domestic producers in domestic market outlets as general public awareness for food safety is limited, and the overall population is very poor and at times is hardly able to afford any food, let alone safe food which may come at some additional cost. However, there is significant public health case for

¹⁵ Economist Intelligence Unit.

improving food safety, as it is without doubt that the current food safety practices (or lack of thereof) are a significant cause of illnesses.

Except for the higher end of the market, where most of the purchases are done through supermarkets, there is no demonstrated demand for higher quality safe food. Unless such demand is created through public awareness and advocacy both for the consumers and public and private sectors, it would be difficult to expect widespread adoption of improved food safety practices in Zambia. There is considerable experience in creating demand for nutritious products supported through donor and government programs through public awareness and advocacy. This experience should be utilized to create demand for food safety.

3.6. Section Summary

The section focused on identifying market conditions that influence safety of the food supply chain. The section illustrated the contextual picture of the agri-food market, and defined constraints for improved food safety. It is difficult to estimate the impact of unsafe food on trade and public health in Zambia, because of lack of data and adequate public attention to food safety. Nevertheless, it is observable that Zambia is underutilizing its potential for agri-food sector development because of the inadequate capacity both in the public and private sector to implement a better food safety control system.

4. Retail Outlets

4.1. Description of Retail Outlets

Zambia has a variety of retail outlets. International supermarket chains are present in major urban areas. Data on the supermarket turnover are not readily available. According to compilation of data from various sources, and based on key informant interviews, annual turnover in international supermarkets may exceed US\$ 210 million¹⁶. However, according to Hichaambwa et al., only around 10-12% of meat and dairy products are sold through supermarkets¹⁷. According to Emongor and Kirsten, around 75% of fresh fruits and vegetables are sold outside of supermarket chains, through open and roadside markets¹⁸.

There are a number of local supermarkets chains, and individual stores, which serve the high- and middle-income consumers; and open markets, which serve the lowest income segment. Additionally, there are small kiosks that sell food and other products in residential compounds. These are considered to serve the middle- to low-income consumers. However, there is no strict delineation of the market segments, as even the highest income groups may at times buy food products in the open markets and vice versa.

4.2. Price and Quality Characteristics

There is considerable price difference for the same type of product sold in various outlets. Supermarkets lead with the highest price almost for every food product. Price of beef in supermarkets is at least 2-3 times above that in open markets. However, in supermarkets one can also buy specific cuts, which have even higher price premiums. The price of Choice Grade steak was around 69 Kwacha/kg, which was equivalent to US\$13/kg.

The prices for locally produced food items in the supermarkets and other stores were slightly lower based on the observations during supermarket visits. However, a study by Emongor and Kirsten notes that for some items supermarket prices were the lowest available (e.g. bread)¹⁹. Observations from supermarket visits suggest that the supermarkets were not used exclusively by the higher-income consumers and there were quite a number of consumers representing middle- and low-income segments.

Food in supermarkets is stored in appropriate refrigerator displays. There are no refrigerators in open markets, food is sold in bulk form either from the ground, or at best from stands. The meat stalls in open markets had very basic conditions, with no refrigeration or cold storage or no protection from flies and insects. Meat in most instances was sold in designated stalls, but which did not have proper sanitary

¹⁶ Supermarkets sales data are not available. This estimate is based on the calculations from publically available figures.

¹⁷ Hichaambwa, Munguzwe, et al. "Patterns Of Urban Food Consumption And Expenditure In Zambia: An Overview Report Based On The CSO/MACO/FSRP Food Consumption Survey In Urban Areas Of Lusaka, Kitwe, Mansa And Kasama, 2007-2008." (2009).

¹⁸ Emongor, R., and J. Kirsten. "The impact of South African supermarkets on agricultural development in the SADC: a case study in Zambia, Namibia and Botswana." *Agrekon* 48.1 (2009): 60-84.

¹⁹ *Ibid.*

conditions. According to people interviewed in the market, the leftover meat is stored at night in a cold storage, where it gets dry. Then in the morning it is brought back to the market for sale. Not far from fresh meat stands, there was a section of live chickens, which were slaughtered on-site at the request of the buyer. There were high risks of cross-contamination, because for instance, all fluids from chicken slaughter ran into a ditch, which went along the vegetable sections, where produce were sold directly from the ground.

There is a large number of stand-alone butcher shops. Some, especially those in urban shopping areas, are clean and demonstrate basic hygiene and sanitary conditions. Some butcher shops visited outside of the urban centers had refrigerating equipment, but did not demonstrate anything close to normal hygiene and sanitary conditions. According to interviews, the animals are slaughtered in designated slaughter stands or abattoirs, which are monitored by the city councils. City councils' officials issue sanitary permits at the slaughterhouses, which were displayed at the butcher shops. Interviewees suggest that butcher shops are the primary and most preferred outlets for meat and fish.

4.3. Storage and Display of Food

Even for the international supermarkets and "higher end" butcher shops the cold storage remains a problem. Frequent electricity outages are normal. While the following examples are not fully representative of the overall situation, they present how electricity outage may influence food safety/quality characteristics. One supermarket visited during October 2013, was closed during the working hours because of the electricity outage. Only one out of three supermarkets visited had the normal clean smell and appearance that one feels when enters a supermarket store. While the displays in supermarkets were similar to that of any supermarket in any other place in the world, some representatives of the processing industry stated that the absence of proper cold storage and handling conditions even in the international supermarket chains creates risks for their products. One of the interviewees noted that he would not buy his own production from the supermarket. Nevertheless, the overall hygienic conditions at the international supermarkets were at much higher level than any other retail outlet visited.

4.4. Supermarket Standards

Normally international supermarket chains would have stringent standards in terms of quality and safety of food items they carry. However, interviews with local processors suggest that there are no such stringent requirements with regards to their products. The only requirement that was commonly acknowledged was the labeling, i.e. the supermarkets required that the product labels contained expiration dates and that they had barcodes.

Such relaxed enforcement of own corporate standards by international supermarkets can be explained with three points. First is that supermarkets claim that they comply with all domestic requirements and mandatory standards issued by ZABS – a minimum requirement for any retail outlet in Zambia. Second is that Zambian government has been encouraging ("requiring") international supermarket chains to

increase stocks of Zambian products sold in the supermarkets. But since most domestic small and medium suppliers hardly can meet the high standards that the supermarkets' normally have, these supermarkets had to relax their corporate food safety practices and standards to meet government requirement to stock products produced in Zambia. And thirdly, Zambian government itself has been applying light enforcement towards food business operators when it comes to food safety, because of the political pressure to encourage growth in employment and economic activity. For example, small and medium processors visited during the trip, who supplied to supermarkets and who were unable to meet any international level food safety requirements, stated that it would not be in accordance with the Government policy to pressure them food safety noncompliance. If the government had to enforce its own food safety requirements, some small and medium FBOs would either be forced out of business or would have incurred significant costs of compliance.

An additional point in this discussions that the Zambian food safety legislation and enforcement is lax and ambiguous, and as such there is a big uncertainty as to how to comply with the government food safety requirements. Therefore, there seems to be a status quo, whereby there is only limited enforcement by the government and limited compliance by FBOs. This may change with the adoption of new food safety regulations, which among others should focus on promoting compliance and helping businesses be more competitive at the same time.

Table 3. Sources of Selected Food Items in Shoprite, Extract from a 2008 study

Commodity	Number and Source of Product			
	Quantity Surveyed	South Africa	Zambia	Other Countries
Breakfast cereals	19	14	5	0
Baby foods	13	10	2	1
Sugar	1			1
Biscuits	20	20		0
Tea	10	5	3	2
Rice	9	5	3	1
Pasta	3	3		0
Soups	9	9		0
Mealie Meal	4		4	0
Total	88	66	17	5
Percent	100%	75%	19%	6%

Source: Muyakwa, Stephen L., Zindikilani Jimmy Daka, and Susan Mwape. Shoprite and the Zambian Economy: A Study on the Linkages between Shoprite and the Local Economy. Centre for Trade, Policy and Development (CTPD), 2008.

Despite the policies to support domestic food products' availability in supermarkets, the majority of processed food products in supermarkets are imported brands or private labels. An anecdotal estimate suggests that around 75-80% of processed food products are sold through supermarket chains are

imported. Most of these imports are from South Africa. On the other hand, most of the basic commodity products, such as meat, milk and dairy products, corn and corn-based local meal (mealie meal) are domestically produced. In addition, Shoprite – the largest South African supermarket chain in Zambia – estimates that around 80% of fresh fruits and vegetables sold in its 19 stores are provided by local growers to the specifications set by the parent Shoprite Group.²⁰ Numerous studies point out that these fresh fruits and vegetables predominantly come from larger farmers.²¹ Small and medium-sized commercial farms usually supply fresh produce to open air markets, kiosks or smaller retail outlets.

4.5. Future Developments

Despite the current overall smaller share of supermarkets in the food retail sector in Zambia, they are expected to grow substantially as the domestic economy grows. With the annual expected economic growth rate of 8 percent over the next 2-3 years, and sustained growth of 5 percent in subsequent years²², Zambia looks like an attractive place for supermarket expansion. This is combined with political stability, relative ease of doing business and favorable security situation compared with some neighboring countries. While no specific data are available on supermarket chains' sales growth rates in Zambia, the indirect data indicate that the annual sales growth in supermarkets was around 9 percent or higher in the past several years – higher than per capita income growth²³. This suggests a favorable market environment for supermarket expansion.

While foreign, especially South African supermarket chains are expected to expand their sales in Zambia, it is not clear whether this expansion would influence the introduction and enforcement of higher food safety standards. The supermarkets would continue to maintain a larger share of imported processed food products, especially private labels produced in South Africa. Most of the expansion of locally sourced products is expected in the fresh and commodity products sales, such as fresh meat, fish, milk and dairy, fruits and vegetables, corn and corn-based meal. Nevertheless, the supermarkets would be expected to comply with the Zambian government's pressure to stock more Zambian-made food products. While Shoprite and Spar did not have such specific requirements when their investments were approved, PickNPay – a relatively new entrant – has a special clause in its investment plan that mandates local sourcing. According to key informant interviews, this mandate is around 50-60% of the total sourcing.

It is unavoidable that the supermarket chains would move towards sourcing more locally produced food products. First, because local sourcing makes better business sense than importing, especially that most of the products with high demand can be produced locally. Second, because the Zambian government's strong position that foreign supermarket chains must source substantial share of their products locally. As such, the supermarkets would be introducing training and capacity building programs to help their

²⁰ Shoprite Integrated Report 2012

²¹ Crush, Jonathan, and Bruce Frayne. "Supermarket expansion and the informal food economy in Southern African cities: implications for urban food security." *Journal of Southern African Studies* 37.4 (2011): 781-807.

²² Economist Intelligence Unit.

²³ This is based on a "back-on-the-envelope" estimation by comparing consumption growth in Zambia with available information about supermarket expansion from annual reports of Shoprite, Spar and PickNPay

suppliers meet some basic food safety requirements. One supermarket chain expects to introduce routine food safety audits among its Zambian suppliers to ensure their continuous compliance to at least GFSI Global Markets Protocols. At the current level of development of the small and medium agri-processing enterprises, such compliance would be difficult.

For the near-term, supermarket expansion would not immediately transfer to more stringent food safety standards. Experience from other countries suggests that such stringent standards are a result of food safety related scares, supermarkets' desire to cater to specific niche demand, or food producers' desire to increase shelf life of products. Moreover, improving food safety compliance in the private sector is not possible without an enabling regulatory environment created by the public sector. At this stage, the public sector is unable to deliver effective enforcement of food safety requirements, which may complicate supermarkets' push for improved food safety standards. Nevertheless, the supermarket expansion will improve the cold storage and display of fresh produce.

4.6. Section Summary

The main focus of this section was to describe how the retail trade for food products is organized in Zambia, and what main retail outlets cater food to Zambian consumers. Open markets and so-called informal retail channels constitute the main retail outlets for Zambian consumers. While supermarket expansion is taking place slowly, it has not yet translated into more stringent requirements for food safety. The new supermarkets offer more hygienic conditions for display and sale of food, but their pressure on local agri-food producers to improve food safety has been minimal. This is going to change in the medium-term, when the international supermarket chains would be insisting on more stringent food safety standards for their local suppliers. Food safety pathways, such as GFSI Global Markets Program (GMP), would be a model of choice for most supermarkets wishing to improve the supply of locally processed agri-food products.

5. Transportation and Cold Chain

Major food safety risks may occur during transportation and storage. A few large companies, such as millers and feed producers, have state-of-the-art storage facilities, where they are able to control humidity levels, eliminate pest infestations and reduce other hazards. However, predominant number of small- and medium-size food business operators lack proper storage facilities. Some facilities visited had their storage section either next to the production/filling lines or just outside under a shed. Unless cold storage is a part of the technological process, as in a case of a dairy operation, it is not available. Several processors noted that they had to add preservatives to the otherwise pure or “organic” product to be able to preserve it for a long shelf life. While an analysis has not been done of the extent of use of preservatives, observations suggest that it could potentially be at high levels.

5.1. Packaging

Part of the problem of adding high levels of preservatives is the lack of good packaging material, and lack of proper thermal processes at the manufacturing facilities. Cooling and sterilization equipment at the small and medium processing facilities is nearly absent. This section focuses on the packaging materials and the next session will discuss the equipment problem. With regards to the packaging materials, most of the food business operators use purchased pre-manufactured plastic cans, jars and bottles. Supposedly, these come already sterile in sterile packages. Since there are no reported cases of foodborne outbreaks, such as salmonella and E. Coli or even botulism, it is difficult to judge as to whether such practices have any large health impacts.

5.2. Transportation and Cold Chain

A few large processors have their own transport fleet, including small and medium sized refrigeration trucks that deliver products to the retailers. These mostly include large dairy, beverage and some meat processors. Some dairy processors also have set up a network of small refrigerators placed in various retail outlets throughout the country, where they exclusively position their products. Some small processors also try to catch up with this trend, but of course capital constraints restrict access to markets.

Supermarket chains and larger stores are equipped with refrigerators and coolers. Meat and dairy products in these stores are presented and sold through refrigerators. Smaller kiosks usually don't have refrigerators, unless provided by the processor. There are no refrigeration facilities in open markets, especially at the meat stands. This is where the majority of food retail is conducted.

5.3. Section Summary

This section described the situation with regards to transportation and cold chain. Frequent power outages, bad road infrastructure and overall lack of vehicle fleet, make food transportation a critical point for food safety related risks.

6. Agri-Food Processing Enterprises

6.1. Current Situation

From the food safety perspective, processing enterprises in Zambia can be grouped in two categories: (i) large enterprises with procedures in place to determine and address food safety risks, and (ii) small and medium enterprises with no or limited food safety procedures in place. There are handful of large enterprises which are either subsidiaries of multinational companies or local companies with foreign ownership. Based on the observations, the food safety procedures in these enterprises are maintained because of (i) reputational risk to the parent; (ii) food safety, as well as biosecurity, is the essential part of the production process; and (iii) lack of food safety can affect the bottom line. These large enterprises have access to international training resources, including in-house corporate training teams and outside courses. They also have sufficient resources to address any food safety risks that may affect their production processes.

6.2. Food Safety Capacity

The major lack of capacity for food safety is observed in small or medium enterprises. A study in 2006²⁴, conducted during the joint World Bank/USAID review of the food safety systems in Zambia, evaluated food safety systems and processes in 15 food business operators (FBOs) (including some international hotels). The study assigned qualitative scores to compare the FBOs compliance with basic GMP requirements. The average scores indicate that the FBOs have at least a minimum level of functionality of food safety systems, and demonstrate basic competence in food safety. Most of them have the capacity to implement HACCP, subject to additional training and resources.

²⁴ Abegaz, Mulat. "Assessment of the Capacity of Food Safety and Quality in Zambia." (2006). Annex 3 Working Paper for the "Zambia: SPS Management. Recommendations of a Joint World Bank/USAID Assessment Team". July, 2006.

Table 4. Evaluation of the overall status of Visited Food Industries in Zambia. Evaluation points: 0 (minimum) to 5 (maximum) average points²⁵

	Basic Requirements of GMP	Enterprises Visited in 2006/Score														Summary Scores		
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	Mean	Median
1	Structure and Fabrication	4	4	4	2	3	3	2	3	2	1	1	1	1	1	2.2	2	1
2	Storage Facilities				2	3	3	2	3	3	2	2	2	1	1	2.1	2	2
3	Raw Material	2	2	2	3	3	2	3	3	3	2	2	2	2	2	2.3	2	2
4	Process				3	3	4	3	2	2	2	2	2	2	1	2.3	2	2
5	Equipment/Machinery																	
5	Personnel Standards	3	3	3	3	3	2	3	3	2	2	2	2	1	2	2.3	2	3
6	Food Handling Practices				3	3	2	3	2	2	1	1	1	1	1	1.8	1.5	1
7	Quality Assurance	3	3	3	4	3	2	3	1	1	1	1	1	2	2	2.1	2	1
8	Pest Prevention	4	4	4	2	2	2	2	2	2	2	2	2	1	1	2.2	2	2
9	Cleaning Systems	4	4	4	2	3	3	2	2	1	2	2	2	1	1	2.3	2	2
10	Management Control	3	3	3	4	3	3	3	2	2	2	2	2	2	1	2.4	2	3
11	Capacity to Implement HACCP	3	3	3	3	3	3	2.5	2	2	1	1	1	1	1	2.0	2	3

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

Source: World Bank/USAID

Box 3. Action 3.1

Establish sustainable in-country food safety training capacity. Trainings in prerequisite systems, such as Good Manufacturing Practices or Good Hygiene Practices could serve as a starting point for such food safety capacity, which could also expand to include certification systems, such as HACCP .

Objectives

Improve access to food safety/HACCP training for the agri-processing sector

Build domestic capacity to deliver basic and timely training

Improve food safety practices at SME agri-processing sector

²⁵ *Ibid.*

Activities

Establish customized and adaptable curriculum for food safety/HACCP training

Identify a local group of trainers based in a university or industry/professional association

Conduct several pilot trainings with international and local trainers

Develop a sustainable model for training delivery

6.3. Constraints to Better Food Safety Practices

Interviews and observations during October 2013 and June 2014 missions reinforce findings of the World Bank/USAID review of 2006. In addition to these findings, however, three specific issues influence the implementation of better food safety practices in Zambian small and medium enterprises. These issues are:

- (i) Limited in-country training capacity for food safety;
- (ii) Most of the small FBOs lack basic equipment for thermal processes (such as sterilization, cooling, filling, packaging equipment);
- (iii) Frequent power outages constrain implementation of good manufacturing practices.

Lack of proper thermal processes and associated equipment is predominantly observed in small food processors, such as those manufacturing various sauces and peanut butter. These are the type of businesses that have considerable potential for growth as the Zambian economy grows and affluent buyers demand more good quality products. In addition, such manufacturers have the potential of exporting unique products to neighboring and distant markets. What constrains them currently, from the food safety perspective, is the lack of control over the technological process. Some manufacturers noted that they had to recall batches of their products because of a layer of mold developed after few days on supermarket shelves.

The World Bank/USAID assessment of enterprises shows that most of the enterprises visited have the capacity to implement HACCP or other risk-based food safety systems. One of the enterprises visited during the assessment mission in June demonstrated full understanding of critical control points (CCPs). These were identified in the food safety plan. However, the manager was not able to fully control these CCPs because of the lack of basic cooking/chilling equipment.

Box 4. Action 3.3

When there is strong public benefit, develop, in cooperation with banks and investment partners, financial tools (loans, guarantees and grants) to upgrade supply chains, buildings, and processing equipment and to introduce HACCP and other management tools needed for modernizing agribusinesses.

Objectives

Improve compliance with good manufacturing and hygiene practices

Demonstrate the impact of improved food safety on increased access to markets

Help introduce good manufacturing practices in the Zambian agr-food processing sector

Activities

Develop a specific list of equipment (e.g. cooking/chilling equipment, pasteurization equipment etc.)

Conduct investment analysis to demonstrate impact

Identify funding sources

6.4. Sector Outlook

The agri-food processing sector in Zambia is growing, fueled by increasing incomes of consumers and overall positive economic outlook for the country. In addition, the government's increasingly export oriented monetary policies, including depreciation of kwacha, put pressure on imports and encourage investments in domestic processing sector. Zambia's vast natural resources, good climate and private investments in primary production create a good environment for new private investments in the agri-processing sector. At the time of the June mission, key informants suggested that a large multinational company is investing in local dairy infrastructure to introduce new line of dairy based soft drinks.

There are a number of subsidiaries of multinational food companies operating in Zambia. These companies and other new entrants are expected to introduce food safety a culture in the Zambian agri-processing sector. However, without significant support, small and medium food enterprises' compliance to modern food safety practices would be very difficult. Partly because such SMEs have significant capital constraints and lending by the local banks remains prohibitively expensive. It is expected that supermarket chains would introduce capacity building programs for their local suppliers in order to help them meet basic food safety practices. This would largely be driven by the Zambian government's push to source locally. However, since the majority of the retail sales are outside of the supermarket sector, these programs would not have any impact on large availability of safe food products.

Therefore, to establish an enabling environment for widespread availability of the safe food, there needs to be increased support to the public sector to improve food safety enforcement, as well as increased support to private sector for more compliance. Additional incentives, such as improved access to food safety training resources would help create domestic human resource base to respond to these new developments.

6.5. Section Summary

The section presented the situation in the food processing industry in Zambia, and the main issues with regards to food safety practices. It highlighted that the small and medium enterprises face the most

challenges, because of the costs involved in adopting better food safety practices, as well as because of lack of training resources and expertise to implement good food safety practices in these enterprises. The section argued that going forward, food safety issues would gain more importance among the consumers and retailers, which would result in need to improve the current practices.

7. Primary Production

7.1. *Agriculture in Zambia*

Despite its vast natural land and water resources suitable for agricultural production, only a fraction of land resources is cultivated in Zambia. More than half of land in Zambia is considered arable, but only 14 percent of that is cultivated. Of this, about 40 percent is used for production of maize, which accounts for 3/4 of crop production in Zambia.²⁶ Zambia's 1.6 million farmers comprise around 70 percent of its labor force. These are predominantly small-scale farmers. Around 3/4 of all maize growers are considered subsistence farmers. Most of the commercial farming is concentrated within 1,000 large-scale industrial farms that sell their output both throughout the country, as well as participate in exports.

Small-scale farming systems in Zambia are overwhelmingly dominated by maize. More than 80 percent of all smallholder farmers grow maize. Cassava is the second most important staple food crop confined to the north and northwestern parts of Zambia. Groundnuts are the second most widely cultivated crop in Zambia and important source of protein in Zambian diets, are frequently intercropped with maize. In Zambia, groundnuts are often considered a women's crop due to their importance for home consumption.²⁷

In Zambia, 2 percent of small-medium scale farmers produce roughly 50 percent of the country's total maize supply. A further 19 percent produce the other 50 percent of surplus maize in Zambia. Despite the high prevalence of maize cultivation in rural Zambia, 36 percent of rural households are in fact net buyers of maize. These farmers tend to control smaller farm sizes and tend to be located in more marginal agro-ecological zones.²⁸

7.2. *The Structure of Fruit and Vegetable Production*

There are only handful of large farms that concentrate on fruit and vegetable production; majority of the production takes place in smaller farms. However, it appears that fruit and vegetable production is commercialized, in that the farmers tend to sell the majority of the produce rather than to retain for their own consumption. There is limited export of fruits and vegetables. There is only one commercial farm that is able to export to Europe, predominantly green beans and peas. This farm has all the required

²⁶ World Bank. 2009. Zambia - Commercial value chains in Zambian agriculture: do smallholders benefit? Washington, DC: World Bank.

²⁷ Sitko, Nicholas, et al. "Technical Compendium: Descriptive Agricultural Statistics and Analysis for Zambia in Support of the USAID Mission's Feed the Future Strategic Review." (2011).

²⁸ *Ibid.*

certifications for access to British supermarket chains, such as Tesco and Sainsbury (Global GAP, BRC, others).

Tomatoes and onions are probably the most widespread vegetables available both in local markets and supermarket stores followed by potatoes, cabbage and some local green vegetables. Because of its agro-ecological conditions, Zambia can grow these vegetables year-round, and therefore the fresh vegetables are available all the time in the marketplace.

Currently only two or three enterprises process fruits and vegetables into various chutneys, sauces and juices. However, these enterprises prefer to import concentrates and purees from China or South Africa, than procure fresh produce locally. There are two reasons for this. First is that local supply is unpredictable and the processors have no capacity to build a local supply chain. Second is that the processors have no suitable equipment to be able process and store concentrates. If more investments in the processing sector occur, we would see more shift to local procurement of fresh produce.

7.3. The structure of Meat Production

Despite its large land resources Zambia has very few cattle. As such, most of the beef production is commercial, and quite well organized. Beef cattle are owned predominantly by medium to large farmers, who either own grazing land or grow feed. These farmers normally raise the cattle from birth to around 200 kg weight, and then sell to feedlots. There are a number of medium to large sized processing companies that own feedlots, but most of the feedlots are owned by specialized farmers. The feedlot system is an essential element from the food safety point of view. Key informant interviews suggest that during the feedlot process, efforts are made to make cattle “look nice”, i.e. attractive for potential buyers. The cattle also undergo vaccinations and treatments necessary to keep them healthy. In the feedlots, the cattle are fed locally produced feeds on the basis of maize. Use of veterinary drugs, supplements and antibiotics is not effectively controlled or monitored neither by government inspectors nor by farmers themselves. Widespread use of tetracycline as a growth promoter or as a “cure for any condition” is a major issue. Key informants suggested that farmers use tetracycline to eliminate any symptoms, without proper diagnosis or properly understating the animal’s condition.

The government has a targeted program for cattle diseases that focus on economic diseases such as FMD and CBPP. Control of zoonoses, such as tuberculosis or brucellosis, while still within the government’s disease control program, is not a priority area and therefore at times underfunded.

7.4. The Structure of Poultry Production

The most of the poultry production in Zambia is done through outgrower schemes, where large hatcheries produce day old chicks and sell them to farmers, who then grow these chicks. Zambians prefer to buy chickens alive, and slaughter either at the market or at home. Therefore most of the poultry is sold live. Some large poultry operations have integrated supply chain, including slaughter facilities. Packaged chicken meat, including various cuts, and frozen and fresh, with premium prices is sold predominantly in

supermarkets. Eggs are sold both in supermarkets and open markets, and are considered as important source of protein for both urban and rural population.

Commercial poultry operators control standard bio-safety procedures, and ensure vaccinations and treatments. However, the extent of antibiotics and other drugs use is unclear. Feed is produced in Zambia through several milling companies.

7.5. The Structure of Dairy Production

Dairy production is relatively small in Zambia but represents significant potential for growth. There are currently 26 milk collection centers across the country that collect milk from smallholder farmers and then sell to large or medium-sized dairy producers. A number of large dairy producers are investments by multinational companies. The key output of the dairy industry is either milk and/or fermented beverage products. Market demand for such products is increasing. Therefore, one large multinational is establishing 11 additional milk collection centers in remote areas in order to source its own products.

Food safety requirements for milk boil down to microbial counts. The convention in Zambia is that microbial counts above 100,000 are considered unacceptable. Milk collection centers claim that they monitor this each time the milk is supplied, but there it is not clear how this is done. It is not also clear why microbial counts are considered as the main indicator for food safety, but presumably this is a convention that has been used traditionally. Using a single microbial count threshold for all milk may be justified because the drinking milk constitutes the majority of all dairy sales. However, with the increase of sales of other dairy products, such as yogurts, creams etc., this threshold would be considered too restrictive. International experience also suggests that such single thresholds create more opportunities for fraud and adulteration, and reduce incentives for proper food safety testing.

7.6. The Structure of Groundnut Production

Groundnuts are normally intercropped with maize and are considered important crop for Zambia. Groundnut-based meals constitute major part of the diet for Zambians. At current, the groundnut production is predominantly smallholder-based. There are no large groundnut processing enterprises. Most of the peanut butter production is done at household level for own consumption and maybe for surplus sale. There are a handful of enterprises that produce peanut butter, and their products sell in major supermarkets. The key issue with groundnut production is aflatoxin contamination.

8. Action Plan

A key constraint for Zambia to overcoming current food safety threats and to meeting new opportunities for growth for food industry is the inadequate public awareness that foodborne pathogens, bad hygiene, poor sanitation and the resulting foodborne illnesses can cause significant burden on public health, and can constrain economic development. Much of the country's legal, regulatory, and institutional framework is able to support efficient food safety management by the public sector, though significant changes would be required (including capacity building) to introduce more modern and risk-based food safety inspection and regulatory system. Public services are overwhelmed by the pressure from other development priorities, and foodborne illnesses do not receive high enough attention at the senior levels of policy making nor within the business community. Shifting to a risk-based food safety regulatory system could help Zambia improve its public services, more effectively allocate scarce human and financial resources within its government departments, and improve the effectiveness of the control of the food system.

While basic laws need to be modernized to facilitate the shift to a system based on international best practices, more needs to be done to improve the current day-to-day practices both in the public and private (manufacturing, retail) sectors for both domestic and export markets while better protecting the human, animal, and plant health that sustains the viable food industry.

The action plan addresses food safety objectives in a hierarchical way. In the current context, two objectives that must be implemented over the short- to medium-term are: (i) to improve access to safe food; and (ii) to introduce risk-based food safety management systems in food value chains (see **Figure 2**). It is believed that these objectives, if addressed, would help improve public health and would help promote more economic opportunities for food enterprises. As suggested in **Figure 2**, the food safety capacity building process should be based on a hierarchy of objectives both for the private and for the public sectors through a structured step-by-step approach to food safety capacity building. The first step is to support the public's access to safe food. Unsafe food would worsen the impact of hunger, and exacerbate the consequences of poverty. Food safety is the intrinsic element of food security, and access to safe food is a basic human need required to achieve food security. There are many opportunities for supporting this in Zambia if there is more public awareness of what constitute food safety issues, and how they could be overcome

To address these objectives, the action plan is structured in three sections: (i) Public-private partnerships; (ii) Public Awareness and Public Policy Support; and (iii) Private Sector Support.

1. Public-Private Partnerships

Public-private partnerships for food safety capacity building are important ways of facilitating public dialogue and creating enabling environment for change, especially when it concerns to food safety which is shared responsibility between public and private sectors. As such, a set of actions is proposed to set up

a dialogue and consultation process for public and private sector actors in Zambia, to identify and agree on the ways of addressing key food safety risks.

Action 1.1. Establish a small commission with expertise in food safety risk profiling to provide science-based advice to government agencies responsible for food safety management. (see **Box 1**).

Action 1.2. Build capacity for risk profiling, including risk assessment, management and communication (see **Box 2**).

Action 1.3: Design a support project to enhance the role of consumer, trade, and business associations in promoting food safety at the retail level.

2. Public Awareness and Public Policy Support

Currently public awareness that foodborne infections can create significant public health and economic development problems in Zambia is very low. The public policy process is not supported by sufficient data on human and economic costs of foodborne illnesses. The proposed actions provide support in establishing a policy process that prioritizes food safety issues based on available information about foodborne illnesses and their impact on human health.

Action 2.1: Establish a system to determine the number and types of cases of foodborne illnesses annually, through data collection and analysis.

Action 2.2: Assess and improve programs for human and animal health monitoring with regards to food safety. These monitoring programs should provide food safety and animal health managers with information needed to focus their efforts on new and evolving priorities.

Action 2.3: Promote consumer and producer awareness about public health, food hygiene, and food safety.

3. Private Sector Support

Most private companies can benefit from assistance to upgrade buildings and processing equipment and for cleaning and disinfection to improve overall quality and safety management systems. The need also exists for supporting the development of coordinated supply chains that may improve compliance with safety and quality standards. Water quality is a major constraint for food safety and the competitiveness of the food industry.

Action 3.1 Establish sustainable in-country food safety training capacity. Trainings in prerequisite systems, such as Good Manufacturing Practices or Good Hygiene Practices could serve as a starting point for such food safety capacity, which could also expand to include certification systems, such as HACCP (see **Box 3**).

Action 3.2: Improve water treatment for overall hygiene and safety in food processing plants.

Action 3.3: When there is strong public benefit, develop, in cooperation with banks and investment partners, financial tools (loans, guarantees and grants) to upgrade supply chains, buildings, and processing

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equipment and to introduce food safety systems (e.g. GMP, GHP, HACCP) and other management tools needed for modernizing agribusinesses (see **Box 4**).

Action 3.4: Strengthen the focus on public advocacy campaigns to highlight the importance of food safety in water sector investment and water quality monitoring).

Action 3.5: Establish Zambia Assured Good Agricultural Practices standard, and implement GAP capacity building programs for farmers and cooperatives.

Annex I. Zambia: Action Plan for Food Safety Management

Recommended Actions	Time Frame	Priority	Agency Involved	Estimated Costs (US\$)	Related Assistance Programs
1. Public-Private Partnerships					
Action 1.1. Establish a small commission with expertise in food safety risk profiling to provide science-based advice to government agencies responsible for food safety management. (see Box 1 for detailed description).	Medium-term	High	MOAL, MOH, Business Associations, DAZ, PAZ, BAZ	250,000	
Action 1.2. Build capacity for risk profiling, including risk assessment, management and communication (see Box 2 for detailed description).	Short-term	High	MAL, MoH, MCTI, MLGH, Academia, Industry, Consumer Association		
Action 1.3: Design a support project to enhance the role of consumer, trade, and business associations in promoting food safety at the retail level.	Short-term	High	MAL, MOH, ZABS, Business Associations	250,000	
2. Public Awareness and Public Policy Support					
Action 2.1: Establish a system to determine the number and types of cases of foodborne illnesses annually, through data collection and analysis.	Short-term	High	MOH	500,000	
Action 2.2: Assess and improve programs for human and animal health monitoring with regards to food safety. These monitoring programs should provide food safety and animal health managers with information needed to focus their efforts on new and evolving priorities.	Medium-term	High	MOH, MOAL	150,000	

Action 2.3: Promote consumer and producer awareness about public health, food hygiene, and food safety.	Short-term	High		350,000	
3. Private Sector Support					
Action 3.1 Establish sustainable in-country food safety training capacity. Trainings in prerequisite systems, such as Good Manufacturing Practices or Good Hygiene Practices could serve as a starting point for such food safety capacity, which could also expand to include certification systems, such as HACCP (see Box 3 for detailed description).	Short-term	High	MOA, MOH, UNZA, ZIFoST, CBU, ZAM, ICBs	500,000	
Action 3.2: Improve water treatment for overall hygiene and safety in food processing plants.	Medium-term	High	GOZ	1,000,000	
Action 3.3: When there is strong public benefit, develop, in cooperation with banks and investment partners, financial tools (loans, guarantees and grants) to upgrade supply chains, buildings, and processing equipment and to introduce food safety systems (e.g. GMP, GHP, HACCP) and other management tools needed for modernizing agribusinesses (see Box 4 for detailed description).	Short-term	High	MOAL	2,500,000	
Action 3.4: Strengthen the focus on public advocacy campaigns to highlight the importance of food safety in water sector investment and water quality monitoring).	Long-term	Medium	MOAL, MOH, Business Associations	150,000	
Action 3.5: Establish Zambia Assured Good Agricultural Practices standard, and implement GAP capacity building programs for farmers and cooperatives.	Long-term	High	GOZ	500,000	

Annex II. Participants of the Interim Consultation

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Annex III. List of Persons Interviewed

Name	Organization	Industry
Sylvester Kalonge, Emanuel Gondwe and Samuel Gondwe	USAID/PROFIT+	Donor supported project
Mukayi Musarurwa	UNIDO and ITC	Donor supported project
Luke Potter and Chitundu Kasase	Technoserve	Donor supported project
Sriram Rama Krishnan	York Farm Ltd.	Food production
Richard Keeley	Hybrid Poultry Farm	Food production
Peter Nieuwoudt	Jungle Beat Ltd.	Food processing
Khama Mbewe	Lumuno Organic Farms	Food Processing
Asif Essa	Dairy King Ltd.	Food processing
Damian Roberts and Brent Stubs	Capital Fisheries	Food processing
Brian Goodwin and Rosie Mercer	Rivonia Ltd.	Food processing
Dale Lewis	COMACO	Food processing
Nick Sitko	Indaba Agricultural Policy Research Institute	Research
Jeremiah Kasalo	Dairy Association of Zambia	Industry association
Maybin Nsupila	Zambia Manufacturers Association	Industry association
Dominic Chanda	Poultry Association of Zambia	Industry association
Christopher Hara and Stephen Mazemba	Quality Management Association of Zambia	Industry Association
Paul Chale	Independent Consultant/Zambia Association of Food Science and Technology	Expert
Groundnut and dairy farmers in Chongwe	Individual small farmers	Food production