

Awakening from the listeriosis crisis: food safety challenges, practices and governance in the food retail sector in South Africa

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Highlights

1. Disease outbreaks and lack of regulation are key food safety concerns in South Africa
2. Food safety governance is provided by 3 government departments and poorly coordinated
3. Food safety in the food retail sector does not always abide by the regulations
4. The current food safety system in South Africa does not ensure population health
5. Effective regulation and an outline of who is responsible for enforcing them is needed

Abstract

Background: The recent listeriosis outbreak in South Africa brought food safety concerns to the fore in terms of both policy and practice. These concerns encompass both health and nutrition aspects, as well as the economy, because the food system in South Africa contributes significantly to economic growth and food security. However, the food sector is challenged with food safety risks, such as foodborne diseases, food fraud and a general lack of effective enforcement of regulation. The inability of government to effectively regulate the food sector is a contributing factor to increased food safety risks. Focusing on the formal sector, which is subject to regulation, this review provides an overview of the current state of food safety policies and regulations, food safety challenges, and food safety practices in the food system, after the listeriosis crisis of 2017 and 2018.

Method: This study used a systematic process to review three sets of data in South Africa: food safety related public policies and regulations, company reports (2013-2018) and media articles (May 2017-May 2018). Food safety policies were selected from a food system policy database created by the research team. The company reports were retrieved from their websites. Factivia was used to search for the media articles. The data were thematically analyzed. The analysis framework was informed by the Food and Agriculture Organization's (FAO) food safety risk analysis. Activities related to food safety risk analysis: risk assessment, risk management, and risk communication were searched for in each material included in the study.

Results: Seventy-four documents made up of 13 policies, 47 media articles and 15 company reports were reviewed. Food safety is regulated by three governments departments: Department of Health (DOH), Department of Agriculture, Forestry and Fisheries (DAFF), and Department of

Trade and Industry (DTI) through bylaws and regulations. The departments are directly (DAFF) or indirectly (DOH through municipal or metro Environmental Health Professional) involved in food safety enforcement, surveillance, and education. The enforcement of different regulatory processes is often poorly coordinated. Responding to this regulatory environment, food safety activities of the food retail industry include a self-regulatory system reliant on internal and third-party food audits, worker training, external testing, and consumer education. Given this fragmented framework and the lack of interaction, it is clear that the governance of the South African food safety system is not “fit for purpose” in that there is a gap in the effectiveness of government regulation and the self-regulation of the formal sector, and a growing risk from an inability to regulate the large informal sector. Food safety challenges identified in our analysis included disease outbreaks, concerns over mislabeling, and lack of regulation for food handling and distribution.

Conclusion: The findings suggest that there should be a combination of responsibility from all levels of stakeholders in the food retail sector in order to improve food safety and prevent food safety breaches. In addition, strong governance of the food safety system is required to enable effective legislation and enforcement.

Keywords: Food safety, food policy, food retail, listeriosis, South Africa

1. Introduction

Listeriosis is caused by eating food contaminated with the bacterium *Listeria monocytogenes* (*Lm*) (Gelbí, Zobaníková, Tomá, Walle, & Ruppitsch, 2018). Between January 2017 and March 2018, there were 978 laboratory listeriosis cases with 674 illnesses confirmed in South Africa (WHO, 2018b). According to the WHO, about 30% of these patients died (WHO, 2018b). This represents a case fatality rate that is higher than what was recorded for the European Union in 2015 (Kurpas & Wieczorek, 2018). Findings from epidemiological and molecular surveillance by the South African National Institute for Communicable Diseases and the Department of Health traced the source of the outbreak to food processing companies Tiger Brands Limited and Rainbow Chicken Limited (RCL) (Department of Health, 2018). At the time of this discovery the products were readily available in the food retail sector.

In addition to the listeriosis crisis, other food safety challenges that can affect health have been reported in the food retail sector in South Africa. For example, bacterial infections, pesticide residues and antimicrobial/antibiotic residues have been found in food products displayed for sale (Moyane, Jideani, & Aiyegoro, 2013; Nyenje, Odjadjare, Tanih, Green, & Ndip, 2012) and some food vendors are unable to maintain hygienic practices during food preparation, display and handling (Sibanyoni, Tshabalala, & Tabit, 2017). In the informal sector, the lack of steady access to electricity prevents proper refrigeration and storage of food (Crush & Frayne, 2011). The media has had a leading role in bringing attention to these issues, as a result, some consumers have become critical of food safety and have lost trust in the food retail sector (Rootman, 2016).

The food retail sector is critical to addressing food safety because it is the last point before food reaches consumers (FAO, 2014). The sector is also specifically important in view of the large

population that depend on it for their daily supply of food (Karamba, Quiñones, & Winters, 2011; Steyn & Labadarios, 2011). However, it is also the sector where the majority of food safety crises are reported, as issues around the inability to prevent growth of bacteria in products (Adekoya et al., 2018; Muyanja, Nayiga, Brenda, & Nasinyama, 2011; Nyenje et al., 2012), maintain hygiene standards (Khuluse, 2015; Sibanyoni et al., 2017; Tonder, Lues, & Theron, 2007) and prevention of food fraud (Tibola, da Silva, Dossa, & Patrício, 2018) are acknowledged. Details of this are provided below.

Shortcomings in food safety governance might be contributing to the aforementioned food safety challenges in the food retail sector. Economic development, urbanization and related transition of diets and formalizing value chains, often outstrips the pace of development of food safety governance and implementation (Grace, 2015). In particular, this is seen in the neglect of food safety standards and practices, which encourages non-adherence to public and private standards (Wilson & Worosz, 2014). Managers of some enterprises find that meeting food safety requirements is too challenging, and that it presents too large a barrier to obtain an official license to operate a food business (Raspor, 2008). The enforcement of liquor licensing in the Western Cape Province, for example, makes it almost impossible for township liquor salesmen to establish legal and formal shops (Petersen, 2016). In the informal food sector, the municipal authority has virtually no involvement in their operations. Part of this is due to the location of their businesses, which are usually run from their own homes and outside of regulated trading areas (Petersen, Charman, & Kroll, 2018).

Ensuring food safety should be a priority as it has significant implications for food and nutrition security. In addition, addressing food safety will help to maintain and improve domestic and international trade to boost economic development (Olanya et al., 2019). In order to improve food safety in the food retail sector, there need to be well-elaborated food safety governance initiatives (FAO, 2017; Nyenje et al., 2012). With the listeriosis outbreak as a point of departure, this review aims to describe and highlight food safety policies and practices in South Africa in order to assess and analyze current challenges and opportunities for change within the food retail sector in order to prevent future food safety outbreaks and foodborne diseases. It is guided by three main questions: 1) What are existing policies relating to food safety; 2) What are the food safety challenges in the food retail sector as represented in the media; and 3) what are the food safety practices food retailers say that they undertake? We answer these questions through the analysis of policy documents, media articles and company reports.

1.1 Food retail in South Africa

This study adopts the FAO's definition of the food retail sector, where the sector "covers organized modern retail as well as traditional groceries, food service industries such as restaurants and cafeterias, and street foods in their various forms" (FAO, 2014, pg. 1). As an emerging economy, the food retail industry plays an essential part of South Africa's economy (Campbell, 2017). In 2016, the industry contributed 9% to overall GDP (Ntloedibe, 2017). It is operated by formal agri-food supply chains and supermarkets that dominate the system (Greenberg, 2015; Peyton, Moseley, & Battersby, 2015). The formal food retail industry supply ready-to-eat meals, drinks and groceries through supermarkets and restaurants (Battersby, Marshak, & Mngqibisa, 2016). In the townships or informal settlements, informal food vendors are predominant; they constituted

about 55% of all small scale enterprises (Peterson, 2016; Skinner, 2016). In a survey of 9 townships between 2010 and 2014, about 4000 food vendors were identified (Petersen, 2016).

Despite the significant contribution of the food retail sector to South Africa's economy, there are frequent food safety outbreaks and a high incidence of foodborne diseases (Mashinini & Dutton, 2006; Meanetje & Dutton, 2007; Mulunda, Segwagwa, Ngoma, & Mefane, 2013; Tonder et al., 2007). In Alice, Eastern Cape, for example, bacterial growth was found in vegetables and boiled rice meals sold by informal food vendors (Nyenje et al., 2012). Food is often also incorrectly labelled: in 2013 and 2014, about 18% of fish found in restaurants and grocery shops in three provinces (Gauteng, Kwa-Zulu Natal and Western Cape) were incorrectly specified (Cawthorn, Duncan, Kastern, Francis, & Hoffman, 2015).

1.2 Conceptual framework

The FAO recommends a risk-based approach to food safety assessment. This approach can be used to “develop an estimate of the risks to human health and safety, to identify and implement appropriate measures to control the risks, and to communicate with stakeholders about the risks and measures applied” (FAO, 2017 pg. 5). It consists of three components: risk assessment, risk management and risk communication. Risk assessments consist of surveillance activities that identify, characterise and assess food safety hazards. Risk management is defined as the “process, distinct from risk assessment of weighing policy alternatives, in consultation with all interested parties, considering risk assessment and other factors relevant for the health protection of consumers and for the promotion of fair trade practices, and, if needed, selecting appropriate prevention and control options.” Risk management refers to activities designed for prevention and

control of food safety hazards such as policies and practices (FAO, 2005). Risk communication involves an interactive process of information sharing about food safety challenges and decisions with all the stakeholders in the food system. This approach is recommended because it requires extensive communication and collaboration between stakeholders to examine and address issues of food safety within a region or value chain (FAO, 2016). For this study, food safety risk analysis was applied in two ways: 1) to explore the regulations and structure of food safety governance in South Africa, and 2) to identify food safety practices in the food retail industry.

2. Methods

2.1 Data sources

A systemic process was adopted to review government policies, company reports and media articles. Supplementary File 1 provides a list of all the documents used for this review.

Policies:

This study was part of a broader food system study “Sustainable and Healthy Food Systems (SHEFS)” conducted by the Centre for Food Policy (CFP) at City University London. CFP with support from the Centre for Complex Systems in Transitions, Stellenbosch University has created a database of all national food system policies still in force in South Africa. To create this database, the website of government departments were searched by an author (SB) for acts, strategies and policies relevant to food system activities and outcomes to create an initial list. This list of 69 policies was compared to academic papers that had a collection of food system national policies such as Hendriks et al. (2017), Boatemaa et al. (2018), and Drimie (2016), updated and reviewed by two authors (SD and LP) who added further policies (11) based on their expert knowledge (Boatemaa, Drimie, & Pereira, 2018; Drimie, 2016; Hendriks, Olivier, & Olivier, 2017). This list

was presented to government officials at a meeting organized by the Office of The Presidency on 16th May 2018 who added 10 more policies to the list. In March 2019, the SHEFS research team at University of KwaZulu-Natal, also reviewed the database and added 7 policies. A database of 97 policies was finally created from which policies related to food safety were selected for this study. The policies were selected to provide information on the activities of the government agencies and the laws that guide their actions.

Media articles: Factiva is a global news database that gathers and provide access to media publications that are not available on the free web. Using Factiva we searched for articles on food safety in South Africa between May 2017 and May 2018, with the search term “food safety.” The search was conducted over Factiva’s full database for South Africa which includes national newspapers, regional press, trade publications, newswires and online news sources. The search term was seen as appropriate as it resulted in a list including 686 articles from 99 media sources while a previous media analysis on the broader food system governance had only resulted in 112 articles with a wider set of terms. These articles were sorted to eliminate duplications and documents unrelated to food safety. After the sorting, forty-seven of the documents were selected. The inclusion of media articles was particularly significant for including reports of food safety practices in the informal food retail sector during the listeria outbreak.

Company reports: Publicly available company reports were searched for information about how companies were putting food safety regulations into practice. No companies were contacted directly since this study adopted a desk review methodology. Our search focused on the four largest supermarket chains in South Africa: Shoprite, Pick ‘n Pay, SPAR, and Woolworths (Peyton et al.,

2015). We obtained these reports from their company websites, and included reports published in the last five years (2013-2018). We reviewed five years of company reports, to track the food safety activities of the companies. Also, since the companies have different timelines for reporting, we choose five years to ensure that we got materials from each company. Fifteen reports were selected.

2.2 Data analysis

A coding frame was created for the components of food safety risk analysis: risk assessment, risk management, and risk communications (FAO, 2017). Deductive codes for food safety risk assessment activities included actions to identify food safety issues (such as screening, inspection of products) and risk ranking/prioritisation food safety challenges. Deductive codes for risk management activities included setting numerical limits for concentrations of substances in food items, standards for production and consumption; performance control, food preparation guidelines and management decisions (FAO, 2005). Food safety risk communication was defined as activities related to the exchange of information on risk, risk perceptions and risk-related factors among risk assessors, risk managers, consumers industry, researchers and other stakeholders (FAO, 2005).

The analysis began with the identification of the deductive codes in the policies, company and media articles. The analysis team was interested in finding these food safety risk analysis activities in the selected documents. This was followed by creating linkage between the codes, appropriate quotes and the conceptual framework. The analysis team sorted the codes into risk assessment,

risk management and risk communication activities after an in-depth examination of the materials. Segments of the documents were selected as quotes to describe and/or support the coded data.

3. Results

3.1 Description of documents in the review

Three types of documents were used in this review: policies (n=13), media articles (n=47) and company reports (n=15) (Table 1). The media articles were categorized by whether the report was a journalistic article (n=31), an opinion piece (n=6), a transcript of a speech (n=4), a summary of new academic research (n=5), or a strategic report (n=1). The media articles were published in 2017 (n=17) or 2018 (n=30). The reports used were published by 29 different media outlets, both domestic (n=18) and international (n=11). Thirteen policies related to food safety were and coded based on their relative objectives, specific conditions, and impact on food safety. The policies were categorized by type of document into legislation (8), strategic document (2) and regulations (2). The years in which these policies were enacted ranged from 1970 to 2016. Nine of the policies were created by DAFF. Three types of documents were retrieved from the food retail companies: annual reports (n=5), news reports (n=8) and webpages (n=1).

Table 1. Characteristics of documents used for the review.

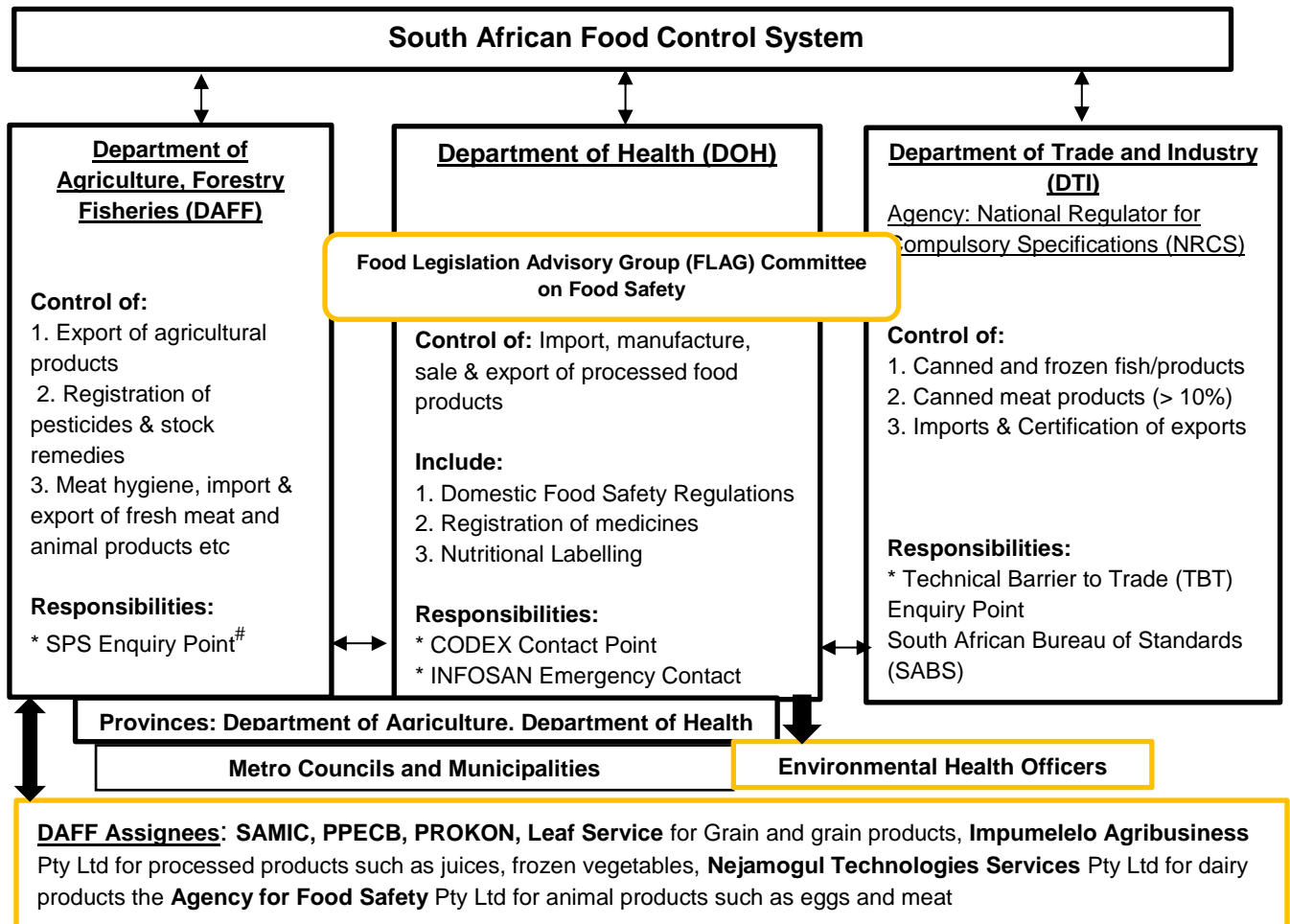
Type of document	Number
Media articles	
Journalistic article	31
Opinion piece	6
Transcript of a speech	4
Summary of new academic research	5
Strategic report	1
Policies	
Legislation	8
Strategic documents	2
Regulations	2
Company reports	
Annual reports	5
Webpages	1
New report	8
Total	74

3.2 Current state of food safety policies

3.2.1 South African food safety control system

The safety of food consumed in South Africa is regulated by three major departments: Department of Health (DOH), Department of Agriculture Forestry and Fisheries (DAFF), and Department of Trade (DTI) through local and international certification standards (Fig 1). These departments examine and approve products before they are released into the market. Products that do not meet the established standards can be seized, destroyed and offenders can be prosecuted.

Fig 1. The South African food safety control system



Source: Orange blocks added to the figure, which was provided by the Department of Agriculture, Forestry and Fisheries (DAFF) Presentation to the Joint Portfolio Committees, 2016#SPS- The Agreement on the Application of Sanitary and Phytosanitary Measures; CODEX- The *Codex Alimentarius* Commission (CAC) of the *Food* and Agriculture Organization/World Health Organization; INFOSAN- the International Food Safety Authorities Network; RASFF- ;NRCS- National Regulatory for Compulsory Specifications; TBT- Technical Barriers to Trade; SABS- South African Bureau of Standards; SAMIC- South African Meat Industry Company; PPECB- Perishable Produce Export Control Board; FLAG- Food Legislation Advisory Group

The Food Safety and Quality Assurance Unit at DAFF leads the implementation of four regulations: The Agricultural Product Standards Act (Act 119 of 1990); Liquor Products Act, (Act 60 of 1989); the Meat Safety Act (Act 40 of 2000); and Fertilizers, Farms Feeds, Agricultural Remedies and Stock Remedies Act, (Act 36 of 1947)¹ (Republic of South Africa, 1947, 1989,

¹ Supplementary Material 1 provide details of all documents used in this review

1990, 2000). Through these acts the department regulates liquor and agricultural products, both processed and fresh produce.

The National Policy on Food and Nutrition (2016) by DAFF reinforces the department's commitment to food safety (DAFF, 2013). The specific measures put in place concerning food safety were to create a centralized food safety control system, create periodic surveillance of the food industry, and to regulate food safety both domestically and internationally.

At the DOH, the Food Control Unit has the mandate to implement the Foodstuffs, Cosmetics and Disinfectants Acts and National Health Act (Republic of South Africa, 1972, 2004). In their 2015-2018 strategic plan, the DOH made a commitment to promote food safety (Department of Health, 2013). The unit is responsible for the safety of all ready-to-eat food products. The DOH's National Institute for Communicable Diseases (NICD) is responsible for providing epidemiology, public health and microbiology testing to support the government's response to communicable diseases (NICD, 2019). The DOH is also responsible for incorporating the Codex Alimentarius Commission standards, guidance and codes of practices into national food safety policies. These include the Sanitary and Phytosanitary (SPS) Agreement, and the Hazard Analysis and Critical Control Point (HACCP) food safety management system.

The National Regulator for Compulsory Specification (NRCS) of DTI controls both locally produced and imported canned meat/fish and frozen products through the Standards Act; Consumer Protection Act; Legal Metrology Act and National Regulator for Compulsory Specifications Act (Republic of South Africa, 2008a, 2008b, 2008c, 2014). The DTI created the

Food Legislation Advisory Group (FLAG) to address trade issues such as the SPS. It is a representative platform between DTI, DOH and DAFF. Other DTI entities such as NIMSA, SABS are also represented on FLAG.

3.2.2 Food safety procedures of the government

The activities of the DOH, DAFF and DTI were classified into risk management (enforcement), and risk communication (education).

Risk management (Enforcement): The departments are mandated to promote food safety through enforcement of the regulations. Some of the thematic areas of enforcement include: safety of agricultural and animal products and labeling of products, through inspection and creation of norms.

- a. *Safety and quality of agricultural and animal products.* The norms and standards for animal health, slaughter houses/abattoir, and import/export requirement and certifications are set by DAFF. The officers inspect products for pests and blemishes using the Meat Safety Act, Animal Disease Act and Agricultural Pests Act. Officers also determine the species origin, type of species, and quantity of each product. When a product meets the requirements, the importer or producer is issued the Veterinary Certificate and the product is declared safe (Republic of South Africa, 2002). The act also states regulations for the slaughter of animals. According to the Meat Safety act, slaughtering of animals is permitted only at registered abattoirs (Republic of South Africa, 2000).

- b. *Grading and labelling of products.* Consumers are legally protected from food fraud by the Foodstuffs, Cosmetics, and Disinfectants Act, 1972 which regulates against misleading or incorrect labels for food products and regulates the use of prohibited ingredients and additives. The act also sets maximum limits for veterinary medicine and stock remedy residues that can be present in foodstuffs. Yet, between May 2013 and January 2014, fish and meat found at retail shops were mislabeled (Cawthorn et al., 2015; Cawthorn, Steinman, & Hoffman, 2013). In particular, sausages, beef patties and deli meats had species that were not declared on the product labeling (Cawthorn et al., 2013). Furthermore, an examination of seafood also reported that shrimps were misrepresented on the product labeling. Shrimps had been substituted with *Litopenaeus vannamei* and *Pleoticus muelleri* (Cawthorn & Hoffman, 2017).
- c. *Hygiene and food handling.* The DOH ensures hygiene practices through the Health Act of 1977 (replaced by the National Health Act of 2003). This act allows the department to set hygiene norms and standards for transportation and premises handling food. At the municipal level, food safety is enforced by the Environmental Health Professionals (EHP) (Mokoatle, Sigudu, & Morse, 2016). However, the lack of EHPs has limited the ability of the department to perform this task effectively: “countrywide, there’s a shortage of at least 3300 EHPs and local municipalities are unable to do the job effectively” (Crouth, 2018). In addition, it was reported that food handlers working on the government’s school feeding program did not know nor practice the HACCP (Sibanyoni et al., 2017).
- d. Food testing: The national microbial and residue monitoring program is the responsibility of DAFF. The department has two chemical residue laboratories in

Pretoria and Stellenbosch for conducting compliance testing of products suspected of non-compliance with regulation and guidelines. For animal products the program conducts test at abattoirs, farms, honey bottling stations, and egg packing stations. Tissue and serum samples collected from these institutions are tested for residue of veterinary drugs, hormones/growth promoters, pesticides, and heavy metals. The Agricultural Research Council (ARC)-Onderstepoort Veterinary Institute is the coordinating laboratory and is assisted by the National Horse Racing Club, the South African Bureau of Standards, the University of the Free State, and the ARC-Institute of Soil Climate and Water. Products that pass the test are provided with certificates. Other products tested in these laboratories include fruits and vegetables, grain, rooibos tea, wine, and dried fruit. In the Rooibos tea industry, the Additives and Microbiology laboratory at Stellenbosch test for the determination of *Salmonella*, *E-coli* and total bacteria count. They also conduct special or pilot surveys on product residues. Findings from the research feed into animal disease and foodborne disease surveillance.

Risk communication (Education): The DOH leads consumer food safety education and aims to promote consumer confidence. The Roadmap for Nutrition in South Africa was published as a strategic document by the Department of Health in 2013 with an aim to promote public health and food safety (Department of Health, 2013). This document proposed to promote consumer education on issues of food handling and hygiene.

3.3 Food safety challenges reported by media in South Africa between May 2017 and May 2018

The two most common subjects mentioned in the media articles were “*outbreaks/epidemics*” and “*infectious foodborne diseases*.” Other common keywords included “*listeriosis outbreak, Listeria*

outbreak, meat product, class action, food hygienist, product recall, technical support, current outbreak, food safety expert, and food safety case.” The food safety challenges cited in media articles were the listeriosis outbreak, concerns over mislabeling, and lack of regulation of food handling and distribution. These issues affect certain groups of people differently due to the socioeconomic status of consumers, whether products are sourced from informal or formal food retailers, and consumer misconceptions about food safety.

3.3.1 Foodborne diseases: Listeriosis outbreak

Out of the 47 articles used for the media analysis, 26 discussed *Listeria* in South Africa and all but 2 were published in 2018. The listeriosis crisis sprung to the forefront of news cycles as the number of related deaths reported in South Africa jumped from "*a handful of cases on occasion in the past*" to *about 200 fatalities nationwide*" (Phaliso, 2018). Most reports were concerned with global recognition of the public health crisis, including the involvement of the World Health Organization (WHO) in fighting the outbreak:

“South Africa’s Listeria outbreak largest on record – WHO” (Staff Reporter, 2018a).

The cause was difficult to trace as symptoms of listeriosis can appear in an infected individual anywhere from a few days up to 90 days after initially ingesting the contaminated food (WHO, 2018a). The outbreak was eventually traced back to polony² produced by the Polokwane factory

² Polony is a South African bologna product made from fat, salt and a composite meat paste called pink slime. Traditional polony is dyed bright pink and is a popular sandwich meat as it is one of the few deli meats that is economically accessible to the poor.

of Tiger Brand's Enterprise Foods³ and by the Free State Rainbow Food Solutions facility (Van Dyk & Malan, 2018). The company reported of the presence of *listeria monocytogenes* ST6 (LST6) in some of their polony products (Dludla, 2018).

Tiger Brands recalled the associated products off shelves on 4 March 2018 (Fortune, 2018). However, over a month after the initial recall, some businesses "*continued to sell viennas and other ready-to-eat meat products said [because] their supplier, Britos, had not advised them not to*" (Payi, 2018). The extended confusion reflected flaws in recall systems, pathogen detection in factories, and contamination of products (Ngalo & Payne, 2018). This was followed by accompanying lawsuits and close scrutiny of the existing conditions that allowed for the crisis in the first places. One opinion article reported the crisis was inevitable because of the lack of hygiene training for food handlers (Ferguson, 2018).

3.3.2. Food safety and labeling challenges

Consumers trust that the labels they see in supermarkets are correct (Cawthorn et al., 2015). Unfortunately, due to poor monitoring and regulation, this is not always the case. Food fraud, ambiguous product origins, and expired products are three of the challenges mentioned in the media articles.

³ Tiger Brands Ltd, is company founded in 1917 in South Africa. The outbreak was traced to the Enterprise Foods (Pty) Ltd a subsidiary of Tiger Brands Ltd. produces chilled and processed meat products, including polony, vienna's, canned meats, etc. (Bloomberg Company Overview)

Food fraud: Seven reports mentioned food fraud. Some of the activities mentioned included selling of fake products (e.g. mixing olive oil with another cheaper oil) and repackaging expired items.

“Olive oil, milk products with melamine, illegal food colorants, expired food with manipulated labelling and illegal alcohol are the biggest players in the South African food fraud industry” (Ralph, 2017).

Ambiguous product origins: The media articles also pointed to how South Africa’s food imports could lead to ambiguous product origins that can imperil the prevention of pathogen outbreaks. Using the example of frozen poultry, one bag of chicken pieces can be sourced from multiple producers or even multiple countries (Mahlakoana, 2018). This severely inhibits the ability of food safety workers in government and industry to easily track and recall a product in the wake of individuals becoming sick.

Expired products: Many consumers do not check expiry dates while shopping and trust supermarkets only to stock products that are still viable. However, this is not always the case as evidenced by the cases reported against the supermarket, Pick n Pay, of keeping expired products on shelves in 2017 (Koen, 2017). These products were found at the Walmer Park Shopping Centre, William Moffett Hypermarket, Walmer Park and Baywet Mall stores in July 2017 (Koen, 2017).

3.3.3 Food safety challenges among different population sub-groups

It is important to note that not all consumers face the same food safety risks as geographic location and socioeconomic class influence what consumers purchase. According to an article about the questionability of quality of imports, products with ambiguous origins are disproportionately

bought by lower income and rural consumers who do not have the luxury of investigating the quality of their products (Mahlakoana, 2018).

"It is consumers in the lower end of the economy who end up buying these products," resulting in "vulnerable South Africans consuming product whose origins and safety they are unsure of" (Mahlakoana, 2018).

3.3.4 Lack of enforcement of food safety regulations

Twenty-five of the media articles used in the analysis criticized the government for the lack of regulation and enforcement of food safety standards in South Africa. Two issues were identified: licensing of vendors, and hygiene practices of food handlers. Attempts to formalize the informal food industry have not been widely successful as there is pushback from the formal food retailers as well as a lack of available capital of the informal traders (Crotty, 2017; Goko, 2017; Makwela, 2017). The formal market excluded smaller producers and food retailers since, *"Supermarket practices favored large producers who could guarantee volumes and quality and had the capital for labelling, standards compliance, refrigeration and transport"* (Knowler, 2017).

Without the proper licensing and registration with the relevant governmental entities, the regulation of informal food vendors is virtually nonexistent. The food vendors have little to no training or external evaluation of their practices such as meat handling, personal hygiene, or equipment cleaning (Crouth, 2018; Payne, 2018). An opinion writer had this to say, *"I have been appalled by the ignorance of basic food hygiene by food handlers...there is a desperate need for a properly accredited training systems nationally for all food handlers in the catering and food industry"* (Ferguson, 2018).

The Minister of Health Dr. Aaron Motsoaledi, confirmed some of these challenges when he responded to the media about the listeriosis crisis. He acknowledged that “*there are flaws in the system, citing a lack of environmental health practitioners (EHPs), but has denied his department should have moved faster in identifying the listeria outbreak*” (Crouth, 2018). As a result, members of parliament requested for standardized food safety guidelines for preparation, processing and manufacturing of food, especially meat (Payne, 2018).

3.4 Food safety practices in the food retail industry

Food safety practices in the industry have come under more intense scrutiny after the failure of Tiger Brands to adequately trace and contain the listeriosis outbreak in 2018. The company reports studied often included very little information about each retailer’s food safety practices. The analysis of the company reports most frequently included talk about internal food audits, food safety training for workers, external testing, and consumer education.

3.4.1 Risk assessment (Research and Surveillance)

Food audits were the main format of identifying food safety risk. The companies reported two types of food audits; at pre-delivery and post-delivery of goods. For pre-delivery audits, the companies mentioned their dedication to maintaining proper labeling standards of their suppliers to ensure they were meeting requirements for labels such as free range, organic, etc. (Pick n Pay, 2013). SPAR notes that emerging suppliers must conform to local good agriculture practice with a goal of conforming to GlobalG.A.P. standards⁴. In the past two years SPAR expected “*large-*

⁴ GlobalG.A.P. is the world’s leading farm assurance program that aims to work with producers to comply with globally accepted criteria for food safety, sustainable production methods, worker and animal welfare, and responsible use of water, compound feed and plant propagation materials

scale commercial farmers to comply fully with GlobalG.A.P." and *"all suppliers are expected to comply with the Global Food Safety Initiative (GFSI)* (The SPAR Group, 2016). Although not much detail was provided, SPAR, Shoprite, and Woolworths cited performing internal monthly food safety audits on goods within their shops by conducting *"in-house quality testing as well as external microbiological and chemical analysis through accredited laboratories"* (Shoprite, 2017, pg 47). According to their 2014 annual report, Pick n Pay conducted annual food safety audits at the factories of their suppliers and producers (Pick n Pay, 2014).

External laboratory testing was cited by all four companies as an essential part of their food safety procedures (Pick n Pay, 2013; Shoprite Holdings Limited, 2017; The SPAR Group, 2013). This was mentioned in regards to their meat products after a Stellenbosch University study of meat labelling reported that 68% of meat products contained species that were not declared on the product label (Cawthorn et al., 2013). SPAR, mentioned that they work with the Consumer Goods Council of South Africa and audit their Brand suppliers using the internationally recognized Global Food Safety Initiative program (The SPAR Group, 2013).

In addition, to food safety audits, Shoprite, SPAR, and Woolworths all mentioned the importance of a central distribution center to monitor and regulate the quality of their products. However, the reports did not go into detail about how they control for food safety within these centers (Shoprite Holdings Limited, 2017; The SPAR Group, 2018a; Woolworths Holding Limited, 2017).

The companies also used recall of products as a food safety mechanism. According to Shoprite, they *"have an electronic recall system in place that enables effective and efficient recall of any*

item” (Shoprite, 2017, pg. 47). During the listeriosis crisis, Woolworths and Spar provided full refund for their customers when a product was recalled:

“Customers who have purchased the product [referring to Savoury rice] should return the product to their local store for a full refund” (Mngambi, 2018).

“Customers are welcome to return these products [referring to all Enterprise processed meats and Rainbow polony products] to our stores for a full refund. No till slips are necessary to return these items” (The SPAR Group, 2018a).

3.4.2 Risk management (Enforcement)

Food safety training was classified under risk management. In the food retail industry, training of workers was the only risk management activity mentioned. Only SPAR and Shoprite specifically mentioned efforts to train workers on food safety and consumer health. Shoprite included a statistic that they trained 46,000 employees in food safety and hygiene in 2017 (Shoprite Holdings Limited, 2017).

In the wake of the listeriosis crisis, training was offered by the Cape Peninsula University of Technology and the City of Cape Town Metropolitan Municipality in the township of Delft for informal food vendors *“to place the spotlight on safe food processing in townships giving small business owners tools to prepare food according to national standards”* (Staff Reporter, 2018b). Another listeriosis training program was started by city officials for informal traders in Johannesburg. Emphasis was placed on prevention rather than control of foodborne illness (Ndimande, 2018).

It was unclear who was responsible for ensuring the safety of products in a supermarket: the government, the supplier, the headquarters of the former food retailer or the store managers. In the example of the expired products being sold on the shelves of Pick n Pay, the Provincial manager

responded to the reports saying, “*although there were in-store protocols to check shelves daily, the management would be rechecking the stores in the region*” (Koen, 2017).

3.4.3 Risk communication: Consumer education

Pick ‘n Pay appeared to focus the most on consumer responsibility and education on food safety issues, advocating that “*food safety goes beyond the shelf*” (Pick n Pay, 2014). SPAR had easily accessible food safety pages on their websites that included information on the best practices for transporting, storing, and cooking food (The SPAR Group, 2018b). They also mentioned the importance of consumer hygiene and the hygiene of cooking areas when preparing food. Woolworths had a food safety page for their Australian holdings, but not one specifically for their South African stores (Woolworths Group Limited, 2019).

4. Discussion

This review provides an overview of the current state of food safety policies, food safety challenges, and food safety practice in the food retail industry in South Africa. Data from media articles, company reports and webpages, and government policies have been used. The study identified food safety challenges including foodborne diseases like listeriosis and food fraud. These challenges existed despite policy initiatives and company practices established to ensure food safety. The findings are aligned with previous studies and is a matter of international concern (Manning & Soon, 2016; Ryser & Marth, 2007; Shears, 2010; Spink & Moyer, 2011). Drawing on the reviewed texts, the discussion highlights the gap in the policies and practices and suggests how to address them to build a more adequate response to the food safety challenges identified.

Table 2 presents a summary of the key findings and gaps. In terms of food safety risk assessment, the study found that research and surveillance is conducted by the government and formal food

retail industry pre-delivery. Previous studies have reported on the DOH's work in analyzing microbiological content of street-foods in 1994 (von Holy & Makhoane, 2006). However, no provision is made by policy to test products at food retail centers. Another gap identified in the review of media articles was that in the informal food retail sector, there was no evidence of risk assessment of products. Overall, two important gaps were identified: 1) confusion regarding who is responsible for identifying and managing food safety risk and 2) inconsistent training of food handlers.

Table 2. Summary of key findings and gaps in food safety governance.

Food safety activity	Food safety practices by different actors			Food safety governance gap
	Policy	Formal retail	Informal retail	
Research and surveillance	Test of products at abattoirs, bottling and packaging station before certification	Risk assessment Internal audits: Laboratory testing of products pre-delivery	None	No government testing of products at retail centers
Perceived risk manager	DoH, DAFF, DTI	Risk management Government, company headquarters, store managers, customers	Vendor	Confusion of who is responsible for managing food safety risk
Training of food handlers	Not applicable	Worker training	Worker training in response to listeriosis	Inconsistent training of food handlers
Creation of norms	Creation of national standards	Company food safety procedures	None	
Risk communication	Consumer education leaflets	Education on company websites	None	Limited reach of people with access to such services

In the government sector, managing food safety within three departments has not been easy. The departments have been unable to coordinate activities, they experience overlap, and have conflicting roles (DOH, DAFF, & DTI, 2013). For example, different government departments

have developed and used “different risk management frameworks, inspection methods, compliance verification and enforcement approaches. The present scenario challenges the government departments responsible for food control to manage risks consistently across different types of establishments and different foods. It also creates situations in which foods of similar risks are inspected at different frequencies and/or in different ways” (Ibid, page 2). This gap can result in neglect and the prioritizing of economic benefits over food safety (Meanetje & Dutton, 2007; Tibola et al., 2018; van Eeden & Korsten, 2013).

Training of food handlers is a key step to ensuring food safety and has been widely recommended internationally, but there is a recognition that it is often difficult to quantify the effectiveness of this training as there are no clear evaluation criteria (Egan et al., 2007). In the policy documents, no provision was made for this in both the formal and informal industry. In the formal industry, only two companies reported training of workers. At the municipal level, the informal workers pay fees to city authorities, but the authorities provide no services to them such as cleaning and sanitation (von Holy & Makhoane, 2006). Studies have reported shortcomings in environmental, personal hygiene and food preparation process of the informal food retail sector (Khuluse, 2015; Skinner, 2016). More concerted efforts should be made to educate and include informal vendors and suppliers into the food safety system in order to protect consumers of all levels of affluence and geographic location within South Africa in order to meet international best practice.

With regards to risk communication, the medium of education found in the policies and company reports is sometimes limited. In 2017, only 40% of the South African population had access to the internet (World Wide Worx, 2017). Yet, webpages were the main medium of communication of

food safety risk by the formal food retail industry. In addition, the usefulness of providing information leaflets by the government is also limited since the population most at risk of food safety tends to have a lower levels of education and may be unable to read and understand such leaflets (Statistics South Africa, 2017). However, it must be emphasized that mere access to information is insufficient as a means of risk communication because it has been studied that consumers react in, often unforeseen, ways to issues of food safety concerns (Verbeke, Frewer, Scholderer, & De Brabander, 2007). Potential solutions for rebuilding consumer confidence in food safety include the need to bridge between lay and expert opinions towards food risks and include interventions like traceability and labelling, segmented communication approaches and public involvement in risk management decision-making (Verbeke et al., 2007). It is critical for the retail sector to improve their risk communication strategies in order to ensure better informed consumers.

In order to improve food safety, there should be some combination of responsibility from all levels of stakeholders in the food retail sector. South Africa is in desperate need of better forms of accountability within its food system and the government should be the biggest player in this role, enacting effective legislation and clearly discerning who is responsible for enforcing these standards. Similarly, food retailers must be able to properly follow these norms and standards and ensure quality and consistency throughout all levels of their procurement and distribution systems. Both food retailers and the appropriate relevant government branches need to find new and effective ways to educate food handlers and consumers on how to protect themselves and others from preventable outbreaks of foodborne diseases and individual infections. Consumers must take some action to protect their own health by learning the proper ways to store and cook food. In

addition, the government's branches in charge of public health should ensure that these educational materials are readily available in different formats and accessible to the general public as well as to food handlers.

4.1 Limitations

This study is not without limitations. It used data from secondary sources that could underrepresent or over-represent food safety in SA. The media articles could have been biased or framed. Some communicators, consciously or subconsciously, select and promote certain facts or points of view, with the aim of increasing the salience of the content to the audience. The study was only limited to the information provided by the policy documents and company reports. Food retailers and government officials were not contacted to follow-up or ask clarifying questions on industry practices and regulations. Thus, the study may present a biased account of food retailers that have more stringent and thorough auditing and food safety enforcement programs that were not properly reflected in their publicly available reports and webpages. Similarly, government enforcement of food regulations may ensure more accountability of food safety throughout the food value chain than is reported by media accounts and passed legislation. No informal food vendors were interviewed or surveyed for the study, which led to a reliance on the limited available data on food safety within the informal food marketplace found in media accounts. The use of information from the 'big four' food retailers alone, is limiting since we excluded other supermarkets such as the R5 Shop, and Wellsave Supermarket.

Integrated annual reports found on the supermarket websites included very little information about food safety, typically just a few short paragraphs. Of those paragraphs, one was usually dedicated

to genetically modified organisms (GMO). This usually attempted to assuage consumer fears over the health implications of GMOs by assuring customers of their efforts to label and sell non-GMO products (Woolworths Holding Limited, 2017). It was nearly impossible to find a definitive list of the processes and controls in place at each company. Some articles mentioned if they were introducing a new program, but nowhere was there a complete list of past and new programs that was made easily available to consumers. It was difficult to discern whether this omission of detail could be attributed to a lack of concern over food safety or a belief that this was less important to consumers and shareholders who may read the report. We recommend that future studies can include in-depth interviews or focus group discussions with groups of key stakeholders to avoid some of these limitations.

4.2 Conclusion

The listeriosis outbreak in South African brought to light a clear need to engage with issues of food safety in the county. This is not an issue that is unique to South Africa, or even to developing countries. As Marion Nestles pointed out, questions over what we eat, where it comes from and how safe it is for us to eat, is a political matter of global concern (Nestle, 2010). This study was based on media articles, policy documents and regulations as well as company reports to examine food safety challenges and activities specifically related to the food retail industry. Although the food retail industry is growing in South Africa, the sector has encountered important food safety challenges. Firstly, this study provides evidence of food safety challenges that can be linked to the listeriosis crisis. This knowledge is vital for provision of an effective food safety system. Secondly, the study showed that food safety challenges are experienced in a different context by socio-economic and geographic locations. This context specific knowledge is important for identifying

individuals who are at risk and for providing targeted services to such persons. Thirdly, this study shows that even where there are regulations in place, the implementation process is problematic. There is a critical need for better forms of accountability within the food system and the government should be the driving force behind a secure food system, enacting effective legislation and clearly discerning who is responsible for enforcing these standards. As Nestle (2010) argues, ensuring that food is safe for all citizens is a key responsibility for government and should be a priority on the political agenda.

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