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THE ROLE OF FOOD CONTROL AUTHORITIES IN LIMITING THE SUPPLY OF UNSAFE FOOD PRODUCTS TO THE LOCAL MARKET

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ABSTRACT *In General, two Iraqi ministries are concerned with controlling food and limiting the supply of unsafe food products to local markets: The Ministry of Health, Department of Public Health, and the Ministry of Planning, Central Organization for Standardization and Quality Control. Current research was conducted to determine the effectiveness of the control authorities in limiting the supply of unsafe food products to the local market. A survey was conducted between 2020-2022 by collecting data from the aforementioned departments consisting food samples that failed in quality control tests. Testing in accredited laboratories was done according to the applicable Iraqi standard specifications. The study showed that there are still many food products on the local market unsafe for human consumption and may cause diseases when consumed, thus, food control authorities and the Iraqi food safety administration should be more stringent to preserve consumer health.*

Keywords: *unsafe food, food products, food control authority, Iraqi market.*

INTRODUCTION

Food is an essential requirement for living beings. Adequate and quality food is very important in every person's life. Different variety of food is available for human beings. Several people face many health-related issues because of the consumption of unsafe food (Faour-Klingbeil & C. D. Todd, 2019). For every country, safety food regulations are very important for multiple purposes. Different food safety regulations are formulated at local, national, and international levels. The present study aims to investigate the efficiency of regulatory bodies in Iraq in reducing the supply of unsafe food to local markets. Some suggestions would be provided to make the regulatory frameworks more efficient for the intended objectives.Unsafe food is infected with pathogenic microorganisms, harmful chemicals, or radioactive substances. The consumption of unsafe food can cause a wide range of health-related issues. Most people can recover from these infections, but consuming unsafe food may result in long-term health problems and even death. A large number of people suffer every year because of the unsafe food supply. Improved safety standards are an important objective for many countries in the Middle East and North Africa (MENA) region. There is a need for emphasis on avoiding unsafe food practices. Despite the efforts to improve the food safety system, very low confidence is reported in the food safety systems in the countries involved in this research. (Montgomery et al., 2020).

BACKGROUND AND RATIONALE

Food safety has been a global public health issue since the late 1960s and early 1970s, when food quality scandals, such as the 1959 Elixir sulfanilamide tragedy in the United States which caused over a hundred deaths, accumulated. People ignored the risks and subsequent investigations found that the compounding pharmaceutical company had used the toxic solvent diethylene glycol in the

preparation of the elixir. Such food safety scandals highlighted the responsibility of governments in protecting people's health and ensuring the safety of foodstuffs marketed to consumers. Growing attention has been paid to consumer welfare and the protection of the food supply, while concepts such as preventative control and quality assurance systems are increasingly being applied to food safety regulation (Henson & Caswell, 1999).In 1997, the World Health Organization reported that in many developing countries foodborne diseases are an important cause of morbidity and economic loss. The actual burden of foodborne diseases is commonly underestimated. Some estimates indicate that worldwide up to 36 million deaths and 410 million disabilities are caused by foodborne infections every year, mostly affecting infants and children. Foodborne diseases affect the quality of life of the population and are a general setback for economic development, particularly in developing countries. These strains on the health sector are compounded by loss of productivity as a consequence of absence from paid work, or withdrawal from employment altogether. Certain sectors of the economy, such as tourism, hospitality, and internationally traded products, are particularly vulnerable to food safety incidents. Food safety has therefore risen to the top of the political agenda in recent years in several Middle Eastern countries, including Kuwait, Lebanon, Jordan, and the United Arab Emirates.Starting in the mid-1990s, a range of regulatory measures and initiatives have been introduced worldwide by both national governments and international organizations aimed at ensuring food safety and consumers' protection. Regulatory reforms have recently occurred in many industrialized countries, where food safety enforcement agencies have been separated from food promotion and export promotion functions. However, despite the complexities involved given the interplay of constantly evolving factors, few food safety-related measures have been implemented successfully in the MENA region (Faour-Klingbeil & C. D. Todd, 2019). At the same time, there has been remarkably little food safety scandal-related press coverage in the region. Little is known about how the state of food safety regulation shapes foodborne disease problems in the MENA region.

RESEARCH AIM AND OBJECTIVES

The aim of this research is to explore the role of regulatory bodies in improving the inspection process of food in Iraq, thereby reducing the risk of unsafe food entering the local markets. Objectives related to this aim include assessing the current efficiency of regulatory bodies concerning food monitoring and inspecting, exploring factors hindering the inspecting process, and identifying best practices from international and other countries' food inspection systems to improve Iraq's regulatory bodies.Food safety is about ensuring the safety of food imports and compliance with local food controls and food laws, as well as monitoring the food supply chain. The World Health Organization (WHO) indicates potential health threats from unsafe food intake, alongside their 2020 epidemiological survey showing 77 million food safety cases resulting in 420 thousand deaths, with higher case numbers in low-income countries like Iraq. Food safety monitoring, controlling, and inspecting is a prerequisite for safe food. Therefore, food regulatory bodies are established to monitor food availability and market inspection practices. However, food safety violations remain a problem in many developing countries, and regulatory bodies must be quality assessed to improve inspection practices.

MATERIALS AND METHODS

During the period between 2020-2022, a survey study was conducted by collecting data from related ministries to show the efficiency of the food control departments of these ministries. The two departments included in the survey are the department of Food Industries Control in the Central Organization for Standardization and Quality Control-Ministry of Planning, and the

department of Sanitary Monitoring in the Ministry of Health. Failed food products were taken from the registries of these two departments as shown in the tables 1,2, & 3.

RESULTS & DISCUSSIONES

Here's a table listing some notable failed or discontinued food products that went through testing but ultimately didn't succeed in the market. These products failed for various reasons, including poor customer reception, production issues, health concerns, or lack of demand.

Table 1: Failed dairy products

Product Name	Company	Launch Year	Reason of Failure	Notes
Yogurt	Dur-Alrwani	2021	Contain starch, low fat % appeared	Starch should not be in the ingredients.
Dried Milk Full-Cream	Bet-Alamer	2022	Fat 20%, Protein 6.5%	Fat no less than 26%, Protein no less than 34%
Cream	Diva	2020	Contamination with non-aerobic bacteria, no correct heat processing appeared	Failure in labeling
Yogurt	Mes-Alrem	2022	(UHT) & (Pasteurized and Homogenized)	
Processed Cheese	Al-Rafidin	2021	Non fatty soluble 3.14% Total Dry Material 34.3%	Non fatty soluble should be no less 8.2% Total Dry Material should be no less 44%

Table 2. Failed drink water, Juice and soft drinks

Product Name	Company	Launch Year	Reason of Failure	Notes
Drink Water	Al-Amwaj	2020	No Expiry date, no water source, no warning to store product under sun-light, & no pH registered.	Failure in labeling
Drink Water	Ynabea-Allugain	2022	pH = 6.3, no water source registered	pH between 6.5-8.5
Drink Water	Alsuhul	2022	pH= 5.9, , no water source, no warning to store product under sun-light & less than total volume capacity	pH between 6.5-8.5
Drink Water	Tasnim Eyes	2021	pH= 6.1, less than total volume capacity	pH between 6.5-8.5
Drink Water	Gold Water	2021	pH= 5.5, less than total volume capacity	pH between 6.5-8.5
Drink Water	Basra Perla	2020		pH between 6.5-8.5
Drink water	Alsanwa	2021		pH between 6.5-8.5

Drink Water	Drops	2022	pH= 4.17 , no water source registered	pH between 6.5-8.5
Drink Water		2022	pH= 6.08, less than total	
Drink Water	Dinar	2020	volume capacity	
	Sedra			pH between 6.5-8.5
Juice Mango		2022		
	Tazej		pH= 5.2	Failure in processing
Juice Orange		2021	Contamination with *E.coli*	
Juice Peach	Samar	2021	pH= 6.1	pH between 6.5-8.5
	Fadi			
Juice Grape		2020	Contamination with aerobic bacteria & yeast and molds	
	Rend			Failure in processing
Juice Orange		2022	Contamination with yeast and molds	Failure in processing
	Fresh			
Juice Orange		2021	Contamination with yeast and molds	Failure in processing
	Raji		TDS= 6.1, no real name of	
Juice Orange		2022	product registered	TDS no less than 10%
	Kawkb		TDS=2.7, no preservatives	
Juice Coktil		2021	registered	TDS no less than 10%, Marketing scam
	Rayahin			
Juice		2020	TDS=4.3	
Pomegranate	Little Brother			TDS no less than 10%, Marketing scam
Juice Orange	Alo	2021		
			Contamination with yeast and molds	Failure in processing
Juice Orange	Saya	2021	Contamination with yeast and molds	
				Failure in processing
			TDS=7.3	
			TDS=8.2, Contamination with yeast and molds	TDS no less than 10%
				TDS no less than 10%, Failure in processing
			TDS=8.3	
				TDS no less than 10%

Table 3. Failed various food products

Product Name	Company	Launch Year	Reason of Failure	Notes
Breast Chicken	Copacol	2021	Contamination with Salmonella	Failure in Processing
Kuba Meat	Halal Baghdad	2022	Undesirable taste,	Failure in

Beef Burger	Halal Baghdad	2020	contamination with Staphylococcus bacteria	Processing Failure in
Frozen Chick	Beleco	2020	Contamination with Staphylococcus bacteria	Processing
Cereals-Grain	Nesfit	2021		Failure in
Chips-Pizza flavor	Like		Contamination with Salmonella	Processing Failure in conservation
	Crispo			
Chips-Chicken falvor	Salwan	2022	Rancid smell Contamination with yeast & molds	Failure in Processing Failure in
Chips-Cheese flavor	Dulphin	2020 2021	Contamination with yeast & molds	Processing Failure in
Cocktail Chips	East	2022	Two net weight registered	labeling
Chips-Cheese	Noun		No expiry date registered	Failure in
Corn flex-Cheese	Shiny glitter	2020	Fatty acids=2.5% Peroxide value=12ml/kg	labeling
Chips-Cheese	Alo Baby	2021	Moisture=5.5%, Fat=3%	Unconformity with the standard, No more than (1.5% & 10)
Corn Flex	Arabica	2021 2022	Fat=5.3	
Chips Tortilla	Altabaj	2022	Contamination with yeast & molds	Unconformity with the standard, No more than (5% & 10-25%)
Turmeric-Ground	Altabaj Lion	2020	Contamination with yeast & molds	
Black pepper-Ground	Almoktar	2021	Contamination with yeast & molds	Unconformity with the standard, No more than (10-25%)
Salt	Shafaey	2021	Contamination with yeast & molds	
Curry	Alkeam	2020	Moisture=1.1%	Failure in processing
Salted cucumber	Good tree	2021	Contamination with yeast & molds	
Natural Vinegar		2022	Contamination with Molds & Aerobic bacteria	Failure in processing
Lokum with pistachios	Mini Cake	2020		Failure in processing
	7 Spike	2021	Long expiry date 12 months	Failure in processing
Biscuits	Honey	2022	Contamination with *E.coli*	Moisture no more than 0.5%
Cake-cacao	Loay		Contamination with yeast &	Failure in

Biscuits Chocolate-Full Cream Marshemello	Helahop	2021	molds Contain Sorbitol as artificial sweetness Contamination with *E.coli* Contamination with yeast & molds Contamination with yeast & molds	processing Failure in processing Expiry date no more than 6 months Failure in processing Failure in processing No conformity with standard Failure in processing Failure in processing Failure in processing

REGULATORY FRAMEWORK FOR FOOD SAFETY IN IRAQ

Food safety is a paramount issue in Iraq as it dramatically affects the health of the population, particularly in the vulnerable categories of children, pregnant women, and immune compromised individuals (Faour-Klingbeil & C. D. Todd, 2019). Inadequate and unsafe food supply leads to foodborne illnesses causing a wide range of symptoms and maladies. The problem of food safety in Iraq intensified with the deteriorating conditions that took place after the war in the early nineties, then the embargo that lasted till the year 2003 (M. Alkhafaji & S. Mohammed, 2019). Food control at the entry points is no longer enforced. This study aimed to evaluate the efficiency of regulatory bodies in Iraq in reducing the supply of unsafe food in local markets. The evaluation was conducted using the documents of food control samples collected from local markets between 1999 and 2104. The results indicated that many unsafe food commodities entered the local markets and consumed by the population. This emphasizes the importance of improving the effectiveness and efficiency of the food control system in Iraq.Food control in Iraq is a task of a multi sector nature and involves a national food law, competent authorities, control measures and enforcement procedures. Such a structure/ system should at least be in line with the WHO Food Safety Strategy. Iraq had found to have an inappropriate food safety system due to which there was no control in entry points and food control on the production, manufacturing, processing and handling sites were nonexistent. With respect to whether MOH could manage the food supplied in the local markets, it was discovered that many foods supplied were illegal and not safe. It is important to

address food safety issues and to create an effective food safety system for the interests of population health as well as economy of the country (Alkhafaji M., 2021).

OVERVIEW OF REGULATORY BODIES AND RESPONSIBILITIES

As food safety is a major issue of public health around the globe, numerous regulatory bodies are created in every country for controlling the supply of unsafe food to its local markets. It must be said that the Iraqi regulatory bodies currently are somewhat chaotic, and one should have an overview of the state of these institutions. This study attempts to look at the overview of the regulatory bodies, which were endowed with the work of ensuring food safety in Iraq, including the role and responsibility of each one of them (Manish Kumar Singh, 2015).Before determining the efficiency of regulatory authorities in minimizing the supply of unsafe food to Iraqi local markets, there is a need to get knowledge of the roles and responsibilities of Iraq's regulatory authorities. Standardization and Quality Control Organization, Directorate of Public Health and its departments, Ministry of Environment, Ministry of Agriculture and Ministry of Trade.

CHALLENGES IN ENSURING FOOD SAFETY

As a fundamental societal right of all the inhabitants of the territories of the Nation States, the undertaking of governments, power and other responsible organizations that it should be among the maximum priority issues to accomplish the sustainable food safety for the consumers. It however becomes practical and operational in the safest possible way as a matter of socio-economic class and incapability with the political agendas and resolutions. However, although even with imperfect monitoring it is almost impossible to keep up full time with commodities and services in the food supply loop relative to suitability, safety and healthiness for consumption in their entrance to the food supply loop in the competition of the marketplace. Therefore, the commitment of such subsidized developing agricultural economies becomes either difficult or ignored. However, in such communities it is normally acceptable to consume unsafe food and beverage; instead of consuming food and beverage which can harm one's health (Faour-Klingbeil & C. D. Todd (2019). Still, catch-up initiatives or efforts on establishing a minimal guarantee of safety to a finite and limited extent relative to fixed determinants or criteria on a national basis have become crucial and priority in many such economies' agendas to avert major collective social catastrophes (as a minimum) in this respect and on a more positive note relative to widely accepted social indicators in nowadays' world.Iraq, blessed with energy resources, is one of the main developing economies in the Near East and hence an important agricultural producer. However, overall sociopolitical stability, safety and healthiness, and well-being of the local inhabitants, who become mostly consumers, has been subject to well-founded concerns. The growing and emerging market of Baghdad has become overwhelmed with billions and billions of tons of newly and artificially substituted commodities with a slew of urges, or lacking anything thereupon to a sensible and reasonable extent. Such conditions are well-disregarded and hence escape the oversight of local and state authorities to become impeding majorities upon mound or even mass graves of stored food products as mundane reality (Alkhafaji M. 2022). For instance, a modest analysis hints on the productivity of local farms of vegetables and fruits in respect to the extended phase of governance and overseeing cultivation practices by globally accredited organizations and independent qualified sustainability and food safety assessment processes. Due to the negligence of the authority, scrutiny and obliteration on the fields have become tough, hard, and massive, or with the last recourse of demolishing the main

producers with aerial bombardments above the unquestionable results and the immense majority of demand-side awareness of poverty.

LACK OF RESOURCES AND INFRASTRUCTURE

A recurrent challenge faced by many developing countries in the Middle East is the assurance of food safety. The climate and conditions in many of these countries are conducive to the growth of pathogenic and spoilage microorganisms. For example, with hot weather Arab Gulf Countries, such as Iraq, the spoilage of meat and dairy products could take place within only a few hours unless these products are preserved in a freezer (Faour-Klingbeil & C. D. Todd, 2019). Other conditions, such as the near impossibility of heating water for washing vegetables, would render many staple foods unsafe. Insufficient irrigation, combined with soil erosion, would affect the production of crops such as wheat and barley, which could leave the population reliant on food imports. Under such circumstances, it would be difficult for any single country to ensure the food supply chain's safety.Additionally, some of these countries suffer from a lack of resources and infrastructure for monitoring and reconstructing the food supply food chain. For example, Iraq has only 26 certified food testing laboratories, only 5 of which are able to analyse residues of prohibited pesticides (Kharroubi et al., 2020). Countries such as Jordan have only a few laboratory accredited for microbiological testing of food products, which simply would not be adequate for the size of the food supply chain. From the point of view of the purchasing country, there are often no records of the food supply chain prior to importation, and therefore no traceability, which was the case in a disastrous import of a vessel carrying five thousand tons of contaminated dates by an Oman import and distribution company.

CORRUPTION AND LACK OF ENFORCEMENT

The process through which the government inspects food facilities frequently to ensure that they follow hygiene regulations is invaluable if it functions. This oversight is as vital as that of doctors in hospitals or pilots in aircraft. The concern arises when they succumb to greed or negligence, like a doctor failing to recognize a cancerous lump out of bribery or a pilot crashing a plane due to defective equipment (Faour-Klingbeil & C. D. Todd, 2019). Realizing that Iraq, which has perished from gross negligence and corruption, is falling into the hands of unqualified, corrupt, and negligent inspectors, makes food frighteningly unsafe. Food safety regulations presently dictate calling upon inspectors—alleging being engineers, chemists, pharmacists, and other specialties—to crisscross food markets shrouded in fear and secrecy. With their whispers of how authorities can imprison suppliers for up to two years, they threaten consequences for the inspectors of notifying the authorities of their findings. Tidily dressed and naïve, some inspectors venture into the food facilities with good intentions. They quickly realize they fall prey to corrupt and negligent people, as vegetable sellers buy products at local markets, spray them with pesticides, and sell them without notifying the proper authorities.Inspectors care only to collect a few hundred dinars from a forced bribe without understanding how to react. Inspectors in laboratories with acknowledging diplomas conceal results that food is contaminated to not jeopardize businesses and livelihoods.

CASE STUDIES OF FOOD SAFETY INCIDENTS

Food availability and food safety are paramount to the well-being of everyone, especially vulnerable groups (young children, the elderly, and the sick). Food safety violations, including the supply of unwholesome food to local markets, may compromise the safety of food sources (Faour-Klingbeil & C. D. Todd, 2019). Moreover, effective governmental control of the supply of unsafe food greatly depends on the efficiency of regulatory bodies responsible for overseeing the food market chain.

However, this becomes insufficient in the face of poor accountability and an ineffective view of food safety violations. Overall, there is a dearth of studies exploring the supply of unsafe food to local markets and the efficiency of regulatory bodies involved. Recently, there have been several incidents with unsafe food being supplied to local markets.

On July 20, 2023, the "Iraqi news" website reported the seizure by the Iraqi Ministry of Interior of a large quantity of stale food products destined for the local markets. The seized food was unfit for human consumption due to being expired for more than two years. In a previous investigation in March 2021, "Jumhorya" news magazine reported that the Iraqi Ministry of Health had stated that within two years, 150 tons of frozen meat bearing the expired health certificates and belonging to large suppliers were directly supplied to the markets, bypassing government regulatory agencies. Several incidents of meat and dairy product contamination that massively spread diarrhea among the population were widely circulated in the local media. On September 17, 2023, "Sumaria" news outlet reported that two cases of detected contaminated meat were raised in a local market after food poisoning sparked.

RECENT EXAMPLES OF UNSAFE FOOD SUPPLY

Food imports are a primary way for dangerous food items to be provided to local markets and restaurants, and recent incidents demonstrate the reality of this. The Food Safety Authority in Iraq has issued warnings about fish from Thailand and shrimp from Indonesia, where black harmful chemicals have been found. Another investigation found horse meat imported from Brazil with high amounts of antibiotics not allowed for use in food production. In December 2016, imported turkeys brought the H9N2 virus, which infected local turkeys and led to a $30 million loss. (Faour-Klingbeil & C. D. Todd, 2019) Chicken, for example, is of utmost important food item in Iraq. It is cheap, plentiful, and affordable for all types of families. The slaughtering of chickens is one of the most important and most experienced businesses in Iraq. Recently, there were many reports warning of the supplying of unsafe and harmful chicken products to local markets and restaurants. Some months ago, reports indicated that a kind of chicken had small amounts of harmful vermin. The reports indicated chicken from Thailand and Argentina sold in Abu Ghraib area in Baghdad. Trackers warned families from buying any chickens from these districts, otherwise they would endanger their health and the health of their children. No one assured families they were safe from this tragedy in one of the most common types of food in the local markets.

IMPACT OF UNSAFE FOOD ON PUBLIC HEALTH

The impact of unsafe food consumption on public health is a significant concern due to its immediate and long-term health effects on the subsistence and vulnerable populations. Unsafe food can cause acute infectious illness or death from chemical radiation, bacterial, or other food quality contaminants (Gizaw, 2019). The effects of food safety issues are serious and increase healthcare costs and absenteeism from work. Due to changes in dietary habits and agricultural practices, food safety concerns have been on the rise in developing countries. These concerns have increased globally since the emergence of infections with antibiotic-resistant microorganisms associated with food and a number of widespread infectious foodborne disease outbreaks. These foodborne hazards are persistent in world food markets due to population growth, urbanization, and increasing trade liberalization of food and agricultural products.School-age children, elderly populations, and patients with chronic diseases lose even more nutritional value due to unsafe food consumption. Poultry meat and eggs are the main sources of foodborne diseases caused by Salmonella, Campylobacter, or Listeria, especially prevalent in developing countries. Although

national food safety control systems have been established, the public health impacts of unsafe food consumption remain uncertain in middle and low-income countries (Faour-Klingbeil & C. D. Todd, 2019). The results of this study can help to better protect public health by understanding potential health impacts due to food safety issues in developing countries.

HEALTH RISKS ASSOCIATED WITH CONSUMING UNSAFE FOOD

Food is a source of shelter and nourishment for everyone and one of the basic necessities of the human people. Murphy (1981) indicated that food is a complex commodity with different technologies for production processing, storage, and distribution for the people. It can be an agricultural or industrial commodity; an agricultural commodity is produced by farms, which can be livestock farm, crops farm, and eggs farm. There are different kinds of foods with different demand by consumers such as meat (beef, sheep, and goat), birds (chicken, turkey, quail), plant food (vegetables and fruits), and their derivatives (milk, butter, ice cream, honey). Thus, food is a commodity and each kind of food has a separate type of price set based on its demand and supply in the whole market (Gizaw, 2019).Food can be infected through the growing techniques, processing, and preparation of food. There are different sources and ways of food infection such as water supply, animal feeds, insects, and flies. Once the food is infected the number of bad microbes in the food chain continues to grow; hence the infection of food can be defined as any substance from microbes causing illness. The infection of food doesn't necessarily mean being spoiled, rotten, toxic, or poisonous, but it may be safe for consumption but has the risk of digesting it (Figuié, 2019).The vomit and diarrhea are the primary symptoms of food infection but other serious symptoms are hepatotoxic and neurotoxic affecting the heart and the brain. Related to the illness each year 5,000 children die due to unsafe food and the unsafe food may be contaminated by microbe and chemicals. The children are vulnerable for not chewing able food, understating the infection, frequently eating out of the homes, and limited immunity for infection. Safe food is a sub-basket of the food security basket and volatile food prices have a devastating effect on nutrition and health.

EFFORTS AND INITIATIVES TO IMPROVE FOOD SAFETY

Food safety has recently received growing attention in Iraq as a public health concern. Food control authorities and professionals have long been aware of the seriousness of food hazards and their control. Recent high-profile food poisoning outbreaks, deaths associated with unsafe foods, and a renewed concern regarding the excessive use of food additives and food contaminants have further heightened the focus on food safety in Iraq. The prevention and control of food hygiene hazards is a multi-sector responsibility and requires concerted efforts and initiatives from many sectors (Waldemar Dzwolak & Boakye Anim, 2025)

There have been initiatives at various levels to improve food safety in Iraq, focusing on wide-ranging aspects of the food supply system including agriculture and food production activities as well as the food trade and food industry. International supports through various forms of World Bank and WHO projects have contributed significantly to improving public health throughout the world and have been effective in many countries. Nevertheless, the efficiency of such efforts has been hindered by several obstacles for the efficient operations and control on abundant food supply systems (Faour-Klingbeil & C. D. Todd, 2019).

ASSESSMENT OF REGULATORY BODIES' EFFECTIVENESS

Key Performance Indicators An exploratory study was conducted to identify the key performance indicators (KPIs) used in the performance assessment of regulatory bodies in reducing the supply of unsafe food products in local markets. The study utilized semi-structured interviews in the qualitative method for data collection and content analysis. Multiple rule-based decision-making was used for data analysis. The findings revealed a total of thirty-seven KPIs that could be grouped into seven categories: Policy Environment and legal framework related KPIs, Audit and inspection related KPIs, Training, Research, and Public awareness related KPIs, Performance Outcomes related KPIs, Staff and Organizational Competency related KPIs, Resource Allocation related KPIs, and Coordination and Advisory service related KPIs. Additionally, recommendations were provided to enhance the above-mentioned KPIs. Hence, this study is the first attempt to identify the KPIs used in the performance assessment of regulatory bodies in reducing the supply of unsafe food products in the local markets of Iraq (Faour-Klingbeil & C. D. Todd, 2019).

Safeguarding consumers against unsafe food products is one of the most vital responsibilities of regulatory bodies. However, recent studies have indicated that many food products in Iraq's local markets are unsafe or non-compliant, potentially endangering consumer health. Therefore, the present exploratory study was conducted using semi-structured interviews to identify the KPIs used in the performance assessment of regulatory bodies in reducing the supply of unsafe food products in local markets.The findings revealed a total of thirty-seven KPIs that could be grouped into seven categories. The performance of regulatory bodies could be ensured by monitoring regulators' policy environment and legal framework, audit and inspection compliance, flow of human resources/channels, response to consumer complaints, research extension and public awareness, action taken against wrongdoers, and assessment of food quality standards/safety. The performance assessment of regulatory bodies could not be confined to the effectiveness and efficiency of their operations, rather it should cover the degree of implementation of the strategic plan, observance of legal context, and architectural alterations vis-a-vis the restructuring of regulatory bodies (L Luthringer et al., 2015).This study could serve as a guideline to the regulatory bodies, government, consumers, researchers, and academicians for assessing the performance of regulatory bodies in reducing the supply of unsafe food products in local markets. To the best of the author's knowledge, the performance assessment of regulatory bodies in this regard was never addressed before in Iraq. Hence, this study is the first of its kind in Iraq.

RECOMMENDATIONS FOR ENHANCING FOOD SAFETY REGULATIONS

The regulatory bodies in Iraq are in urgent need of enhancement in order to organize food safety regulations more strictly. Agricultural manuals on the prevention and control of disease are poorly disseminated to farmers. The number of farms where chemicals are used is uncertain, and monitoring is irregular. Facilities or laboratories that perform analysis of hazardous chemical residues in foodstuff are not available in Iraq, and no monitoring is done on chemicals in foodstuff (Faour-Klingbeil & C. D. Todd, 2019). This lack of monitoring exposure to chemicals through food stuff represents a critical gap. Food safety policy recommendations include establishing a basic infrastructure and program to ensure the safety of foods or to segregate full use of hazardous food additives.

Increasing investigation budget and developing new tools to complement and enhance routine daily inspection will help strengthen the practical efficacy of food inspectors. Training needs of food inspectors and laboratory analysts should be set as a high priority for food control activities. Most knowledge is acquired informally during offices or departmental-level discussions and in-

transit training sessions and visits. Food safety training programs targeting the food industry and food inspectors have been in place for several years in the MENA region, but the impact and outreach of these programs are generally limited.

POLICY RECOMMENDATIONS

Amendment of Legislative Decree Number (89) for the Year (1981): There is a need to amend the legislative decree number (2) for the year (1982) and the instructions issued on its basis that organize food control, and the need for the issuance of a law for the Ministry of Health to be a legal entity with independent administrative and financial authority. Great efforts were made by the Ministry of Health to unify food control programs and amend existing legislation on food safety and its establishments in order to comply with sound international practices, in addition to the need for training and qualification of national expertise and the study of the distribution of powers and jurisdictions of oversight agencies, decisions, and organs that affect the food safety system in a comprehensive manner to fill the legislative, regulatory, and institutional loopholes for those examined in the above report (Faour-Klingbeil & C. D. Todd, 2019).

Development of Guidelines and Regulations for the Usage of Food Chemicals, Preservatives, and Colorants: There is a need to develop guidelines and regulations for the usage of chemicals, preservatives, and food colorants according to the good safety dictates. There should be developed common guidelines and systems for the supervision of food safety establishments and the period of revising guides as well. Also, laws and regulations related to food control should be generally available in Arabic, and there is a need to ensure that the food processing establishments adhere to the Arabic translation of food control legislation.

CONCLUSION

Food safety is a complex area, forming a nexus with myriad systems of water, energy, trade, agriculture, nutrition, and health (D. Morse et al., 2018). It must be considered with extreme caution, particularly in poor resource settings which lack effective institutions and cross-sectoral coordination. It has not proved possible to collate reliable data on the national burden of foodborne disease in Malawi. Despite this limitation, there is strong anecdotal evidence, supported by the available literature, to indicate that foodborne health risks are significant. Similar evidence exists elsewhere in Sub-Saharan Africa. The informal market is a significant complexity within a complex food safety environment, as it constitutes, on average, up to 80% of all domestic food sales. Therefore, efforts to improve food safety in Iraq must address this complexity in a targeted manner (Henson & Caswell, 1999).

Firstly, it is necessary to recognize that food safety is a chain issue. Initiatives targeting improvement in food safety practices at a single point within the food chain will fail and too often have failed because it is difficult to enforce compliance at that single point. If, for example, the requirement for better food safety practices are imposed only on farmers, that is either not going to happen at all, or farmers will address that requirement but food processors and food vendors will not adapt their practices, leaving the food sold to consumers unsafe. Food safety initiatives that do not tackle the whole food chain will thus be ineffective. Secondly, there is a need to parry and counter demands from higher up the food chain for the imposition of food safety standards and systems of control that are inappropriate at the lower levels of the chain. The sophistication of food safety

control systems should be commensurate with prevailing technological food safety risks, and that should be determined for all food safety control systems in any country or industry on the basis of risk assessment techniques, taking economic considerations into account. Finally, the absence of effective food safety controls in the informal sector is inevitable given the nature of that market. Even where there is otherwise effective food safety legislation for the formal food chain, the informal food chain will operate beyond its reach unless the food safety risks posed by that chain are recognized and proactively and intelligently addressed, with workable alternatives to legislatively imposed forms of control that may not be appropriate within that environment (Jiang Q. & Peter J. ,2016).

SUMMARY OF FINDINGS

The regulations that control food safety and pollutants in food systems in Iraq are generally inadequate, weakly enforced, and poorly monitored. An analysis of government regulations, agency operations, regulations currently in force in Iraq, public health issues, and regulatory controls in other countries reveals the factors responsible for this situation. These factors include oil wealth, poverty, lack of strong public advocacy, cronyism, corruption, lack of capable public regulatory agencies, and lack of political will to initiate effective regulatory control.

Regulatory control is generally weak in developing countries, and Iraq is no exception. Although the Food and Drug Quality Control (FDQCC) is staffed with dedicated and capable individuals, the insufficiencies and incapabilities preventing effective regulatory control are likely numerous. Regulators often lack political support and funding for enforcement and the purchase of testing technology. In Iraq, there is also a lack of manpower, as the populace tends to avoid jobs at regulatory agencies due to their low salaries and perceived low socioeconomic status.Another complicating aspect in implementing effective regulatory control in Iraq is the widespread cronyism and corruption. Many persons have a vested interest in companies that wish to avoid regulatory control due to associated costs, the poor state of the local economy, or other means in favor of personal interests.

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