

Research Article

A Practical Study on the Importance of Implementing Food Safety Systems in Food Establishments to Achieve Sustainable Development

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Abstract

With the rapidly growing local and global demand for safe and healthy food products, there is an urgent need for food establishments in the Sultanate of Oman to adopt international food safety standards. This is not merely an option, but a strategic necessity to ensure competitiveness and sustainability. Food safety management systems, most notably the Hazard Analysis and Critical Control Points (HACCP) system and the ISO 22000 standard, serve as pivotal tools for enhancing operational efficiency and guaranteeing product quality and safety.

This research paper aims to provide an in-depth analysis of the strategic implications of implementing these systems. It will evaluate the opportunities and challenges faced by food establishments and assess their contribution towards advancing Sustainable Development Goals (SDGs). The study's methodology is based on a comparative analysis of the perspectives of both industry experts and employees within establishments that have implemented food safety management systems versus those in establishments that have not, using the state of Nizwa as a case study.

Keywords: HACCP, ISO22000, FSSC22000, Sustainable Development Goals (SDGs), Oman, Nizwa, Food Establishments, Food Safety Management Systems

1. Introduction

In recent decades, the global community has increasingly recognized the critical link between food safety, public health, and sustainable development. The **United Nations Sustainable Development Goals (SDGs)**, a set of 17 interconnected global objectives, provide a blueprint for a more sustainable and equitable future. These goals address pressing challenges, including poverty, hunger, health, clean water, and responsible consumption. The food industry, as a cornerstone of global economies and a direct determinant of human well-being, plays a pivotal role in achieving these ambitious targets.

This paper examines the significant impact of implementing food safety management systems within food establishments, and their direct contribution to achieving the SDGs. Specifically, we will analyze the role of four prominent global standards:

1.1. HACCP (Hazard Analysis and Critical Control Points)

This system focuses on identifying, evaluating, and controlling food safety hazards. By preventing contamination and ensuring the safety of food products, HACCP directly supports **SDG 2 (Zero Hunger)** by reducing foodborne illnesses and waste, and **SDG 3 (Good Health and Well-being)** by protecting consumer health.

1.2. ISO 22000 (Food Safety Management Systems)

As an internationally recognized standard, ISO 22000 integrates the principles of HACCP with a broader management system framework. Its emphasis on continuous improvement and supply chain collaboration contributes to **SDG 8 (Decent Work and Economic Growth)** by fostering efficient and reliable food production. It also supports **SDG 12 (Responsible Consumption and Production)** by promoting transparency and accountability throughout the food supply chain.

1.3. FSSC 22000 (Food Safety System Certification)

FSSC 22000 is a comprehensive food safety certification scheme that combines the requirements of ISO 22000 with prerequisite programs (PRPs). This system, which is recognized by the Global Food Safety Initiative (GFSI), ensures compliance with international standards, contributing to **SDG 9 (Industry, Innovation and Infrastructure)** by encouraging best practices and innovation in food safety, and **SDG 17 (Partnerships for the Goals)** by strengthening collaboration among different stakeholders in the food industry.

1.4. BRC Global Standard (British Retail Consortium)

The BRC standard provides a comprehensive framework for managing product safety, integrity, legality, and quality. By setting clear requirements for suppliers and retailers, this standard enhances consumer trust and encourages a more resilient and sustainable food system. It is particularly relevant to **SDG 9 (Industry, Innovation and Infrastructure)** by promoting the adoption of best practices, and **SDG 17 (Partnerships for the Goals)** by fostering cooperation among various parties in the food sector.

By exploring how these specific systems enhance operational efficiency, reduce waste, and build consumer trust, this paper will demonstrate that implementing robust food safety management is not merely a regulatory requirement, but a fundamental pillar for creating a sustainable food environment and, by extension, contributing to the broader global agenda of sustainable development.

2. Research Methodology

2.1. Sample Size and Study Design

The study sample consisted of 10 small and medium establishments from various parts of wilayat of Nizwa. Five of these establishments had implemented food safety management systems, while the other five had not.

2.2. Content of the Analyses

A field case study methodology was adopted for a number of food establishments in the Sultanate of Oman (specifically, wilayat Nizwa), including establishments from the restaurant, cafe, bakery, and food warehouse sectors. The following tools were used:

- Questionnaires and interviews with executive managers, quality and production supervisors, and employees from various disciplines within the establishment.
- Field visits to establishments that implement ISO 22000 standards and Hazard Analysis and Critical Control Point (HACCP) systems, as well as establishments that do not.
- Analysis of previous research studies.

3. Results and Discussion

3.1. This section provides an analytical comparison between food establishments that have implemented food safety management systems (such as ISO and HACCP) and those that have not yet done so. The comparison is based on surveys collected from experts in both types of organizations. The analysis will focus on the main challenges, available opportunities (or needs), and the strategic impact for each category.

3.1.1. Challenges

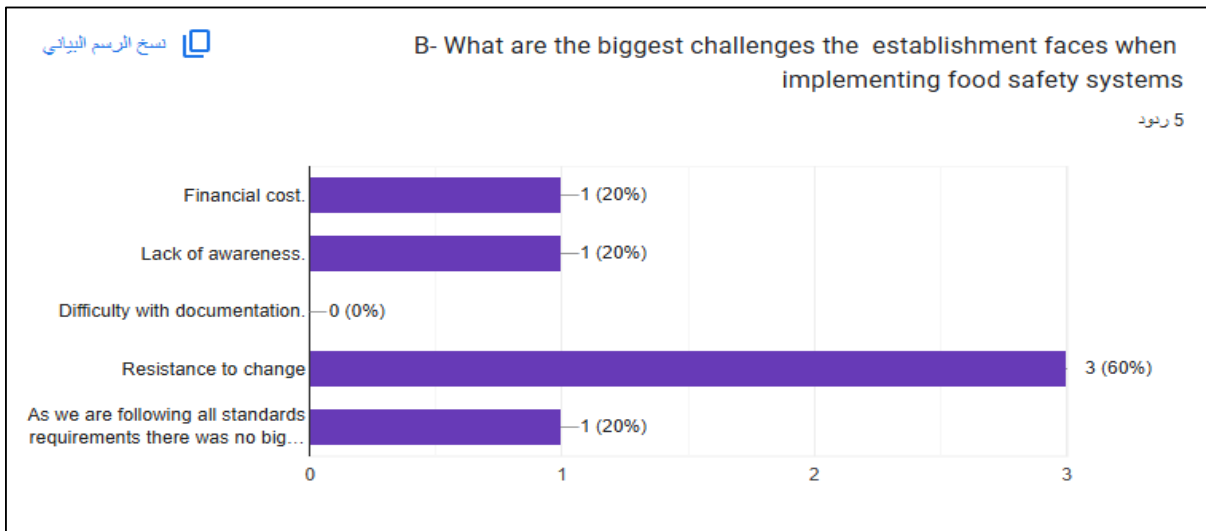


Figure 1(a): Establishments (Implemented FSMS)

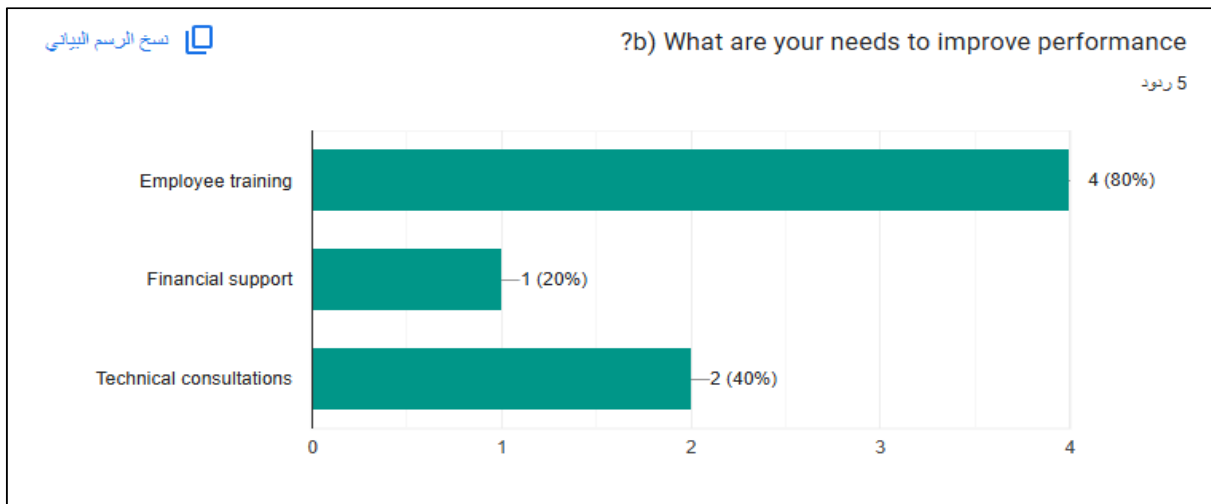
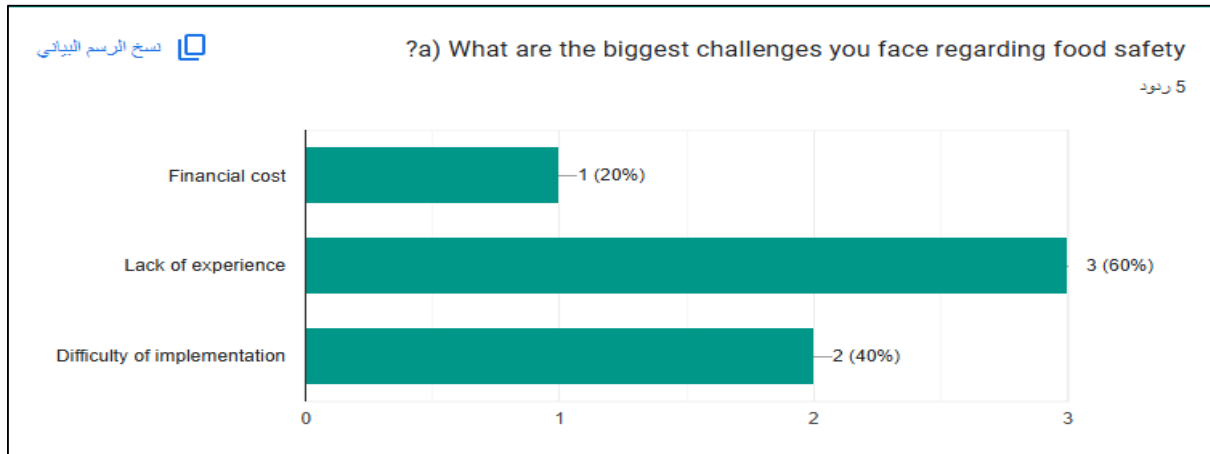


Figure 1(b): * Establishments (Have Not Implemented FSMS)

Analysis: Establishments that have already implemented the systems face challenges more related to people and company culture. These include a lack of awareness, especially at the beginning of the process (20%), and resistance to change from employees or management (60%). The financial cost can also remain a factor for these businesses (20%).

In contrast, establishments that haven't implemented these systems face fundamental challenges with getting started. The difficulties are primarily due to the complexity of implementation (40%), a lack of experience among staff or management (60%), and the cost of certification (20%).

3.1.2. Motivations, Opportunities and Needs

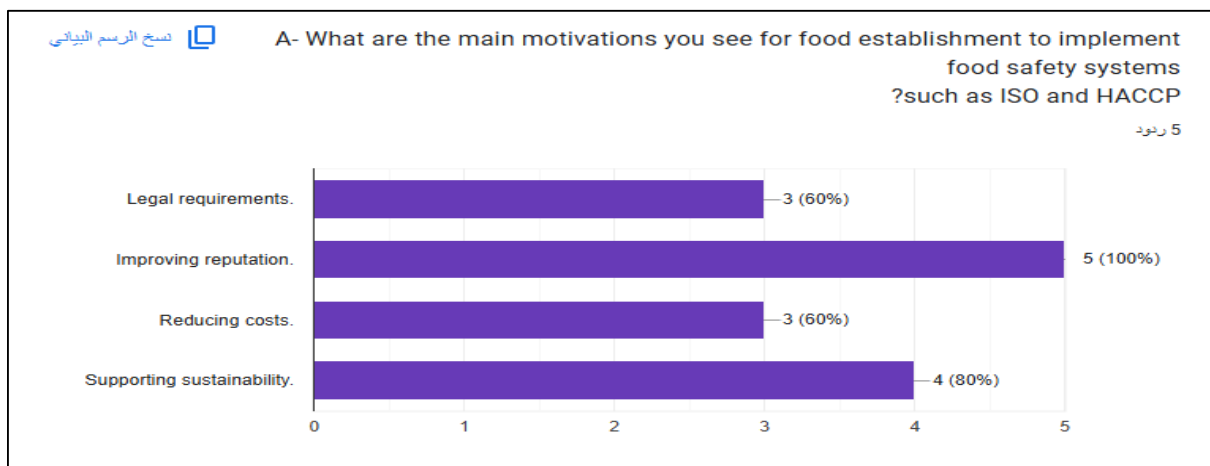


Figure 2(a): *Motivations (For Implementing Establishments)

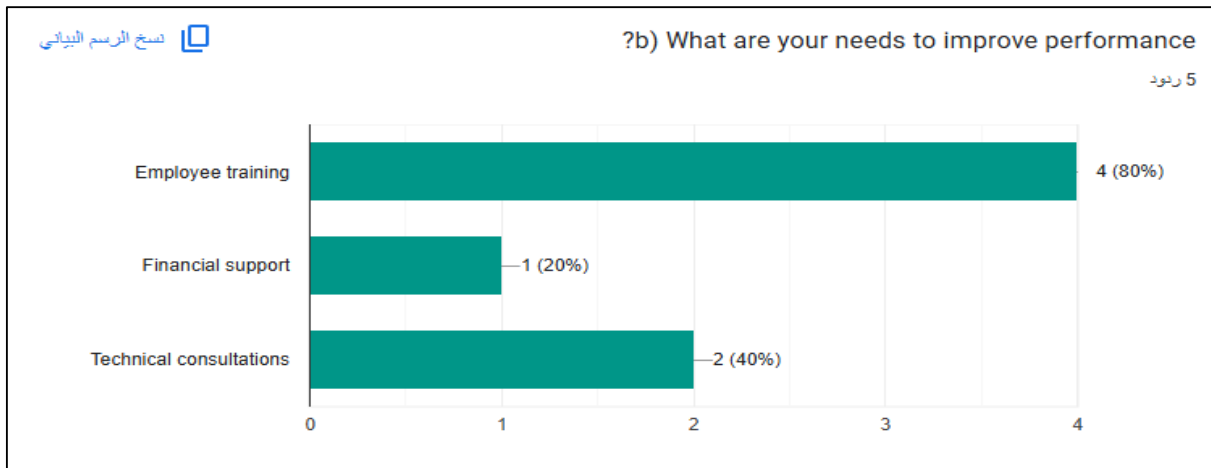


Figure 2(b): *Opportunities and Needs (For Non-Implementing Establishments)

Analysis: The motivations for the establishments that had implemented the systems were a mix of **compliance** (60% due to legal requirements) and **strategic competitive advantages** (100% improved reputation and corporate image (60%) reduced costs through operational efficiency (80%) supported sustainability by contributing to environmental and social goals.

yet implemented the systems were focused on **capacity building** and **external support**. Their needs were identified as (80%) training employees to increase their efficiency (20%) financial support to cover training costs. (40%) consulting services to get expert guidance.

3.1.3. Strategic Impact

3.1.3.1. Impact on Reducing Food Waste

Meanwhile, the needs of the establishments that had not

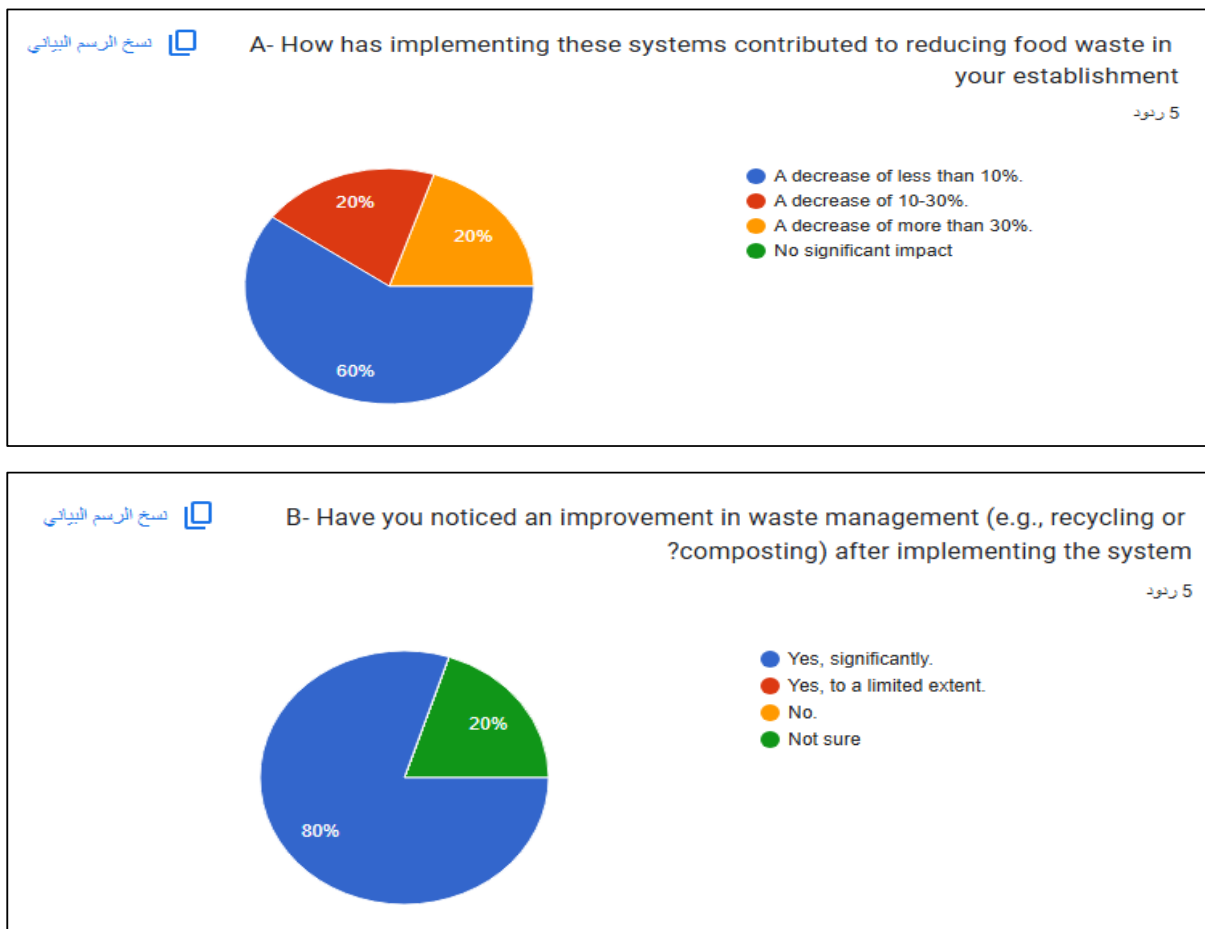


Figure 3(a): *Establishments (Implemented FSMS)

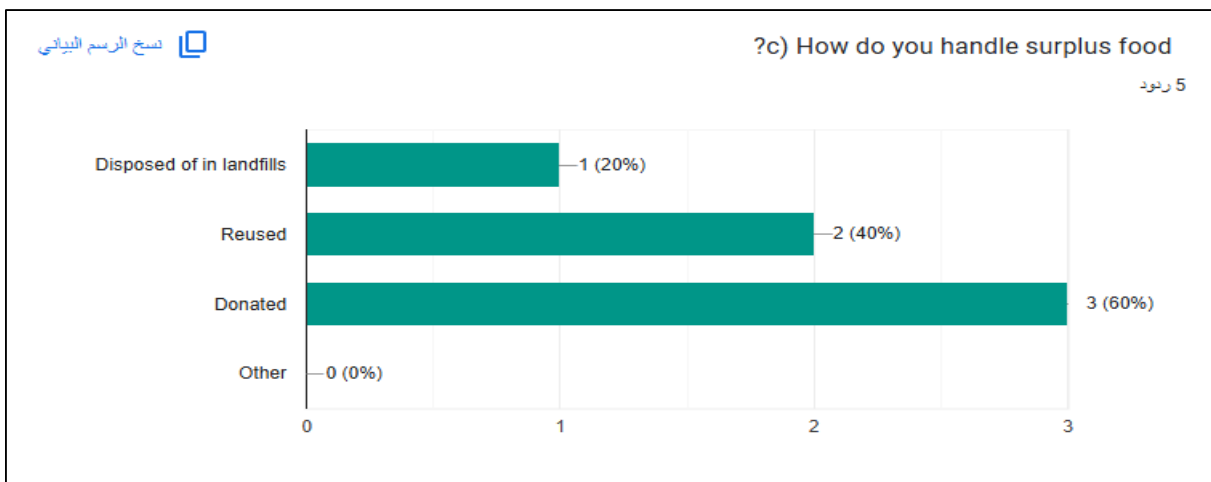
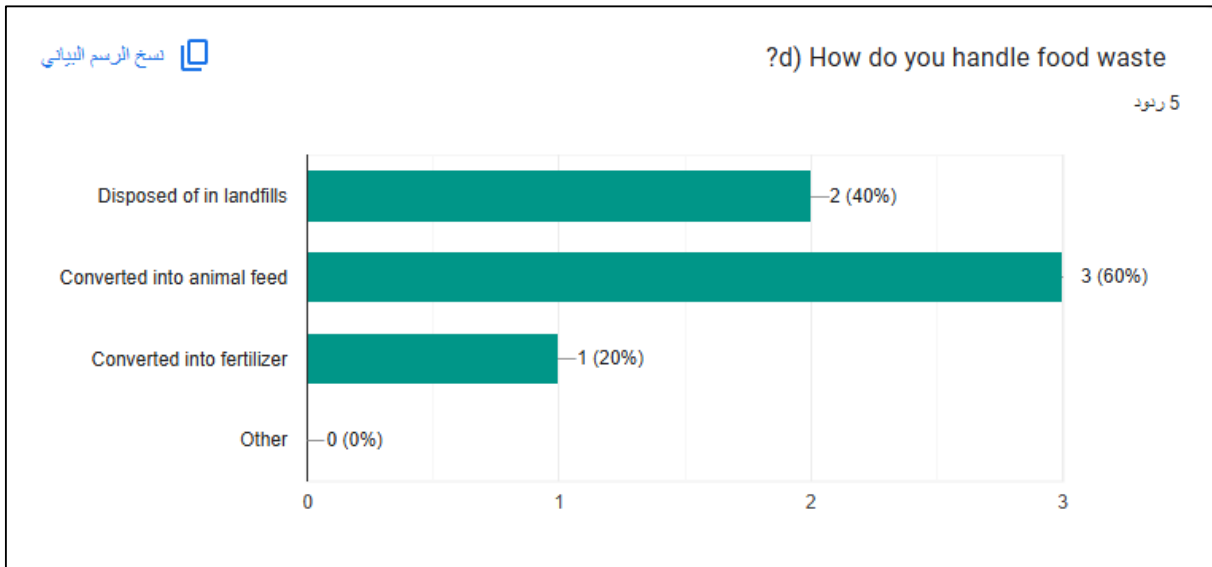
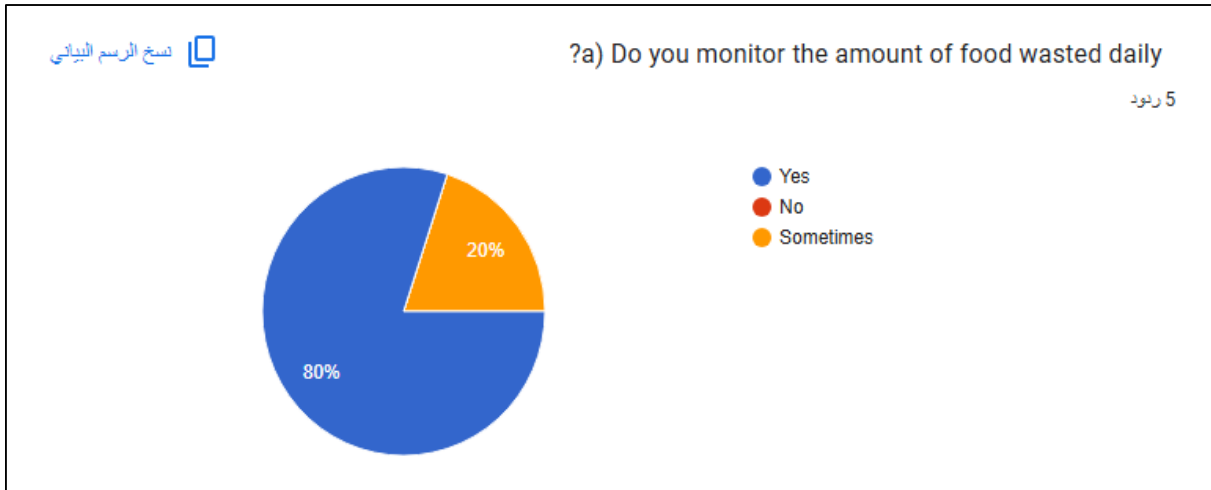


Figure 3(b): *Establishments (Have Not Implemented FSMS)

Analysis: Establishments that have implemented these systems show a clear improvement in reducing food waste. The percentage of waste reduction ranges from less than 10% to over 30%, which proves the effectiveness of these systems in managing resources. On the other hand,

establishments that have not implemented these systems lack the mechanisms for monitoring and control.

3.1.3.2. The Impact on Cost Savings and Profitability

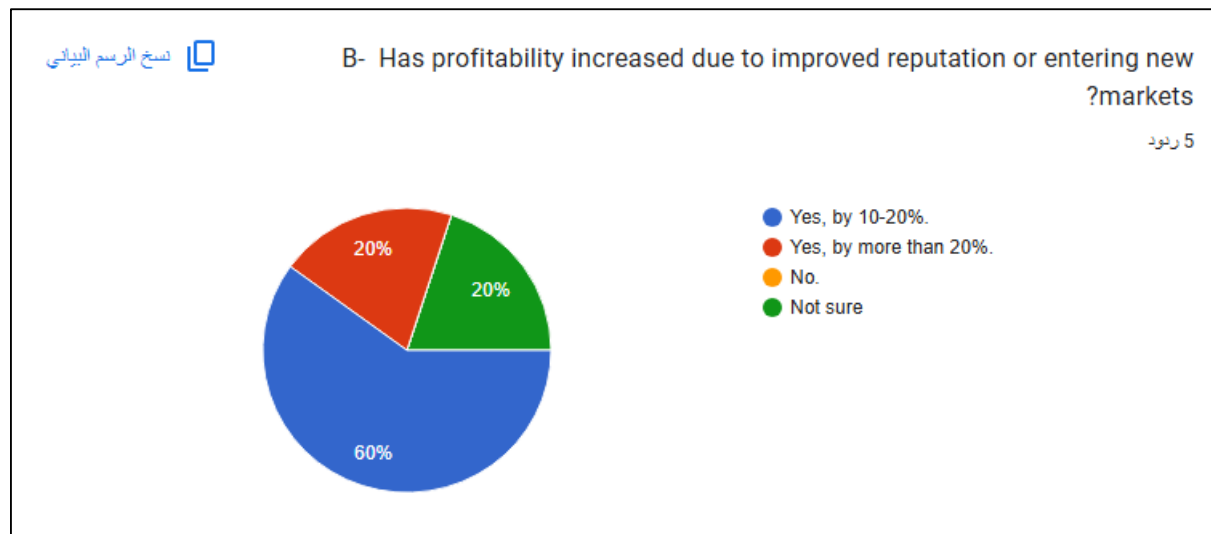
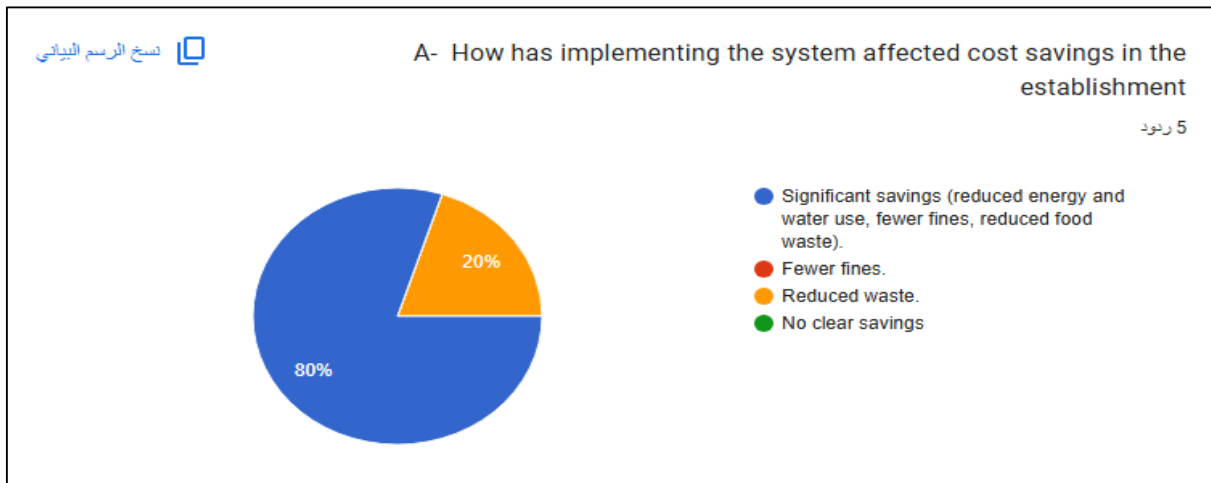


Figure 4(a): * Establishments (Implemented FSMS)

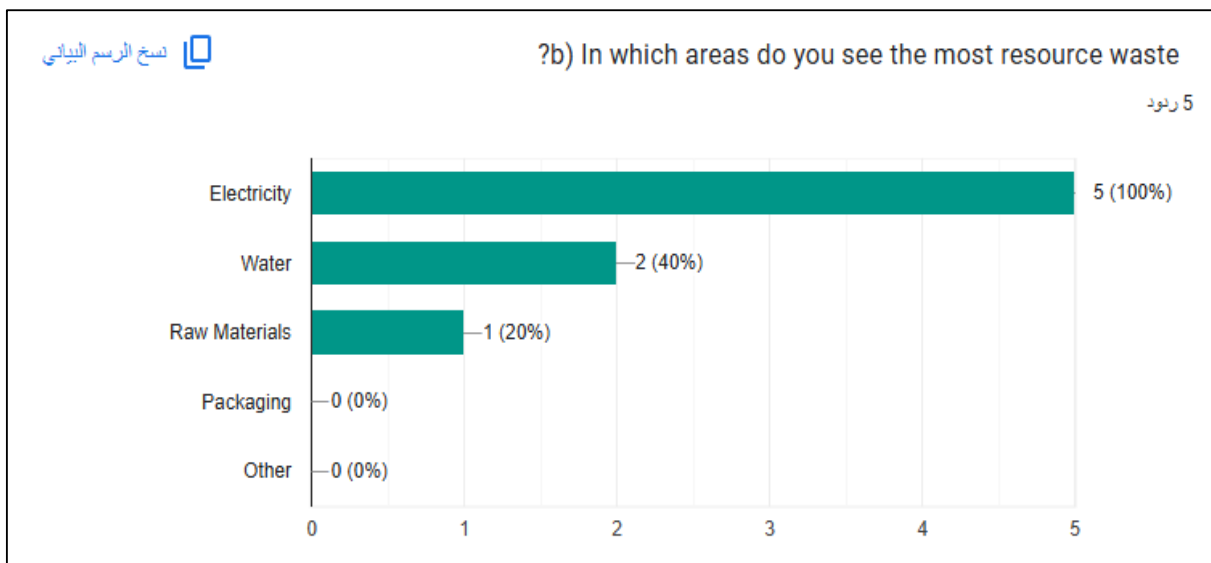


Figure 4(b): *Establishments (Have Not Implemented FSMS)

Analysis: establishments that have implemented these systems achieve significant financial savings and increased profitability due to improved efficiency and reputation. This is a powerful strategic incentive for adopting these systems.

3.1.3.3. The Impact on the Health of Employees and Consumers and Awareness of Sustainability

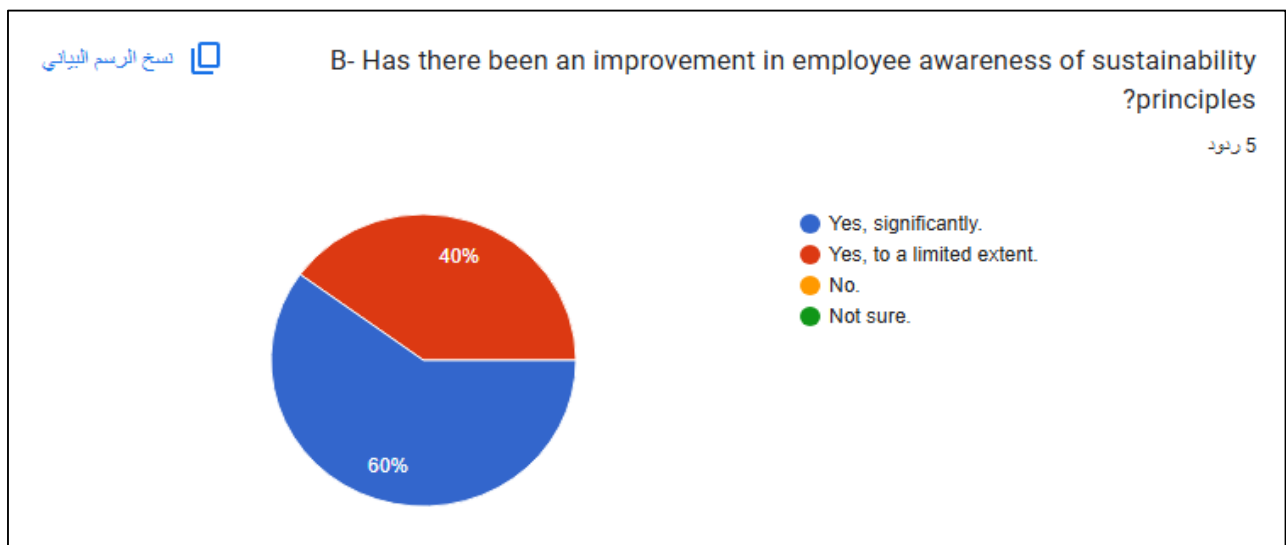
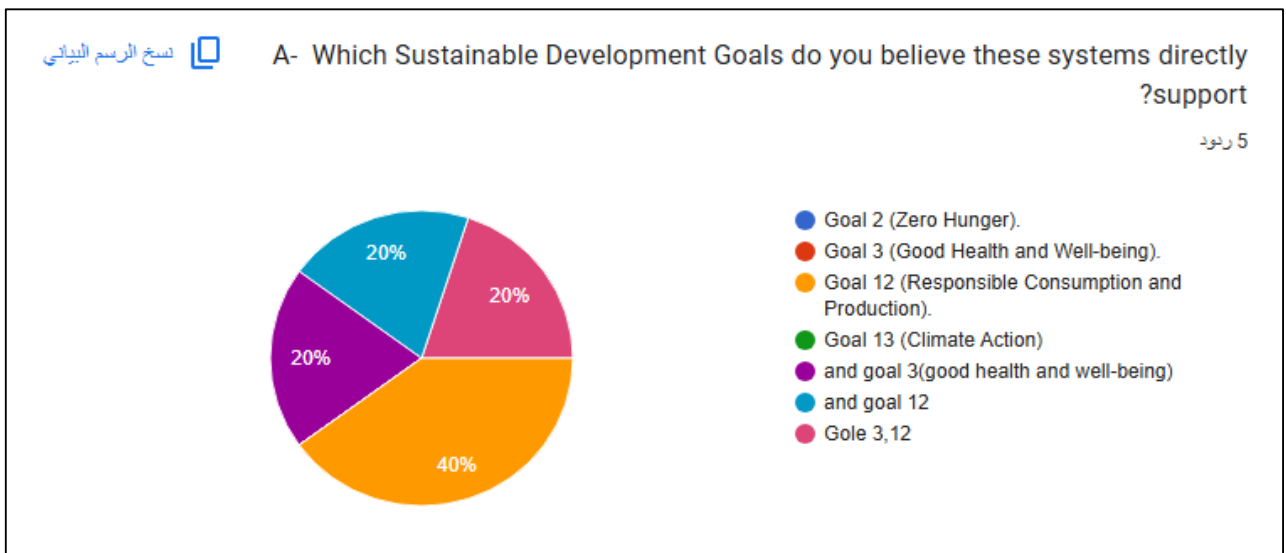
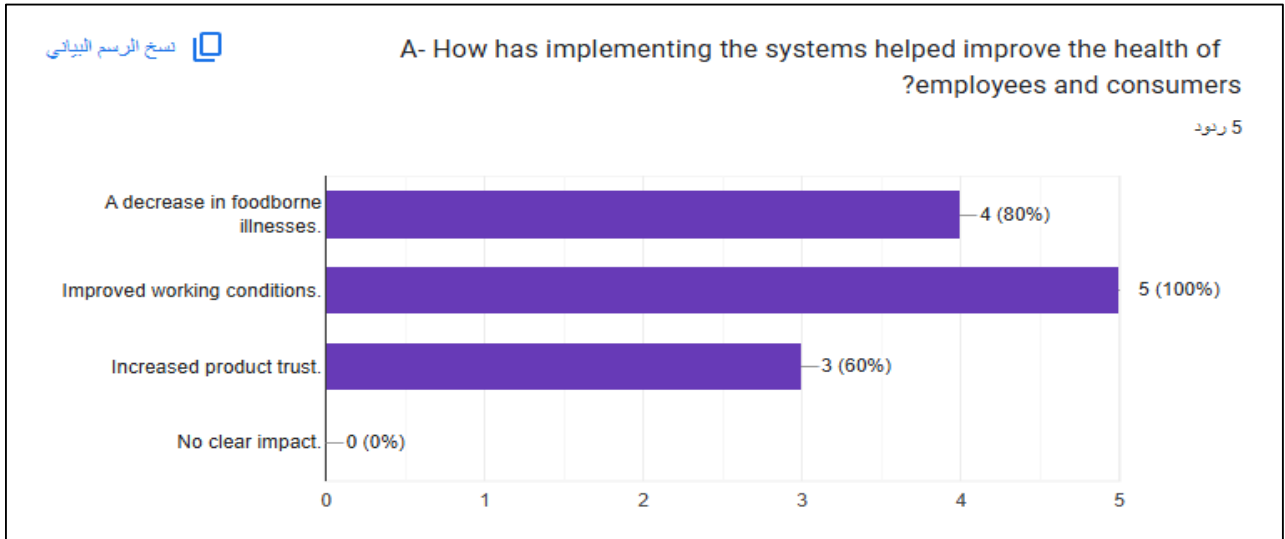


Figure 5(a): *Establishments (Implemented FSMS

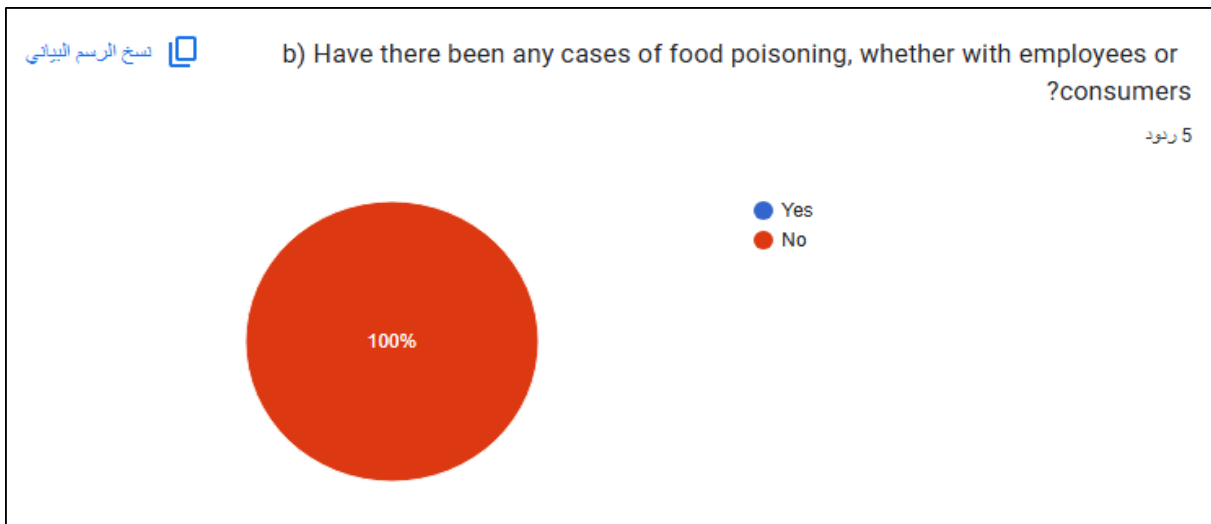
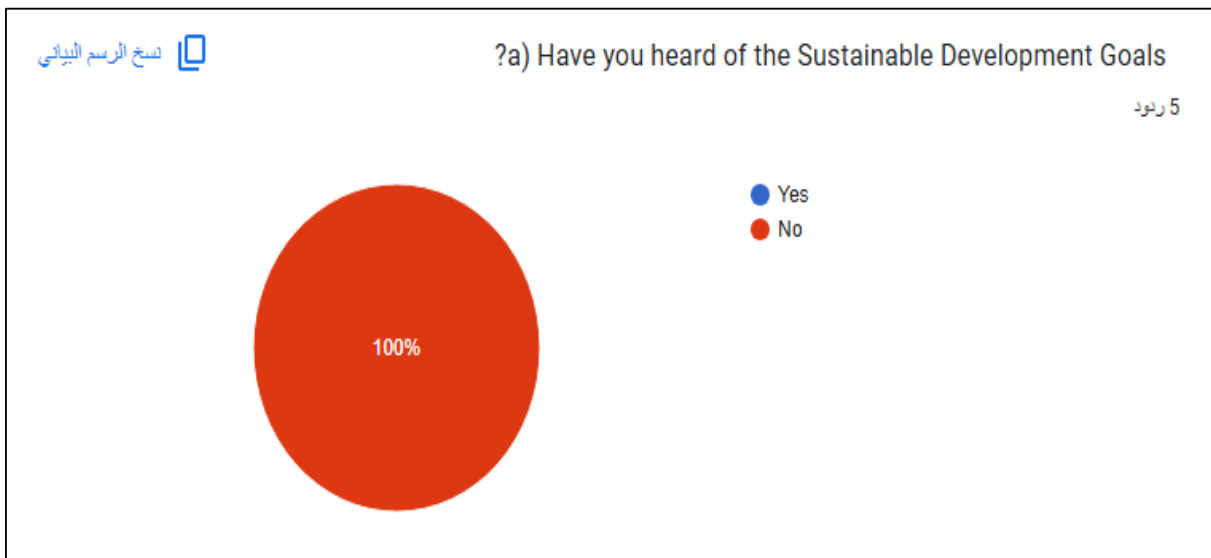
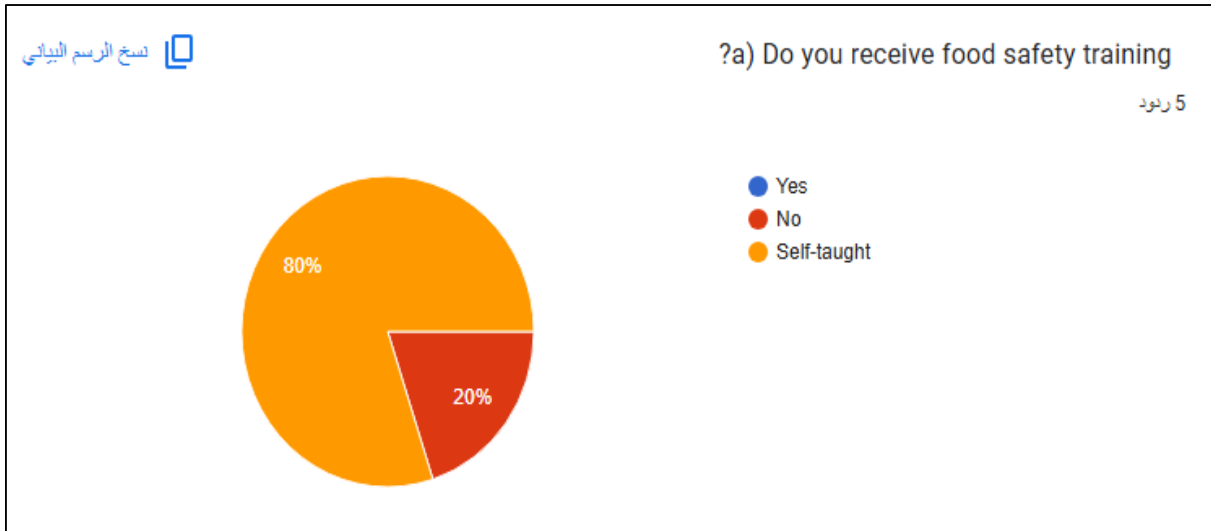


Figure 5(b): *Establishments (Have Not Implemented FSMS)

Analysis: food safety systems directly contribute to improved public health and increased consumer trust. They also boost awareness of sustainability principles within an organization. These strategic effects may be absent in establishments that have not yet implemented these systems.

implemented food safety management systems and those that have not. This is based on two **separate surveys**. The comparison will focus on three key aspects: food safety awareness, organizational culture regarding **food safety, and the hygienic practices** followed.

3.2. This section offers a comprehensive analytical comparison of employees in food establishments that have

3.2.1. Food Safety Awareness (Training)

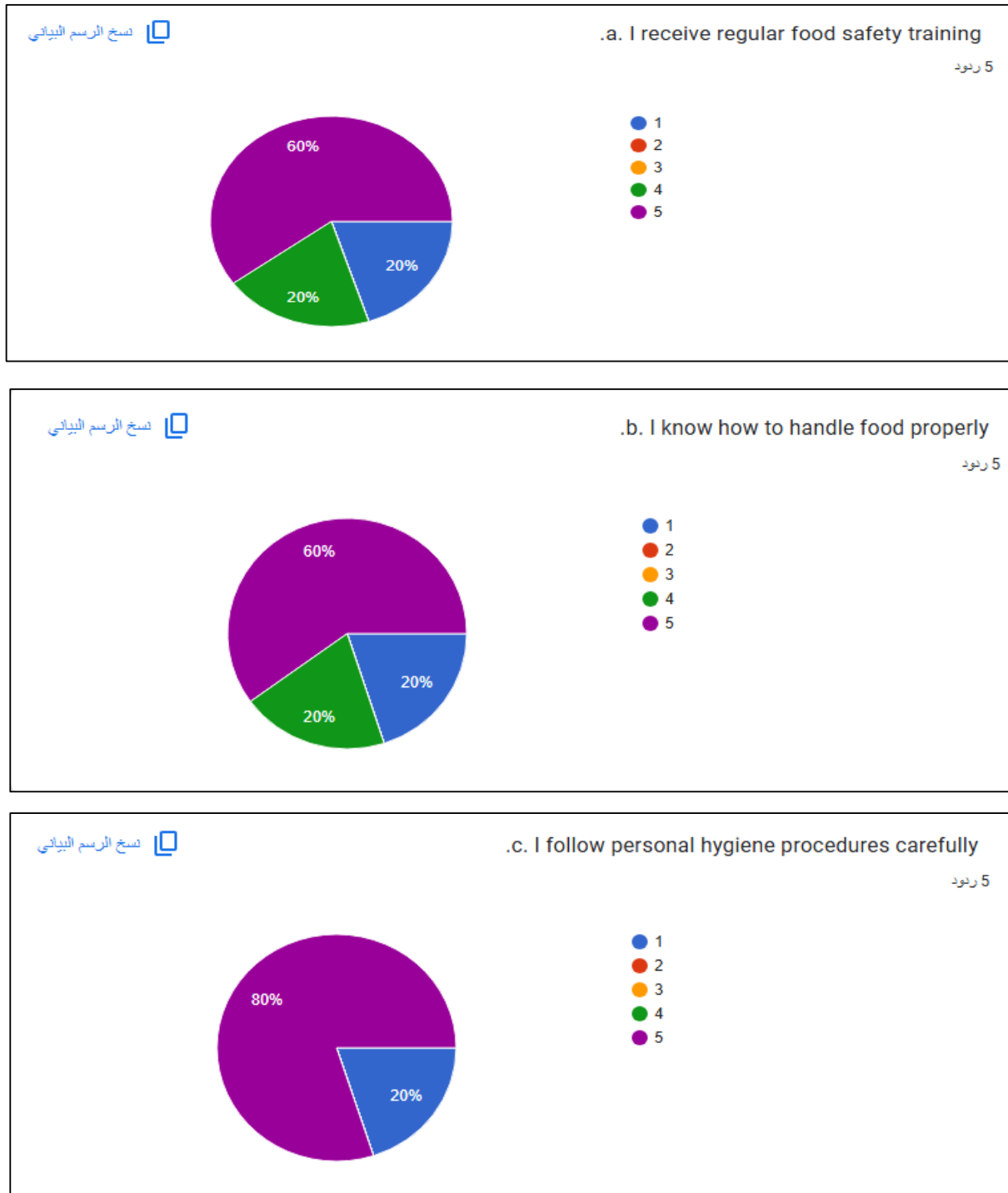


Figure 6(a): *Establishments (Implemented FSMS)

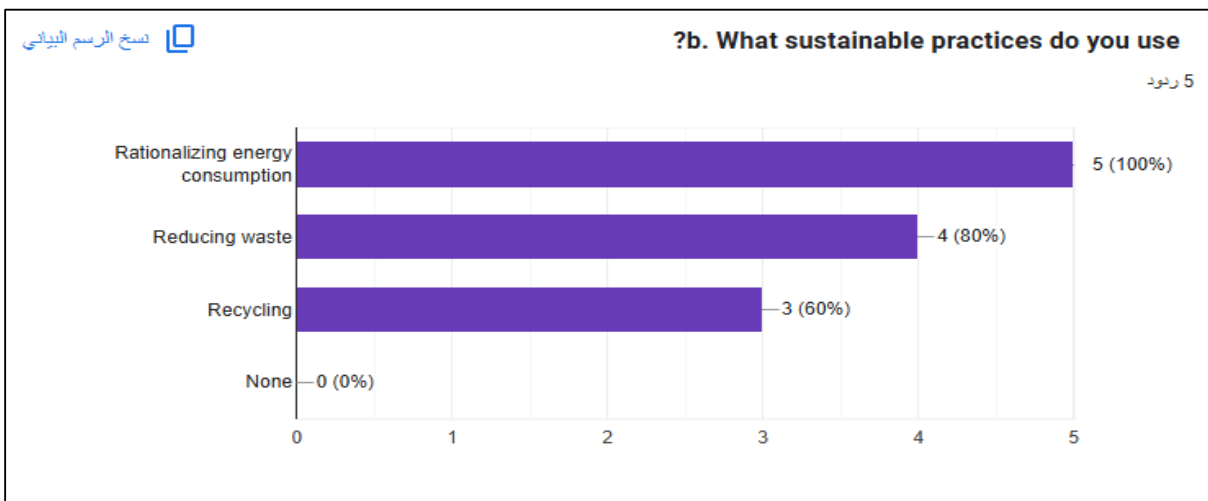
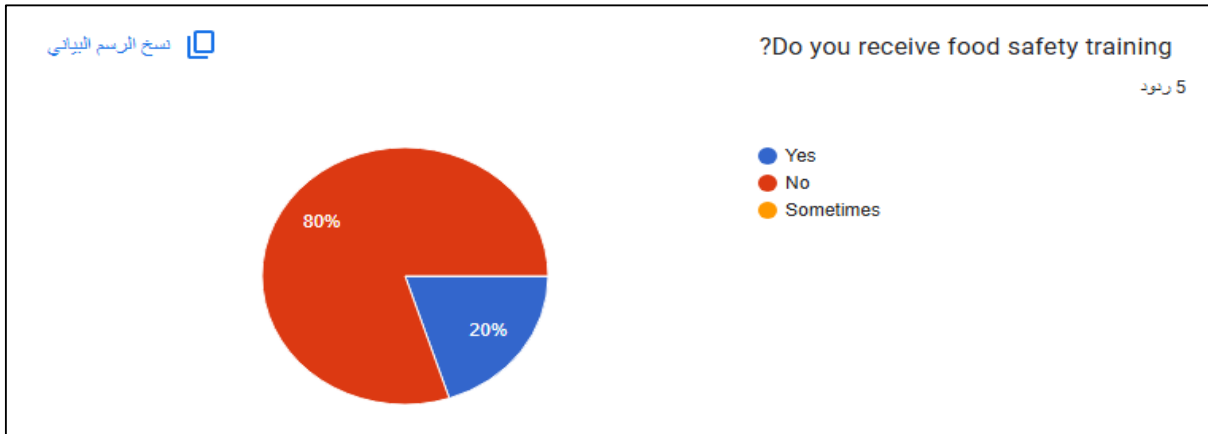


Figure 6(b): *Establishments (Have Not Implemented FSMS)

Analysis: The data reveals a significant difference in food safety training. While only 20% of employees at establishments without these systems receive training, the vast majority of staff at establishments that have implemented them report

getting **regular, highly-rated training**. This indicates the high quality of the training they receive.

3.2.2. Organizational Food Safety Culture

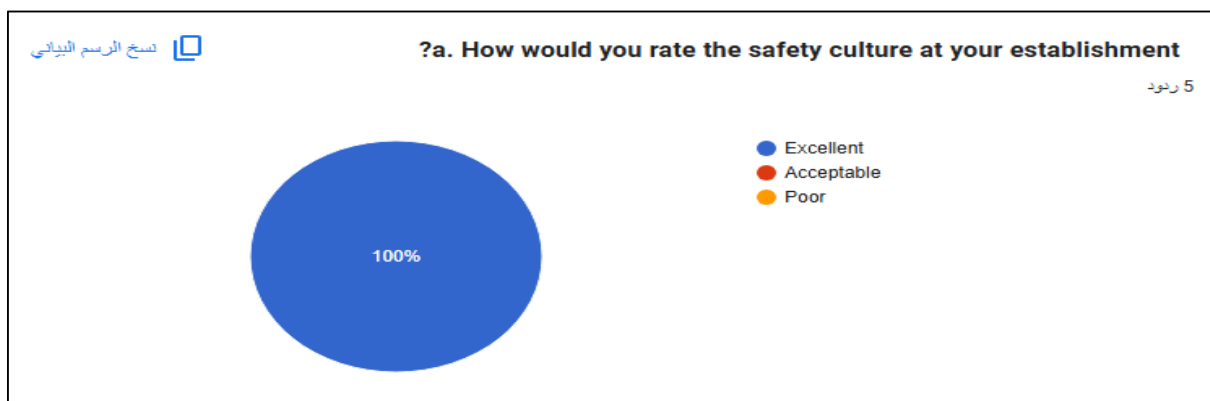


Figure 7(a): *Establishments (Implemented FSMS)

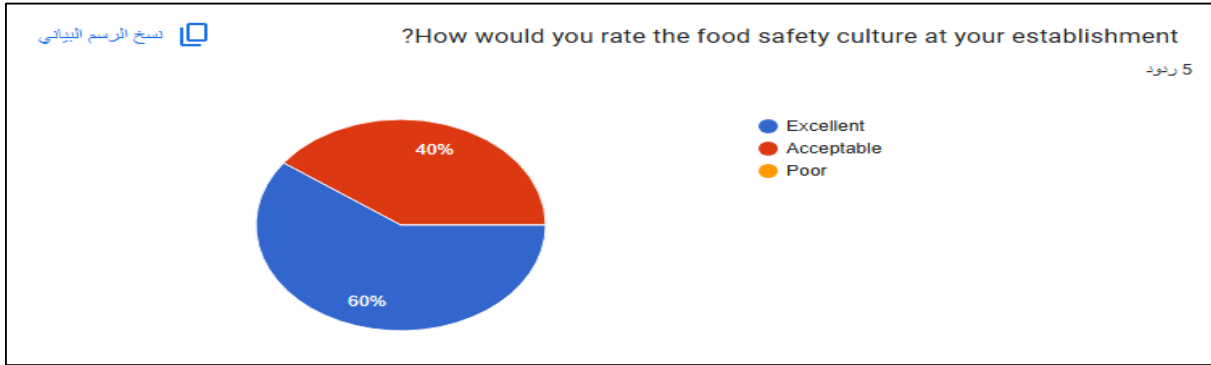


Figure 7(b): *Establishments (Have Not Implemented FSMS)

Analysis: Although a large percentage of employees in non-compliant establishments rate the culture as "Excellent," the fact that 40% rate it as "Acceptable" indicates a disparity in how standards are applied.

In contrast, **all employees** in establishments that have implemented the systems agree that the culture is

"Excellent." This reflects a work environment that is more committed to and consistent with established standards.

3.2.3. Health Practices

3.2.3.1. Knowledge of Proper Food Handling and Personal Hygiene

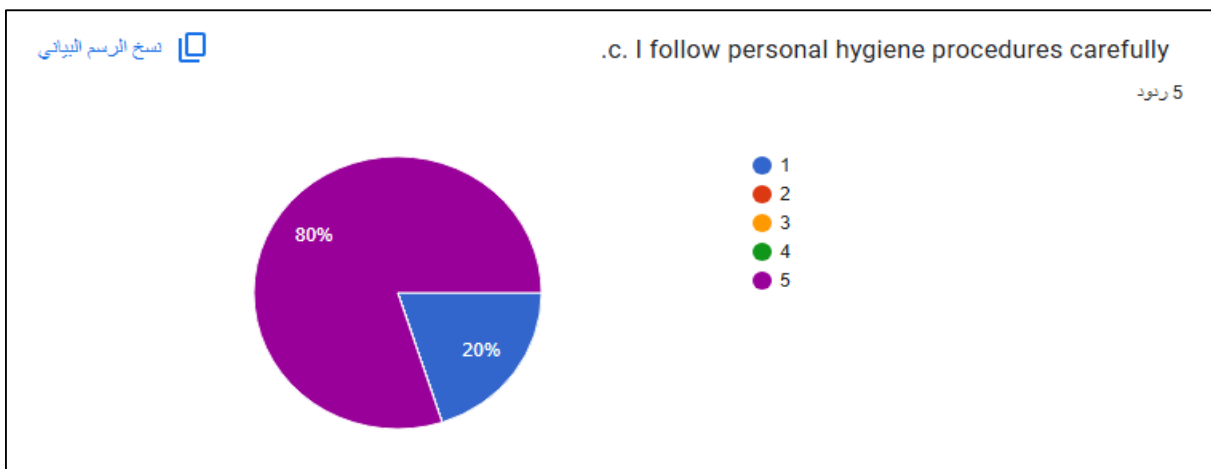
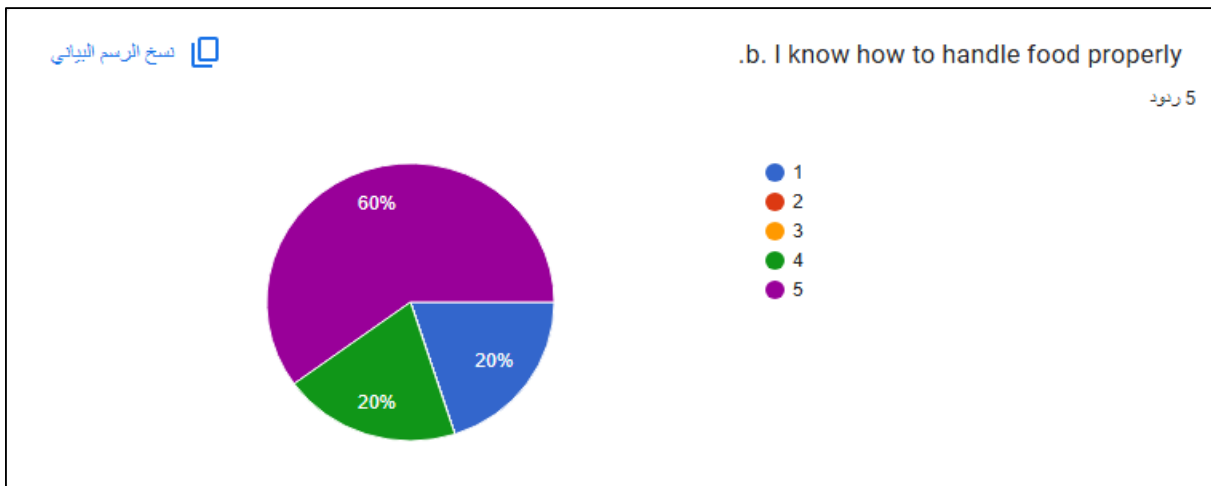


Figure 8(a): * Establishments (Implemented FSMS)



Figure 8(b): * Establishments (Have Not Implemented FSMS)

Analysis: establishments that have implemented hygiene systems show a higher level of commitment to personal hygiene procedures, with 80% of employees reporting they follow them carefully. In contrast, institutions without these systems primarily rely on the practice of "hand washing,"

and a concerning 20% do not follow any specific procedures. Additionally, employees in institutions with systems demonstrate better knowledge of proper food handling.

3.2.3.2. Handling Food Waste

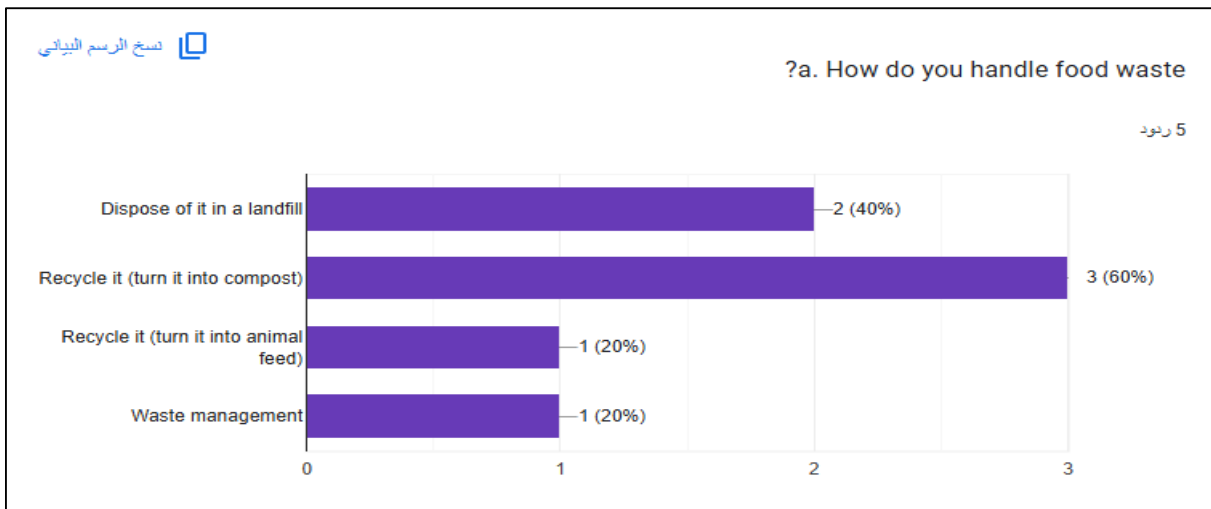
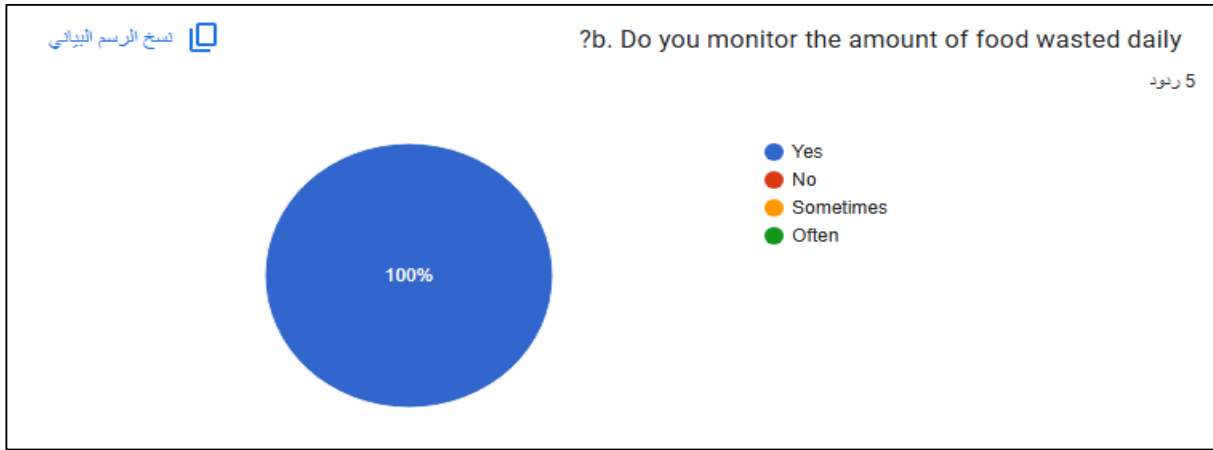
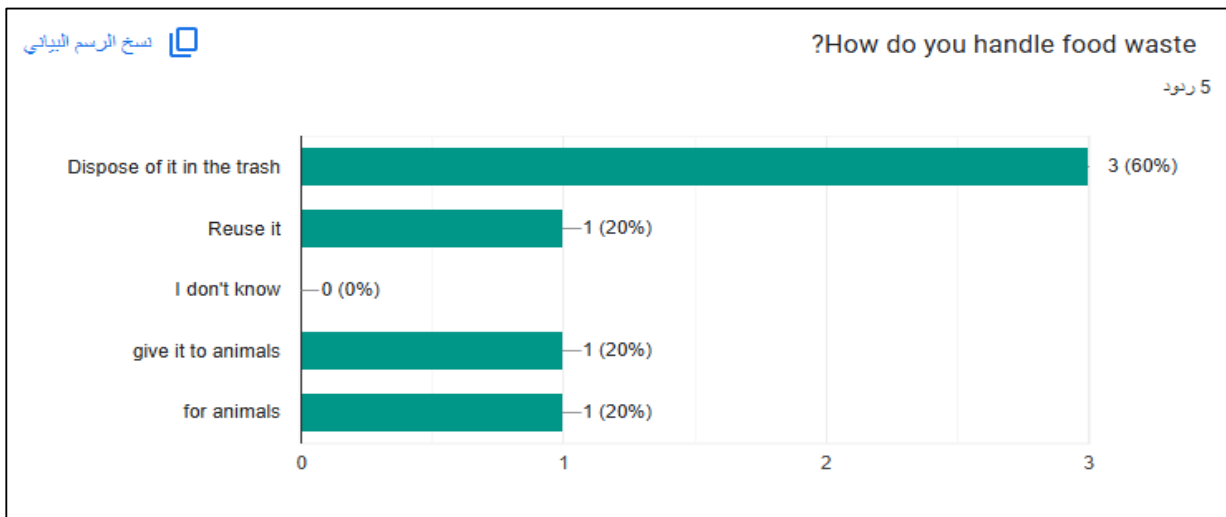


Figure 9(a): * Establishments (Implemented FSMS)



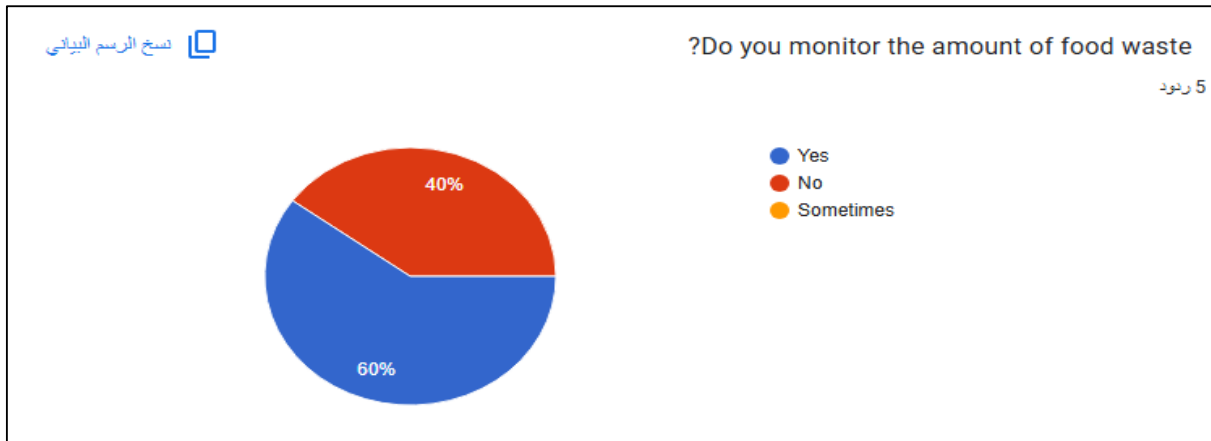


Figure 9(b): * Establishments (Have Not Implemented FSMS)

Analysis: reveals that all employees in establishments with food waste systems monitor the quantity of food waste, compared to only 60% in establishments without such systems. More importantly, establishments with systems follow more sustainable practices for managing food waste, such as recycling it for compost, while institutions without systems primarily rely on disposal in the trash.

4. Recommendations

Strengthen government support for small and medium-sized enterprises (SMEs) to adopt food safety systems by providing incentives and facilities.

Intensify awareness and training programs (including for government inspectors and food establishment owners) on the importance of these systems and their long-term benefits.

Integrate ISO 22000 and HACCP standards into national sustainable development policies and food licensing requirements.

Encourage research and innovation in environmentally friendly and sustainable food safety technologies.

Build public-private partnerships to promote the implementation of sustainable practices in the food supply chain.

5. Conclusions

The implementation of food safety systems is an effective tool to enhance organizational sustainability, by improving

product quality, production efficiency, and resource protection.

These systems provide a healthy and safe working environment, increasing the level of trust by consumers and business partners.

The real added value lies in integrating these systems into an organization's overall development strategy, not just a formal commitment.

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