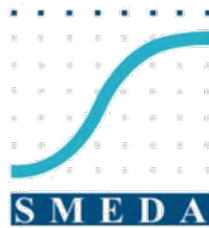


PEST MANAGEMENT IN FOOD PROCESSING



Small and Medium Enterprises Development Authority

Ministry of Industries & Production

Government of Pakistan

www.smeda.org.pk

HEAD OFFICE

4th Floor, Building No. 3, Aiwan-e-Iqbal Complex, Egerton Road,
Lahore

Tel: (92 42) 111 111 456, Fax: (92 42) 36304926-7
helpdesk@smeda.org.pk

REGIONAL OFFICE PUNJAB	REGIONAL OFFICE SINDH	REGIONAL OFFICE KPK	REGIONAL OFFICE BALOCHISTAN
3 rd Floor, Building No. 3, Aiwan-e-Iqbal Complex, Egerton Road Lahore, Tel: (042) 111-111-456 Fax: (042) 36304926-7 helpdesk.punjab@smeda.org.pk	5 TH Floor, Bahria Complex II, M.T. Khan Road, Karachi. Tel: (021) 111-111-456 Fax: (021) 5610572 helpdesk-khi@smeda.org.pk	Ground Floor State Life Building The Mall, Peshawar. Tel: (091) 9213046-47 Fax: (091) 286908 helpdesk-pew@smeda.org.pk	Bungalow No. 15-A Chaman Housing Scheme Airport Road, Quetta. Tel: (081) 831623, 831702 Fax: (081) 831922 helpdesk-qa@smeda.org.pk

JUNE 2018



TABLE OF CONTENTS

1. Introduction of SMEDA.....	2
2. What is Pest?	4
3. Why Pest Control?.....	4
4. Common Pests in Food Industry	5
5. How to Implement Pest Management	7
6. References	11

1. INTRODUCTION OF SMEDA

The Small and Medium Enterprise Development Authority (SMEDA) was established with the objective to provide fresh impetus to the economy through the launch of an aggressive SME development strategy. Since its inception in October 1998, SMEDA had adopted a sectoral SME development approach. A few priority sectors were selected on the criterion of SME presence. In depth research was conducted and comprehensive development plans were formulated after identification of impediments and retardants. The all-encompassing sectoral development strategy involved overhauling of the regulatory environment by taking into consideration other important aspects including finance, marketing, technology and human resource development.

After successfully qualifying in the first phase of sector development SMEDA reorganized its operations in January 2001 with the task of SME development at a broader scale and enhanced outreach in terms of SMEDA's areas of operation. Currently, SMEDA along with sectoral focus offers a range of services to SMEs including over the counter support systems, exclusive business development facilities, training and development and information dissemination through a wide range of publications. SMEDA's activities can now be classified into the three following broad areas:

1. Creating a Conducive Environment; includes collaboration with policy makers to devise facilitating mechanisms for SMEs by removing regulatory impediments across numerous policy areas
2. Cluster/Sector Development; comprises formulation and implementation of projects for SME clusters/sectors in collaboration with industry/trade associations and chambers
3. Enhancing Access to Business Development Services; development and provision of services to meet the business management, strategic and operational requirements of SMEs.

SMEDA has so far successfully formulated strategies for sectors, including fruits and vegetables, marble and granite, gems and jewelry, marine fisheries, leather and footwear, textiles, surgical instruments, transport and dairy. Whereas the task of SME development at a broader scale still requires more coverage and enhanced reach in terms of SMEDA's areas of operation.

Despite the structural shift towards industrialization, agriculture sector is still the largest sector of the economy with deep impact on socio-economic set up. Knowing this fact, SMEDA, since its inception, is highly committed to enhance the competitiveness of local food processing industry in the country. SMEDA 'Agro Food Services' offers a wide range of services to support the industry, including; Identification of potential investment opportunities in the sector, development of business plans and feasibilities etc. Training and capacity building and hand holding of entrepreneurs.

DISCLAIMER

Form of this document and the contents therein are provided only for general information purpose and on an "as is" basis without any warranties of any kind. Use of this document is at the user's sole risk. SMEDA assumes no responsibility for the accuracy or completeness of this document, its form and any of the information provided therein and shall not be liable for any damages arising from its use.

Document No.	PUN/OTC/10
Prepared By	SMEDA-Punjab
Prepared In	June 2018
For information	gazi.saddam@smeda.org.pk



2. What is Pest?

A pest is any living organism, whether animal, plant or fungus, which is invasive or troublesome to plants or animals, human or human concerns, livestock, or human structures. It is a loose concept, as an organism can be a pest in one setting but beneficial, domesticated or acceptable in another.

Food manufacturers should have an expectation that pests are always lurking due to the presence of food in their operations. For these businesses, the dangers of pest infestation occur at several points in the supply chain, including when raw ingredients arrive, inside machinery, in the warehouse or at the customer's warehouse. As a result, food manufacturers have the critical need to remain vigilant and maintain careful records to ensure and demonstrate that pest activity is not having a negative impact on their standards, or those of their customers and auditors. Continual action is critical to preventing an infestation from occurring and effectively managing any potential risk.

3. Why Pest Control?

Pests are inherently drawn towards food. Hence, the food industry is one of the most vulnerable segments which cannot do without pest control to maintain their high levels of food safety. Pests are the carriers of a wide variety of disease causing bacteria, viruses and a host of other organisms. They are a threat to the health of the staff involved in the processing and handling of food, to consumers. Pests are always drawn towards food and thus large sites that manufacture huge amounts of food on a daily basis are a perfect location for pest activities. As a result, food and drinks companies need to ensure they have plans in place to limit this.

Pests are carriers of disease, dirt, and germs, and all of this dangerous bacteria can be easily transferred to food via several different means; first and foremost, immediate contamination can occur when pest faeces and urine are left on surfaces and exposed food. Furthermore, pests will deposit spoiled food in hidden corners, leaving it to rot and causing nasty fumes and odors to permeate through the air conditioning system. Add in the cost of having to repeatedly replace spoiled food and have a dangerous and expensive food safety problem.



When it comes to the food industry, pests pose major threats. Some of these are listed below:

- Spreading diseases through a transfer of pathogens
- Property and equipment damage
- Contamination of food products and work stations
- Bad reputation and loss of credit
- Prosecution and closure

4. Common Pests in Food Industry

The major pests affecting the Food Retail sector include rodents, flies, cockroaches, stored product insects, birds, and ants.

Rodents: Rats and mice are attracted by food supplies but do not venture far from their shelter or nesting sites, so will nest close to food sources. They are capable of a rapid increase in population given an abundant food supply, shelter from predators and benign environmental conditions inside a building. Control of rodents involves the elimination of harborage in and around buildings and preventing access to food, water and shelter. There may be many points of entry to a building, such as cracks, vents, pipes, cabling, drains, doorways, and windows, where measures like blocking, using insect killers and caging etc. can be taken to prevent access.

Flies: A number of fly species are attracted to food odors present in grocery stores, including fruit flies, drain flies and house flies. For commercial pest control it is important to identify which species is present as each has different attractants and breeding habits. The application of standard hygiene practices are particularly important for controlling flies to reduce the attractive odors, feeding material and breeding sites.

These include:

- supplies are not brought in or stored in a rotting state;
- food preparation areas and equipment are cleaned and inspected regularly, including in cracks, crevices and hidden spaces where traces of food and liquid can accumulate;
- garbage is disposed of regularly — at least twice a week in hotter climates;
- garbage containers are cleaned, not overflowing and can shut properly;
- all equipment used to handle garbage is cleaned regularly;



- there is sufficient storage volume for the waste produced;
- the areas where garbage is stored are kept clean and well maintained;
- supply areas and vehicles where spills can accumulate and decay are kept clean;
- the same hygienic practices are applied to canteen and kitchen areas;
- drains are kept free of accumulating organic matter and cleaned with appropriate cleaner.

Cockroaches: can cause particular problems in businesses that handle food because of their ability to hide in small places, their varied diet, rapid reproduction and the diseases they can carry. Removal of waste from food production areas, garbage container design that denies access to all pests, positioning of garbage containers away from the food storage and processing areas, emptying and cleaning frequently, all reduce risk of infestation and also maintain the drains in good condition to prevent accumulation of food debris and means of access and shelter. A number of treatments are available for control of cockroaches, including sprays, aerosols, dusts and bait. In food handling premises the insecticides used must be permitted for use by the relevant authority and will require competent, trained personnel to apply them.

Birds: Buildings provide safe areas for birds to roost around the structure and in spaces such as under roofs. Food stores and waste storage areas may also provide a food supply that attracts the birds. Bird control consists of preventing access to food, water and shelter. Basic practices to prevent access to food and water are:

- keep doors closed when not in use;
- remove spillages quickly;
- keep garbage storage areas clean and containers shut;
- garbage containers should be bird proof;
- remove any standing water where possible;
- regularly check food storage and delivery areas for potential bird access points.

Ants: They can find their way to food sources in buildings through the smallest gaps. They may infest fresh foods, food preparation areas, shelving, packaged foods damaging both the packaging and the food inside and in waste storage areas. The only

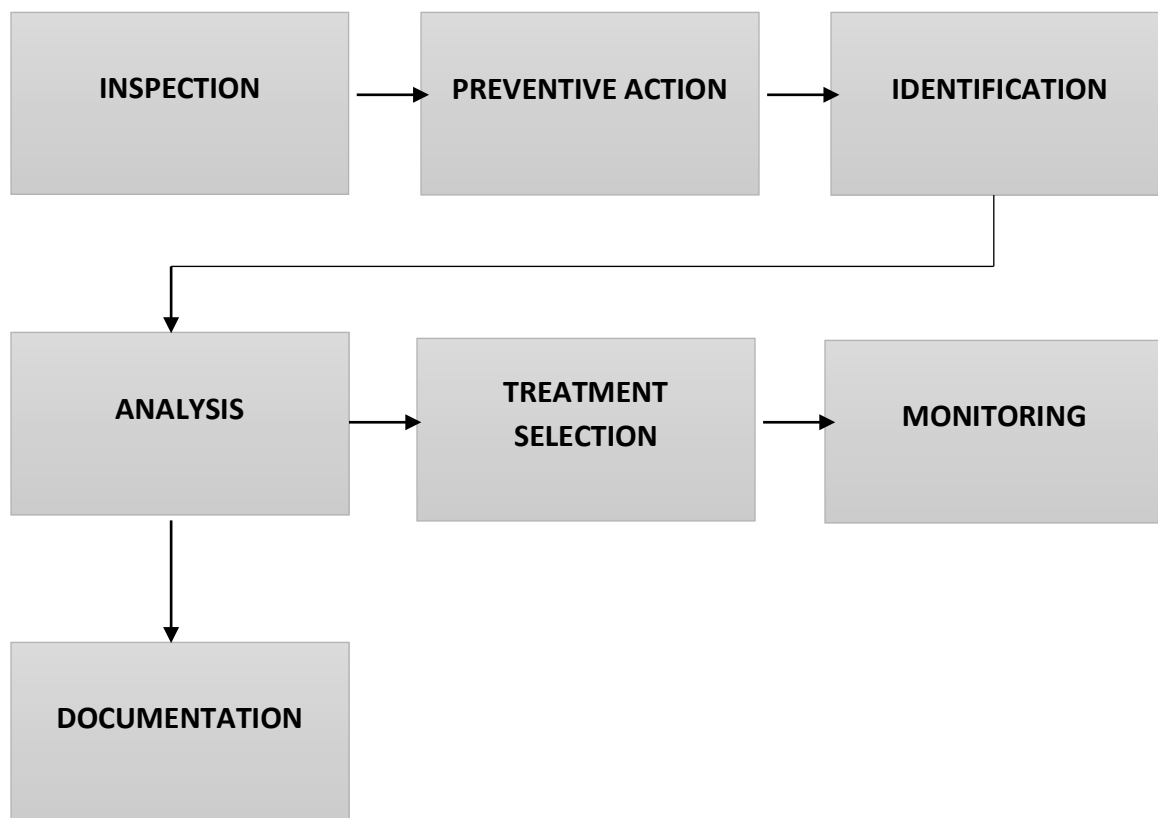


way to control ants is to hygienically clean the floor of the process and storage areas and use of recommended insecticides.

5. How to Implement Pest Management?

Pest management is always successful for a simple reason as it recognizes that pest management is a process, not a one-time event, and that relying solely on chemical controls when so many other tools are available is never the best solution. By addressing the underlying causes of pest infestations – access to food, water and shelter – Pest management can prevent infestation before pesticides are even considered. In practice, it is an ongoing cycle of seven critical steps:

Figure 1: Flow Chart for Pest Management Process





Step 1: Inspection

The cornerstone of an effective Pest management program is a schedule of regular inspections. For food processors weekly inspections are common, and some plants inspect even more frequently. These routine inspections should focus on areas where pests are most likely to appear – receiving docks, storage areas, employee break rooms, sites of recent ingredient spills, etc. – and identify any potential entry points, food and water sources, or harborage zones that might encourage pest problems.

Step 2: Preventive Action

As regular inspections reveal vulnerabilities in pest management program, steps should be taken to address them before they cause a real problem. One of the most effective prevention measures is exclusion, i.e., performing structural maintenance to close potential entry points revealed during inspection. By physically keeping pests out, you can reduce the need for chemical countermeasures. Likewise, sanitation and housekeeping will eliminate potential food and water sources, thereby reducing pest pressure.

Step 3: Identification

Different pests have different behaviors. By identifying the problematic species, pests can be eliminated more efficiently and with the least risk of harm to other organisms. Professional pest management always starts with the correct identification of the pest in question. Make sure your pest control provider undergoes rigorous training in pest identification and behavior.

Step 4: Analysis

Once you have properly identified the pest, you need to figure out why the pest is in your facility. Is there food debris or moisture accumulation that may be attracting it? What about odors? How are the pests finding their way in – perhaps through the floors or walls? Could incoming shipments be infested? The answers to these questions will lead to the best choice of control techniques.

Step 5: Treatment Selection

Pest Management stresses the use of non-chemical control methods, such as exclusion or trapping, before chemical options. When other control methods have failed or are inappropriate for the situation, chemicals may be used in least volatile formulations in



targeted areas to treat the specific pest. In other words, use the right treatments in the right places, and only as much as you need to get the job done. Often, the “right treatment” will consist of a combination of responses, from chemical treatments to baiting to trapping. But by focusing on non-chemical options first, you can ensure that your pest management program is effectively eliminating pests at the least risk to your food safety program, non-target organisms and the environment. You’ll also see higher pest control scores at audit time.

Step 6: Monitoring

Since pest management is an ongoing process, constantly monitoring your facility for pest activity and facility and operational changes can protect against infestation and help eliminate existing ones. Since your pest management professional most likely visits your facility on a bi-weekly or weekly basis, your staff needs to be the daily eyes and ears of the IPM program. Employees should be cognizant of sanitation issues that affect the program and should report any signs of pest activity. You don’t want to lose a day when it comes to reacting to an actual pest presence.

Step 7: Documentation

Let’s face it, the food safety auditor’s visit can make or break your business. An auditor is a person who completely monitors the pest management program and when he finds the pest management measures satisfactory issues a certificate of clearance. Since pest control can account for up to 20 percent of your total score, it’s imperative that your pest management program is ready to showcase come audit time. Up-to-date pest control documentation is one of the first signs to an auditor that your facility takes pest control seriously. Important documents include a scope of service, pest activity reports, service reports, corrective action reports, trap layout maps, lists of approved pesticides, pesticide usage reports and applicator licenses.

6. Cost:

Cost of Pest management varies from size, scope and treatment selection. A small unit can be easily managed by trappings, insect killers and preventive measures discussed above but larger units have to hire services of pest management companies and usually they are paid on monthly basis. The cost of this type of management starts from 25000/-



PKR and goes up depending the size, scope and area of a unit. There are many pest management companies available in Pakistan and Punjab as well.

7. Benefits of Pest Management to the Business:

Pest management involves both prevention and correction in order to reduce the risks of pest infestation, whilst also protecting your business and the environment and it has a proven a track record of significantly reducing the risks and related to pesticides, while improving quality, health and welfare of environment. Needless to say, pest management results in numerous benefits to businesses. It reduces the costs involved in dealing with a serious pest infestation. It offers a flexible solution based on your specific needs and concerns. And it results in a healthier, safer environment for your staff and customers.

Health

Everyone benefits from a safe, pest-free environment. People who suffer from allergies or asthma can become particularly vulnerable during a pest infestation. Pests such as rodents, dust mites and cockroaches can pose serious problems to these people. By reducing the likelihood of infestations, pest management helps protect people's health and comfort.

Economics

Pest management requires a committed, labour-intensive effort to eliminate pest problems. This may appear expensive at first. However, in the long term, it can reduce business costs by effectively dealing with the root causes of pest problems and reducing the likelihood of infestations reoccurring in the future. Also, the pest prevention methods can bring other benefits by, for example, making buildings more energy efficient.

Higher Product Quality

Pest management increases the product quality as there is no risk of infecting the product thus it results in higher sales and builds confidence in customers.



REFERENCES

1. <https://www.rentokil.com/sector-insights/food-retail/pests-in-food-businesses/>
2. <https://www.foodqualityandsafety.com/article/7-steps-to-an-effective-pest-managemet-program/>
3. <https://takecaretermite.com/blog/the-importance-of-pest-control-in-food-industry/>
4. Hockings, F.D, 2014,"Pests, Diseases and Beneficial's", CSIRO Publishing, Melbourne, ISBN 9781486300211