State of the MARKET

RODENT CONTROL in Food Facilities

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Rodents IN FOOD PROCESSING FACILITIES

SURVEY RESPONDENTS

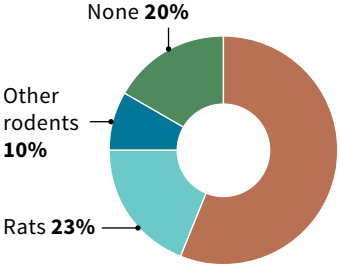
Where they work

Food/Beverage Processor	40%
Food Ingredient Manufacturer	26%
Foodservice/Retail	7%
Consulting Firm/Service	6%
Packaging	3%
Other	18%

What they do

Quality Assurance/Control	44%
Food Safety	27%
Corporate Management	13%
Plant Manager	4%
Sanitarian	2%
Other	10%

Top Rodent Pests



Mice 68%

*Respondents could select multiple responses

Who Provides Your Service?

	Rodent Control	General Pest Control
Pest control company	77%	69%
Internal employee(s)	5%	7%
Both external/internal	16%	17%
No service	2%	7%

DID YOU KNOW?

There's no question that rats and mice are an issue for the food industry, but just how much of a concern are they for managers and executives of food processing facilities? What is being done to control these rodents?

To find out, we asked QA readers. With 90% of respondents having some responsibility for the quality assurance or food safety aspects of at least one food facility, QA's Senestech-sponsored survey revealed that:

- Mice are the greatest issue, followed by rats, and most facilities contract with an external provider for pest control services (page 2).
- Of greatest concern and significance to food facilities is the potential for rodents to contaminate food, resulting in citations or customer reaction (page 4).
- Although nearly all food facilities see proactive pest management as important, they don't all implement proactive practices. (page 6).

THE SURVEY

Sponsored by Senestech, Inc., QA's **2018 State of the Market: Rodent Control in Food Facilities** survey was conducted by Readex Research, a privately held research firm based in Stillwater, Minn. The March 2018 survey sample of 4,208 food processing managers and executives was systematically selected from the circulation file of Quality Assurance & Food Safety (QA). Data was collected from 469 recipients of QA's digital magazine and/or e-newsletter at unique company locations in the U.S., of which 370 work for a company that has at least one food facility. The margin of error is ±4.8 percentage points at the 95% confidence level. Results may not add up to 100% due to rounding or the ability to select multiple responses to some questions.

Monitoring Rodent Presence

Most food facilities (55%) did not see rodent infestations as having increased in 2017 over the previous year. In fact, 39% responded that infestations at their facilities had decreased. How do they know?

The food facilities stated that they measure the presence and volume of rodent activity through one or more methods, including:

- **81%** are informed through the service report from their pest control company.
- **58%** use interior monitors and/or traps.
- **53%** rely on exterior traps.
- **9%** use other methods.
- **4%** do not do any measurement.

While it is exemplary that the vast majority of food facilities do use at least one method to monitor and measure rodent activity, it is just as critical that the root cause be determined and corrective action be taken when that monitoring shows unacceptable levels of rodent activity.

Determining the root cause of rodents generally will require further inspection and, often, a review of historical records. Records that show an ongoing issue in an area or a gradual, regular increase, can be indicative of the source — whether that be a structural issue that needs corrected, a lack of sanitation that needs cleaned, or a supplier who should increase its program or be discontinued.

To further understand the magnitude of corrective action, one need only consider the April 2018 recall of more than 200 million eggs for potential *Salmonella* contamination due to unsanitary conditions and rodent activity — including both live and dead rodents — seen during the FDA inspection of the Indiana farm facility.

As noted in the FDA report, the facility had been monitoring rodent activity, but when the monitoring showed an unacceptable level of rodent activity, "appropriate methods were not used to achieve satisfactory rodent control." (https://bit.ly/2vKioWZ)

The inspection review of the facility's pest control records also showed that a rodent infestation had existed for more than six months, from which, the report stated, "The corrective actions taken by your firm have not been effective at reducing the rodent levels." Such corrective action is critical because of the extent of contamination and damage that rodents can cause. •

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Rodent Problems And Concerns

YOU HAVE CAUSE *to Be Concerned*

While most survey respondents indicated some level of concern with rodent problems, it is interesting to note that 30% had no concerns at all. It is to be hoped that this is due to an extensive, unswerving rodent monitoring, prevention, and corrective action program, as even a single rodent that gets past one's defense can lead to any one — or more — issues of concern (as shown in the graphic at right).

Following are rodent facts on each of the issues from the National Pest Management Association (NPMA) and QA magazine with additional detail on their applicability to food facilities.

- **Food Contamination.** *A house mouse leaves urine trails where it wanders and produces up to 100 droppings per day.* Mice are nocturnal, so they are most likely to venture out of hiding when the plant is dark. Because they are good climbers and jumpers, they have no problem getting up onto sanitized food-contact surfaces (which were likely already sanitized) and in equipment to leave their urine, feces, and hairs behind.
- **Inspections/Audits.** *A rat can squeeze into your facility through a hole the size of a quarter — then live for up to 18 months. A mouse can wiggle through a dime-sized hole and live for up to two years.* FDA tracks its food facility inspection observations, providing an annual summary. In the fiscal year ending September 30, 2017, the two observations most commonly cited in the agency's inspection reports were lack of effective pest exclusion (330) and failure to provide adequate screening or other protection against pests (211). Together these total 541 incidents of regulatory noncompliance.
- **Customer concern.** *With their strong teeth, rodents can gnaw through wire and wood — so chewing into food packaging is "peanuts."* While it is rare (but not unfounded) that a customer would open a box or bag to find a mouse, a small hole in a package could easily go undetected leaving a customer to discover droppings or hairs in

Percent concerned/very concerned about:

60% Food contamination (hairs, droppings, etc.)

56% Inspection/ audit citation

55% Customer concern

51% Damage (packaging, structural, etc.)

46% Spread of disease

42% Rapid reproduction

38% Food consumption

their food. This doesn't even bring into play the impact on your brand should rodent contamination be implicated in a foodborne illness or outbreak.

- **Damage.** *Rodents have been implicated in fires across the country for chewing wires and spilling flammables.* In addition to damage from food contamination and consumption, rats and mice can cause significant damage to equipment and structures — chewing through wires, drywall, pipes, and plastic; leaving nesting materials that attract secondary pests; and even disassembling a building within a few years.
- **Disease.** *Rodents can transmit diseases such as rat-bite fever, salmonellosis, trichinosis, murine typhus, plague, and leptospirosis.* While some of these diseases are transmitted through the bite of the rodent, it is the foodborne disease-causing organisms that are of most concern in a food facility. In addition to sanitation problems of the PCA plant in the 2009 *Salmonella*-contaminated peanut product outbreak, the FDA inspectors detailed numerous rodent issues, including dead mice and feces.
- **Reproduction.** *A female rat can produce up to 40 young per year — and these rats can then begin to reproduce themselves within five weeks.* If even a single gravid female makes her way into the food facility through a small hole, past an open door, or with incoming goods, she can begin a cycle that leads to a severe rat infestation if unchecked.
- **Consumption.** *Rodents consume or contaminate about 20% of the world's food supply.* A mouse, itself, will eat 15 and 20 times each day. Although the amount of food that a single rodent can eat in a food facility may not amount to much, an infestation of rodents can begin to be significant. Worldwide, consumption alone has been estimated as high as 10% of all food. •

DAMAGE FROM THE *Outside in*

Rats and mice are among the most common pests found in and around food processing facilities. They will enter buildings following their noses as they detect the food odors and can cause significant damage once inside. According to *PCT Guide to Commercial Pest Management*, rodents are most commonly found around the exterior of the facilities and in warehouse areas. From there, the rodents will make their way into breakrooms, maintenance areas, and processing areas in search of food, water, and/or warmth.

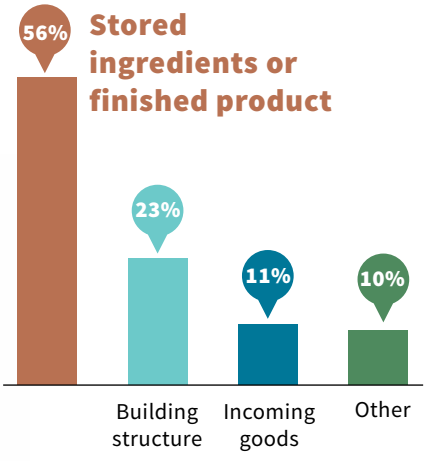
Thus, it makes sense that in **67%** of the facilities where rodents caused damage, that damage was found to be greatest in stored food areas — whether that be for incoming goods, ingredients, or finished product.

Structural damage was the next most noted problem by respondents. This also makes sense as the odors and warmth of food plants will attract rodents from the exterior, and if they don't find an open door, they will seek out gaps and cracks — enlarging them with their sharp teeth if needed to make their way inside. In fact, because the rodents are seeking food and shelter from the cold, fall and winter tend to be the busiest seasons for rodent control service in many areas.

While rodents can and do also come in with deliveries, this statistic shows how cold and diminishing food sources will propel rodents into structures. Once inside, the rodents need a place to hide, so they will gnaw their way into walls where possible, or chew up packaging and other soft or lightweight materials to create their nests.

So, what can you do to eliminate rodents and the problems they cause? On the next pages, we discuss what food facilities are doing to fight back against these destructive pests. •

Of facilities where rodents have caused damage, the greatest damage has been to:



Rodent Control

How **Food Facilities** Are *Managing* **RODENTS**

Although **99%** of all survey respondents see a proactive approach to rodent management as being very important or somewhat important, only **87%** implement practices that are more proactive than reactive.

Taking a proactive approach has always been the best method of pest management, particularly in food facilities where pests can cause great concern and damage (as discussed on pages 4 and 5 of this report). But the increased focus on preventive controls in today's Food Safety Modernization Act (FSMA) takes this to a whole new level. That is, although FDA did not add new regulations pertaining to pest control in FSMA, the agency reaffirmed it as a component of Current Good Manufacturing Practices (CGMPs), adding that it now considers these to be requirements — not guidance.

Thus, an FDA inspector sighting of any evidence of rodent presence in — or potentially around — your facility would not only be cited on his or her report, it would likely be cause for a much more in-depth inspection along with a need for significant corrective action and its documentation.

It is for this reason, as well, that Integrated Pest Management (IPM) practices are essential for rodent management. But while **79%** of facilities surveyed stated that they do implement IPM practices, **15%** were unsure of what IPM is. (See *What is IPM?* page 7.)

New technologies also are being introduced to provide food facilities with other options for control. Some facilities noted familiarity with these, while others have not yet been exposed to or use them. (See *New and Alternative Options in Rodent Control* at right.) •

Of food facilities surveyed, 95% use at least one method of exterior or interior rodent control. The most common are:

Method	Exterior	Interior
Tamper-resistant bait stations with rodenticide	88%	29%
Structural modifications	15%	17%
Sticky traps	10%	52%
Repellents	7%	6%
Reproductive control	2%	4%
Other	9%	39%

New and Alternative Options in Rodent Control

In today's world, technology is continually generating new options for the food industry's processes, production, and practices, and the same is true of the pest management industry. Two of the most recent technologies in rodent management are new methods in electronic monitoring and reproductive control.

While there is some food industry knowledge of both, most respondents were only somewhat or not at all familiar with either. Of the respondents, 71% were unfamiliar with reproductive control, and 73% with electronic monitoring.

To provide a general overview of each:

- **Reproductive control.** Because rodents are always in search of food and water, baits can be very effective — in this case a contraceptive bait. Rodent consumption of the bait reduces fertility, accelerating the natural egg loss in female rats and decreasing the reproductive capacity in male rats. By targeting both genders, populations can be more quickly eradicated.
- **Electronic monitoring**. Trapping has been brought into the technical era through sensors that are set into traps to identify any rodent activity in the trap. In most cases, the systems are wireless with the sensor sending a signal to software from which notifications are made. The monitoring not only provides alerts on the rodents, but also enables digital reporting for ongoing tracking and trending — to facilitate proactive response and prevention. •

What is IPM?

IPM, as defined by the National Pest Management Association (NPMA), is "a process involving common sense and sound solutions for controlling pests. The focus is upon finding the best strategy for a pest problem, and not merely the simplest…. The top priority of IPM is to protect public health and property."

As its nomenclature states, it is an *integrated* approach to pest management in which three key steps are combined:

1. **Inspection.** When IPM is first implemented, a thorough inspection of the exterior and interior of the facility is conducted. While one purpose is to find any existing pests in the facility, its greater purpose is to search out any evidence of previous or current pest presence of any type and identify conducive conditions that could lead to pest invasion. As an IPM program proceeds, inspection involves ongoing monitoring for detection and prevention.
2. **Identification.** If pests or evidence are detected, the second step is identification of the pest. Even when focusing specifically on rodents, mice have different behaviors and feeding preferences than do rats, and even different species of each can require different methods of control. Thus, identification of the specific pest is essential for control.
3. **Action.** The most important step of IPM is taking action to eliminate the pests or the conditions that enable them to enter and survive. Taking action against rodents in food facilities primarily involves:
   - *Exclusion*: *keeping rodents out.* This involves keeping all doors shut when not in use (including dock doors) and ensuring they fit tightly; sealing gaps, cracks, and crevices in the foundation or structure of a quarter inch or greater; screening vents and fixing holes in any screening used in the building, etc.
   - *Sanitation*: *removing food, water, and harborage.* While it is impossible to keep a food facility free of food, it is imperative to clean all spills, scraps, etc., as soon as possible and ensure all areas of the facility and lines are clean and sanitized. Both interior and exterior trash areas can be highly attractive to rodents (and other pests), so must be regularly emptied and the areas kept clean.
   - *Treatment*: *equipment or rodenticides.* Exclusion and sanitation are proactive actions for rodent prevention; treatment can be both proactive and reactive. Maintaining traps, with or without rodenticide baits (as allowed by law) around the exterior and near doors can capture or exterminate rodents, preventing them from entering. Interior traps can provide ongoing protection against any rodents that get through the first line of defense.

A complete IPM program will help a food facility protect itself against the damage and contamination that rodents, and other pests, can cause. •

{ NOW YOU KNOW

No matter what methods of rodent management you implement in your food facility, your program should be regularly monitored for efficacy, include all aspects of an integrated program of "common sense and sound solutions," and incorporate preventive, proactive practices. And now you know:

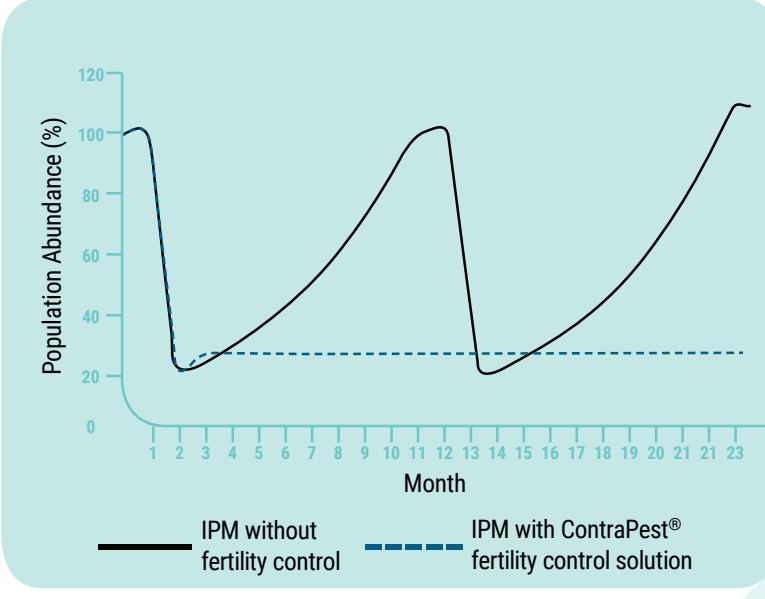
- Whether mice or rats are your primary concern; whether you outsource pest management or control pests internally — it is wise to stay updated on control options and consider exploring new technologies for your facility.
- The **60%** of respondents concerned with food contamination by rodents aren't wrong — any rodent contact with food can spread disease causing consumer illness along with inspection/audit failures and loss of brand reputation.
- Proactive pest management is critical, especially with today's FSMA Preventive Controls requirements. The three steps of IPM can take you far along the road of prevention.

ContraPest®

Do you have a rodent infestation that you just can't solve?

ContraPest® is a proven solution that can work within your IPM protocol to target the reproductive capabilities of Norway and roof rats.

By reducing reproduction, ContraPest® brings rat populations down and keeps them down, magnifying the success of your IPM program.*



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