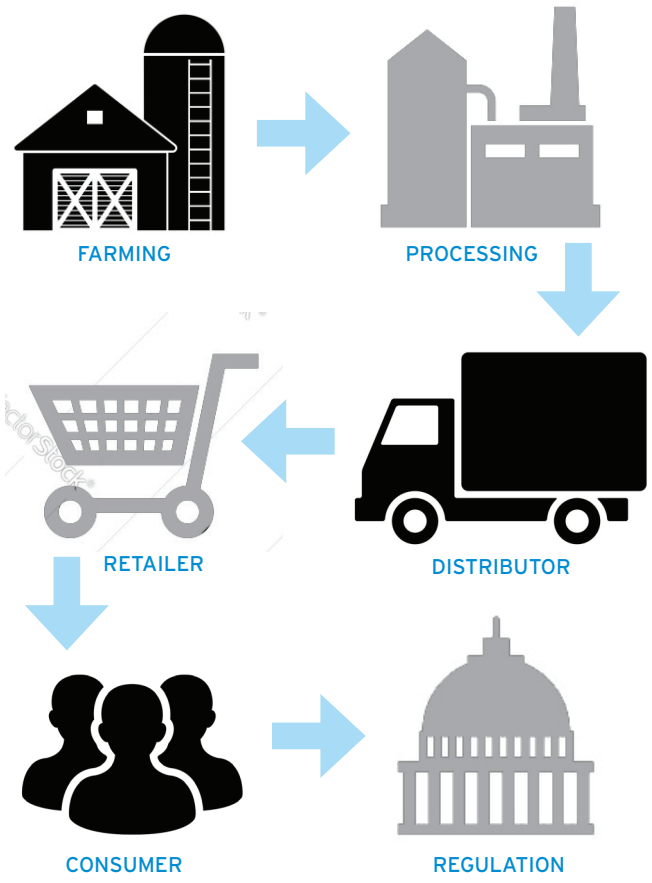
THE PEST MONITOR

BECAUSE PEST PREVENTION MATTERS TO FOOD SAFETY

Summer 2018

TODAY'S TRACEABILITY TECHNOLOGY

In 2002, in response to the terrorist attacks of September 11, 2001, Congress passed the Bioterrorism Act. Included in this significant regulation were a number of provisions designed to improve FDA's food safety efforts. One of these was the first of its kind requirement that those who manufacture, process, pack, transport, distribute, receive, hold, or import food, establish and maintain records to identify the immediate previous sources and immediate subsequent recipients of food. This requirement is commonly known today as tracing "one forward/one back."



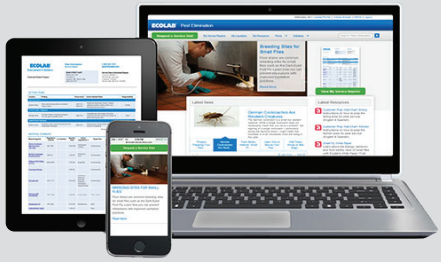
Technology in Pest Management

When data is digitally collected into a single system, it enables tracking and trend analysis of patterns and issues from which proactive decisions can be made for any needed corrective action. This is particularly critical where pests are concerned, because the current Good Manufacturing Practices (GMPs), which include pest management, became regulation rather than guidance with the passage of FSMA. And FDA is focused on pests....

Each year, FDA compiles a list of its Inspections Observations, i.e., noncompliance issues written up in a Form 483. The agency's FYI 2017 report included 707 observations related directly to pests, 538 of which focused on lack of effective exclusion or inadequate screening to prevent pests and protect against the potential of pest contamination. That doesn't even include observations of noncompliance in sanitation, food storage conditions, etc., which can create conditions conducive to pests.

Inspections and recommendations have always been a critical component of successful pest management service. But today's use of electronic service reports, data compilation, and customer portals have improved the ability to track and trend pest activity over time, enabling the industry to stay ahead of pest issues for product protection and regulatory compliance. Integrating an electronic data system with the plant-provider partnership means the pest management provider can more thoroughly review data for trend analysis and recommendations, and the food facility has easy and ongoing access to service reports for quick reference and actionable, proactive pest prevention recommendations.

Whether focusing on tracking for the source of a foodborne illness outbreak, or trending for pest prevention, it's all about data and the ability to be quick, nimble, and proactive.



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TODAY'S TRACEABILITY TECHNOLOGY (CONTINUED)

More recently, the Food Safety Modernization Act (FSMA) enacted by Congress, and signed by the President, in 2011 included the requirement that FDA, with USDA and the States, assess the costs, benefits, compatibility, and feasibility of the use of tracing technologies for the food industry. However, while a pilot project was conducted with the produce industry, no further regulation or guidance has evolved.

Thus, the law is still simply that all involved in the food supply chain be able to track one forward/one back. However, as numerous foodborne illness outbreaks have shown, this often does not enable a quick or even complete traceback to the source of contamination. For example, the early 2018 romaine lettuce E. coli outbreak was – eventually – able to be traced back only as far as the Yuma, Ariz., region in general. With this region producing 90% of the winter season's leafy greens for the U.S. and the extensive amount of time even this non-specific traceback took, five people died and nearly 200 became sick from the outbreak, a great deal of potentially healthy romaine lettuce was trashed, and the entire leafy greens segment faced significant financial impact.

It is for such reasons that improved and seed-to-table traceability technologies are of such importance in the food industry. Additionally, with today's interconnected global supply chain, the ability to quickly trace a food or ingredient beyond the borders of the U.S. is critical.

While increasing the ability to more quickly and thoroughly traceback product, technological advances also provide other benefits for businesses, such as that of data collection and assessment. When electronically compiled, data can be more quickly and easily accessed and analyzed, which is critical for compliance with the added documentation requirements of FSMA; ensuring all is in place for customer audits and global standards; and, as discussed in *Technology in Pest Management* (previous page), increasing the ability to be proactive in pest management.

PEST OF THE QUARTER: HOUSE FLIES

Why are flies attracted to my food facility?

The odors that emanate from food processing facilities can attract a multitude of pests, including house flies which can easily travel up to two miles – and have been shown as able to detect odors from at least that far away.

And it's not just the good food smells from within the plant that attract the flies, it's also the rotting waste smells from unsanitary or open garbage containers. Once in the proximity of the plant, exterior lighting can further attract the flies, and open doors will be an open invitation to entry.

Why are flies a problem?

When flies stop first at garbage or other unsanitary areas to feed, breed or rest, bacteria will collect on their suction-cup-like feet and hairy bodies, as well as their sponging mouthparts as they suck up, vomit, then re-ingest food. When they then journey inside the facility and land on food or food-contact surfaces, they can transfer this bacteria there.

In fact, flies can spread more than 200 pathogens, including the foodborne illness bacteria *E. coli, Listeria*, and *Salmonella*.

With their prodigious reproductive capabilities (See *The House Fly* below), the sighting of an occasional fly today can lead to an infestation in a week...which can lead to food contamination, recalls, and audit or inspection failures.

The House Fly: *Musca domestica* Linnaeus

The house fly is the most common of all large flies in the U.S. and can be identified by its:

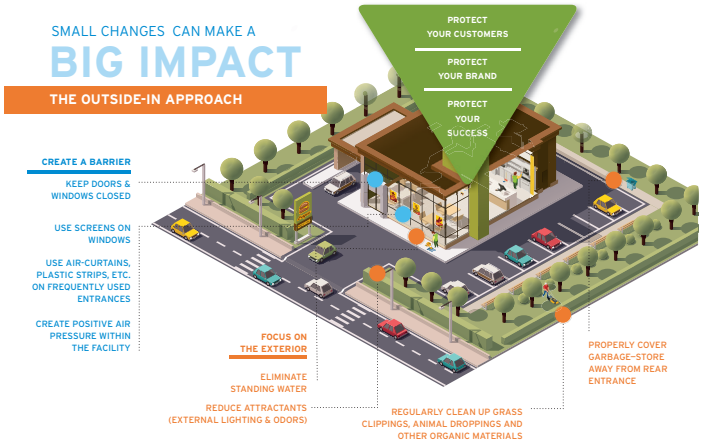
- **Size.** The house fly is 6 to 7 mm (about 1/4 inch) long. Like all insects, it has six legs.
- **Color.** It is grayish in color with thin, vertical black stripes.
- **Eyes.** Its head is dominated by it large, red compound eyes.

Adult flies generally live two to four weeks, but they can survive for up to two months, particularly when suitable food is available. Flies will overwinter in the larval or pupal stage in protected locations to emerge as the weather warms.

They can mature to adulthood within a week when the female can lay up to 500 eggs in a few days, piling batches in small groups. With 10 to 12 generations able to be produced in a single year in temperate areas, an infestation can build quite quickly.

How do I keep flies from being a problem?

A proactive, comprehensive large fly program takes an Outside-In approach to help reduce fly pressure on the exterior, exclude flies from entering the facility, and quickly destroy flies that do gain entry.



The key aspects of the program are four-fold:

Focus on the exterior

- Eliminate standing water
- Reduce attractants
- Regularly clean up grass clippings, animal droppings and other organic materials
- Properly cover garbage—store away from rear entrance

Create a barrier

- Keep doors & windows closed
- Use screens on windows
- Use air-curtains, plastic strips, etc. on frequently used entrances
- Create positive air pressure within the facility

Sanitize the interior

- Remove unnecessary clutter
- Create easy access
- Clean up unsanitary conditions

Partner with your Pest Provider, who

- Inspects your facility
- Identifies conditions that would attract flies
- Recommends ways to reduce fly pressure and entry
- Provides needed treatment

DID YOU KNOW

- House flies tend to stay within two miles of where they were born, but they have been shown to migrate up to 20 miles in search of food. (National Pest Management Association)
- House flies have been around for at least 65 million years. While sources generally agree that they probably originated in the Middle East, they vary as to their arrival in America from as far back as AD 550 to as "recently" as 1492 with Christopher Columbus. (University of Wisconsin-Milwaukee)
- Ecolab has produced a fun video, "Why You Don't Want a Fly as a Friend" in which Ecolab Pest Elimination expert, Dr. John Barcay, shows typical large fly behaviors in a way you have never seen before. Use the video to show your workers how large flies can jeopardize food safety and what can – and should – be done to protect your facility and food.

REGULATORY UPDATE

USDA Proposes Symbols for GMO Labeling

The consumer demand of recent years for labeling of genetically modified/bioengineered (BE) foods originally led to mandates by some states for food manufacturers to include that information on their labels. With the fear that a continuance of such regulation would lead to a patchwork of laws across the nation that would be difficult and expensive for the food industry to implement, Congress intervened to block state laws and passed an act requiring USDA to establish a national regulatory standard for the disclosure of food that is or may be bioengineered (BE).

In response, USDA published the National Bioengineered Food Disclosure Standard proposed rule in May. As proposed, the rule would require that foods labelled for retail sale disclose, if it or its ingredients were bioengineered. It defined BE food as that which "contains genetic material that has been modified through in vitro recombinant deoxyribonucleic acid (DNA) techniques, and for which the modification could not otherwise be obtained through conventional breeding or found in nature."

The proposed rule includes various disclosure requirements, with the most visible being three alternatives for a symbol (shown below) designed to communicate the bioengineered status of a food in a way that would not disparage biotechnology or suggest BE food is more or less safe than non-BE food.

ECOLAB PEST ELIMINATION

1 ECOLAB PLACE
ST. PAUL, MN 55102
1 800 325 1671 WWW.ECOLAB.COM/PEST

ASK THE PEST EXPERT

QUESTION: Are fruit flies just a nuisance or do they spread disease?

ANSWER: In new and groundbreaking research, Ecolab Pest Elimination's R&D team has shown that the fruit fly (*Drosophila repleta*) is more than an annoyance, it can be a significant health threat. Like the house fly, fruit flies will feed and breed in unsanitary areas, then fly to and settle on food and food-contact surfaces. To determine whether this tiny fly can transfer bacteria in its landing, we conducted lab experiments with purpose-built fly enclosures.

Our findings: Our experiments demonstrated direct transfer of bacteria – including *Escherichia coli* O157:H7, *Salmonella*, and *Listeria* – from a contaminated food source to a noncontaminated surface. Through scanning electron microscopy, we saw that fruit flies accumulated the bacteria on their body parts and hairs, enabling the pathogenic transfer from the contaminated surfaces. These data, coupled with the feeding and breeding behavior of fruit flies in unsanitary areas and their propensity to land and rest on food and food-contact surfaces, indicate that fruit flies may be a factor in the spread of foodborne pathogens. *(The research, Fruit Flies as Potential Vectors of Foodborne Illness, was published in the March 2018 issue of Journal of Food Protection.)*

About the Expert

John Barcay, Ph.D.
Ecolab Senior Staff
Scientist and Urban Entomologist

Dr. Barcay is a member of the National Pest Management Association, Entomological Society of America, American Mosquito Control Association, Gamma Sigma Delta (the honor society of agriculture), Society for Vector Ecology and Pi Chi Omega, a professional fraternity for urban pest control, and Independent Organic Inspectors Association.

Dr. Barcay received his bachelor's degree in entomology from Colorado State University. He also received his Master's and Doctorate in Urban Entomology from Purdue University.

To submit questions to Dr. Barcay, email here.

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The Pest Monitor is published by Ecolab to provide general information on pest prevention in Food and Beverage Processing & Handling facilities.