

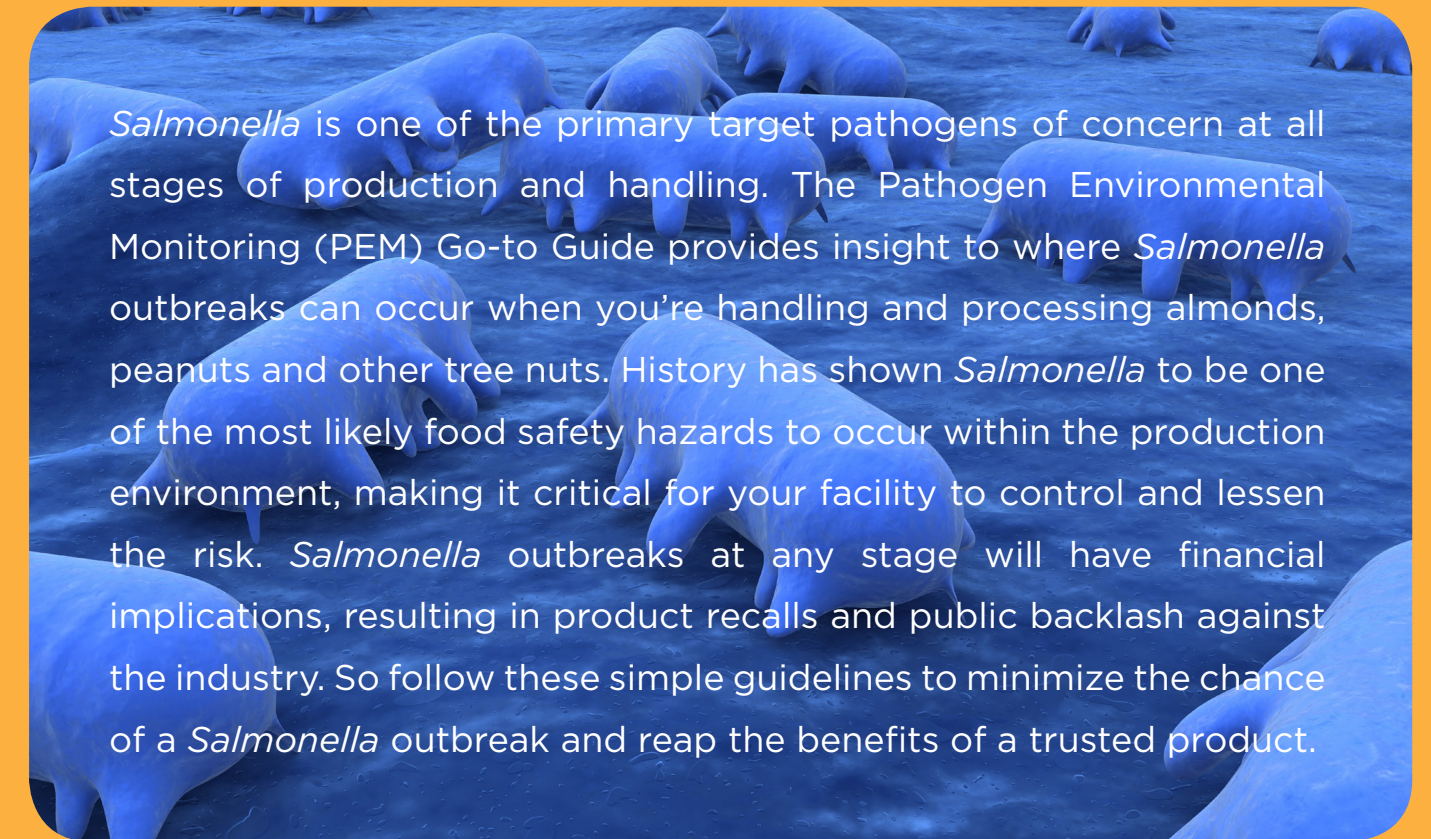
pathogen environmental monitoring go-to guide

questions?

For additional information, review your PEM Manual or go to AlmondBoard.com to download a copy. You can also contact your plant manager for more information.

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Salmonella is one of the primary target pathogens of concern at all stages of production and handling. The Pathogen Environmental Monitoring (PEM) Go-to Guide provides insight to where *Salmonella* outbreaks can occur when you're handling and processing almonds, peanuts and other tree nuts. History has shown *Salmonella* to be one of the most likely food safety hazards to occur within the production environment, making it critical for your facility to control and lessen the risk. *Salmonella* outbreaks at any stage will have financial implications, resulting in product recalls and public backlash against the industry. So follow these simple guidelines to minimize the chance of a *Salmonella* outbreak and reap the benefits of a trusted product.

Presented by the Almond Board of California

california
almonds
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go-to-control equation

If you follow this simple go-to-control equation, you will minimize the risk of *Salmonella* contamination.

traffic control
(personnel and equipment)

+

dust control

+

water control

+

separation of raw and pasteurized product

+

effective cleaning and sanitation

=

Salmonella control

where to test

Sampling sites should be rotated so that all sites in Zones 1-3 are covered within a month. Zone 4 sites should be rotated so that all zones are covered within a quarter. Sampling progression: Zone 1 to Zone 2 to Zone 3 to Zone 4

1

ZONE

DIRECT PRODUCT CONTACT SURFACES

Conveyor belts and buckets, hoppers, fillers, discharge chutes, bins and bin liners, utensils, employee hands. Items or surfaces directly over or in close proximity to Zone 1 surfaces, such as overhead light fixtures, may also be designated Zone 1 if the likelihood of product contamination is high.

What to test for: indicator organisms

When to test: weekly

Minimum number: line dependent

2

ZONE

NON-PRODUCT CONTACT SURFACES CLOSE TO ZONE 1

Equipment framework, drip shields and housings, control panels and buttons, overhead fixtures and piping in close proximity to Zone 1 surfaces, computer screens, maintenance tools.

What to test for: *Salmonella* + indicator organisms

When to test: weekly

Minimum number: 10 to 15

3

ZONE

NON-PRODUCT CONTACT SURFACES IN OPEN PROCESSING AREAS

Floors, walls, ceilings, carts, pallets, trash cans, foot mats, drains, hoses, cleaning equipment, air handling units, condensate drip pans.

What to test for: *Salmonella* + indicator organisms

When to test: weekly

Minimum number: 10 to 15

4

ZONE

AUXILIARY AREAS

Bathrooms, locker rooms, cafeteria and break rooms, office areas, hallways, warehouses and loading dock areas, maintenance shops.

What to test for: *Salmonella* + indicator organisms

When to test: monthly

Minimum number: 10 to 15

keep records

Documenting your samples will give your PEM program credibility. It's as simple as keeping a log book or using a spreadsheet. You should include a facility map with sampling locations. If the *Salmonella* test samples are positive, the map may reveal traffic patterns that contributed to the spread of *Salmonella*.

SAMPLE LOG

Date and time of sampling:
Person(s) collecting samples:
Sample locations:
Submission date to laboratory:
Results:
Corrective actions (if any):

how to test

1	Pre-label sample bags.
2	Wash, dry and sanitize hands.
3	Put on sterile gloves.
4	Carefully remove the sponge/sampling tool.
5	Swab area using consistent pressure.
6	Place the sponge back into the bag and seal.
7	After sampling, wipe down the site with an appropriate sanitizer.
8	Be sure to wash hands and change gloves between samplings.
9	Generate a negative control sample: Remove the sponge from the bag and then place back into the bag. Label the control sample with the same coding system as the other samples.
10	Transport samples to laboratory in clean container with ice packs.
11	During transport, the samples' temperature should not exceed 45°F.
12	Laboratory tests should take place within 48 hours of collection.

Elevated indicator counts?

Elevated indicator organisms could mean *Salmonella* is present. In the event that indicator counts come back high, consult your facility's action plan to implement corrective actions.

Corrective Actions

1	Break down and inspect equipment.
2	Thoroughly clean and sanitize all equipment, surfaces and tools in the area.
3	Re-swab surfaces and equipment where elevated background levels were found.
4	Re-clean, re-sanitize, and re-swab as needed.

If elevated indicator background levels/indicators persist, you may consider the long-term corrective actions outlined at right.

Salmonella positive?

Your facility action plan should outline immediate and long-term corrective actions and be specific for each of the four zones.

Immediate Corrective Actions

1	Limit access to area. Re-direct traffic if necessary. Break down and inspect area and equipment.
2	Perform vector swabbing of the positive sample site. Swab immediate/surrounding area to determine if contamination has spread.
3	Clean and sanitize all equipment, surfaces and tools in the area.
4	Conduct pre-operational inspection. Perform additional vector swabbing. Don't start operations until all tests come back negative.
5	Document corrective actions.
6	Increase frequency of sampling from weekly to daily. After 3 consecutive days of negatives, resume normal sampling.

Long-Term Corrective Actions

1	Eliminate sources of water/water accumulation.
2	Repair structural damage. Eliminate potential niche areas.
3	Review GMPs. Update/Revise cleaning and sanitation procedures.
4	Audit production and maintenance practices.
5	Reinforce personnel hygiene practices.

If you continue to see problem areas, or hot spots, this may be an indication that the *Salmonella* has established itself and is multiplying. It is important to take aggressive corrective actions to eliminate the problem. If the hot spot cannot be eliminated, you should consider physically restricting or removing the equipment from your facility.