

Protecting Caribbean Food Safety and Public Health: Hantavirus, Leptospirosis and Vector-Borne Disease Prevention

Public Health, Food Systems, Homes, Businesses and Communities

Caribbean Agricultural Health and Food Safety Agency (CAHFSA)

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Environmental sanitation is a critical pillar of food safety, public health, tourism resilience, and sustainable development across the Caribbean Community (CARICOM). Poorly maintained environments, rodent infestations, unmanaged waste, blocked drainage systems, stagnant water, neglected properties, and unsanitary surroundings create conditions that enable the spread of communicable diseases while increasing risks of food contamination and environmental health hazards. Recent international monitoring of hantavirus by the U.S. Centers for Disease Control and Prevention (CDC) has renewed focus on the importance of rodent control, environmental hygiene, and sanitary facility management in protecting public health and food systems (CDC, 2026: <https://www.cdc.gov/hantavirus/situation-summary/>).

Poor sanitation is not simply an environmental concern; it is directly linked to public health outcomes, tourism confidence, trade resilience, food safety, and community wellbeing. In tropical regions such as the Caribbean, the convergence of rainfall, flooding, drainage challenges, urban density, and unmanaged waste increases vulnerability to rodent-borne and vector-borne diseases.

Understanding Hantavirus

Hantaviruses are a family of viruses carried primarily by rodents. Humans may become infected through exposure to infected rodent urine, droppings, saliva, nesting materials, or contaminated dust particles that become airborne during sweeping or disturbing contaminated spaces (CDC, 2026: <https://www.cdc.gov/hantavirus/hcp/clinical-overview/>).

While most hantaviruses are not spread between people, certain strains such as Andes virus have demonstrated limited human-to-human transmission under close contact conditions, which has prompted international monitoring and public health vigilance (CDC, 2026: <https://www.cdc.gov/hantavirus/situation-summary/>).

In the Americas, hantavirus infection may lead to **Hantavirus Pulmonary Syndrome (HPS)**, a severe and potentially fatal respiratory disease.

Early symptoms may include:

- Fever
- Fatigue
- Muscle aches
- Headaches

- Chills
- Nausea
- Abdominal discomfort

Severe illness may progress rapidly to:

- Difficulty breathing
- Fluid accumulation in the lungs
- Respiratory failure
- Low blood pressure

The CDC reports that Hantavirus Pulmonary Syndrome has an approximate fatality rate of 38% in reported cases (CDC, 2026: <https://www.cdc.gov/hantavirus/hcp/clinical-overview/hps.html>).

Hantavirus and Food Safety

Although hantavirus is not traditionally classified as a foodborne disease, its relationship to food safety is significant. Rodents can contaminate food ingredients, storage areas, packaging, food contact surfaces, processing facilities, restaurants, warehouses, domestic kitchens, agricultural facilities, and retail markets through urine, droppings, saliva, and physical damage to packaging.

Unsafe cleaning of rodent-infested food environments can also generate contaminated airborne particles, increasing exposure risks (CDC, 2026: <https://www.cdc.gov/hantavirus/prevention/index.html>).

For this reason, effective rodent prevention and environmental sanitation are critical components of food safety management systems.

HANTAVIRUS & FOOD SAFETY RISK

Hantaviruses are carried by rodents. Humans can become infected through exposure to contaminated food, surfaces, or environments.

RODENTS CARRY HANTAVIRUSES **CONTAMINATION OF FOOD & SURFACES** **HUMAN INFECTION CAN CAUSE SEVERE RESPIRATORY ILLNESS (HPS)** **RISK TO FOOD HANDLERS AND CONSUMERS**

COMMON SOURCES OF CONTAMINATION

- RODENT DROPPINGS IN STORAGE AREAS
- CONTAMINATED FOOD & PACKAGING
- CONTAMINATED SURFACES & EQUIPMENT
- DUST FROM RODENT NESTING MATERIALS
- POOR SANITATION PRACTICES

FOOD SAFETY RISKS

- ✓ Contamination of food and food contact surfaces
- ✓ Spread of disease to workers and consumers
- ✓ Severe respiratory illness (Hantavirus Pulmonary Syndrome - HPS)
- ✓ Potential for limited human-to-human transmission

SAFE CLEANING PRACTICES

- ✓ Ventilate area before cleaning
- ✓ Wear gloves and protective equipment
- ✓ Do not sweep or vacuum dry droppings
- ✓ Use wet cleaning methods
- ✓ Disinfect surfaces
- ✓ Wash hands thoroughly

PROTECT FOOD. PROTECT HEALTH.

- CONTROL RODENTS
- MANAGE WASTE PROPERLY
- ELIMINATE STANDING WATER
- PRACTICE GOOD HYGIENE
- STORE FOOD IN SEALED CONTAINERS
- CLEAN & DISINFECT SURFACES
- FOLLOW FOOD SAFETY STANDARDS

GOOD SANITATION AND RODENT CONTROL ARE ESSENTIAL TO PREVENT DISEASE AND PROTECT OUR FOOD.

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Leptospirosis: A Persistent Caribbean Concern

Leptospirosis is a bacterial disease caused by *Leptospira* bacteria and remains highly relevant to tropical and flood-prone environments, including the Caribbean. The disease spreads through the urine of infected animals, particularly rodents, livestock, dogs, and wildlife (CDC, 2026:

<https://www.cdc.gov/leptospirosis/about/>).

Humans may become infected through:

- Contact with contaminated floodwater
- Exposure to contaminated soil
- Contact with contaminated food or drinking water
- Exposure through cuts or broken skin
- Contact with contaminated surfaces or environments

The bacteria may survive in contaminated water or moist soil for weeks to months, particularly in warm climates (CDC, 2026: <https://www.cdc.gov/leptospirosis/prevention/>).

Symptoms may include:

- Fever
- Severe headache
- Muscle pain
- Vomiting
- Red eyes
- Jaundice
- Kidney complications
- Liver complications
- Respiratory distress

Heavy rainfall, flooding, blocked drainage, and poor sanitation significantly increase exposure risk.

Poor Sanitation and Mosquito-Borne Disease Risks

Poor sanitation also contributes significantly to mosquito-borne disease transmission.

Standing water in neglected environments creates breeding conditions for mosquitoes, particularly *Aedes aegypti*, which transmits:

- Dengue
- Chikungunya
- Zika
- Yellow Fever

Common mosquito breeding sites include:

- Blocked drains
- Discarded tyres
- Buckets
- Uncovered drums
- Construction debris
- Abandoned containers
- Roof gutters
- Stagnant puddles
- Overgrown lots with water accumulation



The World Health Organization confirms that chikungunya is a mosquito-borne viral disease transmitted by infected *Aedes* mosquitoes that breed in urban environments where standing water is present (WHO, 2026: <https://www.who.int/news-room/fact-sheets/detail/chikungunya>).

The Pan American Health Organization continues to highlight the regional risks associated with arboviral diseases in the Americas and Caribbean (PAHO, 2026: <https://www.paho.org/en/topics/arboviral-diseases>).

Poor sanitation therefore creates a **dual public health burden**, increasing both rodent-borne and mosquito-borne disease risks simultaneously.

Environmental Sanitation: Prevention Starts with Clean Surroundings

Maintaining sanitary surroundings remains one of the most effective public health interventions available.

Environmental risk factors include:

- Overgrown lots
- Illegal dumping
- Uncollected waste
- Poor drainage
- Standing water
- Neglected buildings
- Scrap material accumulation
- Food waste build-up
- Unsanitary food environments
- Poorly maintained public spaces

These conditions create opportunities for:

- Rodent harbourage
- Mosquito breeding
- Food contamination
- Disease transmission
- Environmental nuisance conditions

Managing Overgrown Lots and Neglected Properties

Overgrown lots and neglected properties create ideal shelter for rodents and disease vectors. Tall grass, unmanaged vegetation, debris, scrap materials, and stagnant water provide breeding and nesting environments that place neighbouring homes, schools, businesses, food establishments, warehouses, tourism facilities, and communities at risk.

CARICOM Member States should consider strengthening environmental sanitation regulations to require:

- Routine maintenance of private and commercial lands
- Removal of excessive vegetation
- Elimination of stagnant water
- Proper waste management
- Prevention of rodent harbourage
- Improved drainage management

Member States should also consider empowering municipal, environmental health, and public health authorities to:

- Inspect neglected properties
- Issue notices of non-compliance
- Require corrective action within established timelines
- Impose administrative penalties or fines where owners fail to maintain properties that create public health hazards
- Recover remediation costs where public authorities must intervene directly

A sound public health policy principle is that registered landowners and occupiers should maintain their properties in sanitary condition so that they do not contribute to vector breeding, rodent infestation, environmental contamination, or health risks affecting surrounding communities.

Recommended Sanitation and Pest Prevention Measures for Food Establishments

Codex Alimentarius General Principles of Food Hygiene (CXC 1-1969, revised 2022)

1. Integrated Pest Management (IPM)

Food business operators should establish and maintain a documented pest prevention and control programme based on risk assessment, facility vulnerability, and the nature of food operations.

Measures should include:

- Conduct scheduled internal and external inspections of the facility, surrounding grounds, roof spaces, drainage systems, loading bays, storage areas, and waste handling locations to identify evidence of pest activity, harbourage, ingress points, or environmental conditions conducive to infestation.
- Implement a documented pest monitoring programme using appropriate monitoring devices, traps, bait stations, or surveillance tools positioned according to facility risk and operational requirements.
- Maintain specific rodent monitoring measures for internal and external perimeter areas, including trend analysis of pest activity and escalation protocols where increased activity is detected.
- Engage only competent, licensed, or appropriately qualified pest management service providers where external pest control support is utilized.
- Ensure pest control chemicals, baits, traps, and treatments are suitable for food environments, properly controlled in tamper proof devices, and applied or placed in a manner that does not contaminate food, food contact surfaces, packaging, ingredients, water, or equipment.
- Establish documented procedures for investigation, containment, corrective action, and verification whenever pest activity is identified.

- Maintain complete pest control records including inspection findings, monitoring results, treatment activities, corrective actions, verification outcomes, and contractor reports.
- Prevent pest harbourage by controlling vegetation, standing water, accumulated debris, unused equipment or materials, and structural defects around the premises.
- Review pest control effectiveness periodically and revise control measures based on trends, incidents, seasonal risks, or facility changes.

2. Food Storage and Stock Protection Controls

Food storage systems should be designed and managed to protect food from contamination, pest access, deterioration, and cross-contamination.

Measures should include:

- Store food, ingredients, packaging materials, and food contact items off the floor and away from walls to permit inspection, cleaning, ventilation, and pest monitoring.
- Use clean, durable, food-grade, covered, and pest-resistant storage containers where appropriate.
- Inspect all incoming goods, raw materials, packaging, and deliveries for signs of pest infestation, contamination, water damage, spoilage, tampering, or compromised packaging prior to acceptance.
- Reject, isolate, or segregate any incoming goods that present food safety concerns.
- Remove damaged, contaminated, leaking, infested, or otherwise compromised stock immediately from food storage and processing areas.
- Maintain effective inventory control systems such as FIFO (First-In, First-Out) or FEFO (First-Expired, First-Out) as appropriate.
- Clean spills, leaks, and food residues immediately to prevent attracting pests or creating microbial growth conditions.
- Maintain storage environments at appropriate temperature, humidity, and ventilation conditions to preserve product integrity and minimize pest attraction.
- Segregate allergenic, chemical, non-food, returned, or rejected materials to prevent cross-contamination.

3. Facility Design, Maintenance and Structural Integrity

Food premises should be designed, constructed, and maintained to minimize contamination risks and prevent pest ingress.

Measures should include:

- Seal cracks, holes, service penetrations, gaps around pipes, wall openings, and other structural defects that may permit pest entry.

- Maintain doors, windows, loading docks, vents, shutters, ceilings, drains, and access points in sound condition.
- Install protective barriers such as insect screens, door sweeps, air curtains, self-closing doors, or equivalent controls where necessary.
- Maintain adequate drainage systems to prevent water accumulation, flooding, sewage backflow, or environmental contamination.
- Eliminate standing water, roof leaks, plumbing leaks, condensation, and excess moisture that may encourage pest activity or microbial growth.
- Ensure walls, floors, ceilings, fixtures, and food contact areas are constructed of cleanable, durable materials appropriate for the food operation.
- Maintain external grounds in sanitary condition, including vegetation control, debris removal, and management of surrounding nuisance conditions.
- Establish preventive maintenance programmes for infrastructure, utilities, and sanitation-related systems.

4. Waste Management and Refuse Control

Waste should be managed in a manner that prevents contamination, pest attraction, odour nuisance, and environmental health risks.

Measures should include:

- Remove waste from food handling and storage areas at a frequency sufficient to prevent accumulation and contamination risk.
- Use clearly identified, durable, leak-proof, cleanable, and covered waste containers appropriate for the type of waste generated.
- Separate food waste, recyclable materials, hazardous waste, and general refuse where relevant.
- Clean and sanitize waste containers, waste holding areas, compactors, and collection points at appropriate intervals.
- Maintain waste storage areas in a sanitary condition and positioned to minimize contamination risks to food operations.
- Prevent accumulation of food residues, liquids, packaging waste, and debris that may attract rodents, insects, birds, or other pests.
- Ensure external waste storage areas are protected from weather, scavenging animals, pest access, and drainage contamination.
- Arrange timely waste removal by authorized waste service providers.
- Monitor waste management systems routinely as part of sanitation verification programmes.

Safe Cleaning Practices

CDC advises against dry sweeping or vacuuming rodent-contaminated spaces because contaminated particles may become airborne (CDC, 2026: <https://www.cdc.gov/hantavirus/hcp/clinical-overview/>).

Safer practices include:

- Ventilating enclosed spaces
- Wearing gloves and protective equipment
- Disinfecting before cleaning
- Using wet cleaning methods
- Safe disposal of contaminated materials
- Thorough handwashing afterward

Strengthening Public Sanitation Across CARICOM

Environmental sanitation requires coordinated action beyond individual households and businesses.

CARICOM Member States should consider:

- Harmonized sanitation standards for vector control, drainage, waste management, and public market hygiene
- Stronger public health enforcement for sanitation compliance
- Investments in drainage upgrades, stormwater systems, flood mitigation, and waste infrastructure
- Enhanced rodent and mosquito surveillance programmes
- Public awareness campaigns promoting sanitation and disease prevention

Household Protection Measures

Households should:

- Store food securely
- Clean kitchens daily
- Remove clutter
- Repair holes in walls and roofs
- Maintain yards
- Clear drains and gutters
- Eliminate standing water
- Store waste securely
- Avoid attracting rodents

During rainy periods:

- Avoid floodwater exposure
- Wear protective footwear
- Cover cuts and wounds
- Avoid unsafe water contact
- Prevent children from playing in contaminated water

Traveler's Precautions

Traveler's should:

- Avoid rodent-infested accommodations
- Avoid contact with rodent droppings
- Choose hygienic food establishments
- Drink safe water
- Avoid floodwater exposure
- Practice hand hygiene
- Seek medical attention if symptoms develop after travel

Going forward

Hantavirus, leptospirosis, dengue, chikungunya, and other sanitation-linked diseases reinforce an important public health reality:

Environmental sanitation protects food safety, public health, trade, tourism, and community wellbeing.

The Caribbean cannot separate food safety from environmental hygiene. Clean homes, sanitary food facilities, maintained public spaces, effective drainage, pest control, responsible property management, and coordinated public health action are essential to building safer and healthier Caribbean communities.

CAHFSA encourages continued collaboration among governments, municipalities, businesses, households, and communities to strengthen environmental sanitation and reduce preventable public health risks across the region.

For more information visit CAHFSA's website at www.cahfsa.org