

PART ONE. SECTION IV:

Controlling Damage to Food Commodities

I. CLEANING AND INSPECTING

If sound storage procedures for commodities, as addressed in the following chapter, are followed, insect and rodent problems will be minimal. The problems can be further controlled with a program of cleaning and inspecting.

The program should include (1) closing or removing open food containers, (2) repairing damaged packages, (3) removing and disposing food unfit for human consumption, and (4) inspecting and cleaning the storage area regularly according to a planned, scheduled program.

Table 1.4: Guidelines for Warehouse Inspections

Area to be inspected	Inspect for
Outside the warehouse	<ul style="list-style-type: none"> -Cleanliness -Condition of roof, walls and windows -Security--fences, guards, locked doors and windows
Inside the warehouse	<ul style="list-style-type: none"> -Condition and cleanliness of ceilings, floors and walls -Adequate ventilation -Placement of rodent baits / traps -Presence of hazardous substances such as chemicals and pesticides -Presence of fire extinguishing equipment, dates not expired
Food storage area	<ul style="list-style-type: none"> -Distance between stacks, and between stacks and walls -Interlaced or bonded stacks -Use of pallets free of exposed nails or wooden splinters which may tear bags -Segregation of damaged food -Insect infestations -visual and sounds -Rodent or bird infestations -Stale food which has been stored too long -Leaking, stained or discolored containers, bulging or rusting cans and caking of food within bags -Germination of grain in sacks -Short-weight containers
Warehouse office area	<ul style="list-style-type: none"> -Cleanliness -Adequate shelving -Adequate lighting -Condition of office equipment

II. INSECT CONTROL

A. FUMIGATION

In all cases, READ THE MANUFACTURER'S LABEL BEFORE USING FUMIGANTS. *Due to the extreme toxicity of fumigants, the utmost caution must be taken during their handling and administration.*

Fumigation is the use of a gas to kill insects and rodents. The purpose of fumigation is to destroy all stages of insects present in the material to be treated. An atmosphere that is toxic to insects will also kill rodents or other forms of animal life. Fumigation, will not eliminate mold or bacteria. Because there is no residual kill, insects or rodents may recontaminate the commodity immediately after fumigation. In order to protect stored foods a great emphasis must be placed on cleaning when sprays and fogs are used to eliminate insects.

To conduct an effective and safe fumigation, certain conditions must be met, including, but not limited to the following:

- appropriate temperature
- proper use of tarpaulins and sealing technique
- proper dosage and time exposure
- monitoring for presence of fumigants
- safety precautions
- inspection and follow-up.

B. INSECTICIDES (OTHER THAN FUMIGANTS)

Again, READ THE MANUFACTURER'S LABEL BEFORE USING INSECTICIDES. Insecticides are useful tools when used with stack rotation and thorough cleaning. Nothing takes the place of cleanliness.

Sprays

Insecticide sprays are applied to surfaces and will leave a residue that continues to kill insects that contact it. **Be careful not to spray on product.** Effective life of the residue depends on many things, including type of insecticide, surface to which it is applied, temperature, and humidity.

Fogs and Mists

Insecticide fogs and mists move through the air to reach insects that may not be reached by contact sprays. They are especially effective against flying insects and insects that cannot be reached with contact sprays (for example, on surfaces of bags containing food). Close all doors and openings in the warehouse to prevent escape of the fog or mist. Read and follow manufacturer's label instructions.

III. RODENT CONTROL

The primary method of rodent control is cleaning to eliminate harborage and food in the warehouse and around the storage area. Remove debris, weeds, trash, and food outside. Keep the inside of the warehouse clean of all food, especially containers of food unfit for human consumption and awaiting disposal. Remove or repair torn and broken packages. Openings into storage buildings should be protected against rodents with screen having openings not larger than 6.35 mm. Doors must fit tightly and they must be kept closed when not in use.

Bait Stations

To help control rodents, exterior bait stations containing fresh anti-coagulant poison should be maintained around the periphery of the grounds, 100 feet apart and around the exterior of the building, 50 feet apart. Bait stations must be checked frequently, (at least twice monthly) so that the bait does not become wet, moldy, or infested with insects.

Tracking Powder

Tracking powder can be used in limited areas (not where it could contaminate food) where a mouse problem is suspected.

Snap Traps

Snap Traps can be used; however, they must be given daily attention to be effective.

Glue Boards

These are useful against mice. They can be distributed among the stacks of food where mice become entangled with the glue and cannot escape. Glue boards must be inspected frequently, to be certain that they are fresh and effective. To increase effectiveness, place under a box with openings at each end (to create a tunnel), to protect from dust and to offer shelter to rodents.

Multiple-Catch Traps

These traps are for interior use and can hold up to 30 mice. Some require winding; all require weekly inspection.

IV. REFERENCE CHART FOR CONTROLLING DAMAGE TO FOOD COMMODITIES

Table 1.5: Controlling Damage to Food

Type of damage	Evidence of damage	Methods of control	Action necessary
Short-weight containers	Bags appear slack. Containers are not as heavy as normal when lifted. Weighing a random sample of bags and containers indicates short-weight.	If bulk shipments, increase vigilance of bagging operation at port. Increase security in storage areas and during transport.	Repackage or assign a new weight to the containers. Prepare Loss and Adjustment Reports and enter transactions on stack cards and in warehouse inventory ledgers.
Leaking, broken or torn bags or containers	Spilled food in transport vehicle. Food spills from containers during unloading. Bags are torn and containers are dented or crumpled.	Handle properly--do not throw, stack too high or use hooks Contact donor if packaging material/container appears inadequate.	Repackage food fit for human consumption. Inspect sweepings and either reconstitute or dispose of sweepings declared unfit for human consumption. Prepare Loss and Adjustment Reports and enter transactions on stack cards and in warehouse inventory ledgers.
Wet, stained or moldy bags or containers	Containers are wet to the touch or dripping. Containers are discolored Unusual smell (moldy or chemical) Caking of food.	Ship in waterproof holds or in adequately sealed cargo containers. Keep under cover when stored outside. Transport using tarpaulins. Insure adequate air circulation. Do not store past expiration date on container.	Inspect and reconstitute food fit for human consumption; dispose of food declared unfit for human consumption. Food dampened by rain may be dried and reconstituted. Prepare Loss and Adjustment Reports and enter transactions on stack cards and in warehouse inventory ledgers.
Bulging or rusted tins	Rust on outside of container, especially near seams and lids. Shape of container is bulging and distorted.	Do not store in direct sunlight Do not store past expiration date on container or longer than four months.	Inspect and reconstitute food fit for human consumption; dispose of food declared unfit for human consumption. Prepare Loss and Adjustment Reports and enter transactions on stack cards and in warehouse inventory ledgers.

Type of damage	Evidence of damage	Methods of control	Action necessary
Rodent or bird infestation	Rodents or birds in the warehouse Excrement on the floor or stacks Gnawed bags or containers Footprints in dust Nests	Cleanliness and maintenance are critical to preventing infestations. Keep both the outside and the inside of the storage facility clean and free of debris. Close holes or openings in walls, floors and ceilings. If possible place screens over windows and ventilation openings. Cats are effective in controlling rodents. Traps can be set along the interior walls of the warehouse, at each side of every outside door, and in rafters. Insure that no poisons or traps are accessible to the cats.	Inspect and reconstitute food fit for human consumption; dispose of food declared unfit for human consumption. Prepare Loss and Adjustment Reports and enter transactions on stack cards and in warehouse inventory ledgers.
Insect or moth infestation	Flying insects Live or dead insects or larvae on the floor Traces of insects or larva in dust Grain bags have small holes and excessive dust Noise heard inside the bag Irregular holes in the grain or beans Strong odor	Cleanliness is critical to prevent insect infestations. Keep both the outside and the inside of the storage facility clean and free of dust and debris.	Inspect and fumigate; dispose of food declared unfit for human consumption. Prepare Loss and Adjustment Reports and enter transactions on stack cards and in warehouse inventory ledgers.
Seepings	Loose food from slack or torn bags on warehouse floors Loose food on warehouse floors after reconstitution	Keep bags of food from being handled roughly or moved too many times. Instruct laborers to avoid as much spillage as possible during the reconstitution of food.	Frequently sweep floors to keep them clean. Reconstitute all food that may be fit for human consumption. Determine if sweepings are unfit. Prepare Loss and Adjustment Reports and enter transactions on stack cards and in warehouse inventory ledgers.

V. REFERENCES

1. CARE. *Food Resources Manual*. 1998. Food Aid Management Website: <http://www.foodaidmanagement.org/commoditymgmt.htm>.
2. Bibliography available at FAM.
3. USAID. *Environmental Documentation Manual – For P.L. 480 Title II Cooperation Sponsors Implementing Food-Aided Development Programs (Final Draft)*. Reprinted April 1998.
4. USAID. *A Field Guide to USAID Environmental Compliance Procedures*, based on the USAID Environmental Manual for P.L. 480 Title II Food for Development Programs. March 5, 1998.