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## Pantry Pests

Many different insects feed on or breed in flour, cereals, cornmeal, cookies, crackers, macaroni, rice, grains, dried fruit, cured meat, candy, nuts, and other stored foods. Spices, especially red pepper, paprika, and chili powder, also are attractive to insects. Infestations may develop whenever such foods are kept for long periods (60 days or more). Stored-product insects, if given enough time, can penetrate any packaging except glass and metal. Infestations can start in the home, store, warehouse, mill, processing plant, or in transit.

## Control

Follow these steps when food is infested:

1. Locate the source of infestation. Check seldom used packages of cereal, oatmeal, pancake flour, cornmeal, and raisins. Dry dog food stored in the basement or pantry also may be a source and bird seed often is infested with Indian-meal moths.
2. Wrap infested food in a heavy plastic bag; bury or have it picked up by a garbage disposal service as soon as possible. You may disinfest foods such as flour with heat or cold (see step 3), then sift and place the material in a tightly closed container. However, sifting will not remove all insect fragments or feces.
3. Heat or cold treat susceptible foods after you have had them for 60 days, even if they do not appear infested.
  - \*Cold treat packaged foods such as cake mixes and spices in their original containers. Expose them to 0° F. or lower temperatures for 3 days. Larger packages may need to be held at 0° F. for 7 days.
  - \*Heat treat foods such as flour, beans, nuts, and whole grains. Spread in shallow pans to insure thorough, uniform heating and place in a 150° F. oven for 15 to 20 minutes.
  - \*Heat treat dried fruits by placing in a cheesecloth bag and dipping in boiling water for about 6 seconds.
4. Store insect-free foods in tightly closed glass or metal containers: glass jars with screw-on lids are best.
5. Clean pantry and cupboard shelves, particularly cracks, crevices, and spaces under shelves. Remove all crumbs and spilled food with a vacuum cleaner.
6. Insecticide treatment is supplemental to good housekeeping since it will have no effect on insects breeding within food packages. Paint or spray the shelf surface with a household grade of only one of the following: 2 percent malathion (premium grade) or 1/2 percent diazinon. Insecticides are usually sold in concentrated form; mix the concentrate of one insecticide in water according to table 1 or employ a ready-to-use formulation labeled for pantry pests.

7. Allow the insecticide to dry thoroughly; 12-24 hours are adequate. Cover shelves with shelving paper and replace properly packaged food items (see step 4).

## Prevention

Follow these steps to help prevent future infestations:

1. Avoid long storage periods by purchasing susceptible or seldom used foods in small quantities. Store such products in tightly closed glass or metal containers or in the refrigerator.
2. At time of purchase, examine foods such as cornmeal, coarse cereals, and macaroni to insure that they are insect free. Check the packaging date to establish its freshness. If you open a package for examination, place the contents in a tight container. Do not shake the package before examination since adult insects normally reside on the surface of the cereal and may be missed if they are mixed up with the product. If infested, return and exchange the product for an insect-free one.
3. Use older packages before newer ones and opened packages before unopened ones. Be sure to store susceptible foods in insect-proof containers. Insects cannot attack properly protected foods!
4. Heat or cold treat dried foods that you will store for more than 60 days (see step 3—CONTROL). This is especially important in late summer and in the fall.
5. Keep storage areas clean. Do not allow cereals, flour, crumbs, or food fragments to accumulate on shelves or in cracks and crevices since exposed food will attract the flying stage of pantry insects. Vacuuming is the best procedure. Cleaning with soap and water is less effective because the water washes some food particles into cracks and crevices. Infestations may begin in davenport and chairs where food is dropped between the cushions and not regularly cleaned-up. Occasionally, flour and carpet beetles can survive and reproduce in the vacuum cleaner. Be sure your vacuum cleaner is emptied at least every 30 days.
6. Don't forget to check the dry dog or cat food or your bird food for stored-product insects.

Mention of a commercial name does not imply endorsement nor does failure to mention a name imply criticism.

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## Insects that Infest Food

The following insects are found most often in infested food. However, the steps listed for control and prevention generally handle other pantry pests, too.



Sawtoothed and Merchant Grain Beetles—are usually reddish-brown but may vary in color from light tan to almost black. Somewhat smaller, narrower, and flatter than flour beetles, they can squeeze into folds, seams, and cracks of packages. They infest many foods such as dried fruit, crackers, dried meat, macaroni, whole grains, and breakfast cereals. Larvae are cream-colored, slender worms that feed on the same foods as the adult stage.

Flour Beetles—are reddish-brown and somewhat rounded in shape. The beetles lay eggs directly in flour, bran, other milled products, and sometimes dried fruits. Breeding is continuous as long as temperature, moisture, and food supply are favorable. Larvae are whitish or cream-colored.



Drugstore Beetles and Cigarette Beetles—are brown and quite oval in shape. They are more active than flour beetles and have a wider range of food habits. They infest all foods infested by saw-toothed grain beetles as well as spices and paper products such as books.

Larder Beetles—are almost black with a light-yellow or cream band or "saddle" across the middle of the body. About 1/3 inch long, they are among the largest beetles found in home-stored food.

Larder beetles are usually found in materials of animal origin such as dried or cured meat. However, they also survive on crumbs or spilled foods accumulating in cracks and crevices of drawers and shelves.



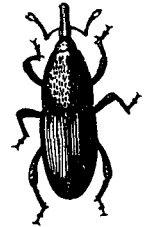
Occasionally the source of infestation can be a dead mouse or other animal or even an accumulation of dead insects. Larvae are quite hairy and generally brown with definite light cross-bands on the body corresponding to the segments. The shed skins of the larvae often are found in or near infested food.

Smaller but similar beetles may be found in storage areas. These include the common black carpet beetle and the cabinet beetle. Black carpet beetle adults are all black while cabinet beetles are black and white with touches of brown.



Foreign Grain Beetles—are the smallest of the insects pictured on this sheet. They are usually found in damp and moldy cereal products. They often are noticed near windows.

Granary Weevils and Rice Weevils—are closely related insects attacking whole grains or seeds and, occasionally, macaroni. They leave small round exit holes in kernels. The weevils may also infest milled products, such as flour, that are caked or crusted. Acorns collected and stored may be the source of a heavy weevil population in late fall and winter.



Indian-Meal Moths—are the most common moths infesting food in the home. The small adults often are mistaken for clothes moths. Light-colored, they have a copper band on the outer part of each front wing. Only the larvae feed. They spin a silken webbing in infested food.

Mediterranean Flour Moths—are less common in the home than any other insect. Adults have light-gray front wings marked with small black lines. When the moth is at rest, wings are folded tightly back along the body and the front end of the body is elevated. Larvae infest many different foods and spin a silken webbing.



**Table 1. Mixing instructions for household insecticides**

Chemical	Concentration	Amount of concentrate for		Concentrate after mixing
		1 cup water	1 gallon water	
malathion (Cythion)	57 percent	3/4 tsp.	1/4 cup	2%
or diazinon (Spectracide)	24 percent	1 tsp.	3/8 cup	1/2%

One or two cups of the mixture will cover most cupboards when painted on. Do not apply excessive amounts. Do not forget cracks and back edges. Do not spray food or utensils or allow the spray to drift onto them. Do not spray near an open flame. This treatment leaves a residual deposit of the insecticide for several weeks to kill walking or crawling insects. Attempting to control these insects with the use of household bleaches, detergents, or sterilants is worthless.