



EB1396

WASHINGTON STATE UNIVERSITY
 EXTENSION

MEAL MOTHS

Meal moths attack stored grain products or household foodstuffs. Once established in food, insect populations can increase and infest vulnerable material throughout the home, apartment, or storage area. Some adult moths do fly into the home through open doors or windows, but most are carried inside from outdoor storage or in packaged goods or groceries.

Everyone's home is vulnerable. However, those who do not store food properly have the greatest problems. Spilled or exposed foods attract the insects and increase the chance of infestation. Foods that are not tightly sealed, especially those maintained for long periods of time, are particularly susceptible to infestation.

The Indianmeal moth and the Mediterranean flour moth are the most prevalent meal moths which infest foodstuffs in Washington. Several other moths that are found occasionally in foodstuffs include the meal moth, the whiteshouldered house moth, and the brown house moth.



Adult Indianmeal moth.

Indianmeal Moth

The adult Indianmeal moth, *Plodia interpunctella*, has a wingspan of about $\frac{1}{2}$ to $\frac{3}{4}$ -inch. The tips or outer half of the wings are reddish brown or "coppery," while the basal portions are grayish-white. The larvae are usually off-white but can be pink, yellow, greenish, or brownish. At maturity the larvae are about $\frac{1}{2}$ -inch long.

The adult female can lay several dozen to several hundred eggs. The larval stage may last from a few weeks to 9 or 10 months, depending on temperature. The larvae, which spin a great deal of webbing while they are feeding and maturing, are usually found in or near silk tubes. When ready to pupate, larvae leave their tubes to spin a cocoon. They often migrate a considerable distance from their food source while searching for a pupation site, and are found on walls, countertops, and ceilings. This is especially true when infestations are heavy. There can be four to nine generations per year, depending on the food supply and house temperature.

The larval stage is the feeding or "pest" stage. Indianmeal moth larvae appear in grain, cereal and grain products, dried fruit, dog food, candy, dried milk, and many other foodstuffs.



Mediterranean flour moth larva.



Cake mix infested with Indianmeal moth. Note larva and dead adults. Larval frass appears at lower

center.

Mediterranean Flour Moth

The Mediterranean flour moth, *Anagasta kuehniella*, has a wingspan of about one inch. Forewings are grayish with dark zigzag lines; the hindwings are off-white. This moth is most easily recognized by its characteristic resting pose. The moth raises the front of the body, giving the wings a distinct downward slope. The tip of the abdomen protrudes up between the wings. Larvae are white to whitish-pink and about $\frac{1}{2}$ -inch long at maturity.

The adult female can lay several hundred eggs. The larval stage normally lasts about 40 days, but can last considerably longer at cooler than optimal temperatures. Under favorable conditions, four to five generations hatch annually. Larvae spin a great deal of webbing on or near their food, as does the Indianmeal moth. These larvae, too, live in silk tubes. Mediterranean flour moth larvae pupate in silken cocoons in clean flour or other food, away from infested material. Mediterranean flour moth larvae generally feed on the same materials as the Indianmeal moth.



Adult Mediterranean flour moth.

Meal Moth

The meal moth, *Pyralis farinalis*, has a 1-inch wingspan. The adult's wings are attractively banded in thirds—brown, light brown, dark brown. Wavy white lines separate the brown bands. Off-white larvae have black heads, and reach about one inch at maturity. Frequently, the bodies of the larvae carry orange tinting at each end.



Adult meal moth.

The adult female meal moth lays about 200—400 eggs. The larval stage sometimes takes as little as 6 weeks. Larvae spin tough silk tubes that are coated or mixed with food particles; they stay in these tubes and feed from the open ends. When fully developed, the larvae leave these tubes and spin silken cocoons in which they pupate.

The larvae of this moth species feed on a variety of grain products. They are generally a problem on food products that are in poor condition, moist, or stored in damp places.

Whiteshouldered House Moth

The whiteshouldered house moth, *Endrosis sarcitrella*, is not common in household products but is found occasionally, and thus deserves mention. The adults are quite distinctive, having grayish-white wings with dark spots and a "shoulder" area that is bright white. This white shoulder becomes dingy as the adults age. Adults are roughly the same size as meal moths. Larvae are white with brown heads and are about $\frac{1}{3}$ -inch long at maturity. Larvae feed on grain products, wool or other protein-based carpets, corks, dry seeds, fungi on trees, on rubbish in bird nests, and on other foodstuffs or organic debris which has accumulated undisturbed.

Brown House Moth

The brown house moth, *Hofmannophila pseudospretella*, is about as common as the whiteshouldered moth. The bronze-brown adult has dark spots on the forewings and is slightly larger than

the whiteshouldered moth. Larvae, white with tan heads, are about $\frac{1}{4}$ -inch long at maturity. Larvae feed in grain products, furs, paper, carpets, insect collections, dried fruits, and on a variety of other stored products.

Prevention and Control of Meal Moths

Sanitation.

The primary method for avoiding problems with stored product pests is good sanitation. Some points to remember include:

- Spilling or leaving food exposed (as a common practice) attracts and harbors these pests. Avoid these practices and you will probably never have this problem.
- Cookie crumbs and bits of dried pet food may fall behind furniture or under appliances where children play or pets are fed. Toaster crumbs and crumbs from food preparation fall into cracks beside the stove or refrigerator. Stored grains, etc., may also fall behind storage drawers. Pull out appliances and drawers occasionally and thoroughly vacuum these out-of-the-way locations.
- Buy "storage" food such as flour grains only in quantities that you will use in a reasonable length of time. Materials stored for long periods (for example, six months or more) are often the source of serious infestations. Pests can develop here without being observed and explode into near unmanageable numbers.
- Most cupboard pests can chew their way into cardboard boxes or plastic sacks. Place stored materials into tight-fitting containers, preferably of glass or other tough material. If an infestation should occur under these conditions, it probably will be limited to a single jar. Glass jars should have rubber seals, and plastic containers must have tight-fitting seals. Tiny hatchlings can crawl through even the tiniest of gaps. The best storage is cool and dry. If at all possible, you may want to consider refrigerated storage of little used but important dry goods. When dried pet foods are accessible to mice, an unusual problem may occur. Rodents steal the pet food and may store

large quantities in unobservable places, as in wall voids and sub-floor spaces. Then, if meal moth pests locate the stolen food, you will have a difficult time finding and removing the problem source. Dried pet foods are one of the most frequent stored products attacked by these pests, so it is wise to be especially attentive to storage of these foods.

- If such pests become apparent, locate the source immediately and get rid of it. If you act early enough, this may be the only material infested. Examine unopened cardboard boxes thoroughly. If there is the slightest suspicion—be ruthless—throw it out. If the material appears uninfested and you prefer to keep it, at least use a containment/inspection technique. Place the material in a jar or Ziploc bag and inspect it frequently. A jar with a tight seal is best since the insects cannot escape. Ziploc bags* are often more convenient, but you will have to inspect them more frequently. Many of these pests can chew their way out and move to new food sources.
- Use a vacuum cleaner to remove debris from cracks and corners of storage areas. Also clean all nearby areas, especially spills and crumbs behind and alongside of stoves and refrigerators. Check the dishwasher area and toaster for crumbs. Scrub storage space and vicinity with very hot water and a strong detergent solution. Allow to dry thoroughly.

***Be certain such plastic bags are manufactured for food use.**

Chemical Control

Chemicals are not generally recommended. If the problem becomes severe and widespread, you might want to contact a reputable pest control operator (exterminator). Chemicals should not be the primary tool. They can only supplement the more important steps of sanitation. Location of the pests in food prohibits the use of sprays in those areas. Use sprays only in cracks, crevices, or areas away from food where larvae might hide, or where flying adults might collect.

Mechanical Control

Food which has been exposed but shows no visible signs of infestation may be placed in shallow pans and heated in an oven for about an hour at 140°F. Prop the oven door open slightly to prevent scorching the food. Also stir occasionally to encourage rapid heat penetration. Thorough freezing will accomplish the same end.

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Use pesticides with care. Apply them only to plants, animals, or sites listed on the label. When mixing and applying pesticides, follow all label precautions to protect yourself and others around you. It is a violation of the law to disregard label directions. If pesticides are spilled on skin or clothing, remove clothing and wash skin thoroughly. Store pesticides in their original containers and keep them out of the reach of children, pets, and livestock.

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