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## UNL Extension in Lancaster County

### Managing House Dust Mites

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Photo Credit: American Academy of Allergy, Asthma and Immunology

House Dust Mite (highly magnified).

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House dust mites are found in most homes. They are microscopic, eight-legged creatures closely associated with us, but they are not parasitic and do not bite. They don't burrow under the skin, like scabies mites or live in skin follicles, like skin follicle mites.

The concern about dust mites is people are allergic to them. Symptoms associated with dust mite allergies include sneezing, itchy, watery eyes, nasal stuffiness, runny nose, stuffy ears, respiratory problems, eczema and (in severe cases) asthma. Many people notice these symptoms when they stir dust during cleaning activities. But, dust also contains other allergens, including cat and dog dander, cigarette ash, cockroach droppings, mold spores and pollen.

How can you find out if you're allergic to dust mites? An allergist, a medical doctor specially trained to treat allergies, should be consulted for proper diagnosis.

The dust mite allergen is their tiny feces and body fragments which are components of dust. These particles are so small they can become airborne and inhaled when dust is disturbed.

## **Biology**

There are two species of house dust mites found in North America. These mites are so small they are virtually invisible without magnification. Female mites lay cream-colored eggs coated with a sticky substance so eggs will cling to the substrate. These mites have two distinct immature stages. Under optimal conditions, the entire life cycle from egg to adult takes three-four weeks.

House dust mites feed on human skin scales, pollen, fungi, bacteria and animal dander. Dust mites do not drink free water, but absorb water from the air and the environment.

To thrive, dust mites need very warm temperatures (75-80 degrees F) and high humidity levels -- 70-80 percent relative humidity. One study showed when humidity is 60 percent or lower, the mite population stops growing and dies out.

Humans continually shed skin and lose about 1/5 ounce of dead skin each week. We also spend about one-third of our lives sleeping so high levels of dust mites are often associated with the bedroom, especially bedding and the mattress. Dust mites also eat animal dander so allergens will be plentiful in areas where family pets sleep.

## **Dust Mite Management**

To eliminate dust mite allergens, first, take actions to reduce dust mite populations and second, reduce exposure to dust. No one method has been found for reducing mites and relieving allergy suffering.

**LOWER HUMIDITY** -- Reduce humidity levels to less than 50 percent inside your home, especially in the bedroom. This isn't hard to do in the winter, but can be a challenge in Nebraska during summer months, especially in homes without air conditioning. Studies have shown air-conditioned homes have ten times fewer dust mite allergens than non-air-conditioned homes. In addition to cooling the house, air conditioning reduces the humidity dust mites need to thrive. A study has shown using an electric blanket for eight hours each day reduced dust mites by 50 percent in one month.

**AVOID FURRY OR FEATHERED PETS** -- Pets with fur or feathers contribute to the dander in the dust and increase food source for mites. If you are a pet lover, locate their sleeping quarters as far from yours as possible and furnish their sleeping area so it can be cleaned easily. Hardwood or vinyl floors with washable area rugs are ideal.

**REDUCING AIR INFILTRATION** -- Airing out the house with open windows allows entry of pollen, which is another allergen as well as food for dust mites. In some climates, incoming air may be humid, which promotes dust mites.

**CLEANING/HEAT TREATMENTS** -- Wash all bedding weekly. Research has shown laundering with any detergent in warm water (77 degrees F) removes nearly all dust mite and cat allergen from bedding. If you cannot launder blankets, dry clean them once a year. Shampoo, steam clean or beat non-washable carpets once a year.

**SELECT APPROPRIATE FURNISHINGS** -- Avoid overstuffed furniture because it collects dust. Also avoid wool fabrics/rugs because wool sheds particles and is eaten by other insects. Use washable curtains and rugs instead of wall-to-wall carpeting. If you cannot replace carpeting, have it steam cleaned at least once a year, springtime is best. This will prevent a build up of dust mites feeding on skin cells in the carpet during the summertime. Enclose mattresses and pillows in plastic to decrease mite populations in the bed. Replace feather pillows with synthetic ones.

## **Dust Management**

Eliminating dust from the environment is important in reducing allergens in sensitive people.

**VACUUMING** -- The most important tool for managing house dust and dust mites is the vacuum cleaner. Regular, thorough vacuuming of carpets, furniture, textiles and other home furnishings such as draperies will help keep dust mite populations low. Vacuums with a water filter are preferable to those with a disposable paper bag because a water vacuum removes a greater range of particle sizes than paper-bag types. There are vacuums with highly efficient filters (HEPA) designed for use by people with allergies to dust. It is better to vacuum thoroughly once a

week rather than lightly on a daily basis. Vacuum mattresses and padded furniture thoroughly; 20 minutes for each mattress is not too long.

**DUSTING** -- Dust furniture before you vacuum so the dust has time to settle on the floor, where it can be picked up by the vacuum. Do not scatter dust. Instead, dust with a damp cloth rather than dry dusting. Spraying furniture polish/dusting liquid directly on surface reduces airborne particles by 93 percent compared with dry dusting.

**AIR PURIFIERS** -- A researcher at the University of Texas-Austin found a HEPA air filter was much more effective at removing dust than ion-generating air purifiers which make particles electrically charged to remove them from circulating air. For more information on this research, visit [HERE](#)

The problem with ion-generating air filters is they emit significant amounts of ozone. Ozone irritates the lungs and can cause chest pain, coughing, shortness of breath and throat irritation. According to the US Environmental Protection Agency (EPA), ozone may worsen chronic respiratory diseases such as asthma and compromise the ability of the body to fight respiratory infections. The EPA also states manufacturers and vendors of ozone devices often use misleading terms to describe ozone. Terms such as "energized oxygen" or "pure air" suggest ozone is a healthy kind of oxygen. Ozone is a toxic gas with vastly different chemical and toxicological properties from oxygen. For more information about health problems associated with ozone, check out <http://www.epa.gov/iaq/pubs/ozongen.html>

## Chemicals

No acaricides are registered for dust mite control, but benzyl benzoate or tannic acid may reduce levels of dust mites. Be careful if you decide to use these chemicals. According to the Mayo Clinic, these chemicals worsen allergies in some people. It is wise to use non-chemical dust mite control measures around people with serious allergies.

Cleaning and non-toxic approaches listed above should give adequate control, except in humid, tropical regions of the world.

### Constituents of House Dust

cigarette ash, incinerator ash, fibers (wool, cotton, paper and silk), fingernail filings, food crumbs, glass particles, glue, graphite, animal and human hair, insect fragments, paint chips, plant parts, pollen, polymer foam particles, salt and sugar crystals, human skin scales, animal dander, soil, fungal spores, tobacco, wood shavings.

For more information The following references contain technical information on house dust mites:

- Alexander, J. O. 1984. "Arthropods and human skin." Berlin: Springer-Verlag. 442 pp.
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