Basic Methods and Procedures

for
Spider Pharm's
Housefly Feeding and Breeding Kit

Simple, clean and practically odor-free methods for the care and feeding of housefly larvae, pupae and adult flies for use as feeder insects

Housefly life cycle
(80-85 °F)

Egg: <24 hours
1st Instar larva: ~1 day
2nd Instar larva: ~1 day
3rd instar larva: ~2-3 days
Puparium: ~4 days
Adult: >1 month

Adults will start to breed about 2-3 days after eclosion (hatching from pupae) and start to lay eggs about 1-2 days later.

Environmental conditions

Optimum temperature & humidity
~85-90 °F, 40-60% RH
Optimum lighting (adult flies)
16h light : 8h dark
Tolerances
Flies and maggots can tolerate temperature above 100 °F but should be kept out direct sunlight.
Adult flies can be kept at room temperature (~68-72 °F), especially if they can thermoregulate (control their own temperature) by moving in and out of warmth provided by a desk lamp.
Adult flies may be kept under constant lighting.
Maggots may be kept in constant light or dark.

Scheduling

It is best to add fresh egg-laying media to the cage every day, though you can do this less frequently if you do not need fresh maggots or hatching pupae every day.
The sugar-water should be changed at least 2-3 times per week.
You also leave the maggots and flies alone for a few days by adding additional media for the maggots and enough sugar-water for the adult flies.
The flies may continue to lay eggs for more than a month but it is better start fresh cages every 1-2 weeks and clean them after they have been in use for 2-3 weeks. Otherwise, they start to become too soiled, moldy and/or smelly and you may start to have problems with diseases or mites.
If necessary, you can use light (phototropism) to move flies from used to fresh cages.

Safety

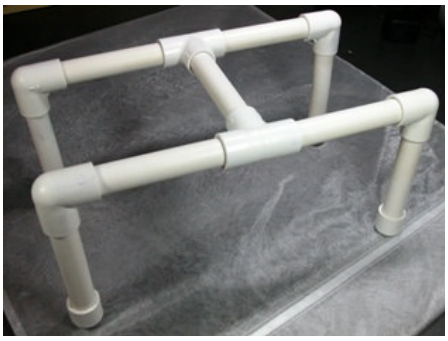
Keep fly cages clean and replace soiled cages regularly. Avoid breathing or aspirating dust or debris from flies or cages to avoid allergic reactions and respiratory infections.

Kit Contents

- ✓ 10 grams housefly pupae
- ✓ 2' x 2' organza bag cage
- ✓ PVC pipe support frame
- ✓ Deli tubs for water and egg-laying media
- ✓ Petri dishes for dry food
- ✓ Ground dog food
- ✓ Sugar/powdered milk mix
- ✓ Baker's yeast
- ✓ Pre-sifted wood chips
- ✓ Paper towels

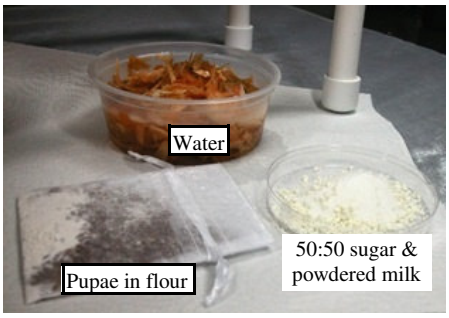
Not included

- ✓ Pot and stove for boiling water
- ✓ Measuring cups & spoons
- ✓ 1/8" plywood sheet, 2' x 2'
- ✓ 3/4" x 1-1/2" stick, 2' long
- ✓ Incandescent desk lamp
- ✓ Sifters
- ✓ Plastic shoe boxes
- ✓ White flour
- ✓ Vacuum (not mouth) aspirator



Assemble cage

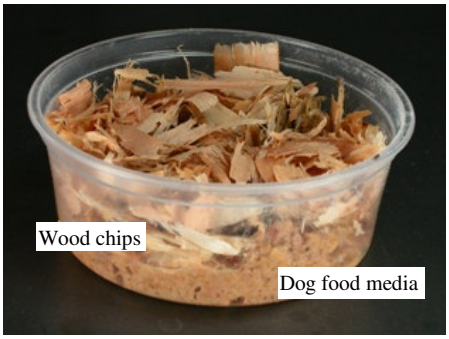
1. Cover your table top or board with paper toweling.
2. Assemble the PVC pipe frame as shown and place it inside the bag. (You can make a frame yourself from 5" lengths of PVC pipe and connectors.)
3. Close the cage with a 2' piece of a 1x2.
4. Position the desk lamp a few inches from bottom corner of bag, so it can light and warm that corner.



Add pupae and sugar, water & food

1. Unfold the paper toweling and open the bag of pupae, leaving the bag on the toweling.
2. Add deli tub filled with water and wood chips.
3. Add Petri dish of sugar/powdered milk mix.

Note: The flies need sugar soon after emergence will survive for long periods of time on powdered milk, sugar and water.



Add egg-laying media after mating has started (~3-4 days post-eclosion)

1. Add 2/3 cups boiling water to 1/3 cup dog food and allow to soak until cool to lukewarm (<105 °F), stirring occasionally.
2. Mix a pinch yeast into 1 teaspoon sugar .
3. Stir the yeast/sugar mix into the dog food in a deli tub
4. Fill with large, pre-sifted wood chips (Pre-sifted over 1/4" (4-mesh) sieve.)

Note: Chips provide a substrate for egg-laying and maggots and can improve aeration of media.

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Nutrition

Maggots and flies can be very nutritious if they are given a decent diet and we and others routinely get much better results (lower mortality and improved growth and reproduction) using flies raised on a dog food than standard fly diets. You can also improve or adapt the nutritional value for your animals by using well-fed maggots and flies and by adding supplements to diets, especially if you know that your animal has special nutritional requirements.

Possible Supplements

- Chicken eggs or egg yolk for cholesterol
- Olive oil for essential fatty acids
- Juices (carrot, grape, tomato, citrus, vegetable) for carotenoids and many other phytonutients, either canned or blended fresh or from steamed or boiled vegetables.
- Boiled grains, e.g. chicken mash
- Commercial vitamins, minerals or dietary supplements

Use organically grown supplements when possible.

Basic formula

- 1 parts dry dog food (Purina HiPro™)
- 2 parts boiling water
- 1 pinch Baker's yeast per cup

The yeast is mixed with a little sugar to prevent clumping and should only be added after the dog food has cooled below 105 °F.
All or part of the water may be replaced with juices and other supplements may be added after cooling, if reasonably sterile. Larger batches of media may frozen in convenient quantities for use as needed, but add fresh yeast after thaw.

Using flies as feeder insects

The different stages (maggots, pupae and flies) and sizes provide many options for feeding a wide range of animals.

- Some insects, spiders and lizards prefer flying insects and can be fed by allowing pupae to hatch in their cages or the flies may be fattened up in cages before they are used.
- On the other hand, many wandering spiders, shrews and birds may prefer to catch the maggots or pupae. For some animals, you can introduce the maggots in dishes or shallow cups, with a little flour to keep them dry and prevent them from crawling out.
- Maggots, pupae or flies may be used as-is to feed fish or they may be killed and sterilized first in boiling water. Sterilized flies may also be air-dried or frozen for use as needed.
- Fruit fly and housefly maggots can also be used to make a very nutritious mash for hatchling birds and other animals, that is frequently preferred over artificial or other diets. Use a mortar and pestle to mash the maggots, possibly adding a little water if needed.

Odor

The cultures should be odorless or have a slight yeasty smell. Acetic acid (vinegar) or other foul odors are usually a sign of too much anaerobic microbial growth (without air) and that the media needs better ventilation.

In most cases, odor problems may eliminated by stirring the wood chips into the media to improve aeration. It may also be necessary to reduce the amount media for egg-laying or development, to increase the concentration of maggots and giving them a chance to eat through the media faster, with less leftover. Sterile culture techniques and/ or high levels of antibiotics are used by some.

Ordering Information

Spider Pharm kits for raising flies were designed to be made from readily available materials or they be ordered online or by contacting us at:
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PO Box 1090
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Telephone: 928-427-6589
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Changing food / harvesting flies

1. Dim room lights and turn the back of the cage toward a bright window or desk lamp.
2. Shake the cage to drive flies towards the light.
3. Slide the stick to the side, to reach in.

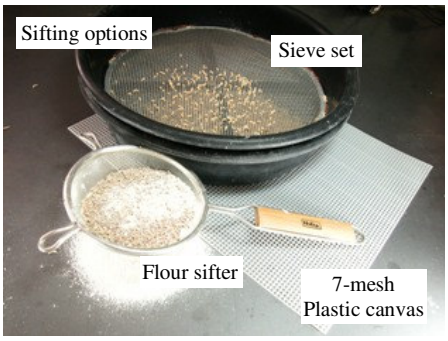
Flies may be harvested with vials or a vacuum-powered (not mouth) suction device. Dishes of media should be shaken to chase out flies and can be transferred directly to another bag to prevent remaining flies from escaping.

Raising maggots

Transfer maggots to larger containers of fresh media as they grow and consume the food.

1. Prepare a larger batch of media and spread this about 1 cm deep in a plastic shoe box.
2. Add the maggots, media and wood chips from the egg-laying tub.
3. Cover with 2-3 cm of wood chips.

(Maggot pans do not need covers. The maggots should not crawl out if they have good ventilation.)



Harvesting maggots and/or pupae

1. Dry the maggots or pupae by mixing with excess white flour.
2. Remove wood chips with a larger sieve.
3. Remove the flour with a fine sieve
4. Cleaner batches of pupae may be harvested by allowing maggots to crawl through sieves.
5. Smaller maggots may be harvested or the maggots sized, using sieves with different mesh sizes.

Pupation

1. Transfer the maggots to a shoe box or pan and add flour to absorb excreted moisture and other waste material.
2. Store in a warm, dry place with good ventilation..
3. Shake or stir periodical to prevent clumping.

Pupae can be stored for up to 10 days at 8 °C. Bring to room temperature for a few hours every 4 days for better viability.

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