

Fly Food

Items Required

Ingredients: 120 g Agar
 1,600 ml Molasses
 730 g Yeast
 1,300 g Cornmeal
 310 ml Phosphoric-Propionic Acid Mix

Acid mix: 418 ml Propionic acid
 50 ml Phosphoric acid (85%)
 532 ml dH₂O

Plastic/Glass: The appropriate number of filled 100-vials trays, 16-bottle (1/2-pint) trays, 1/2-gallon bottles, and so on. Note that the vial trays should be relatively square and undamaged, otherwise they will not fit correctly into the vial-filler.

Other: 5-liter measuring jug (x 2)
 1-liter measuring jug
 2-liter measuring cylinder
 1-liter measuring cylinder
 Wooden spoon
 Metal whisk
 Latex gloves
 Paper towels
 Trash bag

Turn on Steam Kettle

1. **Close drain:** Push in knob at base of kettle, and turn knob clockwise until tight.
2. **Release pressure:** Lift small lever on left side of kettle a few times.
[Removes air/water/steam left in the pipes from the previous user]
3. **Turn on steam:** Push the lever (on pipe against wall to the left of the kettle) until you hear it hiss. Lever controls the amount of steam delivered to the kettle.
[There are a few levers on the pipes - if you don't know which one to push, find someone who does]

Water

4. **Add water to kettle:** Using the 5-liter measuring jugs, add **14.5 liters hot water** to the steam kettle.
[It is important that the water is accurately measured, so place jugs on a flat, horizontal surface (i.e., not the sink) to check volume]
5. Turn kettle mixer ON, and use the lowest speed setting (the block on/off/speed knob is located behind the head of the mixer).
6. **Add water to jugs:** Using the 2-liter measuring cylinder, add **2 liters hot water** to each of the **two** 5-liter measuring jugs.

Agar

7. Weigh **120 g agar** into a plastic beaker.
8. Slowly add the agar to the kettle with the mixer on. As the agar is added, vigorously mix the agar-water with the whisk to prevent lumps forming.
[Be very careful to whisk away from the mixer blades!]

Molasses

8. Measure out **1,600 ml molasses** in the 2-liter measuring cylinder.
9. Increase the speed of the mixer and pour the molasses into the kettle. Use the wooden spoon to get as much of the molasses out of the cylinder as possible.
10. Stop the mixer, and use the spoon to mix the contents of the kettle.
11. Turn kettle mixer back on to its lowest speed setting, and **close the kettle lid**.

Boil Water-Agar-Molasses Mix

12. a) It is essential that the mixture comes to a full boil. This normally takes 20-25 minutes after adding the agar/molasses.
b) Keep the mixer on low and the kettle lid closed. Look into the kettle every few minutes to see if mixture is boiling (lots of bubbles around the edge of the mixture).
c) The steam can be increased, but be careful to not let the mixture overboil.

Yeast and Cornmeal

[Begin while water-agar-molasses mix comes to the boil]

13. Weigh **730 g yeast** into a large plastic beaker.
14. Weigh **1,300 g cornmeal** into a large plastic beaker.
15. Slowly add the yeast to one of the measuring jugs containing 2 liters of water, and mix vigorously with the whisk to prevent lumps forming. Continue to mix for another minute or so after all the yeast is in to remove any lumps.
16. Add cornmeal to the other jug of water. The cornmeal can be added rapidly provided you mix vigorously with the whisk.
[It is best to have the jugs in the sink while adding the yeast and cornmeal since this is messy]
17. **Once the water-agar-molasses mix has come to the boil**, open the kettle lid, and increase the mixer speed.
18. Pour the yeast slurry into the kettle (using the wooden spoon to get all of it out of the jug).
19. Pour the cornmeal slurry into the kettle.
[The cornmeal will settle out in the jug. It must be added as a slurry, or it will form lumps in the kettle. First, use the whisk to mix the cornmeal/water again in the jug to make it pourable. To get the rest of the cornmeal out, dip the jug into the kettle (away from the mixer blades!), to get some of the liquid mix into the jug, whisk, pour the slurry into the kettle, and repeat until the jug is empty]
20. Stop the mixer, and use the spoon to mix the contents of the kettle (pay special attention to the bottom of the kettle where cornmeal may have settled).
21. Turn kettle mixer back on to its lowest speed setting, and **close the kettle lid**.

Boil Water-Agar-Molasses-Yeast-Cornmeal Mix

22. a) It is essential that the mixture comes to the boil, and simmered for 10-12 minutes. This normally takes 18-22 minutes after adding the yeast/cornmeal.
- b) Keep the mixer on low and the kettle lid closed.
- c) Open the kettle every few minutes, stop the mixer, and use the wooden spoon to stir the bottom/sides of the kettle (especially the drain) to prevent the cornmeal settling and forming lumps.

- d) Once the mixture is boiling the stem may have to be reduced to prevent overboiling.

Vial filler

[While water-agar-molasses-yeast-cornmeal mix simmers]

23. The vial-filler needs to be put together. Put main unit on its side, with the handle upwards. Slide in the white, plastic perforated sheet, and hook over the bottom end of the handle (the side with the metal plate goes towards the bottom of the unit). Slide in the metal perforated sheet with the flat side against the white sheet. Screw the unit together with the nine screws (the springs go under the unit). Turn the unit right-way-up and make sure the handle opens and closes the holes.

Finish Cook

24. Open the lid of the kettle, turn off the stem, release the steam from the kettle, and increase the speed of the mixer
25. Measure out **310 ml acid mix** in the 1-liter measuring cylinder.
26. Add the acid mix to the kettle, and leave the mixer running for a minute or so.
27. Stop the mixer, and use the wooden spoon to mix the contents of the kettle to ensure the acid is well mixed in. Wait another minute to let any large lumps (there should be very few if the food is made correctly) sink to the bottom.

Pour Vials/Bottles

28. Using a small jug add fly food to a 5-liter measuring jug, pour the food into the vial-filler reservoir, and pour the desired number of 100-vial trays.
[The depth of food in vials should be around 1 inch - much less/more and we cannot use the vials. Occasionally, some vials will receive no food from the filler, and these should be filled by hand using the 1-liter measuring jug]
29. Put the filled vial-trays into the pillowcases and fold the ends to prevent flies getting in.
30. After filling all trays of vials, empty any food remaining in the vial-filler reservoir (either to the kettle if no more food is required, or to a plastic beaker if it is), put the filler in the sink, and fill with hot water.
[Try not to let food dry on the surface of the vial filler, as then it is much more difficult to clean. Leaving the water on for a while really helps clean the filler]

31. Fill any bottles by hand using the 1-liter measuring jug (fill this jug from another vessel - don't dip it directly in the kettle). 1/2-pint bottles need to be filled to a depth of 3/4 to 1 inch, and 1/2-gallon bottles filled to a depth of just over 1 inch.

[This can be messy, and for cleaning it is convenient to pour over the grid in the center of the media room floor]

32. Trays of 1/2-pint bottles should be put into pillowcases. 1/2-gallon bottles should be plugged immediately.

Cleaning

33. **Plasticware:** Pour any excess fly food into the steam kettle, and thoroughly rinse all plasticware in the sink. Make sure our plasticware is brought back to the lab.

34. **Steam kettle:** Use the spray hose and a stiff brush to clean out the inside of the kettle.

[This takes a while. It is better if the water is really hot. Also, don't open the drain until you have "diluted" the food remaining in the kettle a bit - it drains much easier then. Remember that others use the kettle, so its important that it is clean when you are done]

35. **Vial filler:** Take the filler apart with the long screwdriver. Rinse the screws (take care to not drop them down the drain!), the plastic and metal sheets, and the main vial-filler unit. The entire system must be very clean, otherwise when you next pour it will be much more difficult. Once clean, leave the vial-filler pieces and screwdriver on the black table. Don't put it back together.

36. **Floor:** Use the spray hose and squeegee to clean obviously dirty bits of the floor.

Plug Vials/Bottles

37. Leave the vials and bottles overnight in pillowcases. The following day plug each vial with a cotton/rayon ball, and plug each bottle with a peice of rayon rope.

[The bottles may have condensation inside. Using kimwipes, with a gloved hand dry the inside of the bottles before plugging]

38. Wrap the vials and bottles in bags, date, and put into the 18°C room on the 5th floor (rm. 5006)

REAGENTS NEEDED:

Lab Scientific:

Agar	FLY-8020-10	Agar (80-100 mesh, 10 kg)
Molasses	FLY-8008-16	Molasses (unsulphered, 16 liters)
Yeast	FLY-8030-20	Yeast (nutritional, flake, 20 kg)

Genesee Scientific:

Cormeal	62-101	Yellow Cornmeal (11.3 kg)
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Fisher:

Propionic Acid	A258-500	Propionic Acid (500 ml)
Phosphoric Acid	A242-500	o-Phosphoric Acid (85%, 500 ml)

CONSUMABLES NEEDED:

Fisher:

Vials	AS-515	Shell vials (narrow/polystyrene/bulk, 500/case)
Bottles	AS-117	Stock bottles (8oz, round, 250/case)
Cotton balls	AS-212	Cotton balls, large (2000/case)
Rayon rope	12-640-41	Rayon rope (20lb/case)
Trays/Dividers	AS-260	Trays/Dividers for narrow vials (50/case)

EQUIPMENT NEEDED:

Steam kettle + mixer