CLAIMS

1. An automated insect rearing system comprising:

a food dispensing station having a horizontal surface and configured to receive a rearing container having a population of insects disposed within from an insect dispensing station having a horizontal surface;

a food dispenser comprising a food container and a food dispensing vessel, a first end of the food dispensing vessel coupled to a second orifice defined in the food container and a second end of the food dispensing vessel movable to be proximate to the horizontal surface to dispense food from the food container to the received rearing container at the horizontal surface;

a robotic storage system comprising one or more shelves to store one or more rearing containers; and

a transportation unit positioned and configured to transport rearing containers from the food dispenser to the robotic storage system.

2. The automated insect rearing system of claim 1, wherein the transportation unit is further positioned and configured to transport rearing containers from the insect dispensing station to the food dispensing station.

3. The automated insect rearing system of claim 1, wherein the transportation unit comprises a conveyor belt to transport rearing containers from the food dispensing station to the robotic storage system.

4. The automated insect rearing system of claim 1, wherein the robotic storage system further comprises a robotic arm to transfer rearing containers from the transportation unit to a shelf of the one or more shelves.

5. An automated insect rearing system comprising:

a robotic storage system one or more shelves configured to receive and store one or more rearing containers, each rearing container comprising a population of immature insects;

a robotic arm configured to move rearing containers from a horizontal surface external to the robotic storage system to a shelf of the one or more shelves, and to remove rearing containers from the shelf;

a monitoring system comprising:

one or more temperature sensors positioned to sense a temperature of an environment at the robotic storage system; and

a temperature control in communication with a heating and cooling system configured to provide heated or cooled air from the heating and cooling system to the robotic storage system, the temperature control configured to adjust an ambient air temperature of the robotic storage system.

6. The automated insect rearing system of claim 5, further comprising:

a pump positioned to remove liquid from a rearing container stored on a shelf of the one or more shelves; and

a water dispenser positioned to add water to the rearing container.

7. The automated insect rearing system of claim 5, further comprising a dispensing unit, the dispensing unit comprising:

a dispensing surface; and

a food dispenser positioned to add food to a rearing container positioned on the dispensing surface; and

wherein the robotic arm is further configured to move rearing containers from the robotic storage system to the dispensing unit and to move rearing containers from the dispensing unit to the robotic storage system.

8. The automated insect rearing system of claim 5, further comprising a draining station, the draining station comprising:

a draining surface;

an articulating arm having a cutting implement;

a draining conduit; and

an emergence vessel;

wherein the robotic arm is further configured to transport rearing containers from the robotic storage system to the draining station; and

wherein the articulating arm is configured to cut the rearing container using the cutting implement to drain the contents of the rearing container into the draining conduit and the emergence vessel.

9. An automated insect rearing system comprising:

a robotic storage system comprising a one or more shelves configured to receive and store one or more rearing containers, each rearing container comprising a population of immature insects;

a robotic arm configured to move rearing containers from a horizontal surface external to the robotic storage system to a shelf of the one or more shelves, and to remove rearing containers from the shelf;

a sex sorting unit comprising an imaging device and a computing system configured to receive images from the imaging device and determine a sex one or more immature insects within a rearing container based on the sizes of the respective one or more immature insects; and

wherein the robotic arm is further configured to transport rearing containers from the robotic storage system to the sex sorting unit.

10. A method for automated insect rearing comprising:

dispensing, using a food dispensing station, a quantity of food into a rearing container comprising a population of immature insects;

transporting the rearing container, using a transport unit, from the food dispensing station to a robotic storage system, the robotic storage system comprising one or more shelves;

moving, using a robotic arm of the robotic storage system, the rearing container from the transport unit to a shelf of the robotic storage system;

monitoring, using a monitoring system comprising one or more sensors, the population of immature insects and an environment within the robotic storage system; and

adjusting, by the monitoring system, the environment within the robotic storage system based on signals from the sensors by adjusting a temperature control configured to adjust an ambient air temperature of the robotic storage system, the temperature control in communication with a heating and cooling system configured to provide heated or cooled air from the heating and cooling system to the robotic storage system.

11. The method of claim 10, further comprising:

dispensing the population of immature insects into the rearing container using an insect dispenser station; and

transporting, using the transport unit, the rearing container from the insect dispenser station to the food dispensing station.

12. The method of claim 10, wherein the transportation unit comprises a conveyor belt to transport rearing containers from the food dispensing station to the robotic storage system.

13. The method of claim 10, wherein the robotic storage system further comprises a robotic arm to transfer rearing containers from the transportation unit to a shelf of the one or more shelves.

14. The method of claim 10, further comprising:

repositioning the rearing container within the robotic storage system to receive food from a food dispenser; and

dispensing, using the food dispenser, a second quantity of food into the rearing container.

15. The method of claim 14, wherein the repositioning the rearing container and the dispensing the second quantity of food is based on the monitoring of the population of immature insects by the monitoring system.

16. The method of claim 14, wherein the repositioning the rearing container and the dispensing the second quantity of food is based on a predetermined feeding schedule.

17. The method of claim 10, further comprising dispensing, using a water dispenser, water into the rearing container while the rearing container is positioned on the shelf.

18. The method of claim 10, further comprising pumping water out of the rearing container while the rearing container is positioned on the shelf.

19. The method of claim 10, further comprising:

capturing an image of at least a portion of the population of immature insects in the rearing container by an imaging device of a sex sorting unit; and

determining, by a computing device, a sex of one or more immature insects of the population of immature insects based on the image.

20. The method of claim 10, further comprising:

transporting, using the transport unit, the rearing container from the robotic storage system to a draining station; and

draining the contents from the rearing container into a draining conduit and an emergence vessel.