

## Step 5: Test and Refine the Solution (Debug and Verify)

Deliverable: Test outputs, discussion of logic, and system refinements.

### Test Outputs :

Scenario	Inputs (Conditions)	Expected Output	Logic Output (actual)
Pet eats as expected	Current Time = 08:00AM, Food Level = 80%, Bowl Weight before feed = 50g Bowl weight after 10 mins = 0g Pet = present	Green Light, no alert → Successful Feed <ul style="list-style-type: none"> <li>Motor rotates,</li> <li>food dispensed</li> <li>consumption logged,</li> </ul>	Green Light, no alert → Successful Feed <ul style="list-style-type: none"> <li>Motor rotated,</li> <li>food dispensed</li> <li>consumption logged,</li> </ul>
Pet does not eat	Current Time = 08:00AM, Food Level = 80%, Bowl Weight before feed = 50g Bowl weight after 10 mins = 50g Pet = present	Red light , <b>ALERT</b> staff→ Food not eaten <ul style="list-style-type: none"> <li>Motor rotates,</li> <li>food dispensed</li> </ul>	Red light , <b>ALERT</b> staff→ Food not eaten <ul style="list-style-type: none"> <li>Motor rotates,</li> <li>food dispensed,</li> </ul>
Food bin is empty	Time = 08:00, Food Level = 0%, Bowl Weight = 0g	Red light , <b>ALERT</b> staff → No food dispensed	Red light , <b>ALERT</b> staff→ No food dispensed

### Decision Logic :

- Pet Eats as expected** : If food is dispensed successfully at the set 8AM time, and bowl weight successfully changes after 10 minutes after food dispensing and the pet is present then a **green light** will appear and **no alert** will be sent to the staff indicating a successful feed
- Pet does not eat** : If food is dispensed successfully at the set 8AM time, and the bowl weight DOES NOT CHANGE after 10 minutes while the pet is present then a **red light** will be displayed and an **ALERT** will be sent to the staff indicating an unsuccessful feed.
- Food Bin is Empty** : If food has issues being dispensed at the set 8AM time and food level weight remains at 0 after 8AM, then a **red light** will be displayed and an **ALERT** will be sent to the staff indicating an unsuccessful dispense of food.

**Suggested Improvements :** Several improvements can be done to further improve the system

Featured Improvement	Description	Unit (Discrete/Continuous)
1. Add pet presence detection	<ul style="list-style-type: none"><li>• Use motion or proximity sensors to confirm pet actually approach the bowl</li><li>• This will help differentiate between absence and refusal to eat</li></ul>	<ul style="list-style-type: none"><li>• Discrete</li><li>• Pet Present vs Not present</li></ul>
2. Tracking Consumption Amount	<ul style="list-style-type: none"><li>• Tracks how much food was eaten by the pet</li><li>• This helps with monitoring health and appetite trends for each pet</li></ul>	<ul style="list-style-type: none"><li>• Continuous</li><li>• Ex : 30g consumed</li></ul>
3. Refill Reminder System	<ul style="list-style-type: none"><li>• Alert/notify staff when the food resource within pet feeder is low before it becomes empty</li><li>• Prevents missed feedings and errors on feeding times rotation</li></ul>	<ul style="list-style-type: none"><li>• Discrete</li><li>• Is empty vs not empty</li></ul>
4. Assigned pet feeder per unique pet id	<ul style="list-style-type: none"><li>• Assign 1 pet feeder to each unique pet to properly monitor overall feeding habits of each pet.</li><li>• Will add individual behavioral data for each pet</li></ul>	<ul style="list-style-type: none"><li>• Discrete</li><li>• PET001</li></ul>