## Module 2: Waste-to-Resource Strategies Within Agri-Food Systems

**Lesson C Quiz: Measuring Waste & Calculating $CO_2$ Impact**

**QUIZ LINKS:**

[Module 2 Lesson C Quiz - Responder Link]

**Multiple Choice**

What is the first step for measuring waste?

A. Estimating waste volumes
B. Calculating $CO_2$ emissions
C. Sorting waste by color
D. Measuring bin weight after collection

Use ____ to convert volume to mass.

A. Temperature (°C)
B. Surface area ($m^2$)
C. Density (kg/L)
D. Pressure (Pa)

If mass per bin is 15 kg, and is emptied 3 times a week, what is the weekly waste total?

A. 30 kg/week
B. 50 kg/week
C. 60 kg/week
D. 45 kg/week

Which of the following is the correct formula for CO2-eq?

A. $CO_2$-eq = Mass of waste (kg) ÷ Emission factor
B. CO2-eq = Mass of waste (kg) × Emission factor (kg CO2-eq/kg waste)
C. $CO_2$-eq = Volume of waste (L) × Density (kg/L)
D. $CO_2$-eq = Emission factor × Temperature (°C)

What is the correct emission factor for food waste?

A. 0.9 kg $CO_2$-eq/kg
B. 2.5 kg $CO_2$-eq/kg
C. 3.2 kg $CO_2$-eq/kg
D. 1.9 kg $CO_2$-eq/kg

If the density of food waste is .5 kg/L, and bin volume is 30 L, what is the mass per bin?

A. 15 kg per bin
B. 10 kg per bin
C. 5 kg per bin
D. 30 kg per bin

Which of the following is NOT a method mentioned when estimating waste volumes?

A. Visual estimation
B. Counting bins
C. Weighing samples
D. Methodical estimation

**Graph Question – Waste Measurement & $CO_2$ Impact**

A cafeteria tracked its food waste for one week. The graph below shows the **total mass of waste (kg)** sent to three different pathways:

| **Pathway** | **Waste Mass (kg)** | **Emission Factor (kg $CO_2$-eq/kg)** |
|---|---|---|
| Landfill | 30 | 2.5 |
| Compost | 20 | 0.9 |
| Anaerobic Digestion | 10 | 0.5 |

The following 3 questions will use the table above

### Question 1 (Multiple Choice)
Which pathway produced the **highest $CO_2$-eq emissions**?
a) Landfill
b) Compost
c) Anaerobic Digestion
d) All are equal

### Question 2 (Short Answer)
Calculate the **$CO_2$-eq** for each pathway and the **total weekly emissions**. Show your work.

### Question 3 (Interpretation)
If the cafeteria wanted to cut its emissions in half, which pathway should it reduce first, and why? Write 2–3 sentences

### True or False
We don't need to know data when measuring waste, and can rely on guessing for solutions

### Short Answer
A cafeteria has a 30 L bin for food waste. The density of food waste is 0.5 kg/L. If the bin is emptied twice a week, what is the total weekly mass of waste?

Answer should:
- Show your work

### Short Essay
Explain how to measure the amount of food waste a cafeteria makes in a week and how to figure out how much $CO_2$ it produces. Use an example with numbers in your answer.

Requirements:
- Show your work
- Be 3 sentences minimum