APPENDIX - 1

Respiration rate

The rates of O_2 uptake, and CO_2 release are calculated as follows :

- Rate of O_2 uptake ($cm^3\ kg^{-1}h^{-1}$) :

$$\frac{([O_2]\ initial - [O_2]\ final)}{100} \times (V_{container} - V_{shoot}) \times \frac{1000}{P_{shoot}} \times \frac{60}{T}$$

- Rate of CO_2 release ($cm^3\ kg^{-1}h^{-1}$) :

$$\frac{([CO_2]\ final - [CO_2]\ initial)}{100} \times (V_{container} - V_{shoot}) \times \frac{1000}{P_{shoot}} \times \frac{60}{T}$$

Where :
- $[O_2]$ initial = Initial oxygen concentration (%)
- $[O_2]$ final = Final oxygen concentration (%)
- $[CO_2]$ initial = Initial carbon dioxide concentration (%)
- $[O_2]$ final = Final carbon dioxide concentration (%)
- $V_{container}$ = Container volume (cm^3)
- V_{shoot} = Bamboo shoot volume (cm^3)
- P_{shoot} = Bamboo shoot weight (gram)
- T = Time (minute)

Gas Concentration (O_2 and CO_2)

The O_2 and CO_2concentration in the package can be calculated as follows :

- O_2 package (%) = 20.9% - ($[O_2]$ initial – $[O_2$ final])
- CO_2 package (%) = $\dfrac{CO_2 \text{ increase measured (\%)} \times \text{Volume container (ml)}}{\text{Volume of gas injected (ml)}}$

Transpiration rate

Transpiration rate in the container can be calculated as follows :

- Partial pressure in the container (kPa) =

  RH increase measured (%) x Saturation pressure (kPa)

- The amount of water which is produced in the container (l) =

$$\frac{[\text{Volume of the container (l)} - \text{Volume sample (l)}]}{\text{The pressure in the atmosphere (kPa)}} \times \text{Partial pressure of } H_2O \text{ in the container (kPa)}$$

- The amount of water loss by the sample (g)

  Number of liter gas in 1 mol x The amount of water which is produced in the container (l)

- Transpiration rate (g H_2O vapor $kg^{-1}h^{-1}$) =

$$\frac{\text{The amount of water lost by the sample (g)}}{\text{Weight of bamboo shoots (kg)} \times \text{Time (hour)}}$$

(Dadzie and Orchard, 1997).