1 THERMAL LOSSES CALCULATION

$[\frac{W}{m^2 K}]$ $[m^2]$ $[K]$

τ_p $\quad q_{dp} = K \cdot S \, (T_{HP} - T_{AMB}) = 0{,}93 \cdot 1{,}3 \, (35-20) = 18{,}1 \, W$

$T_{HP} = \frac{T_{MAX} + T_A}{2} = \frac{60+10}{2} = 35°C \quad = 15{,}6 \, \frac{kcal}{h}$

τ_d $\quad q_{dd} = K \, S \, (T_{Hd} - T_{AMB}) = 0{,}93 \cdot 1{,}3 \, (50-20) = 36{,}3 \, W$

$T_{Hd} = \frac{T_{MAX} + T_u}{2} = \frac{60+40}{2} = 50°C \quad = 31{,}2 \, \frac{kcal}{h}$

2 EQUATIONS

$$q_s \, (\tau_p + \tau_d) = m_d \, c \, (T_u - T_A) + q_{dd} \, \tau_d + q_{dp} \, \tau_p + V_s \, c \, (T_u - T_A)$$

$$q_s \, \tau_p = V_s \, c \, (T_{MAX} - T_A) + q_{dp} \, \tau_p$$

SI

$$q_s \, (1+5) \cdot 3600 = 100 \; 4186 \; (40-10) + 36{,}3 \cdot 1 \cdot 3600 + 18{,}1 \cdot 5 \cdot 3600 + V_s \; 4186 \; (40-10)$$

$$q_s \; 5 \cdot 3600 = V_s \; 4186 \; (60-10) + 18{,}1 \cdot 5 \cdot 3600$$

T.U

$$q_s \, (1+5) = 100 \cdot 1 \, (40-10) + 15{,}6 \cdot 5 + 31{,}2 \cdot 1 + V_s \cdot 1 \, (40-10)$$

$$q_s \cdot 5 = V_s \cdot 1 \, (60-10) + 15{,}6 \cdot 1$$

3 SOLUTION

1. WITH LOSSES $\quad V_s = 100{,}5 \, kg \quad q_s = 1021 \, \frac{kcal}{h} = 1187 \, W$

2. WITHOUT LOSSES $\quad V_s = 100 \, kg \quad q_s = 1000 \, \frac{kcal}{h} = 1163 \, W$