

3

It was suggested on an online forum that it would be possible to cook a chicken by repeatedly slapping the chicken with one hand.

It was claimed that the energy transferred to a chicken in 8000 slaps would be sufficient to raise the temperature of the chicken from 23°C to 165°C .

In an investigation to test the claim, the effective mass of the hand was taken as 1.75 kg and the speed of the hand just before impact with the chicken as 6.25 m s^{-1} .

- (a) Deduce whether the data confirms that 8000 slaps would be sufficient.
Assume that no energy is transferred from the chicken to the surroundings.

mass of chicken = 0.875 kg

specific heat capacity of chicken = $1770\text{ J kg}^{-1}\text{ K}^{-1}$

efficiency of energy transfer from the hand = 65%

(5)

- (b) Explain whether the assumption made in (a) is realistic.

(2)

(Total for Question 3 = 7 marks)