

# INVESTIGATING MEAT

## Investigation 1

### Aim

Finding out whether a tough cut of meat can be made more tender when mechanical forces are applied.

### Equipment

- Digital scales
- Digital timer / stopwatch
- Red chopping board
- Chef's knife
- Measuring jug
- 4 small saucepans
- Temperature probe and wipes
- Slotted spoon
- Kitchen roll
- 4 sticky labels and marker pen

### Ingredients

- 200g tough cut of lean meat – either beef, pork or lamb. For example, beef brisket, pork collar steak, lamb scrag end.

## Method

- Cut the meat into 4 pieces of equal weight. Try to ensure the meat has the same thickness.
- **You will have 4 samples:**
- Control – leave as it is.
- **Variation 1** – on a red chopping board, tenderise the meat by beating it well with a meat tenderiser (a rolling pin will also be suitable for this task).
- **Variation 2** – on a red chopping board, tenderise the meat by scoring the surface of the meat in a criss-cross pattern with a chef's knife.
- **Variation 3** – on a red chopping board, tenderise the meat by cutting the sample into smaller pieces – approximately 8 diced pieces.
- Place each sample of meat in a small saucepan and add approximately 100ml cold water. You may need more water if your saucepans are large
- Leave the meat to soak in the water for 5 minutes.
- After 5 minutes, apply heat and bring the water to 80°C. Then, simmer gently for 15 minutes. **Keep an eye on the water – if it evaporates, top it up using freshly boiled water.**
- Remove the meat and drain on kitchen paper and allow to cool.
- Photograph and examine each sample carefully. Note any visible changes to the fibrous structure of the meat when compared with the control.
- Then, gently pull the muscle fibres from each sample apart in order to determine how easy or difficult the fibres are to separate.
- Finally, taste the meat and compare how tender / chewy each sample is when compared to the control.

## Results

Original meat before start of experiment	Image of sample before cooking	Image of sample after cooking	Samples ranked in order of tenderness (1 being least tender, 4 being most tender) BY HANDLING MEAT SAMPLES	Samples ranked in order of tenderness (1 being least tender, 4 being most tender) BY TASTING MEAT SAMPLES
Control			1	1
Variation 1			2	2
Variation 2			3	3
Variation 3			4	4

## Conclusions

Summarise your findings here. You should consider:

- Control –
- Variation 1 –
- Variation 2 –
- Variation 3 –
- Which method produces the least tender sample? Explain your reasoning.
- Which method produces the most tender sample? Explain your reasoning.
- What advice would you give to a chef to ensure the meat he serves is as tender as possible?

## Extension task

Investigate the Maillard reaction. Create an experiment that demonstrates how the colour of meat changes due to cooking.

Develop this experiment using different cuts of meat, in order to determine how tender / tough the cuts of meat are.