

# G2 TENDEROMETER SAMPLE PREPARATION/TESTING

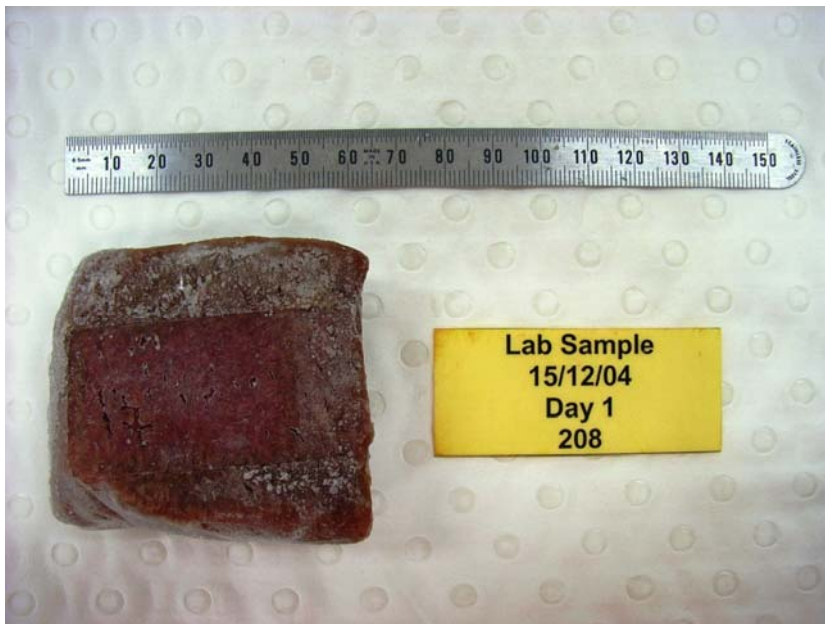
Valid on day of printing: 15/10/2009

## INTRODUCTION

The sample preparation and cooking methods described here are based on those published by Hopkins & Thompson (2001) for lamb and Perry et al. (2001) for beef. The cooking regime should achieve a medium degree of “doneness” and the methods have been used in the Sheep and Beef CRC’S respectively. The objective is to determine the force required to shear through a cooked sample of meat with a cross-sectional area of 1cm<sup>2</sup>. This force is reported usually in Newtons.

## SAMPLE PREPARATION – COOKING (LAMB)

1. For **lamb** the meat sample should be approximately 65g, with dimensions of approximately 60-70mm length, 40-50mm width, 20-25mm thick as shown below. (A small nick on the surface at a corner should be made so the orientation of the fibres is clear after cooking).



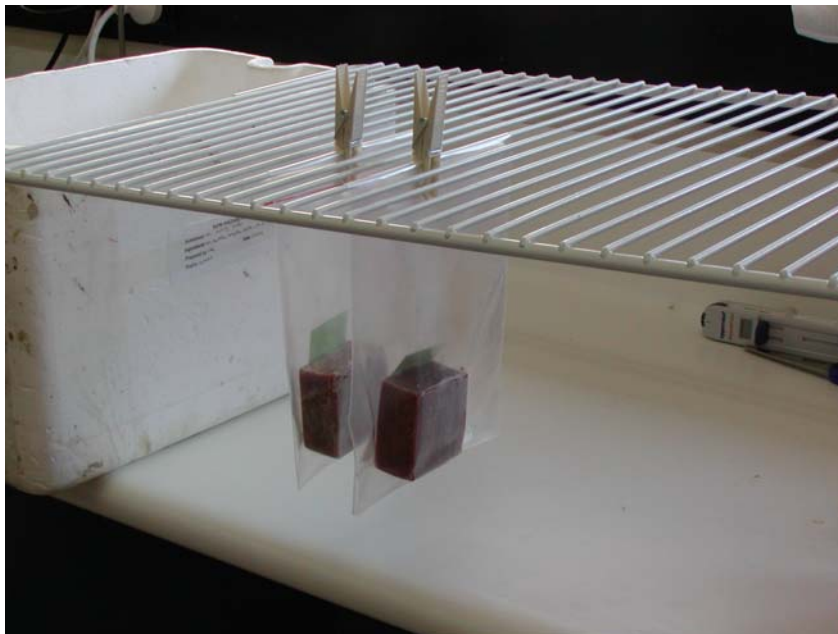
2. Lamb can be cooked from frozen provided the samples are prepared as per point 1 before freezing.
3. Heat water bath to 71C, the reference thermometer should be used to ensure the water bath temperature is correct (once every few days should be sufficient).
4. Place sample in a plastic zip lock bag. The critical consideration is that the sample in the bag is totally immersed in the water (this may mean spiking the bag at the top to release excess air).

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5. Clip zip lock bags onto freezer/fridge shelf using a clothes peg/bulldog clip, sufficient room should be left between/around samples to ensure adequate cooking occurs for all samples.



6. Place into water bath, record starting time and cook for **35 minutes**. The water bath ideally should be 80 to 90 L with a pump to circulate the hot water.
7. Remove from water bath after 35 minutes. Cool in bath of cold water for **30 minutes**; remove from bag, dry with paper towel.
8. Put into new bag with label and store in fridge overnight until testing next day.

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## SAMPLE PREPARATION – COOKING (BEEF)

1. For **beef** the meat sample should be approximately 250g, with dimensions of approximately 90mm length, 60mm width, 45-50mm thick. (A small nick on the surface at a corner should be made so the orientation of the fibres is clear after cooking).
2. For chilled samples hold at 4°C for at least 30 minutes to standardise pre-cooking temperature (samples can be cooked from frozen if desired provided the samples are prepared as per point 1 before freezing).
3. Heat water bath to 71C, the reference thermometer should be used to ensure the water bath temperature is correct (once every few days should be sufficient).
4. Place sample in a plastic zip lock bag. The critical consideration is that the sample in the bag is totally immersed in the water (this may mean spiking the bag at the top to release excess air).
5. Place into water bath, clip top to rail, record starting time and cook for **60 minutes**. The water bath ideally should be 80 to 90 L with a pump to circulate the hot water.
6. Remove from water bath after **60 minutes**. Cool in bag under cold running water for 30 minutes; remove from bag, dry with paper towel.
7. Put into new bag with label and store in fridge until shear testing.

## CUTTING SAMPLE FOR SHEARFORCE TESTING

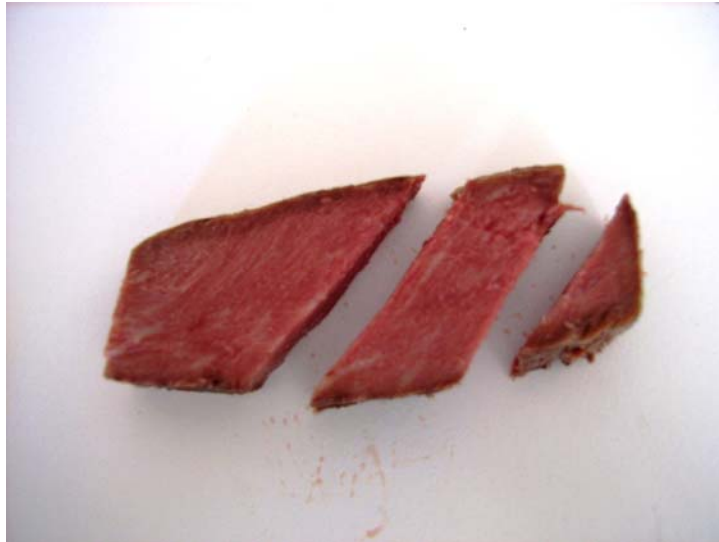
1. Place sample in slotted channel with fibres lengthwise across channel (as shown for lamb) and remove a thin slice to “square up” the surface. If the guide is not available mark a slice with a steel ruler (10 mm) and cut a slice.



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2. If using a guide push cut surface to vertical edge and cut slice to preset width using a knife (10mm).
3. Cut slices parallel with fibres on the long axis into sections of 10 mm wide (see photo).



4. Avoid any connective tissue and fatty areas. Cut 6 sections per cooking block.
5. Place sample into Tenderometer cutting chamber for testing (the sample must have the fibres along the long axis so the blade of the machine cuts across the fibres).

## TESTING USING TENDEROMETER



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## Standalone Operation

1. Turn emergency stop button clockwise to power on the Tenderometer.
2. Set the digital indicator to zero while the scale is empty by pressing the zero key (>0<), the zero symbol >0< is displayed on the indicator.
3. Place cut meat into sample tray and slide into the moving platform.
4. Press the special function key (f), the display will now show a <H> symbol.
5. Zero the Tenderometer by holding down the special function key (f) until two audible beeps are heard.
6. Align the sample under the anvil and press the start cycle button.
7. Record the peak reading as shown on the screen.
8. Zero the Tenderometer by holding down the special function key (f) until two audible beeps are heard.
9. Repeat process for the six sub samples.

**NOTE: The Tenderometer may be stopped at any time by pressing the emergency stop button**

The Tenderometer gives shear force values as Kgf and the mean of the 6 readings should be calculated. One Kgf is equivalent to 9.8N. For lamb a target of approximately 38 N on average (measured on the Tenderometer) will mean the product will achieve an overall liking score of 65, with a 10% failure rate based on extensive research. A similar target level can be applied for beef.

Hopkins & Thompson (2001) The relationship between tenderness, proteolysis, muscle contraction and dissociation of actomyosin. *Meat Science* **57**, 1-12.

Perry et al. (2001) Methods used in the CRC program for the determination of carcass yield and beef quality. *Australian Journal of Experimental Agriculture* **41**, 953-957.

### **For further information please contact:**

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