final report

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Meat app development – Stage 2

Providing the time and temperature data for modelling analysis for development of the iPhone app

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1 Background

1.1 Reasoning behind the project

MLA is trying to build an iPhone software (APP) which will assist consumers in cooking red meat more accurately and more consistently. Sensory Solutions was asked to assist in defining and discerning the parameters for cooking steak in a number of different ways.

Over time, MLA would like to build the specifications for cooking a number of meat cuts according to the following parameters;

Cut of Meat	Thickness	"Doneness"	Cook Type
Tenderloin	10mm	Rare	Electric stove
Cube Roll	20mm	Medium Rare	Gas stove
Striploin	30mm	Medium	Gas BBQ
Rump	40mm	Medium Well	
		Well Done	

Stage 2 of the research focused on cooking the products on the gas stove and gas bbq, this stage was not only used to develop the parameters of cooking, but also to obtain learning's in terms of understanding issues which may arise between how a consumer may cook the meat compared to the internal MLA protocols and thus development also of the final cooking protocols.

2 Methodology

2.1 Overall measures

Sensory Solutions will, as far as possible cooked the meats according to the MSA cooking protocols. The following measures were taken;

- Cook time and rest time, including when to turn the meats.
- Cook temperature / Cook setting / Rate of convection (based on how long it takes to bring 500mL water to the boil).
- Internal temperature of the meat at specified times, including after rest.
- Weight & approximate size of the individual pieces of meat.

Figure 1: Weighing / measuring the meat cuts

Figure 2: Cooking set up in the kitchen – gas bbq (with markings of temperature settings)

Figure 3: Cooking set up in the kitchen – gas stove top

2.2 Cooking protocols

The following protocols were developed with MLA;

1. Steaks were provided to Sensory Solutions pre-sliced into similar sizes (within cut of meat) and pre-determined thicknesses (as per the design).

Figure 4: Cuts of meat provided

2. Steaks were all brought to an internal temperature of 8-10°C prior to cooking.

3. On the stove, the pan was pre-heated to hot for all steaks to start the cooking process. Once hot, pan temperature was dropped just before placing the steaks into the pan. On the bbq, the steaks were cooked on the plates which had been turned down just before placing the steak down on the bbq.

4. No more than two steaks were cooked in the pan at once, generally one at a time. In contrast, due to the size of the plate, two steaks were cooked at a time on the bbq.

5. Cut of meat was sprayed with oil, rather than the pan.

6. Cooked to specified degree of doneness;

    - Rare: Turned only once and cooked until “very soft” with the back of tongs.

Figure 5: Example of RARE cooked meat

    - Medium Rare: Cooked on one side until moisture visible on top surface. Meat is turned once and cooked until moisture visible on top and steak felt “soft” with the back of tongs.

Figure 6: Example of MEDIUM RARE cooked meat

- Medium: Cooked on first side until moisture pooling on top surface. Meat is turned once only and cooked on the second side until moisture visible and steak feels “springy” with the back of the tongs.

Figure 7: Example of MEDIUM cooked meat

- Medium Well Done: Cooked on first side until moisture pooling on top surface. Meat is turned once only and cooked on the second side until moisture visible and steak feels “firm” with the back of the tongs.

Figure 8: Example of MEDIUM WELL cooked meat

- Well Done: Cooked on first side until moisture pooling on top surface. Meat is turned once only and cooked on the second side until moisture visible. Reduce the heat and continue to cook until the steak feels “very firm” with the back of the tongs.

Figure 9: Example of WELL DONE cooked meat

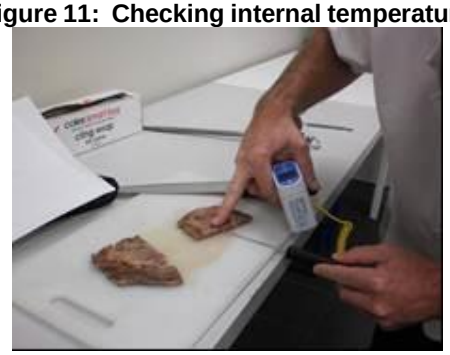
7. Additional steps for thicker (30mm and 40mm) steaks which were cooked beyond medium were introduced. The meat was cooked to medium and then removed from the stovetop and placed in the oven at 160 - 180□C until cooked appropriately. Measures were also taken for cooking this thicker and more well done meat cooked entirely in the pan. For the bbq steaks, rather than moving the steaks to an oven, cooking was continued with the bbq lid down. Some steaks were also cooked with the lid up the entire time as a point of comparison.

8. Once cooked, the meat was covered in foil and then allowed to rest.

Figure 10: Meat at rest

9. All measures were documented and provided to the MLA in an excel file.

Figure 11: Checking internal temperature



3 Results

3.1 Data

All data was provided to MLA in an excel spreadsheet to assist in the development of a model to provide cooking instructions in an application for an i-phone.

Figure 12: Recording the data