



# final report

Project Code: A.MPT.0018  
Prepared by: Dean Gutzke  
Date published: August 2008

PUBLISHED BY  
Meat and Livestock Australia Limited  
Locked Bag 991  
NORTH SYDNEY NSW 2059

## Commercialisation of MSAT

Meat & Livestock Australia acknowledges the matching funds provided by the Australian Government and contributions from the Australian Meat Processor Corporation to support the research and development detailed in this publication.

This publication is published by Meat & Livestock Australia Limited ABN 39 081 678 364 (MLA). Care is taken to ensure the accuracy of the information contained in this publication. However MLA cannot accept responsibility for the accuracy or completeness of the information or opinions contained in the publication. You should make your own enquiries before making decisions concerning your interests. Reproduction in whole or in part of this publication is prohibited without prior written consent of MLA.

## 1.0 Introduction

The purpose of this project is to continue the commercialisation of MSAT under the direction of MLA. The objectives were to:

- i) Aid in the development of the commercialisation of the MSAT product.
- ii) Assist MLA in developing commercialisation plans for value-added beef and lamb products including MSAT.

This report reviews work associated with final production trials, and export and evaluation of MSAT Lamb product samples from Tatiara Meat Company, Laverton, Victoria.

## 2.0 Overview of Results

Under Project P.PIP.0144, Tatiara Meat Company trials conducted final lamb project trials during November 2007. These final trials produced MSAT samples assessed by Tatiara to be acceptable for export and market assessment by Japanese users.

However, as Tatiara was hosting 13 Japanese chefs at Bordertown during March, Tatiara recommended and conducted the market assessment of MSAT samples during this visit to Australia by these chefs.

### Finished Product Assessment

The MSAT lamb steak samples were presented to 13 Japanese chefs at Tatiara Bordertown. These chefs ranged from fine dining restaurants to Quick Service Restaurants (QSR's)

**Product:** MSAT product (using shoulder meat trimmings) produced on 10 November 2007.

**Product Format:** Cooked round MSAT Lamb steaks, approximately 100gms net weight (120gms raw weight).

### Key Results:

#### a. Sensory

**Eating Quality** - The chefs were mixed with their feedback. Some considered the samples very good meat eating quality while others considered that it had 'mince' type eating qualities.

**Fat Content** - Similarly, some chefs considered that the samples were acceptable in terms of leanness while others considered that the samples were too fatty.

#### b. Pricing

An indicative pricing of A\$8-9/kg FOB was provided and all the chefs considered that the pricing was unacceptably high for a processed meat product.

### Summary:

1. The feedback is unclear and inconclusive at this stage. This may be due to the chefs having a wide range of backgrounds from higher end restaurants to QSR's with ground meat products. Thus the opportunity for MSAT meat products on their menu's may vary considerably. For example, it would be expected that MSAT would have limited opportunity if the Japanese QSR chef is comparing MSAT to a 'hamburger patty' product.

2. It would appear that some chefs were initially unaware that MSAT was a processed meat product. However, once informed that MSAT was a processed meat product, they appear to have lower 'price' expectations of the product. Price should be considered in the context of specific markets or market segments and their product specifications or requirements of MSAT 'type' products.

**Next Steps:**

Tatiara have successfully completed their production trial work under this project but have limited resources to continue with further market assessments of the MSAT product.

However, there is a need to assess the Japanese food service market opportunity for MSAT in more detail. The food service market in Japan consists of a number of market segments ranging from QSR's and mid-tier restaurant chains to high end dining. In the QSR segment, these range from well-established Japanese chains such as Lotteria through to western chains such as McDonald's.

Each segment needs to be assessed in terms of their market share and menu opportunity for MSAT. Market research should determine:

- Market size
- MSAT product opportunity (eg, core menu items or Limited Time Offer (LTO))
- Sensory, appearance and eating quality feedback
- Other product specification (technical) issues
- Price point issue
- Other commercial issues
- Short-term or longer term opportunity?

This market research is important to determine the market segment which warrants the most priority and focus for further development.

**Recommendations:**

**Recommendation 1.** MLA to accept this report as completion of lamb MSAT project work with Tatiara Meat Company.

**Recommendation 2.** MLA to review further market development research options for MSAT including research of the various segments of the food service market in Japan.

**3.0 Production Trial Report**

The Meat Strip Alignment Technology (MSAT) was trialed out at Tatiara Meat Company (TMC) factory at Laverton, using lamb shoulders as the sole raw material. TMC had hired the most of the equipment required for the trial except, the alignment device and the accumulator which was sent from Food Science Australia (FSA), in Cannon Hill, QLD.

**Meat Strip Preparation**

- whole bone-in shoulders were boned out for the MSAT trial. (There was no neck muscle in the shoulder as the neck muscle was being used for shoulder racks.)
- Fat cap was removed from the shoulders, and the shoulder was cut using the strip cutter.

- Steaks were passed through the tenderizer once.

**Comments**

- There was large variation in strip sizes
- There was also some evidence of some connective tissue not being cut by the strip cutter.

**Emulsion Preparation**

One batch of emulsion was prepared from the meat left over after the steak preparation from the shoulder meat.

***Procedure for emulsion preparation using the 40L Stephan Bowl Cutter***

1. Add meat to the bowl cutter and cut for 10secs – scrape the bowl.
2. Add salt, sodium tripolyphosphate, caramel colour 602, sugar, starch, gum and sodium erythorbate and ½ the ice into the bowl cutter and cut until mixture reaches 5°C. Scrap down bowl.
3. Add remaining ice and cut until mixture reaches 6°C. Scrap down bowl.
4. Cut further until the emulsion temperature reaches 8 - 10°C. If mixture does not appear smooth enough cut until emulsion reaches a maximum of 12°C.
5. Store chilled (0°C) in moistened covered tubs until required.

***Procedure for Brine Preparation***

1. Chill water to 4°C.
2. Add sodium tripolyphosphate and mix until dissolved
3. Add salt and sugar and mix until dissolved.
4. Store chilled until required
5. Just prior to use, add the Erythorbate and mix until dissolved.

**Final Product Mix**

One batch of MSAT product was prepared.

1. Standard formulation with shoulder meat trimmings in the emulsion  
90kg batch of final product mix was prepared for the product.

Meat strips	-	60.7kg
Brine	-	11.2kg
Emulsion	-	18.0kg
<b>Total</b>	-	<b>90kg</b>

***Procedure for final product using the mixer/grinder***

1. Attach the grinder plate to the mixer/grinder.
2. Add meat strips to the mixer and start the mixing.
3. Slowly add the brine through the grills on the mixer and mix for 5 minutes.
4. Check that the brine has being absorbed and the meat strips are tacky. If not mix for further 2 minutes.
5. Stop the mixer and pull any strips that might have wrapped around the paddles in the mixer.
6. Add the emulsion and mix for 4 minutes. Stop the mixer.
7. Start the mixer using the mixer/grinder switched to push through any strips and brine that might have got caught on the screw portion of the mixer/grinder.
8. Keep pushing the meat through the mix the grinder plate until meat strips covered in emulsion start coming through.
9. Pull any strips that might have wrapped around the paddles in the mixer.

10. Mix for further 2 minutes.
11. Remove the product from the mixer and keep it chilled until required.

### Assembly of the Alignment Device

1. Hose down prototype before assembly using hot water and sanitizer.
2. Bolt together the manifold and manifold cover (It can be advantageous to place the manifold cover in hot water before bolting the MSAT line together).
3. Place lid on Thompson filler.
4. Place 2 hose clips on each of the 8 filler lid protrusions to reduce the chance of the tubes coming off the lid protrusions.
5. Attach hoses to lid (it can be advantageous to flush lines with hot water and to dip the ends in hot water to ensure a easy fit to the MSAT head and manifold).
6. Secure Gatling gun onto bench, using a minimum of 2 clamps, but preferably 3).
7. Place 1 hose clip on each of the prototype manifold tubes.
8. Attach hoses to prototype manifold tubes and tighten hose clips enough to secure the tubes.
9. Tighten hose clips on Thompson filler lid.
10. Adjust hoses to remove crimps etc.
11. Tighten hose clips on prototype manifold tubes.
12. Attach the cone.
13. After product has flowed through for approximately 5 minutes, retighten the hose clips on manifold and lid and the bolts holding the manifold and cone.

### Filling of the Product into Casings using the Risco Vacuum Filler

1. Cut the casing to a length that would fit into TMC's cartons.
2. Clip one end of the casing and label the casing with the trial details etc
3. Fill the cone on the filler to the top with the product mix.
4. Slowly allow the product to pass into the filler and through to the accumulator whilst continually topping up the cone on the filler. Slowly fill the tubes and the alignment device – ensuring that the product is flowing through each of the tubes.
5. Fill the product into the casing, ensuring that there are no air pockets in the product.
6. Clip the casing so the casing is firm.  
*Note: The pressure at which the product is filled will have an impact on the finished product.*
7. Freeze the product in a -20°C freezer for 48 hours.

### Formulation used

#### Pump/Extension Brine Formulation at 18.5%

% pumped product 18.50

Batch Weight 15.00

Ingredients	% in Strip Blend	% in brine	Weight	UOM
STTP	0.25	1.60	240.20 g	
Salt	0.75	4.80	720.61 g	
White Sugar	0.30	1.92	288.24 g	
Sodium Erythorbate	0.17	1.09	163.34 g	
Ingredient 1	0.00	0.00	0.00 g	
Ingredient 2	0.00	0.00	0.00 g	
Water		90.58	13.588 kg	
<b>TOTAL</b>		<b>100.00</b>	<b>15.000 kg</b>	

NB: Extension/pump rate is based on meat strip weight only **NOT** on the final product blend weight.

**Emulsion**

**Emulsion Parameters**

Batch Weight

20

Ingredients	%	Weight	UOM	TOTAL REQUIRED	
				1 Batches	UOM
Lamb Mince 80-85 CL (5 mm Mince)	68.725	13.745	kg	13.75	kg
Salt	0.750	0.150	kg	0.15	kg
Sodium Tripolyphosphate	0.250	0.050	kg	0.05	kg
White Sugar	0.300	0.060	kg	0.06	kg
Caramel Powder	0.125	0.025	kg	0.03	kg
Carrageenan	0.480	0.096	kg	0.10	kg
Starch	2.400	0.480	kg	0.48	kg
Sodium Erythorbate	0.275	0.055	kg	0.06	kg
Ice	26.695	5.339	kg	5.34	kg
Ingredient 1	0.000	0.000	kg	0.00	kg
Ingredient 2	0.000	0.000	kg	0.00	kg
<b>TOTAL</b>	<b>100.000</b>	<b>20.000</b>	<b>kg</b>	<b>20.00</b>	<b>kg</b>

**Final Mix Formulations (Standard Ratio)**

Total Batch Size

90 kg

Ingredients	Batch Size	Batch Size	TOTAL REQUIRED	
	Percentage	Weight (kg)	Batches	Weight (kg)
Meat Strips	84.33%	60.718	1.00	60.718
Brine @ 18.5% extension	15.67%	11.282	1.00	11.282
<b>SUB TOTAL</b>	<b>100.00%</b>	<b>72.000</b>		<b>72.000</b>

Ingredients	Batch Size	Batch Size	TOTAL REQUIRED	
	Percentage	Weight (kg)	Batches	Weight (kg)
Meat/Brine Blend	80.00%	72.000	1.00	72.000
Emulsion	20.00%	18.000	1.00	18.000
<b>TOTAL</b>	<b>100.00%</b>	<b>90.000</b>		<b>90.000</b>