



FINAL REPORT

Australian Meat Processor Global Technology adoption awareness – Plant visits and IFFA 2019 in Europe

FINAL REPORT

PROJECT CODE: 2019-1013

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1.0 EXECUTIVE SUMMARY

The Australian meat industry has been progressive in developing strategies for the adoption of new automation. The AMPC has supported this project to support the Processors to become updated with international developments. The initiative, as a global technology awareness (GTA) activity has supported the industry by inviting participation at senior levels to take part in an international tour of operating plants in Europe and attend focused presentations of relevant technologies visiting leading international companies, exhibiting at IFFA 2019. BMC has been engaged to execute the project, establishing a programme of visits based on its international Food Automation networks. The programme for the tour has also been established based on overall requirements of the individuals participating from the organisations that responded to the AMPC Expression of Interest. Independent and self-funded participation was also facilitated by the project. Figure 1 presents the list participants from companies that took part in the project.



No	Title	Family name	First Name(s)	Organisation	No	Title	Family name	First Name(s)	Organisation
1	Prof	Baillie	Craig	USQ	16	Mr	Lyon	Graham	FLETCHERS
2	Mr	Bird	Michael	GUNDAGAI	17	Mr	Maguire	Tom	TEYS
3	Mr	Border	Fraser	USQ	18	Mr	Mathers	Brad	AMPC
4	Mr	Brereton	Neil	JBS	19	Dr	McCabe	Bernadette	USQ
5	Prof	Brett	Peter	USQ	20	Ms	McHugh	Kate	AMPC
6	Mr	Briggs	Daniel	HARVEY	21	Mr	Naden	Sean	JBS
7	Mr	Odell	Nathan	CAMPBELLS	22	Mr	Nicolaou	Nektarios	TFI
8	Mr	Clancy	Shane	KILCOY	23	Mr	Oosthuizen	Paul	VV WALSH
9	Mr	Cody	Peter	VV WALSH	24	Mr	Reabel	Jason	JBS
10	Mr	Cole	Chris	NCMC	25	Mr	Richards	David	BINDAREE
11	Ms	Fletcher	Melissa	FLETCHERS	26	Mr	Shaw	Wayne	HARVEY
12	Mr	Formaggin	Steven	NCMC	27	Mr	Taylor	James	CAMPBELLS
13	Mr	Gathercole	Justin	GATHERCOLE	28	Mr	Toovey	Michael	FLETCHERS
14	Mr	Holloway	Nick	ex M&S	29	Mr	Treffone	Graham	JBS
15	Prof	Khodabandehloo	Koorosh	BMC	Self - funded from organisations already participating				

Figure 1: Participation in the AMPC GTA and IFFA tour 2019.

In addition to IFFA, participants took part in tours of meat plants, technology provider facilities and attended several presentations as well as a half-day Technology Workshop organised by the MLA and facilitated by BMC.

Figure 2 provides an outline of the full tour.



May 2019	
2 nd	Departure from Australia arriving on the 3rd.
4 th -7 th	IFFA – Frankfurt Germany
- 4 th	IFFA
- 5 th	AM: IFFA PM: MLA Workshop
- 6 th	IFFA all day and option at 1000 AM – Frontmatic Stand Tour
- 7 th	1530 Flight to Copenhagen
7 th -11 th	Copenhagen Denmark
- 8 th	AM: DMRI – PM: Frontmatec
- 9 th	DC Holsted – Daka –NIRAS
- 10 th	Marel Progress Point
- 11 th	0810 AM Flight to Brussels (weekend day off)
11 th -14 th	Brussels Belgium
- 12 th	Weekend day off in Brussels
- 13 th	AM: Marmo and PM: CSB
- 14 th	End of AMPC tour – return Flights.

Figure 2: AMPC GTA and IFFA 2019 tour overview.

The findings and tour has been considered positive meeting expectations, based on the feedback received from participants. A formal questionnaire has been used to seek individual reports and feedback on all aspects of the tour. All participants found IFFA and the technical content of the tour of great value. Figure 3 provides the summary of the feedback with high percentage scores received in response to the project questionnaire.

Based on feedback from all participating organisations	
<i>Overall Technical Content</i>	85%
<i>Overall: Planning and Organisation</i>	88%
<i>Overall: Accommodation & Meals</i>	86%
<i>Overall: Travel and transfers</i>	89%
<i>Likelihood of participating in a similar future AMPC tour</i>	92%

Figure 2: AMPC GTA and IFFA 2019 tour overview.

The participants have positively reported on the significant value of the project, highlighting the benefits as well as importance of the networking opportunity the tour provided within the group. There is strong indication that the participants will take part in future initiatives.

2.0 INTRODUCTION

During 2018, BMC concluded a project relating to the management of change (AMPC Project 2018-1112). As an accompanying action, this AMPC project was proposed to invite processing companies to participate in a tour involving attendance at IFFA and visits to international companies in Europe.

At the start of the project, Processors were invited to take part on the tour on the AMPC Expression of Interest Portal. The AMPC project funding supported one candidate from each organisation and, BMC has been able to include other participants at a reduced rate, taking advantage of the economies of scale, with approval of AMPC on a case by case basis. The Processors that took part included:

- B.E Campbell
- Bindaree Beef
- Fletcher International
- G. A. Gathercole
- Gundagai Meat Processors
- JBS Australia
- Kilcoy Pastoral Company
- Northern Co-Operative Meat Company (NCCMC)
- Teys Australia
- Thomas Foods International (TFI)
- V&V Walsh Meat Processors & Exporters

University of Southern Queensland (USQ), currently in the process of establishing a meat automation laboratory in support of the red meat sector in Australia, participated on the full tour with representatives from the Centre for Agricultural Engineering, funded by the University.

The preparation of the tour included direct communication with and consideration of each Processors expectations in advance of the detailed planning.

The tour achieved all its objectives and provided a balanced overview of the different topics of interest to the Processors.

3.0 PROJECT OBJECTIVES

The objectives of the project have included:

- Define a Global technology adoption tour to coincide with IFFA 2019
- Invite participation from leaders in Meat processing companies
- Plan and organise travel for the full group of participants
- Execute the tour/IFFA 2019 attendance, and document participants learnings/feedback
- Produce a final report, including participants reviews of the tour.

4.0 METHODOLOGY

The approach to the planning has been as follows:

- Produce long list of locations and organisations to visit
- Invite participation and produce list of industry leaders' names to taking part
- Present options to AMPC and potential participants, seeking input to personalise the tour if possible.
- Finalise tour route and present final plan for the tour, accommodating individual requests and diversions for specific participants, where possible and practical
- Present final plan, reach sign-off, Execute the tour plan and report.

5.0 PROJECT OUTCOMES

The arrangements for the tour have been possible with direct involvement of the potential hosts, which were short listed after consultation with Processors. All AMPC members participating were contacted by BMC after the project start and almost all were visited before the tour.

The tour plan as in Figure 4, was established after several reviews and considerations.

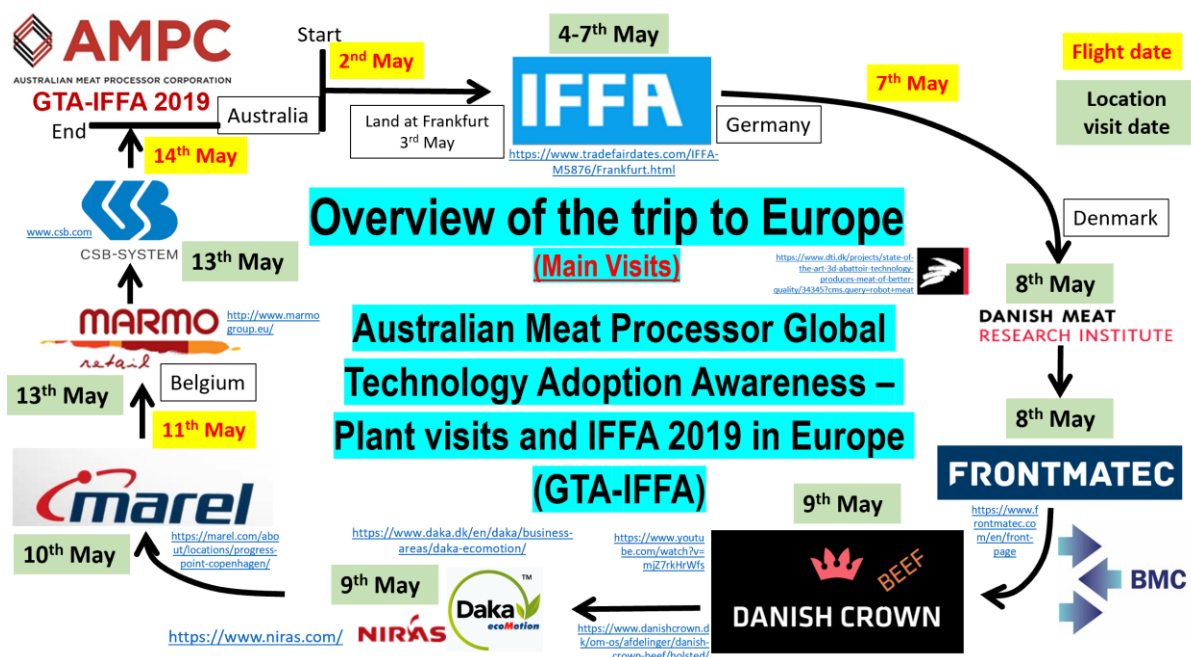


Figure 4: Host of the AMPC GTA and IFFA 2019 tour- travel and timing.

In addition to the above, specific participants visited other companies during the gaps in the tour as well as in parallel, following specific interests. These have included the following:

- DK Foods (Denmark)
- GM Steel (Ireland)

- Meat plants in Ireland (with arrangements through GM Steel)
- Processing facilities in Denmark (with arrangements through NIRAS)
- E + V Technology (Germany)

Appendix 1 gives access directions and contacts for obtaining the presentations from the tour.

5.1 Travel plan and itinerary and participation

The initial plan for the tour had been to meet as a group and travel the same route from Australia to all destinations and return as a group. However, to meet with individual preferences the Group travel was only possible with a few participants. To take advantage of the best fares in a most comfortable cabin on international sectors, group fares were negotiated, which introduced additional segments for certain participants. On the whole, however almost all participants requirements were met, including changes during the trip.

Hotel accommodation and group meals (as practical and within budget) were booked in advance, as well as specific transfers, where essential strict timings had to be kept for departure and arrival to certain venues or trips.

Figure 5 provides the attendance outcome from the tour as recorded during the tour. Note, certain last-minute deviations may have not been added.

2019-1013 AMPC GIA-HFA		CONTACT NOS : +44 7966 297 136 or +41 468 499 286 (TEXT ONLY) or bmdevon@aol.com																												
<p>To modify your choice please email bmdevon@aol.com asap. * Leaving 12 noon for Brussels Airport</p>																														
<p><i>Last update 3rd May 2019</i></p>																														
Day	Activity	1. Baillie	2. Bird	3. Border	4. Bredon	5. Bratt	6. Briggs	7. Odell	8. Clancy	9. Cody	10. Cole	11. Fld cher	12. Formagin	13. Gathercole	14. Holloway (BMC- ex 1985)	15. Khodabandehbo (BMC)	16. Lyon	17. McGuire	18. Mathers	19. McCabe	20. McHugh	21. Naden	22. Nicolau	23. Osthuizen	24. Rebel	25. Richards	26. Shaw	27. Talyr	28. Toovey	29. Treflone
Friday 3rd May 2019	Meal(s) on arrival at Hilton Frankfurt City Accommodation at Hilton City Frankfurt	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Saturday 4th May 2019	Dinner at Ojo de Agua, Hochstraße 27, 60313 Frankfurt Accommodation at Hilton City Frankfurt	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Sunday 5th May 2019	AFTERNOON MLA WORKSHOP at Hilton Hotel. Dinner at The Ivory Club, Taunusanlage 15, 60325 Frankfurt Accommodation at Hilton City Frankfurt	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Monday 6th May 2019	10 AM Frontmatic welcome at IFFA Hall 9. MULTIVAC dinner evening. Accommodation at Hilton City Frankfurt	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Tuesday 7th May 2019	Flight SK 676: dept. 15:30 Terminal 1 P.R.A. arr. CPH 16:55 Dinner (location in Copenhagen to be advised) Accommodation at Radisson Blu Scandinavia Hotel Copenhagen	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Wednesday 8th May 2019	Visits to DMRI & Frontmatic Dinner (location in Copenhagen to be advised) Accommodation Radisson Blu Scandinavia Hotel Copenhagen	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Thursday 9th May 2019	Visits to DC Holsted, Daka Ecomotion, NIRA5 Accommodation Radisson Blu Scandinavia Hotel Copenhagen	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Friday 10th May 2019	Dinner (location in Copenhagen to be advised) Dinner (location in Copenhagen to be advised) Maret Visit Accommodation at Hilton Brussels City	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Saturday 11th May 2019	Dinner in Brussels - to be planned prior to arrival in Brussels. Flight SK 693: dept. 08:15 CPH arr. BRU 09:50 Accommodation at Hilton Brussels City	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Sunday 12th May 2019	Dinner at Restaurant Espanan, Avenue De Frié 190, Brussels Accommodation at Brussels Hilton City	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Monday 13th May 2019	Marmite and CSB VISITS BBQ at CSB Accommodation at Brussels Hilton City	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Tuesday 14th May 2019	Airport train Brussels North to Brussels Airport ticket required	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	

Figure 5: Overview of the tour, programme and attendance.

5.2 Tour days 3rd to 7th May 2019

All participants arrived on 3rd May 2019 and the first networking event took place over dinner.

IFFA opened on 4th May at 0900 and all participants made their own specific arrangements to the Halls and contacting specific technology companies.

In advance of the tour, interests were communicated by the participants, including the requests to meet certain companies at IFFA. With assistance from Mr Nick Holloway, BMC prepared a short guide for the participants with the Exhibitors locations, as requested.

The networking of the group continued over dinner on 4th May.

On 5th May the participants continued their tour of IFFA and in the afternoon, the majority attended the MLA Workshop following the programme in Figure 6.

AMPC Sunday 5th May 2019
AUSTRALIAN MEAT PROCESSOR CORPORATION
GTA-IFFA 2019 **1345 Programme at Hilton Frankfurt City**

1345 Introduction - Brad Mathers, Prof Koorosh Khodabandehloo
1400 **Multivac presentation, Andrew Hutchison Managing Director, Multivac Australia.**
1430 Introduction from MLA Christian Ruberg (please also see separate document from MLA)
Technologies to enhance human performance in meat processing – exoskeletons
Helmut-Schmidt Universität, Prof. Dr.-Ing. Robert Weidner
Ergonomics considerations exoskeleton design. Followed by Q&A.
1500 **Fraunhofer Institut Stuttgart, Florian Blab**
Ergonomic assessment and solutions for heavy physical work – From functional textiles to motorized exoskeletons. Followed by Q&A.
1515 **Suit-X USA, Andy Hayes**
'the now and soon' of exo-skeleton designs applications and opportunities. Followed by Q&A.
1530 **Afternoon tea break**
1600 Investment and Education, Michael Henderson & Ozgur Tuna, Australian Consulate-General.
1615 Australian and New Zealand meat processors to outline their needs, and to reflect on the potential opportunities. Followed by Q&A
1645 MLA – Conclusions
1700 **Rapiscan x-ray imaging Dr Ed Morton and Vince Creagh**
Opportunities with 3D imaging of livestock, carcass and offal. Followed by Q&A
1745 Close
Other attendees/guests:
Tony Miles, AFFCO, New Zealand
Damien Fergus, Ovation, New Zealand
John Hart, John Dee Warwick Australia
Bruce Fyfe, Auckland Meat Processors
MLA: Sean Starling, Darryl Heidke, Richard Apps, Kelly Hawley, John McGuren





**Call +44 7966 297 136
if you need assistance**




Please plan arrive by 1330 at the Hilton Frankfurt City to make the 1345 start. Speakers please arrive before 1330.

Figure 6: Afternoon Workshop 5th May 2019.

Feedback from processors' questionnaires on the workshop is summarised below:

	%
Overall 5th May AMPC - MLA session and workshop	77
<i>Facilities and beverage at Hilton</i>	91
<i>Technical sessions logistics and organisation</i>	80
<i>Multivac presentation</i>	76
<i>Helmut-Schmidt Universität, Prof. Dr.-Ing. Robert Weidner</i>	75
<i>Fraunhofer Institut Stuttgart, Florian Blab</i>	75
<i>Suit-X USA, Andy Hayes</i>	76
<i>Investment and Education, Michael Henderson & Ozgur Tuna</i>	70
<i>Rapiscan x-ray imaging Dr Ed Morton and Vince Creagh</i>	76
<i>Overall content and discussions</i>	73

For specific feedback, please refer to Appendices.

On 6th May the participants were invited to visit the Frontmatec stand during their visit to IFFA at 10 AM.

The following topics were available for viewing:


- Trim management system
- Robotic pork rib pulling system
- Robotic splitting of beef and pork carcasses
- Hygiene equipment
- Lamb break up machinery
- Q- line butchery stations

There was opportunity for wider networking at the Multivac evening on 6th May 2019, which was gratefully appreciated by all who attended.


5.3 Tour days 7th - 10th May 2019

After IFFA on 7th May, the participants had opportunity for exchange and networking on the journey to Copenhagen in the afternoon.

On 8th May, visit to DMRI and Frontmatec took place following the Agenda in Figures 7 and 8 respectively.



AMPC Wednesday 8th May 2019
AUSTRALIAN MEAT PROCESSOR CORPORATION
GTA-IFFA 2019 0900 DMRI




Venue: Gregersensvej 9, Building 9., 2630 Taastrup
 Contact person: Ole Ryding, +4572202690 olr@dti.dk

Danish Meat Research Institute
 Danish Meat Research Institute (DMRI) is the international leading research and innovation centre within food of animal origin. DMRI assists our customers in improving their competitiveness.

Our experts develop solutions for the meat industry and provide domestic and international consultancy and training within process design, productivity improvement, product quality and hygiene to abattoirs and processing companies.


DMRI is focusing on methods and technologies for efficient production of safe meat products of high quality at competitive prices. At the same time, DMRI is committed to enhancing the working environment and animal welfare as well as demonstrating due care to the external environment.

<https://www.dti.dk/projects/state-of-the-art-3d-abattoir-technology-produces-meat-of-better-quality/34345?cms.query=robot+meat>



Provisional Agenda – subject to change without notice

0900	Welcome to DMRI, setting the Scene, Ole Ryding
0915	On Line CT for the meat industry, Lars Bager Christensen https://www.dti.dk/the-world-8217-s-first-online-ct-scanner-for-food/38790?cms.query=dmri+ct+scanning+
0940	Live Demo - On line CT scanner
1015	DynaCQ - Dual live demo, Peter Stentebjerg
1050	Pork Carcass 360° screening, Jeppe Dam
1120	Beef faecal contamination screening, Rikke Hjorth Nielsen
1150	Bung handling machine for Lamb, Claus Hindborg Christensen
1220	Beef rib pulling - concept, Carsten Jensen
1150	Sandwich during presentations and departure
1300	End.



For further information and contact with DMRI, the participants have the following contacts:

Ole Ryding, +45 72 20 15 66 olr@teknologisk.dk
 Niels Madsen +45 72 20 26 90 ntm@teknologisk.dk

Figure 7: DMRI Visit 8th May 2019.

AMPC Wednesday 8th May 2019

AUSTRALIAN MEAT PROCESSOR CORPORATION
GTA-IFFA 2019

1400 - Frontmatec

FRONTMATEC

Frontmatec develops world-leading customized solutions for automation in the food industry, other hygiene sensitive industries and the utilities industry. We are especially renowned for our high-quality systems for the entire value chain of the meat industry – from carcass grading to slaughter lines, cutting and deboning lines, hygiene systems and control systems to logistics and packaging.



<https://www.frontmatec.com/en/front-page>

Provisional Agenda

- 14:00 Welcome (KGA) - Corporate presentation
- 14:15 Vision systems (TLA)
 - BCC 3
 - Ribeye camera
- 15:15 Coffee break
- 15:30 Ultrasound and invasive probes (TLA)
 - AutoFom
 - NitFom
- 16:00 Controls (KGA)
 - SCADA
 - Manufacturing Execution Systems
- 16:30 Discussion
- 17:00 Departure



Figure 8: Frontmatec Visit 8th May 2019.

3 locations were visited on 9th May 2019. Figure 9 provides the details and the timing of the tour.

AMPC Thursday 9th May 2019: Overview

AUSTRALIAN MEAT PROCESSOR CORPORATION
GTA-IFFA 2019



Figure 9: Visits 9th May 2019.

The programme for 10th May was hosted by the team at Marel as in Figure 10.

AMPC Friday 10th May 2019

AUSTRALIAN MEAT PROCESSOR CORPORATION
GTA-IFFA 2019 Marel 0900-1615



Friday 10th May 2019	0730 Breakfast	Room and breakfast is pre-paid
	0830 Coach to Marel Kirstinehøj 56B, 2770 Kastrup, Tel: +45 89 30 43 80	Coach transfer is pre-paid
	1630 Return coach to Radisson	Coach transfer is pre-paid
	1800 Dinner (details will be in the next update)	Dinner is pre-paid for delegates who have confirmed attendance
	Recommend packing for early departure	

Provisional Programme

- 0900-0915 Welcome
- 0915-1000 Trim handling
- 1000-1100 Introduction CaseReady
- 1100-1115 Coffee break
- 1130-1230 Premium former
- 1230-1330 Lunch – Burger tasting session
- 1330-1430 Showroom tour
 - Streamline
 - Trim management
- 1430-1515 Introduction Innova
- 1515-1545 Innova session showroom office
- 1545-1615 closing



<https://marel.com/about/locations/progress-point-copenhagen/>

Figure 10: Visit to Marel Progress Point Copenhagen.

5.4 Tour day 13th May 2019

Marmo and CSB were the final two companies visited on the tour. Figure 11 gives the agenda for the day, concluding the main part of the tour.

AMPC Monday 13th May 2019

AUSTRALIAN MEAT PROCESSOR CORPORATION
GTA-IFFA 2019 0930 Marmo + 1400 CSB

MARMO
retail
Reppelsebaan 65 B-3294 Molenstede
<http://www.marmogroup.eu/>

CSB-SYSTEM
www.csb.com
An Fürthenrode 9-15, D-52511 Geilenkirchen

Monday 13th May 2019	0700 Recommended time for breakfast	Room and breakfast is pre-paid
	0800 Coach to Marmo Reppelsebaan 65 B-3294 Molenstede, Belgium	
	0930 Tour of Marmo	
	1230 Coach to CSB An Fürthenrode 9-15, D-52511 Geilenkirchen, Germany	
	Lunch on Wheels	
	1400 Arrive at CSB	
	Presentation and tour at CSB	
	CSB German BBQ	
	1730 Coach departure to Hilton Brussels City	



- 1400 Welcome and tour
- 1430 CSB Australia
- 1445 CSB Services
- 1515 CSB Automation
- 1600 Discussion
- 1615 BBQ
- 1830 Depart for Brussels



Figure 11: Visits to Marmo and CSB in Belgium and Germany.

6.0 DISCUSSION

The AMPC Global Technology Awareness and IFFA provided the participants with the opportunity to review and examine potential adoption opportunities in technology as well as practice. As the sector's foremost innovation platform, IFFA once again brought together all players from the industry, retail trade and butcher's trade. Many companies exhibit their latest developments and show piece technologies. From slaughtering to end of line packaging and despatch as well as operations managements tools and IT capabilities were presented by the many exhibitors. The post IFFA visits covered a comprehensive range of topics, complementing the new innovative areas of development presented during a Workshop organised by the MLA.

Everyone participating on the tour has reported highlights as relevant to their respective businesses. The following provides a range of topics and interests as reported by the participants:

- Sustainability, animal welfare and future of plastic packaging
- Value adding processes
- Automated slaughtering technology for beef
- Automated retail packaging technologies
- Slicing machinery
- Imaging and CT scan technologies
- Automated storage and retrieval systems (SRS)
- Mechanical Deboning Machinery (MDM)
- Meat primal forming machinery
- Robotic splitting for beef
- Hock cutting automation
- Sterilizer equipment and tailored hygiene systems
- Automatic bag size cutter and custom printing equipment
- High performance String Machine
- Lamb slaughtering equipment
- RFID solutions for knives
- Bandsaw with high speed braking system
- X-ray Inspection equipment
- Foreign object detection
- Exoskeletal technology
- Beef carcass grading systems
- Foreign object detection equipment
- Rib eye grading camera
- Management software and traceability solutions
- Vertical plate freezer system

- Barrier bag alternative solutions
- Biodegradable packaging
- High yield fixed weight slicing
- High rate tray de-nesting
- Package inspection including integrity of seal, label and foreign object
- Crust freezing (spiral, tunnel and carousel)
- Sustainable packaging machines
- Meat Grinding
- Water recycling for tripe washers/refiners
- Robotic and manual knife sharpening equipment
- Carton label verification
- Small footprint vacuum packaging system
- Continuous meat stringing systems
- Quick stop bandsaws
- Recycle brine injection systems
- Tray pack sortation and divert system
- Continuous non-stick elevation conveyor system
- Continuous membrane skinning
- Multi box forming/lidding and palletisation
- Contamination Detection
- Soaker pads with CO2
- Lined cardboard for recycling
- Individualisation of consumer preference
- ERP systems for value adding
- Carcass and primal yield prediction
- Hide pullers and offer rail systems
- Beef striploin trimming similar to 3D trimmer for pork loins
- Gondola system to deal with complexities
- Trim management systems

The above represents the highlights mentioned by the participants as highlights and interests.

Important findings from the tour relate to:

- Automated slaughtering technologies including:
 - Bung separation and handling
 - Hock cutting
 - Carcass splitting
 - Offal processing
 - Carcass inspection

- Sanitisation
- Imaging and x-ray (for grading and inspection)
- Energy and water management
- Automation in cutting areas
- Automatic de-boning
- MDM
- High speed and thin slicing
- 3D trimming
- Packaging solution
- SRS
- Integrity and information inspection for package, case and labels
- Flow management and traceability for yield and efficiency optimisation

The above identify areas for follow up action and exploration for adoption. It is envisaged that a more focused tour aims at visiting the technologies that are in use or implemented for the first time in a related sector of the industry. Such a tour could consider setting up R&D opportunities with the technology developers that have achieved the solutions considering specifically the needs of Australian companies. Example include the pork leg deboning capability by Mayekawa, Beef splitting by Frontmatec and Jarvis, and chine bone system for beef by MidWest.

The tour points to many follow up actions and points to opportunities for supporting technology adoption of solutions that would be first in Australia. The tour also highlights and confirms the investments in R&D in topics such as 3D trimming, X-ray and Vision grading and yield prediction, whilst pointing to the more difficult topics such a foreign body detection and separation.

The participants have positively commented on the networking value of the project and would participate on future tours of this kind.

It is considered that in early 2019, a technology status tour, focusing on adoption of newly developed solution, may be planned with participants also having the opportunity to attend the International Food Automation Networking (IFAN) Conference, 8-9 April 2019 in Atlanta. The tour could consider stops along the route including Japan (pork leg de-boning), locations in Europe to follow up on the priority interests as listed above, including beef splitting, and locations in USA to see rib-eye grading, chine bone cutting automation, robotics in beef operations by Jarvis, or other topics as appealing to the participants to be taking part.

7.0 CONCLUSIONS/RECOMMENDATIONS

Overall the project has been considered highly successful based on feedback received, Figure 12 provides the scores under the important headings.

AMPC Project 2019-1013 GTA and IFFA Tour	
The scores are averages of the participants figures that were provided	%
<i>Process to apply to be on the tour if applicable</i>	84
<i>General arrangements: exhibition information, tickets, etc</i>	88
<i>Flights overall</i>	85
<i>Hotels overall</i>	84
<i>Food and restaurants overall</i>	88
Overall 5th May AMPC - MLA session and workshop	77
6th May 10 AM session at Frontmatec	63
Visit to DMRI 8th May 2019 morning	88
Visit to Frontmatec 8th May 2019 afternoon	74
Visit to DC Holsted 9th May 2019 morning	88
Visit to EcoMotion 9th May 2019 afternoon	74
Visit to NIRAS 9th May 2019 afternoon	81
Visit to Marel 10th May	97
Visit to Marmo - 13th May 2019 morning	89
Visit to CSB 13th May 2019 afternoon	90
Likelihood of participating in a similar future AMPC tour	92

Figure 12: Assessment of the project by those who participated and provided feedback.

The following recommendations have been the result of networking discussions and conclude the findings of the tour.

8.0 ACKNOWLEDGEMENTS

BMC, on behalf all parties, would like to thank the following organisations and members of their team who made this tour possible:

DMRI, NIRAS, Frontmatec, Danish Crown, EcoMotion, Marel, Multivac, CSB, Marmo, DK Foods, GM Steel, E+V, MLA and AMPC. Special thanks to Mr Chris Ruberg, the presenters and the MLA team for making the 5th May Technology Workshop possible.

BMC wishes to give special thanks to AMPC and in particular Brad Mathers for support and facilitation of the project.

The participation of USQ and enthusiasm to engage long term initiatives with the Processors must receive special note.

BMC wishes to thank all the participants for their kind interest and for taking part.

9.0 APPENDICES

Appendix 1 provides information or contacts for follow up on specifics presented during the visits.

Appendix 2, 3 and 4 contain participants reports, observations and interests to follow up and overall feedback including all aspects of the tour.

9.1 APPENDIX 1

Presentations:

9.1.1 8th May 2019 DMRI

Please see separate folder or use link below for presentations. Also see contact below:

https://dtioffice365-my.sharepoint.com/:f:/g/personal/olr_teknologisk_dk/Ekr3XH50lmZLueTnKfbh2J4Bimr26unjuApRi-yda3nrTQ?e=T0rEsH

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9.1.2 8th May 2019 Frontmatec

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Thomas Lauridsen



Area: Instruments
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9.1.3 9th May 2019 DC HOLSTED ECOMOTION and NIRAS

DC HOLSTED

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9.1.4 10th May 2019 Marel

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9.1.5 13th May 2019 CSB

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