final report

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IFFA 2016 Technology Exhibition, Study Program and Global IP scanning

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Executive Summary

This project supported an Innovation Delegation to the IFFA meat processing technology international trade exhibition (Frankfurt, May 2016) and associated activities.

The IFFA trade exhibition, held every 3 years, is widely regarded as the leading global technology showcase in meat processing. In 2013, 63,000 trade visitors from around 142 countries attended IFFA to view products and services offered by 1000 exhibitors. A number of new technologies have previously been successfully evaluated and later adopted by Australian processors as a result of past processor attendance at IFFA.

A key objective of the 2016 delegation is focus global innovators on the needs of Australian red meat processors and to identify research and development opportunities to service Australian processors.

The study tour and "global technology scanning" was coordinated by MLA included representatives from the red meat processing industry, MLA and the Australian Meat Processor Corporation (AMPC).

It was funded using AMPC processor levies matched with MDC funds. It included:
visiting the Cambridge University Centre of Manufacturing Innovation
visiting retail outlets in London to review retail packaging and consumer trends
supporting 10 Australian processors to attend the leading triennial global trade exhibition for meat processing, IFFA
visiting red meat processing plants and technology organisations in Denmark and Italy.

Robots which work collaboratively with people, hot lamb curries from vending machines and 3D-printed meat – could this be the red meat industry of the future? It's actually already happening,

These are some of the insights after returning from the global trade exhibition for meat processing, IFFA and a study tour through Europe to map emerging technology, trends and systems for value-adding red meat.

It paves the way for the creation of a Value Chain Technology Centre of Excellence in 2016 supported by the MLA Donor Company (which doesn't use producer levies). This will act as a brains trust of global 'thought leaders' and technology partners to secure the future of innovation in Australia's red meat value chain.

The trip reinforced the world leading innovation developed in Australian red meat processing, especially in terms of automated boning and objective carcase measurement technology, both highly successful recent MDC programs.

Insights revealed that most of the automation in European processing plants was for logistics, such as handling of pallets and packed products. This is because there is a lot less variation in carcase size in the main processing sector of pork compared to red meat processing in Australia.

"As a result, we are definitely ahead of the game in terms of sensing technology and automation to manage product variation."

The real 'wow' factor from IFFA was the realisation that Australia's program in automated meat processing integrated with highly advanced subsurface sensing (such as DEXA) is leading the world.

Australia is head and shoulders ahead of the world in this area now, which is anticipated to deliver strong benefit to producers in the form of a more competitive processing chain, and much more accurate producer feedback on livestock processing performance," he said.

Meat in the future

The innovations and trends on show at IFFA included 3D printing using 'ink' made from emulsions from different meats which cooks as it is piped onto a hot plate, along with the latest developments in packaging, sensing and measurement technologies, value-adding processes, and automated robotic processing.

3D printing may seem like futuristic technology but it is already being trialled in Europe to create high-end, designer meals. There could be potential to use a red meat 'ink', to value-add lower value cuts although more research needs to be done in this space.

Another new area of development was the area of collaborative robots. Unlike large industrial robots, these small, nimble machines are designed to work alongside humans in manufacturing or processing. They could be used in red meat processing to make value chain efficiency gains which could flow back to producers.

Australia on show

Australian-led innovation in red meat processing was also on show at IFFA. As well as the BladeStop technology, visitors at the trade show were among the first to sample pre-cooked Australian lamb ready meals from vending machines, a new and novel supply chain.

This concept is the brain-child of Australian value-adding company Frews, supported by the MLA Donor Company. The vending machines can heat single-serve meals such as lamb meatballs in Massaman curry in just two minutes and will be trialled this year at railway stations and universities in Melbourne, Europe and the Middle East.

The vending machines not only value-add secondary cuts and provide convenient meals to time-poor consumers, but create a new opportunity for Australian lamb in the face of volume restrictions into the EU (which apply to frozen but not cooked product). The vending machines also collect point of sale information and potentially consumer feedback. The vending machines received a really good response at IFFA.

Consumer trends

These vending machines align with an emerging trend in the UK and Europe of retail-ready meals.

The retail ready market in Europe is significantly different to Australia. Consumer trends have paved the way for premium retail-ready, individual serve meals. As well as meat dishes, consumers can buy pre-packaged serves of vegetables or fruit.

These products attract a higher price point due to their individual nature and freshness – in London they were priced at three meals for £10. Presentation is important. Packaging clearly identifies protein, carbohydrate and fat levels in response to healthy eating trends."

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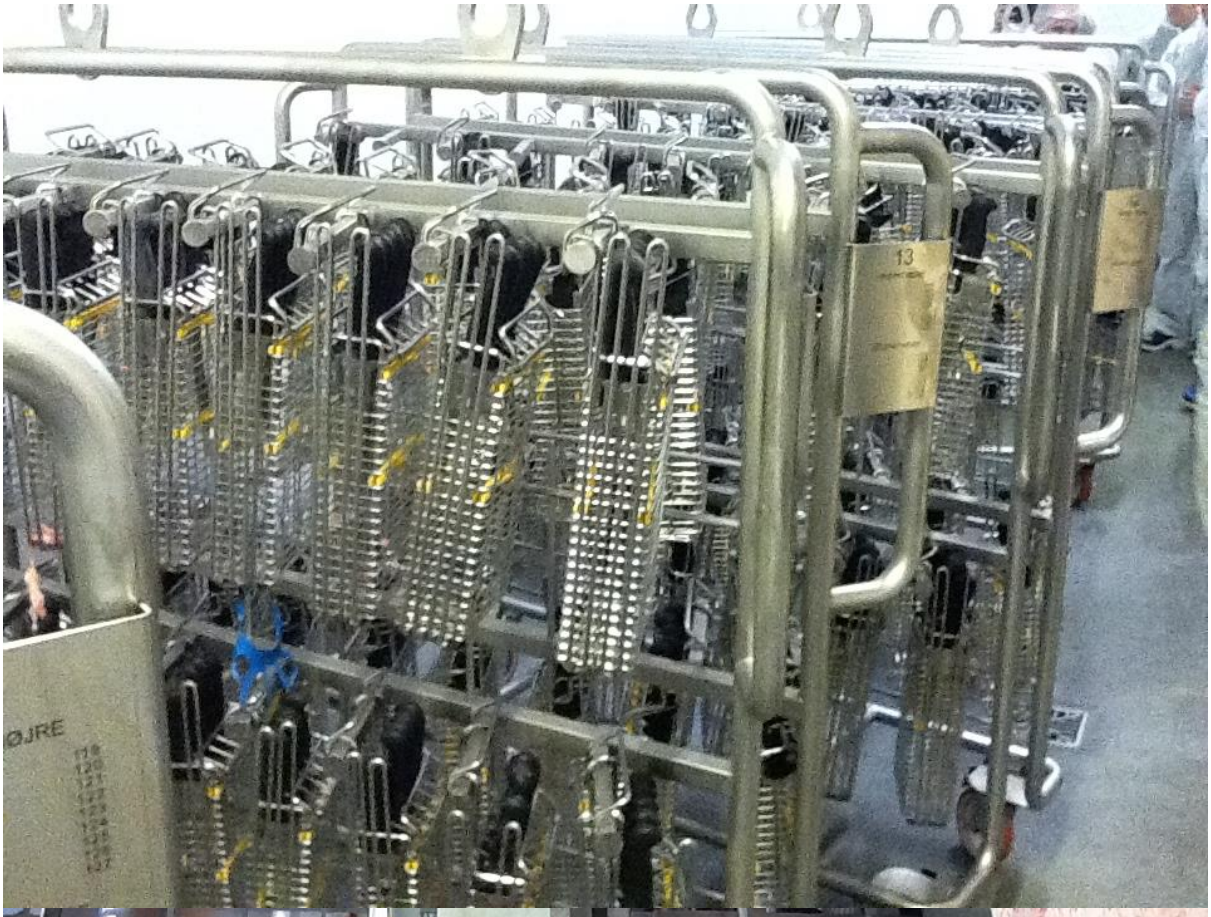
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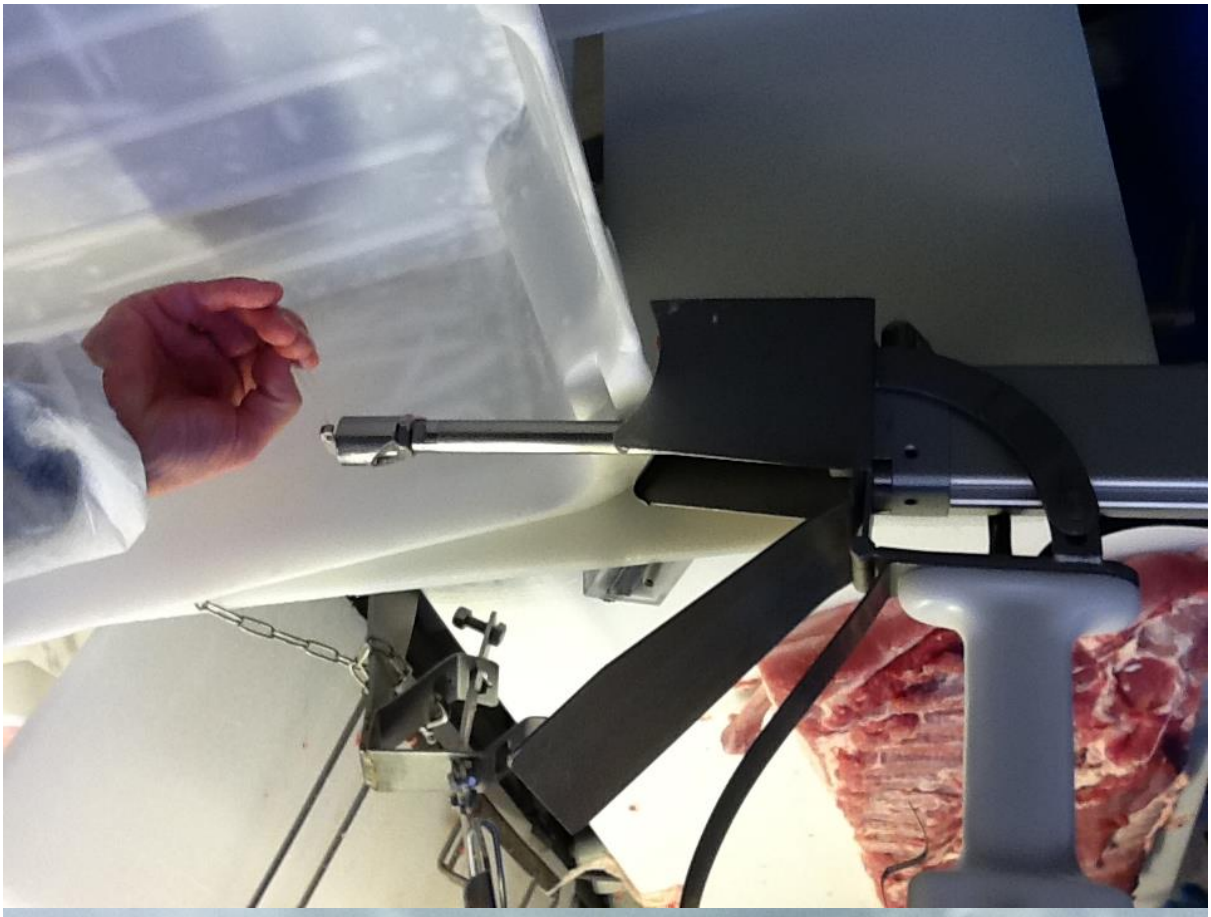

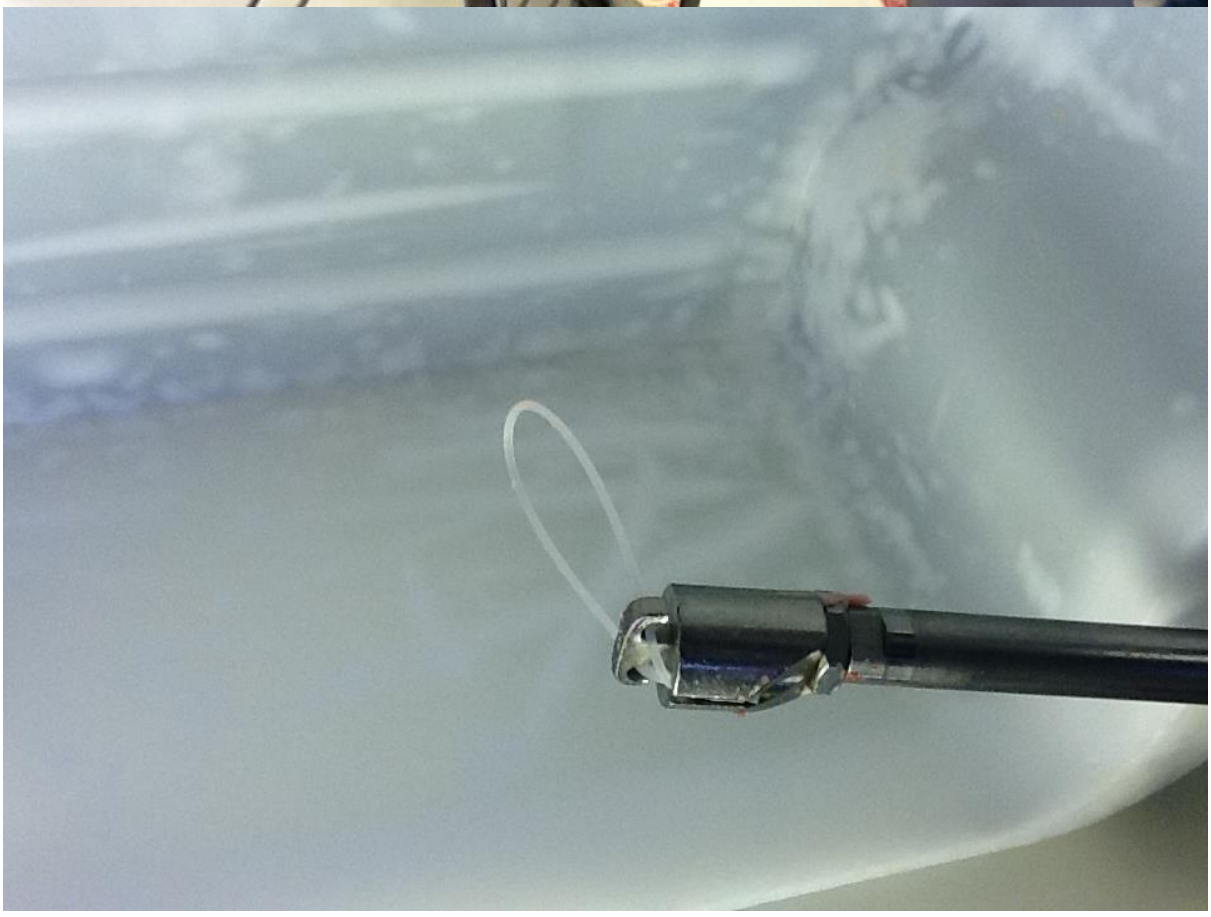

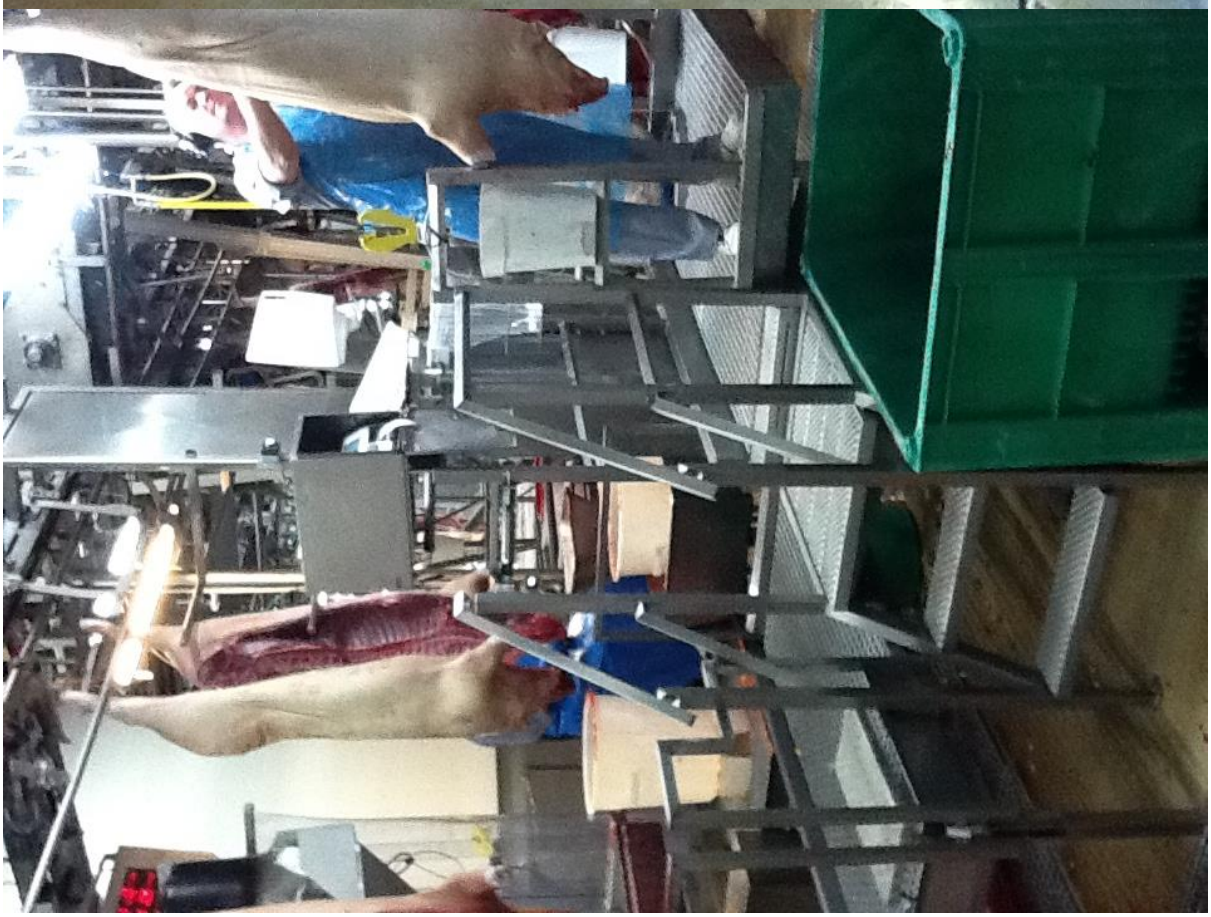

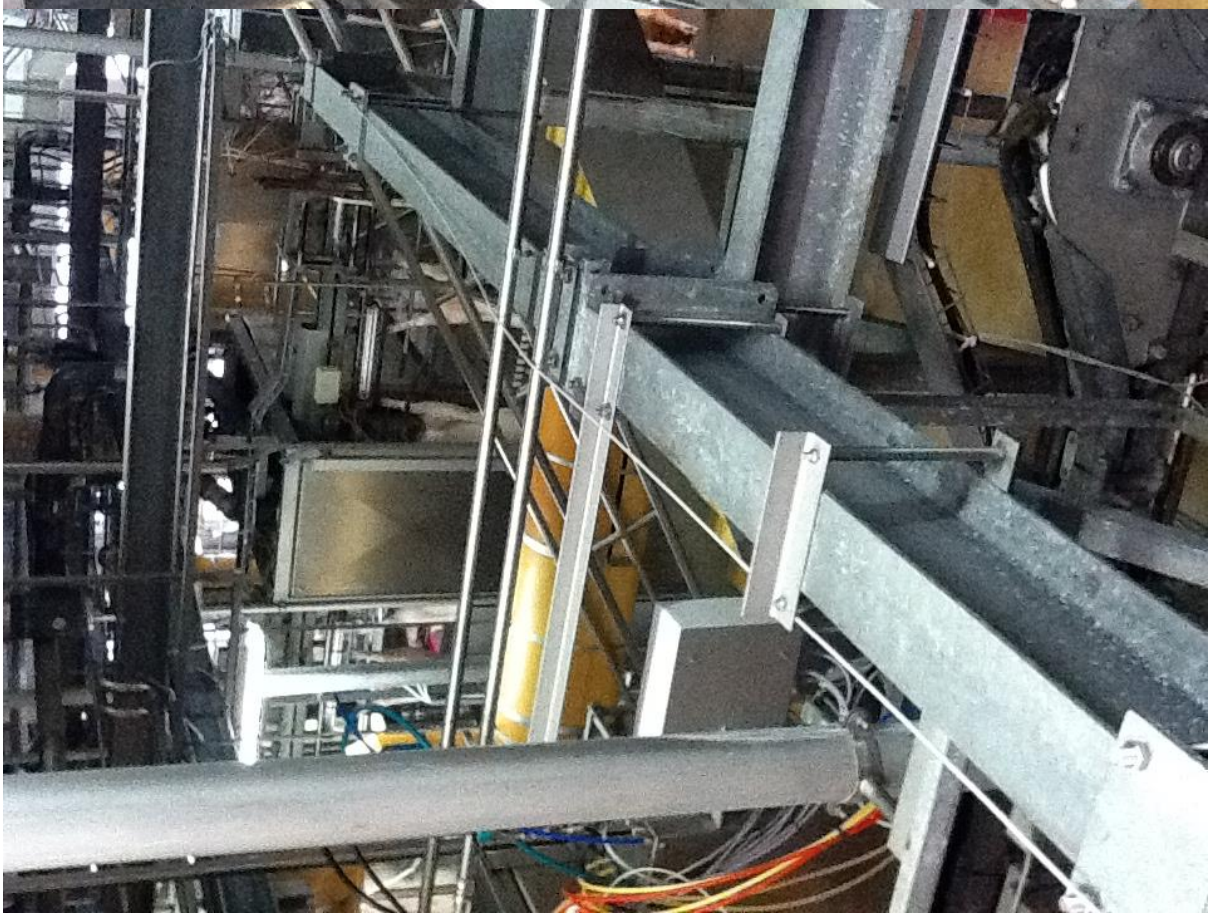

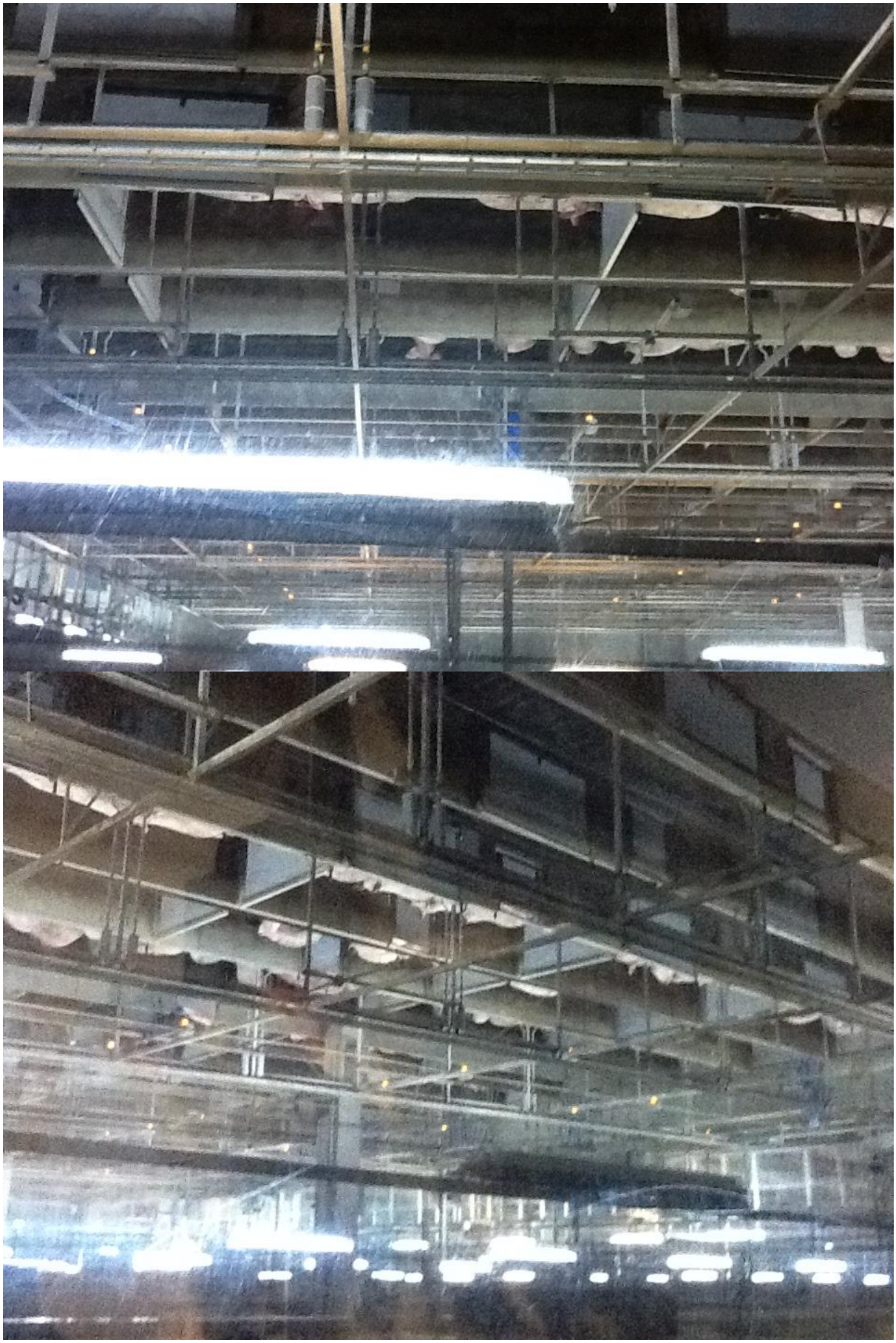

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1 Project Objectives

The program has the following components:

- Attendance at the IFFA event to examine the range of exhibits covering slaughtering, breakdown, dressing, trimming, processing, weighing, filling / packaging, conveying, cooling, storing, transporting and selling, as well as value adding for meat and meat products.
- Visits to EU processing works and innovation centres to further examine international meat processing technology developments to inform technology and process automation strategy for Australian red meat processing.
- Determination of what might be applicable and/or that could be further developed as projects integrated into the current technology strategy of MLA or AMPC, or that could apply to Australian processing companies, notwithstanding the recognition of commercial decision making for any specific uptake.

Each participant will report on their observations at the exhibition to the benefit of the Australian industry, and at a level of detail appropriate to the level of support toward attandance.

This project will answer the following key questions:

- Assessment of new technology options that might apply to the existing MLA or AMPC strategy in relation to:
  - Preliminary or fundamental R&D. This phase includes all the preliminary research work done typically in labs, provider's facilities and outside processing plants.
  - Assisted Adoption. Once a prototype has shown enough promise, it will betested under normal operational conditions, and if those tests are successful the system may be permanently integrated in the host site operations (e.g. options for PIP type projects).
- What new technoogies are under development that directly relate to current gaps in the Australian approach?
- What technologies or approaches might apply to further R&D in Australia?
- What is the focus and strategy of technology providers and processors in the EU and other countries? How can this inform the Australian direction?
- What learnings can be gained from comparing these approaches to the approaches in Australia, what are the gaps and what information do we need to upgrade the current information on these activities for processors in Australia?

2 Description of technologies applicable to the Australian red meat industry

Upon completing the IFFA exhibition attendance, the processor will include in the report:

- The various technologies (description, what is commercially available or being developed);
- How the technology works (if available), alternatively-
- Summary of overseas approach, investigations or concepts around a possible solution (if not commercially available),
- Summary of capabilities available or involved in investigating the task/issue,
- Summary of benefits, opportunities and outcomes;
- Data if available on the operation of a similar technology or solution;
- Other ideas and concepts that could relate and/or apply to Australian conditions.
- Summary of a possible R&D project based on the above (could be an industry project, PIP, review, education, extension or adaptation or adoption related activity.

Please add descriptions of technologies viewed that may be of interest in the Australian red meat industry.

IFFA

1) **Value Adding**
   i) 3D Printing – video available
   ii) Vending machine – red meat products – current MLA/Frewstall project
2) **Automation & Robotics**
3) **Objective Carcase Measurement**

Site tours

1) **CSB "SmartFactory" Tour to Van Rooi Meats (Helmond NL: 12k pigs/day) and Promessa (Deventer NL: boning & distribution)**
2) **ABB Robot Application Centre, Regional Application Centre for Collaborative Robots Friedberg, Frankfurt - Robotics coworker robots - automation**
3) **Attec site tour & showcase of lamb machines automated machines (Primal/Middle/Forequarter)**
4) **Horsens**
5) **Danish Crown in Holsted, Beef - Danish Crown in Horsens largest Danish Crown pork plant.**
6) **Visit to local biogas plant, and new Daka biodiesel plant**
7) **Visit to Danish Meat Research Institute,**
   a) **- Objective carcase measurement**
   b) **- Progress on on line CT**
   c) **- Packaging and quality - shelflife**
   d) **- Hygiene**
   e) **- New measuring technologies for quality and foreign objects**
   f) **(CT measurement, automated fat trimming, etc)**
8) **Inalca**

3 Technology opportunity investigated in further depth

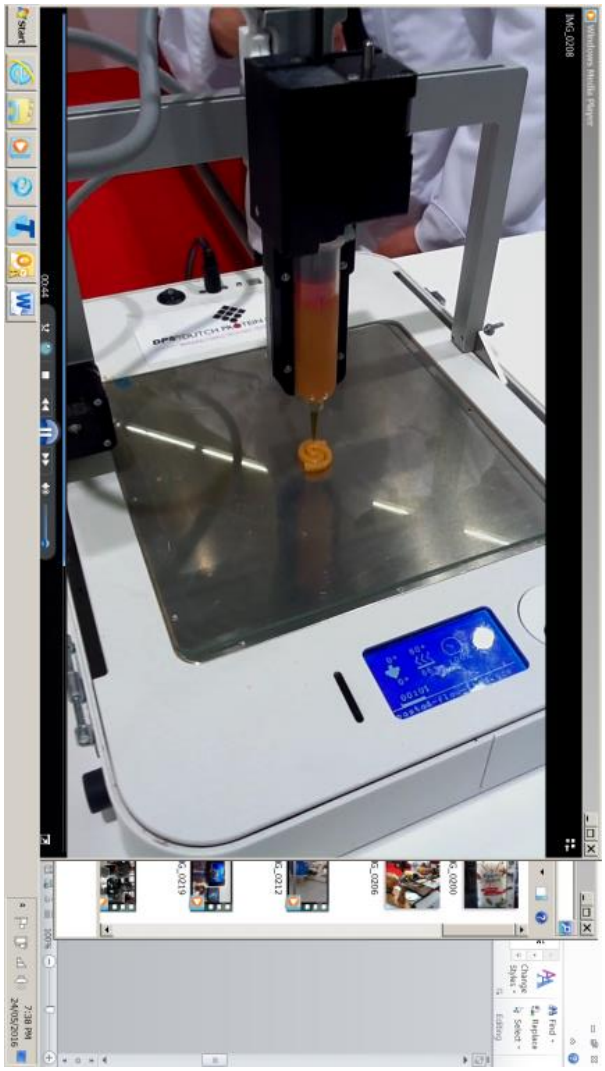
Participants will:

- examine new smallstock and beef technological advances and critique these in relation to opportunities for Australian processors;
- see how new technologies are being implemented by processors in the EU;
- understand the capabilities available and emerging;
- contribute to a consolidated program report and also a specific PIP project report relating to a key technology (to be identified in the application);
- investigate and report on a specific issue/area of choice in relation to Australian processing conditions and requirements.

3.1 3D Printing Value Adding

Describe the task, issue, practice, technology, process or opportunity that you seek to investigate in relation to technology and automation including:

- *Detail the task*
- *Detail the challenges occurring now for processing practice*
- *Detail the opportunity*
- *Detail the information you seek to gain through the study tour*
- *Detail the likely benefits to industry in investiga ting this technology area.*

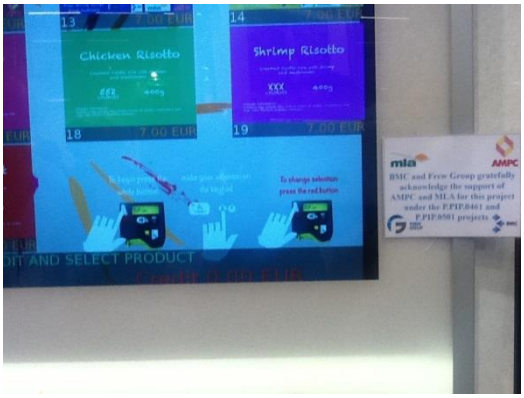


3.2 Vending Machine for red meat products – Current MLA project P.PIP.0501 outcomes

Describe the task, issue, practice, technology, process or opportunity that you seek to investigate in relation to technology and automation including:

- *Detail the task*

- *Detail the challenges occurring now for processing practice*
- *Detail the opportunity*
- *Detail the information you seek to gain through the study tour*
- *Detail the likely benefits to industry in investigating this technology area.*



3.3 Objective Carcase Measurement

Describe the task, issue, practice, technology, process or opportunity that you seek to investigate in relation to technology and automation including:

- *Detail the task*
- *Detail the challenges occurring now for processing practice*
- *Detail the opportunity*
- *Detail the information you seek to gain through the study tour*
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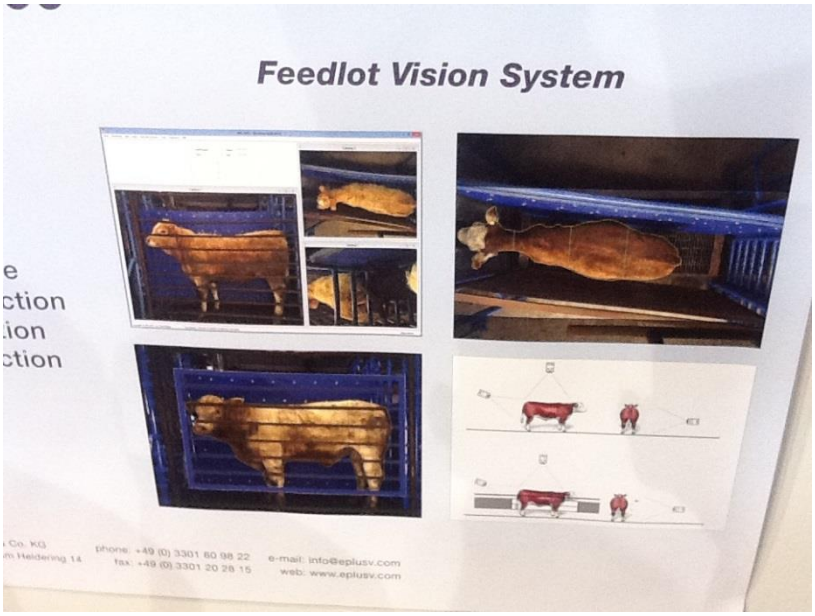

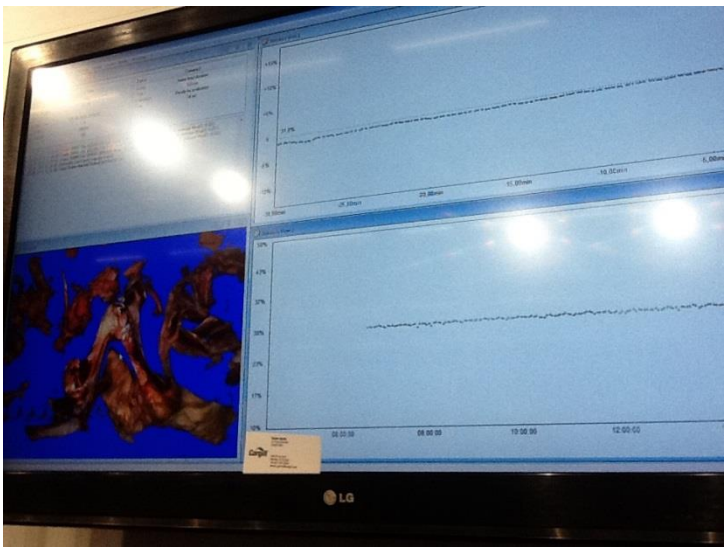

3.4 Automation & Robotics

3.4.1 ABB Site presentation and tour

Describe the task, issue, practice, technology, process or opportunity that you seek to investigate in relation to technology and automation including:

- *Detail the task*
- *Detail the challenges occurring now for processing practice*
- *Detail the opportunity*
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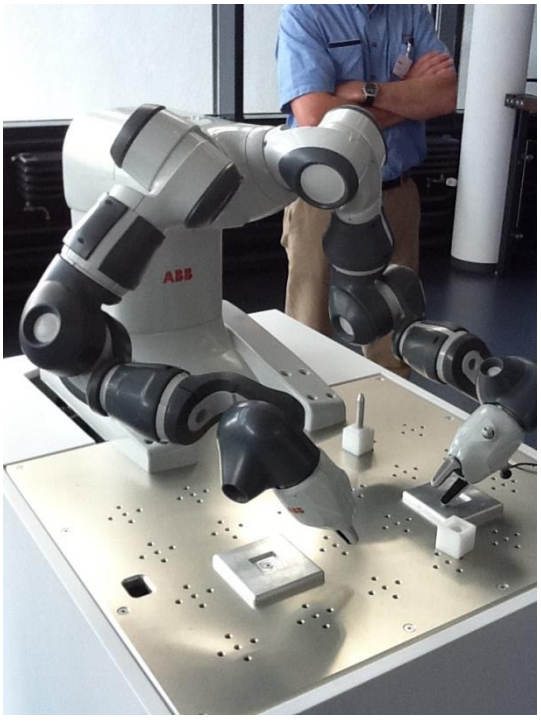
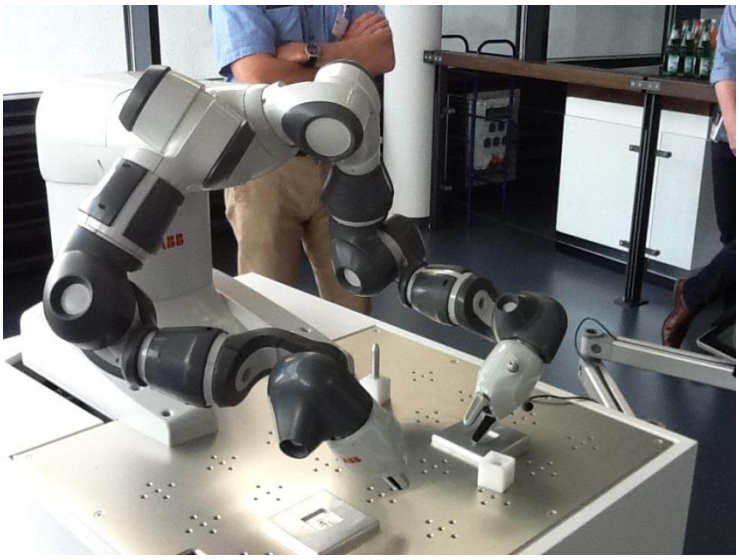




3.5 Pork processing Equipment - ATTEC

3.5.1 ATTEC , Denmark A/S Mommarksvej 293-297, Tandslet, 6470 Sydals

Site tour and demonstration of pork automation equipment
(Primal/middle/forequarter machines)

Describe the task, issue, practice, technology, process or opportunity that you seek to investigate in relation to technology and automation including:

- *Detail the task*
- *Detail the challenges occurring now for processing practice*
- *Detail the opportunity*
- *Detail the information you seek to gain through the study tour*
- *Detail the likely benefits to industry in investigating this technology area.*











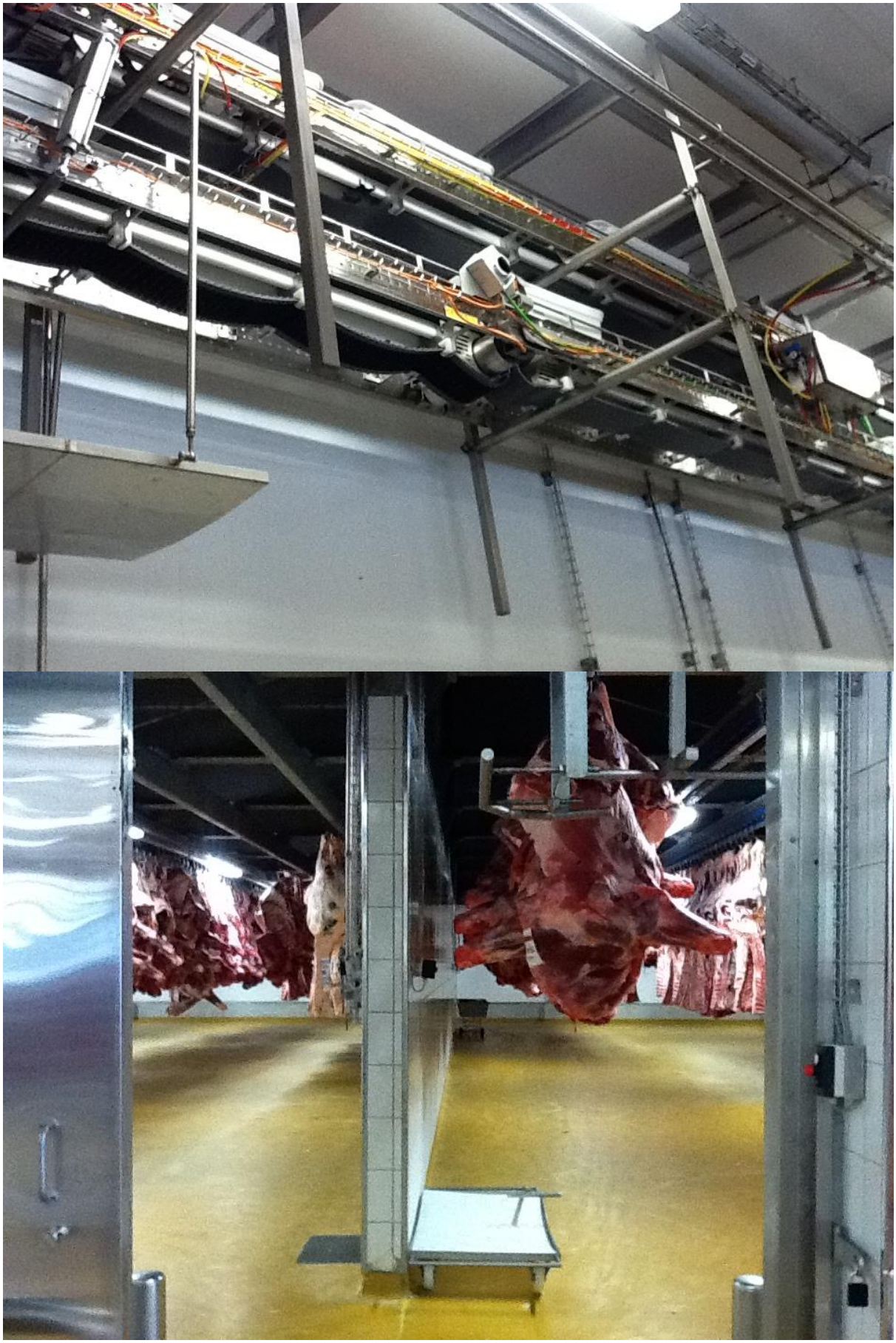

3.6 Beef Processing

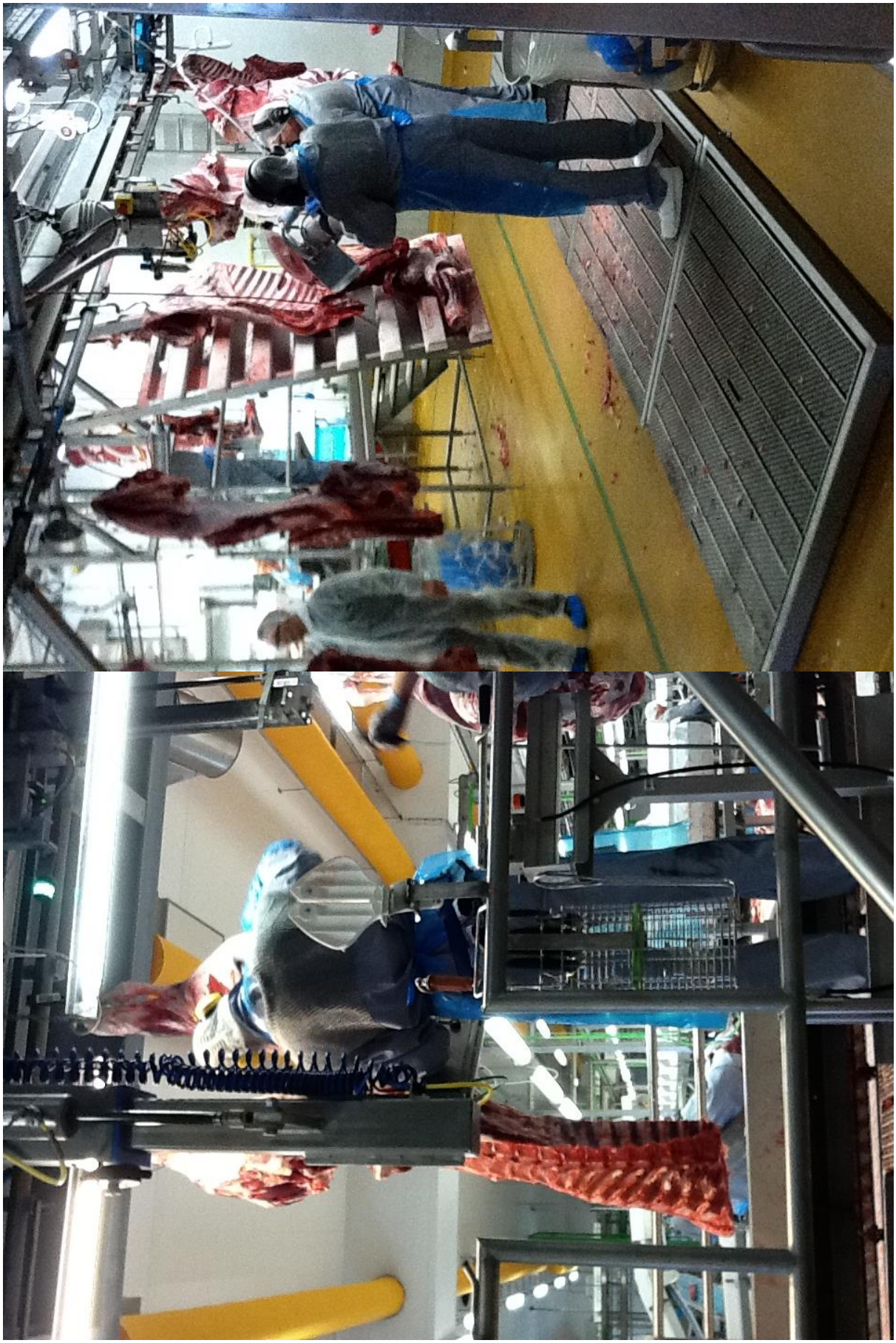
3.6.1 DANISH CROWN , Energivej 5, 6670 Holsted

Site tour of beef processing facility

Describe the task, issue, practice, technology, process or opportunity that you seek to investigate in relation to technology and automation including:

- *Detail the task*
- *Detail the challenges occurring now for processing practice*
- *Detail the opportunity*
- *Detail the information you seek to gain through the study tour*
- *Detail the likely benefits to industry in investigating this technology area.*



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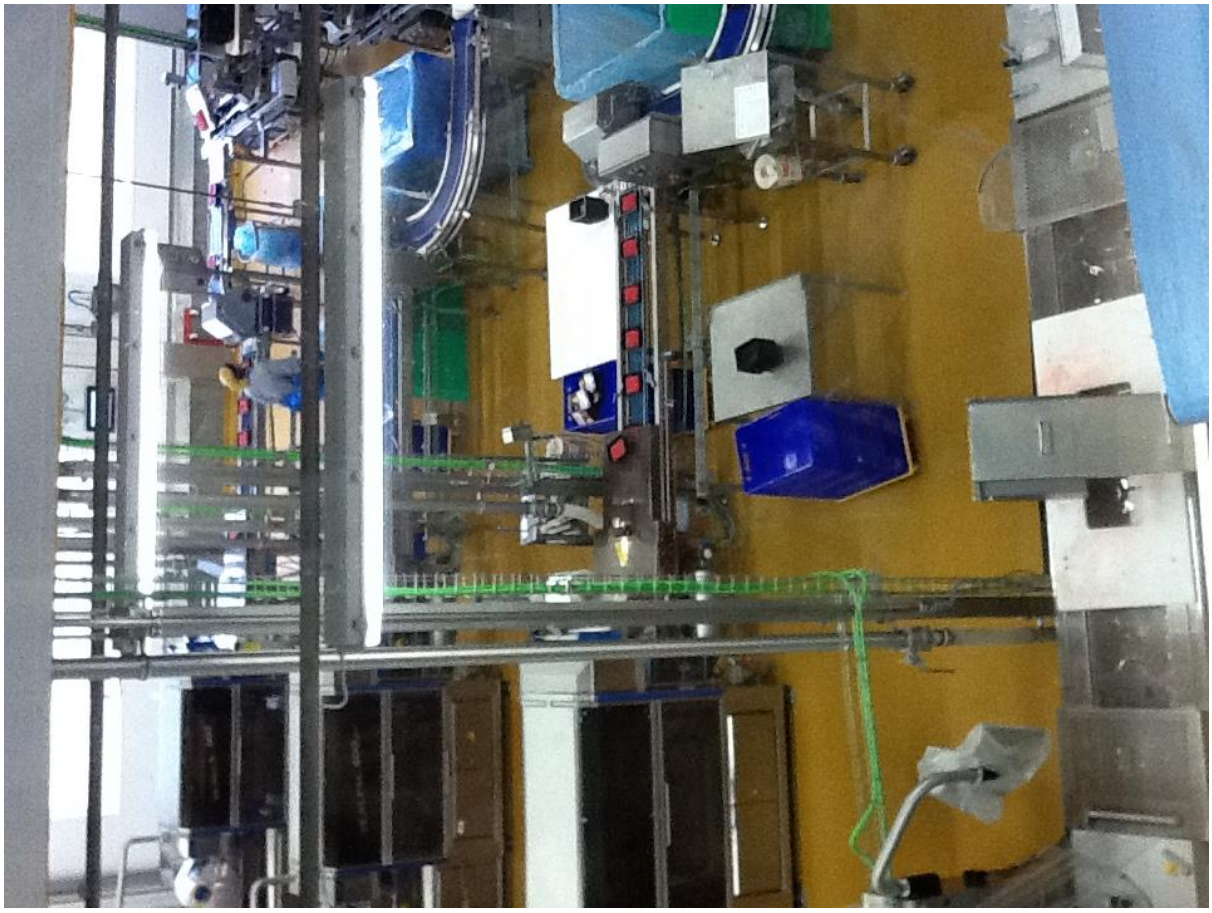

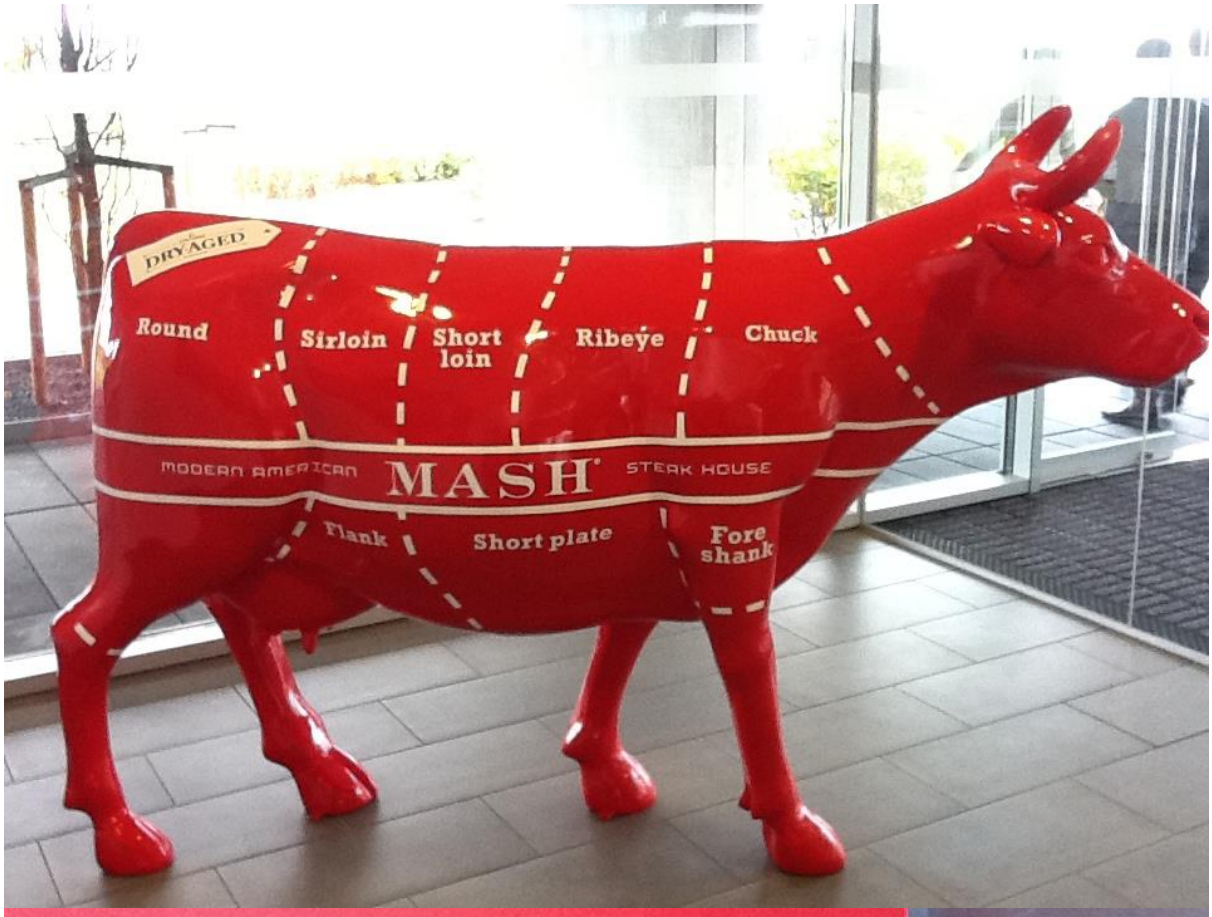
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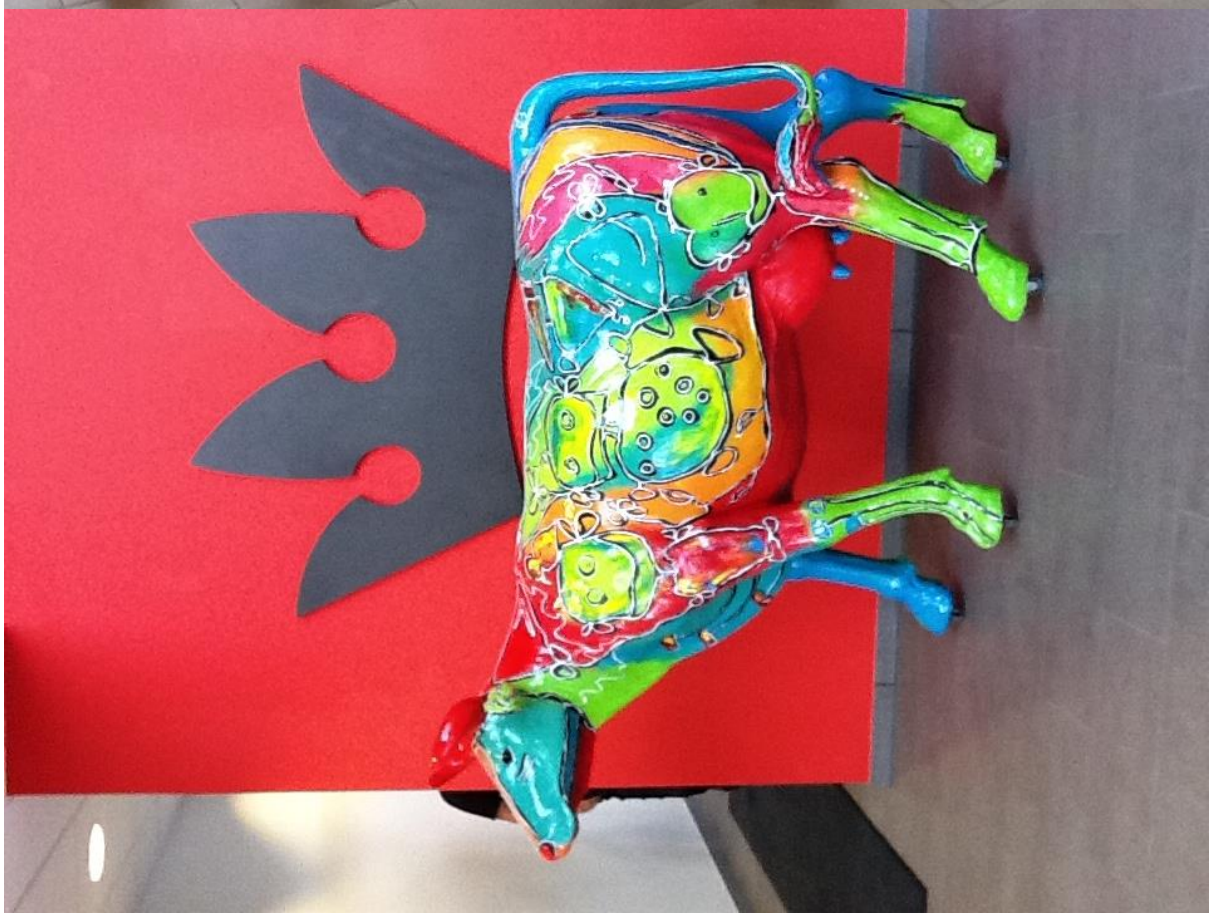
Sirloin
Short loin
Ribeye
Chuck
MODERN AMERICAN
MASH
STEAK HOUSE
Flank
Short plate
Fore shank



3.7 Pork processing

3.7.1 DANISH CROWN AMBA Pork processing site presentation and tour

Revenue - Danish Crown Group Approx. 60 bn DKK

Employees - Danish Crown Group Approx. 26,000

Members - Approx. 8,000

Supplies - Approx. 22 million pigs (14.5 million in Denmark)

Approx. 0.7 m head of cattle - 0.3 m in Denmark

Danish Crown A/S:

Danish Crown Pork: 21 pig slaughterhouses and cutting plants

Danish Crown Beef: 5 cattle slaughterhouses and cutting plants (including one in Germany)

Subsidiaries Ownership

Tulip Food Company - 100%

ESS-FOOD - 100%

Tulip Ltd. - 100%

Plumrose USA - 100%

Sokolow - 100%

Dat-Schaub - 90%

Scan-Hide - 76.6%

3.7.2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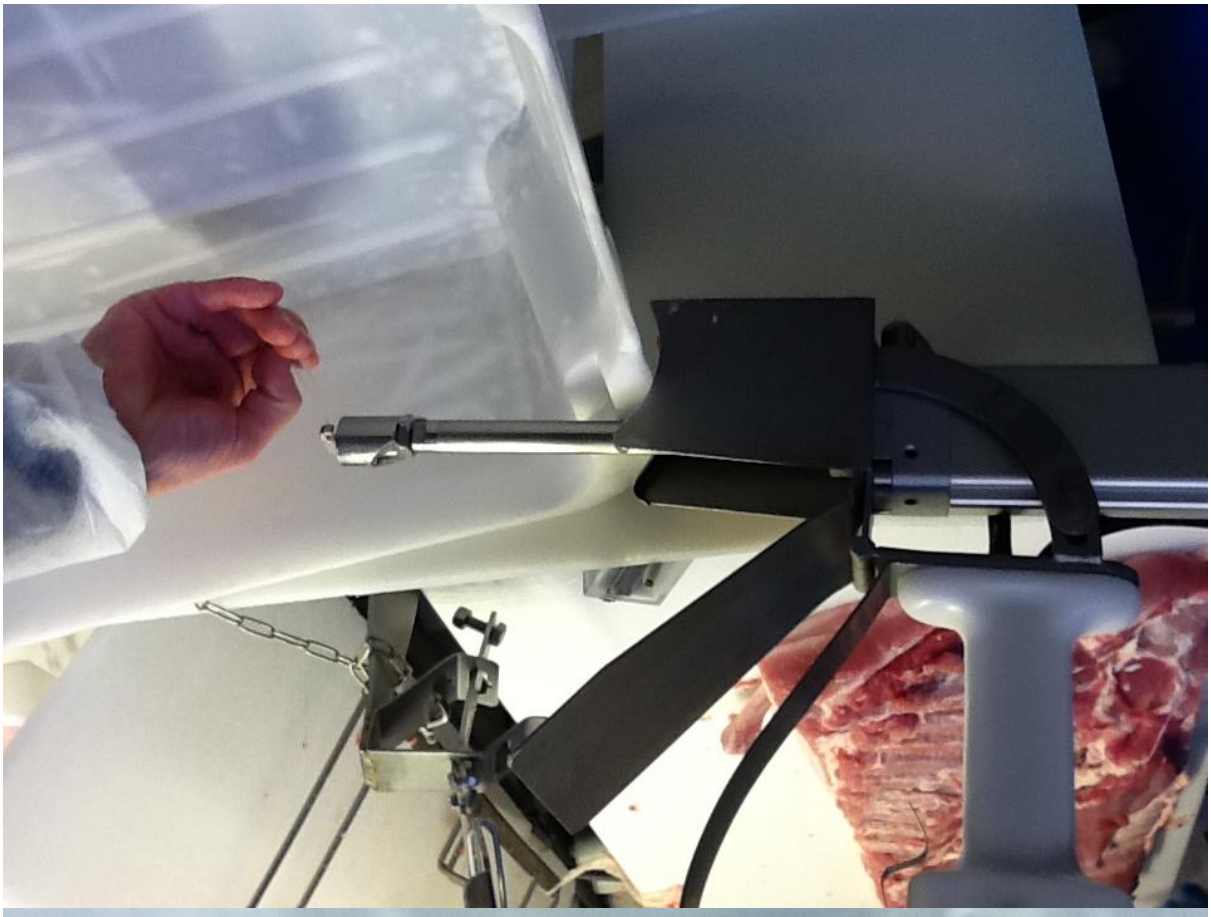
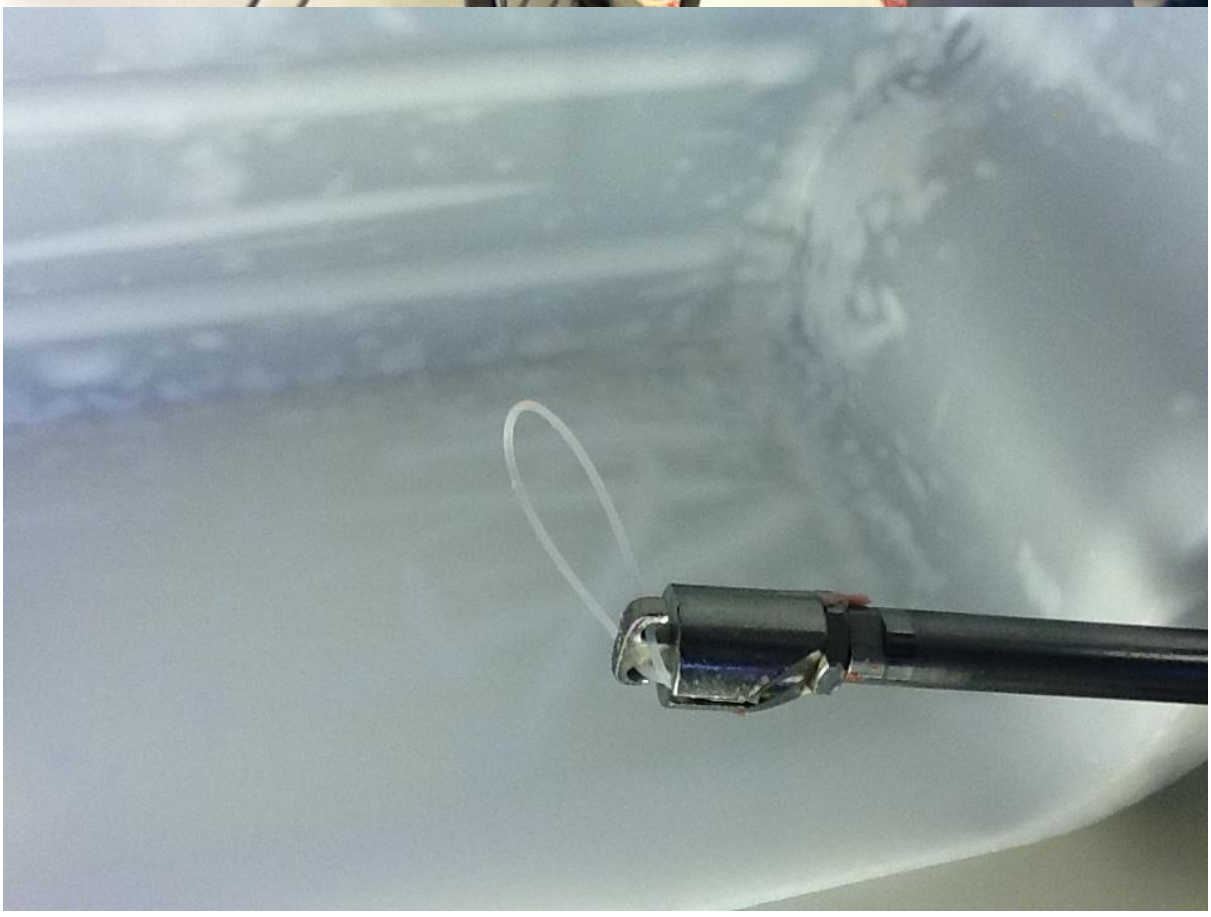
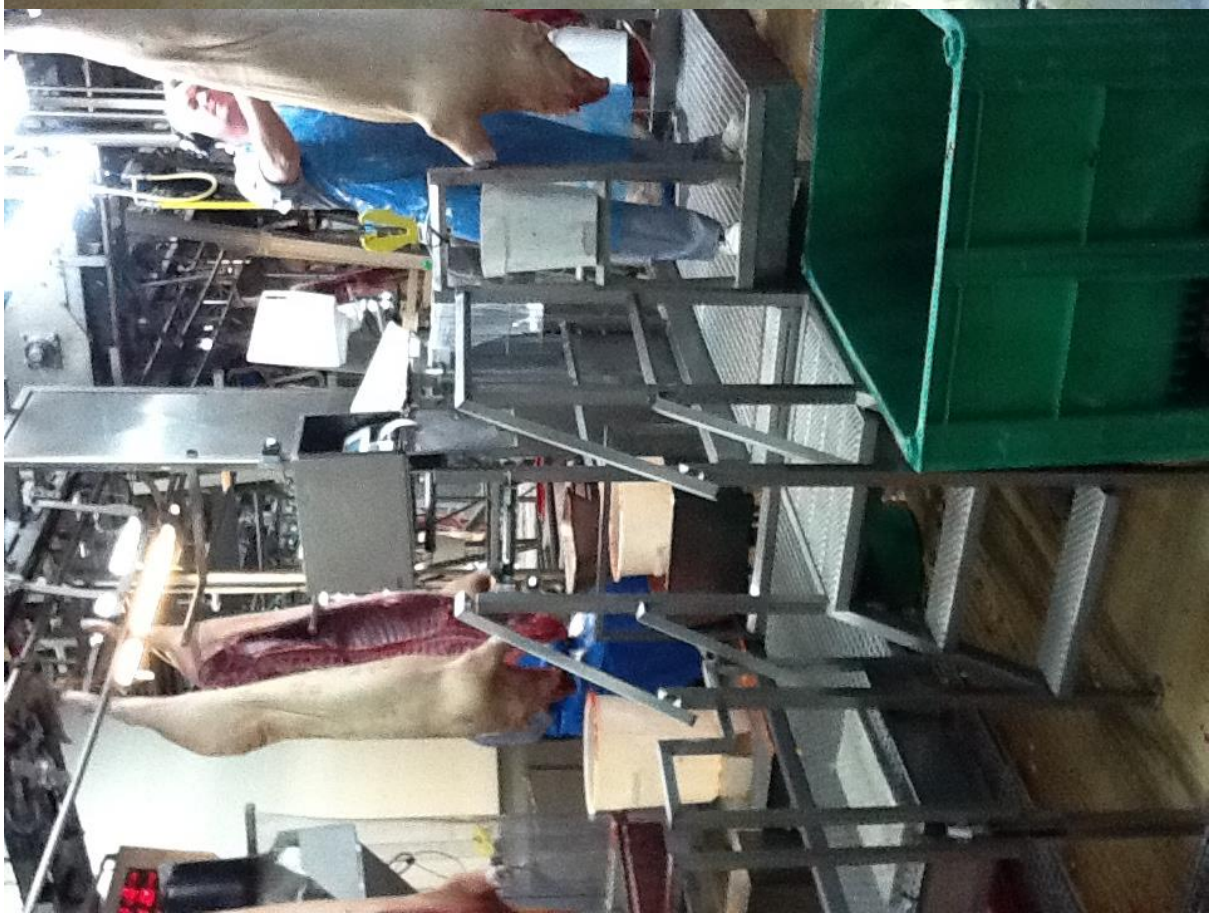
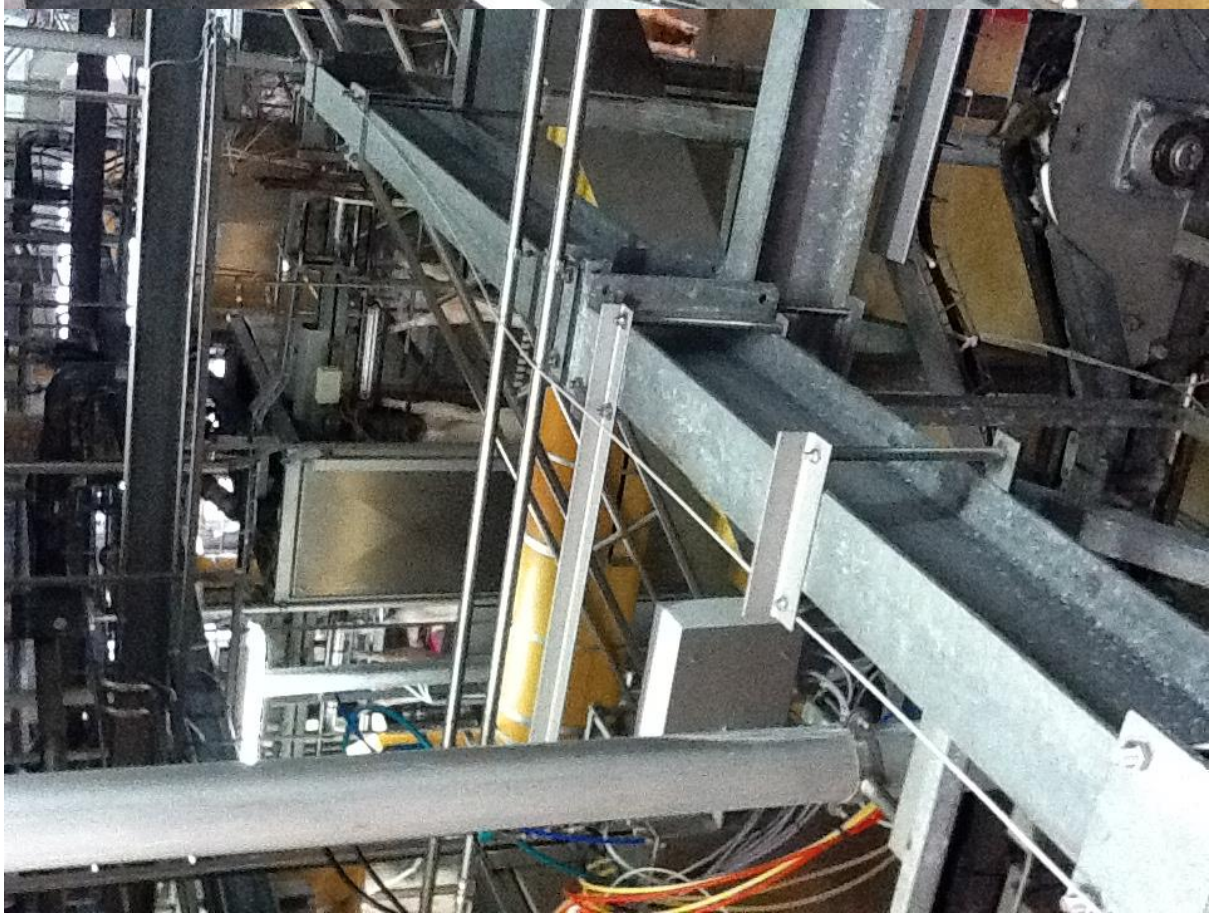
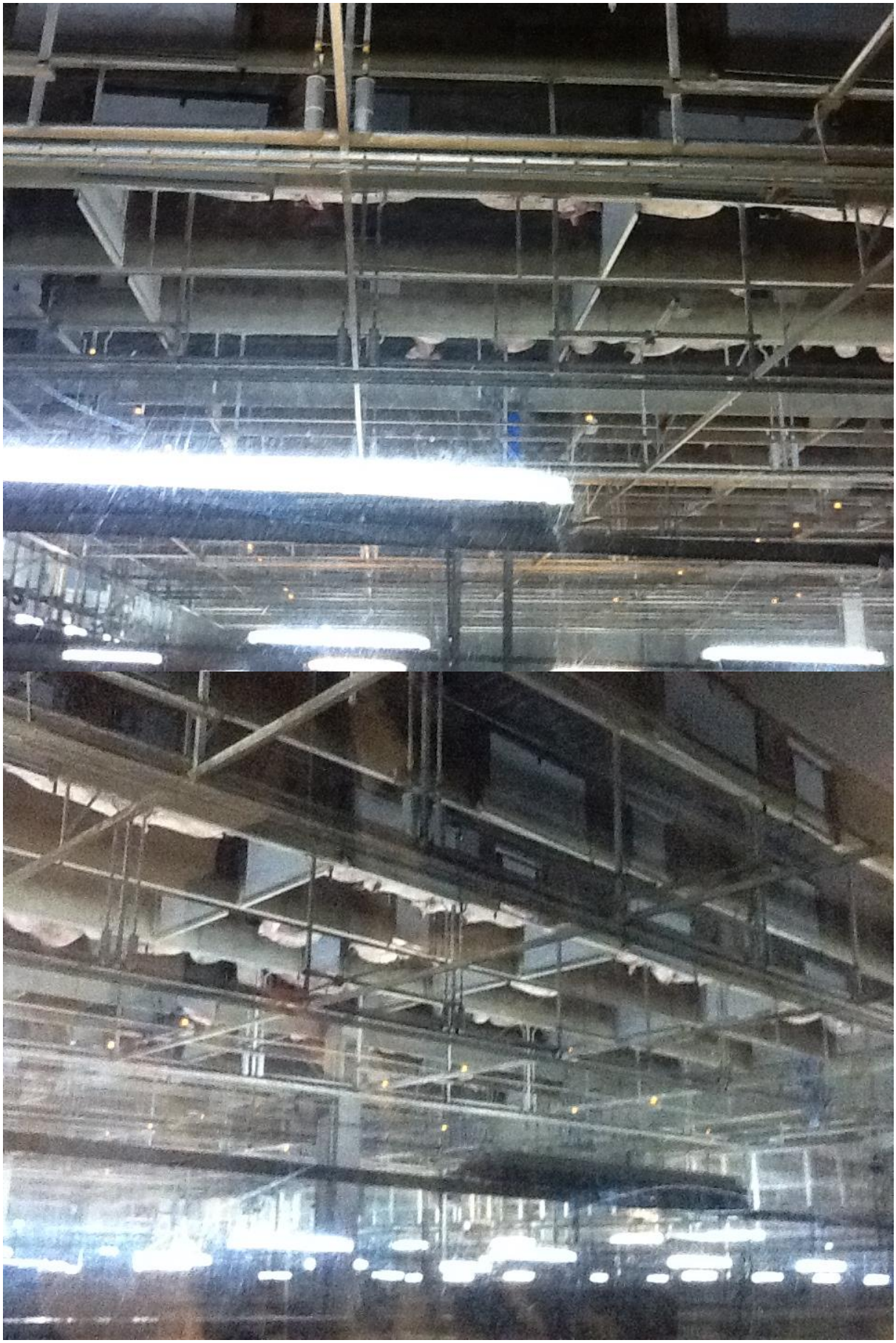




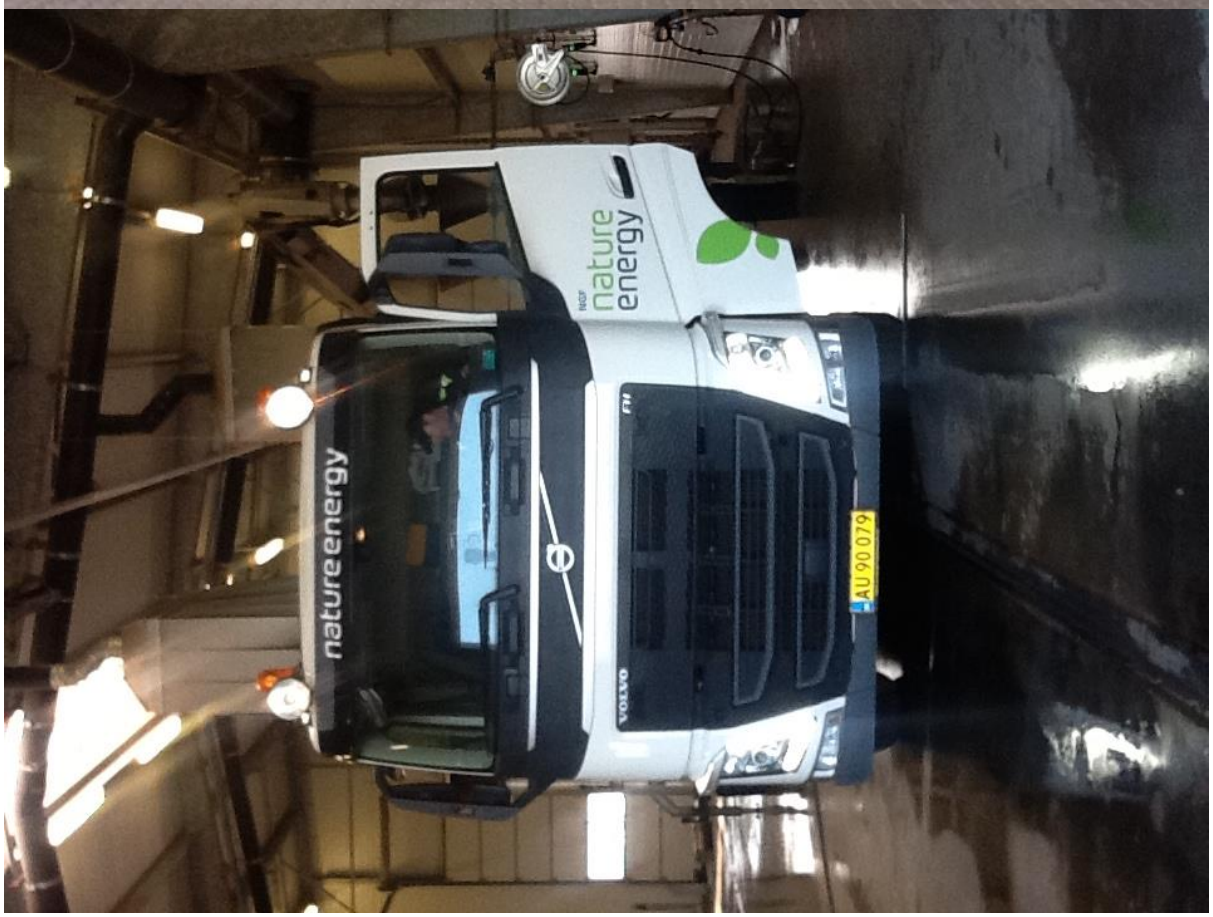






3.8 Bio Gas and Diesel processing

3.8.1 Danish Crown beef processing site presentation and tour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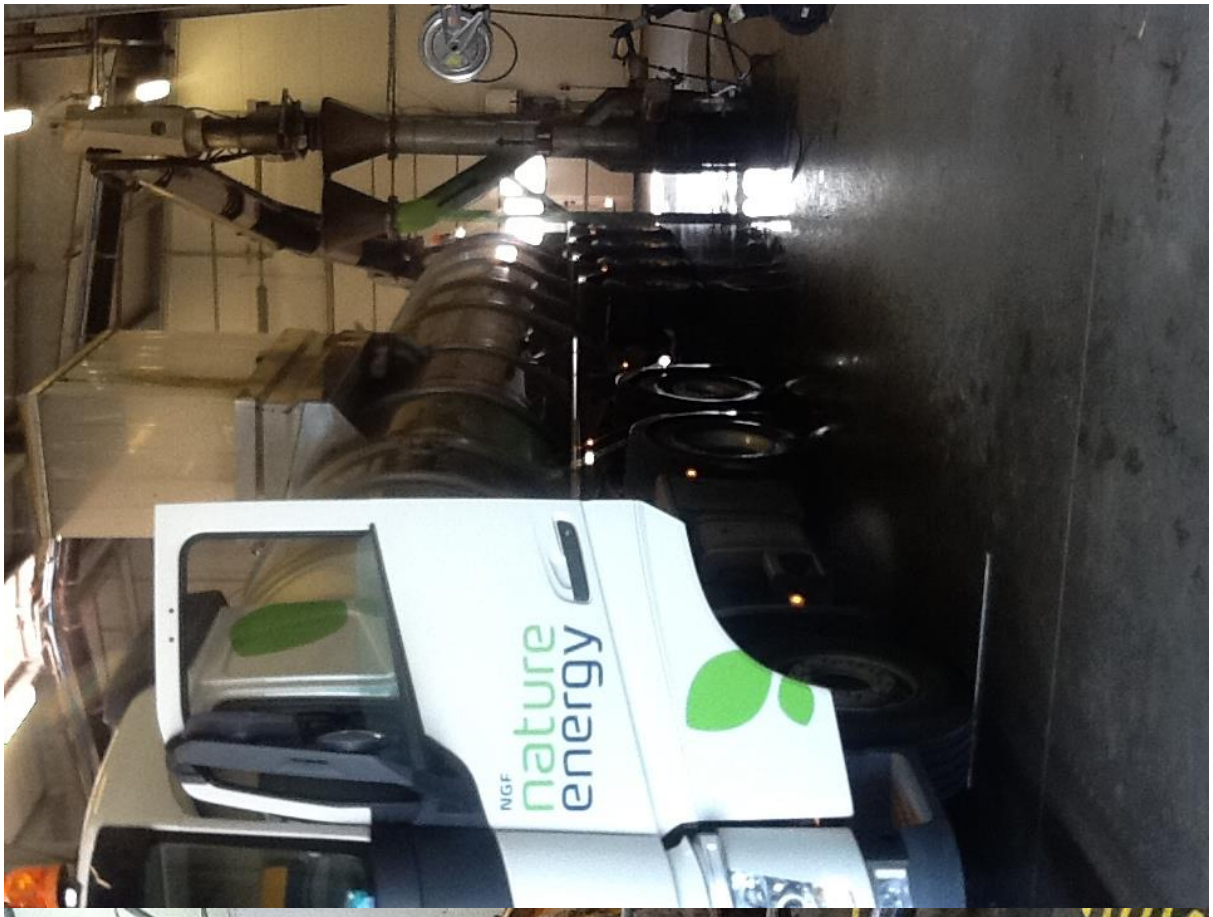
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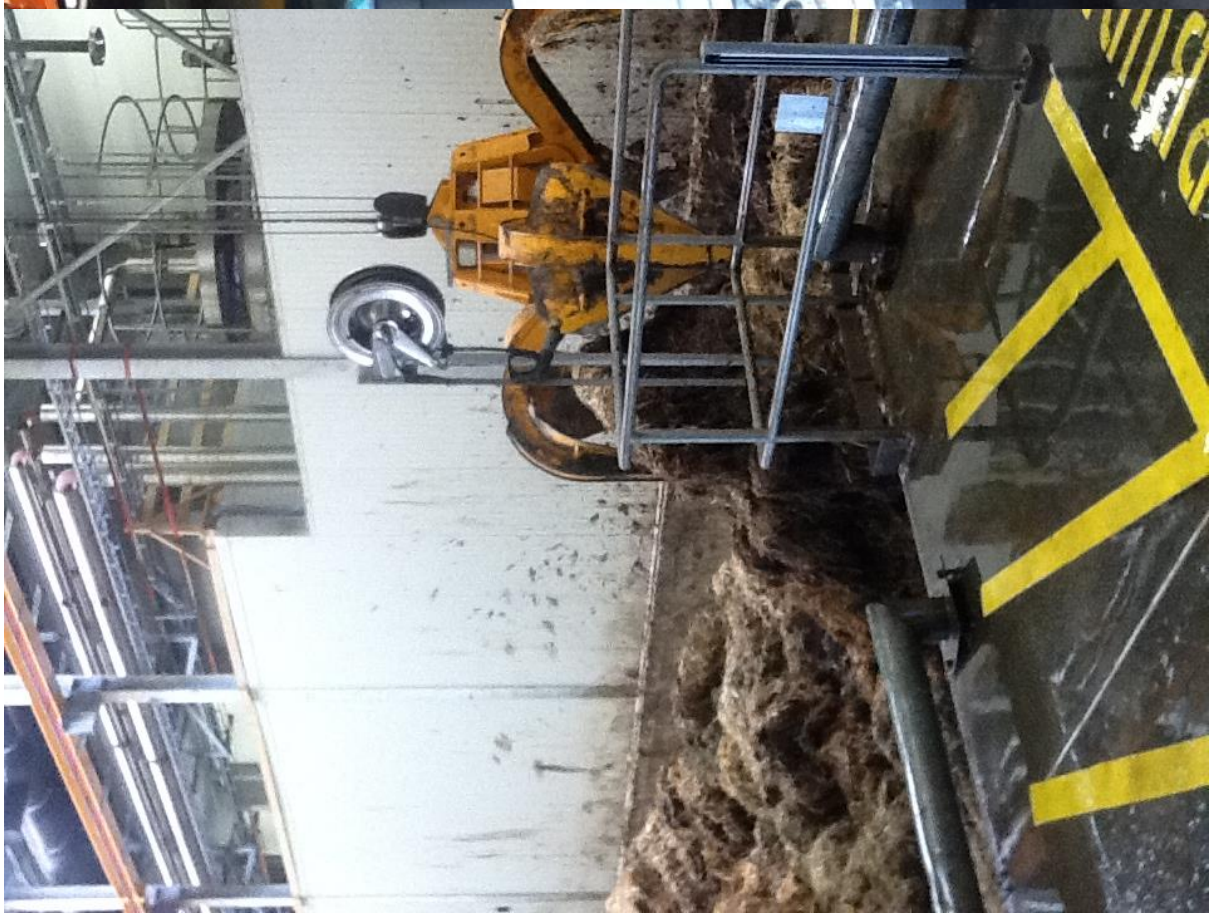


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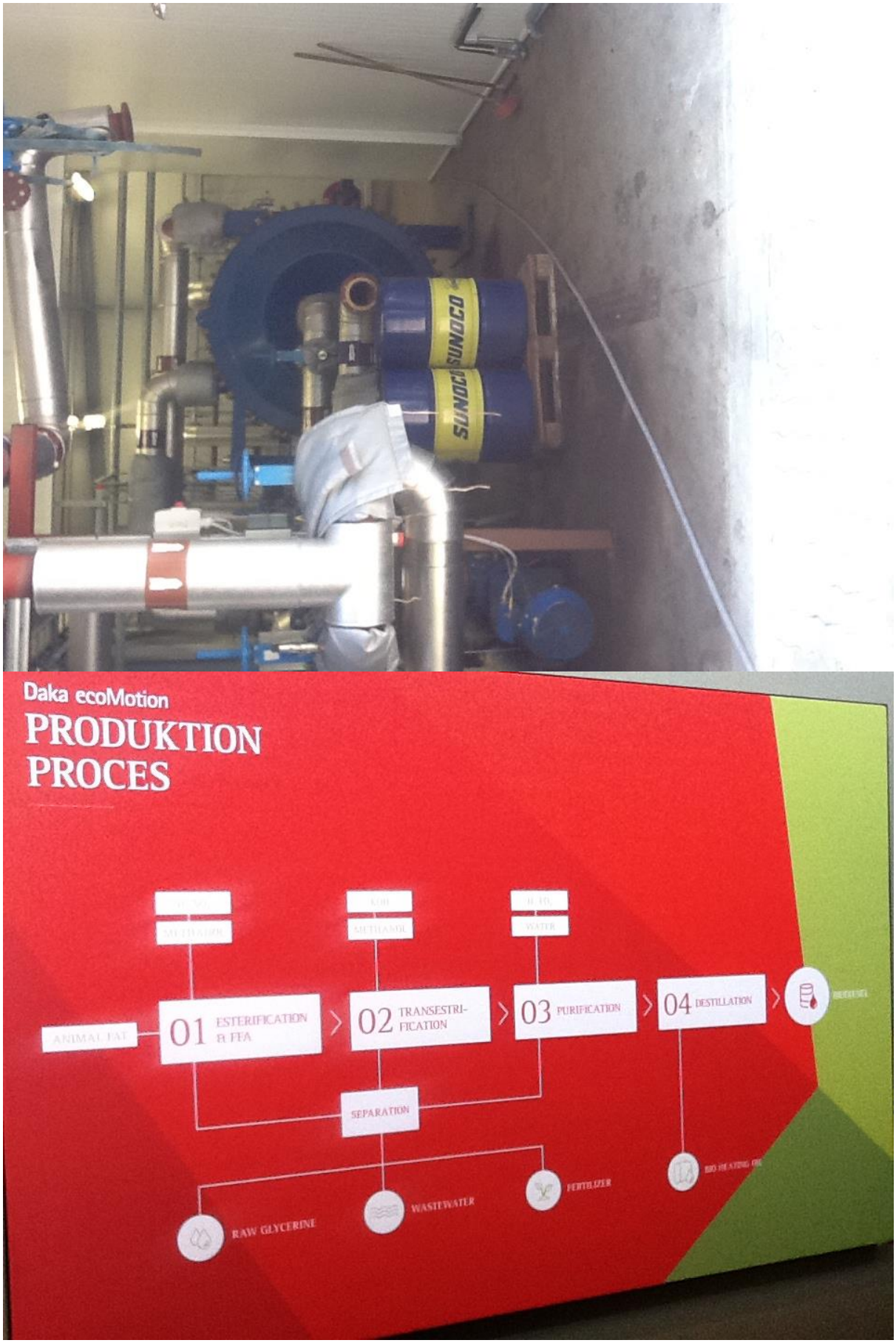
SUNOCO
Daka ecoMotion
PRODUKTION
PROCES
ANIMAL FAT
01 ESTERIFICATION & FFA
02 TRANSESTRI-FICATION
03 PURIFICATION
04 DESTILLATION
SEPARATION
RAW GLYCERINE
WASTEWATER
FERTILIZER


Biodiesel

3.9 Beef Processing Inalca

3.9.1

http://www.itfoodonline.com/en/files/re_COGENERAZIONE_BIOMASSE/ab_energy/COGENERATION%20PLANTS/Case%20History%20Inalca

https://www.youtube.com/watch?v=cdOF6M6LuRw&feature=youtu.be

http://www.google.com/patents/US6334811

Ospedaletto Lodigiano

The Ospedaletto Lodigiano plant was inaugurated in 1999 and is the largest plant for the production of beef and industrial meat-based processed products in Europe.
With a total surface area of 400,000 m2 (60,000 of which are covered) and a slaughtering capacity of approximately 6,000 head per week, the Inalca Spa plant in Ospedaletto has production lines featuring state of the art technology, guaranteeing excellent quality standards which respond to the rigorous hygienic-sanitary regulations of the European Union. All stages of the production process are carried out within the plant in a completely integrated manner. In addition to the first processing stage typical of the slaughtering industry (beef sides, quarters, fresh and frozen cuts), the plant also manufactures products with a high service content. The portioned fixed and variable weight products, ready meals, minced meats and hamburgers, also sold under the Montana brand, are destined in particularfor the large-scale distribution chains. The great variety of processing methods gives added value to the meat and guarantees a complete production cycle. With a production capacity of 10,000 tons of fresh hamburgers and 5,000 tons of portioned and fresh ready products per year, the new plant's extremely high degree of process automation makes it a global reference model for modernity and degree of innovation.
surface area total 400.000 mq covered 60.000 mq (planning permission for a further 100,000 m2)
Certifications:
- ISO 9001:2000
- ISO 14001:2004
- BRC Certification

MAIN ACTIVITIES EC code
Slaughtering IT 2270 M
Butchering IT 2270 M
Preparation of meats or minced meats IT 2270 M
ENG
Production capacity Data per year
Slaughtering 150 head/hour 350,000 head
Boning and butchering 100,000 tons
Portioned and processed in MAP 10,000 tons
Preparation of meat and minced meats 15,000 tons
Refrigerated deposit 10,000 tons
Energy and the environment:
- Refrigeration plant refrigeration units 10,000,000
- Heating plant Thermal kW 17,000
- Water treatment for 70,000 equivalent inhabitants
- Cogeneration system
Electrical kW 4,600
Thermal kW 4,260
Inalca Spa
viale Europa,10 26864
Ospedaletto Lodigiano (LO)
Tel: 0377 9791
Fax: 0377 979471

4 Key Messages

Overall impressions of the IFFA exhibition

- What is the focus and strategy of technology providers and processors in the EU and other countries? How can this inform the Australian direction?
- What learnings can be gained from comparing these approaches to the approaches in Australia, what are the gaps and what information do we need to upgrade the current information on these activities for processors in Australia?