



final report

Project code: A.SCT.0068 & P.PIP.0083

Prepared by: Liam McNamara

Teys Australia

Date submitted: August 2014

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

Teys Australia Internship Program

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.

Executive summary

Developing the capability of our people in the beef industry is essential to ensure the long term development and efficiency of our practices. Teys Australia (Tey's), with the support of Meat and Livestock Australia has developed a program to ensure communication channels are open between the Australia industry and one of the leading meat industry research organisations – Texas Tech University.

Still in its infancy stages, the program's aim is to create an exchange to provide opportunities for leading Texas Tech University students to become involved in the Australian red meat industry as well as open channels for Teys individuals to learn more about the US red meat industry.

At this stage, the reciprocal program has not commenced, however, over a two year period selected students from Texas Tech University have been involved in the Australian red meat industry.

Contents

Executive summary	2
Contents.....	3
Background	4
Project Objectives and Outline	4
Project Outcomes	5
Conclusion.....	6
Recommendations	6
Appendix A - Weekly Reports from Interns	7
Appendix B- Intercollegiate Meat Judging Competition (ICMJ)	10
Appendix C - Exit Interview	13

Background

The Teys Australia International Research Internship Exchange Program (IRIEP) was developed to broaden the company's professional horizons by facilitating the exchange of nominated talent between Teys Australia (Tey's) and Texas Tech University (TTU) in the USA.

The program's aim is to provide opportunities for both entities to grow professional meat industry talent and expertise and provide a learning opportunity for individuals assessed and identified as high performing talent in both organisations.

There were 2 programs undertaken in 2012 and 2013 where two TTU interns came to Australia for a short period of time to conduct projects at Teys Australia. The objective of the 2012 program was to:

- Identify considerations for building an ongoing industry program to link Australian companies with leading institutions.
- Conduct research projects using TTU undergraduate students.

It was clear that while successful, the 2012 program required some improvement for this program to give real value to both Teys and TTU as well as the Australian red meat industry. As such, the learnings from the 2012 program were used to provide more purpose and direction to the 2013 program.

The 2013 program structure changed from 2012 the program, with students from TTU coming to Australia for a shorter time period. This 2013 program formed the foundations of the IRIEP for the Texas Tech students coming to Australia, and also of the reciprocal exchange of selected Teys Australia employees, undertaking the exchange in the USA. The reciprocal exchange has not occurred

Project Objectives and Outline

Over the 2 programs, the interns were selected by Dr. Mark Miller of Texas Tech University to participate in the program. They were informed of the opportunity and were responsible to make the necessary travel arrangements to travel to Australia.

The immediate job upon arrival was to work with Teys Australia representatives in QLD to understand the differences and ways of slaughter, fabrication, shipping, and lab testing in the Australian meat industry. After successful rotation the students were in charge of grading carcasses in the chiller according to USDA grading standards and compared it to the Meat Standards Australia (MSA) as well as AUSMEAT grading systems.

The students not only got to experience the industry within processing plants but also got to do some research off site at University of New England in Armidale, NSW and also visit many feedlots and associations related with the Australian meat industry. The students were also actively involved in the Intercollegiate Meat Judging competition that took place in Wagga Wagga, NSW.

Through all of these practices the students were able to create a strong relationship with the Australian meat and livestock industry and have transferred their knowledge of the industry to everyday practices. This has created a valuable work and learning experience for both participants.

Project Outcomes

Relationships Created

The relationship created between Texas Tech University and Teys Australia as well as Meat and Livestock Australia was a positive one. On personal levels many business relations were created that transcended overseas and the students have continued to engage with other parties in Australia and discuss the ever changing industry both at home and overseas.

Expertise Developed

The students were able to use their knowledge of the United States beef industry to correlate with the Australian beef industry to compare quality grading standards. They discovered that the Australian grading system (MSA) is more rigorous than the United States system (USDA) but believed it was not as important in assisting in creating price differentials.

The students' expertise was also used in assisting with the judging programs at the Intercollegiate Meat Judging competition in Wagga Wagga where they assisted with coaching and coordinating with students.

Conclusion

In conclusion, the experience created for the Texas Tech interns to learn about the Australian meat industry and the Australian culture was a valuable one. Also, the knowledge shared to the Teys Australia staff over the visits has strengthened their capability in understanding the USDA and the similarities and differences to the MSA grading system. The relationships developed are continuing and the internship has strengthened the communication channels between Texas Tech University and Teys Australia.

Recommendations

The students enjoyed their experiences in Australia and found it a valuable learning and work experience. To ensure a mutually beneficial arrangement, it is important to have a well-structured program that outlines clear goals and areas of focus for the interns to work on. For future exchange programs, it would be beneficial to have interns work on a project in an area where they have a strong knowledge, to ensure information sharing for a mutual benefit.

Appendix A - Weekly Reports from Interns

Week 1

From what you saw this week, what drew your attention the most?

Participant 1: The leadership of the supervisors! It seems like no matter where I went, somebody was trying to help somebody out. I also didn't realise how much technology is required in the operation of a packing plant. I was fascinated by the amount of technology and how it all works. When it is working correctly it makes production more efficient.

Participant 2: From all that I observed what drew my attention or impressed me the most was the employees ability to work under changing conditions. Anything can cause a problem in a beef plant, the hard part is knowing how to respond. The supervisors do a great job when these problems arise at finding a solution and leading the workers under them to fix the problem. I was also impressed with the processes used in the boning process.

What areas did you spend time in this week? And what did you learn from each of these areas?

Participant 1: Tuesday and Wednesday I spent most of the day in load out. We learnt the different types of shipping and the requirements needed for the product to leave the plant. We also learned how to repair boxes and how to scan out loads. Thursday and Friday were spent mostly in the boning room where I learned the safety procedures required to keep production operating and actually helped take samples and record procedures. I also helped with bone checks, to see how clean the bones are getting and with the separation of tendons. I learned a lot of general knowledge about the boning room.

Participant 2: Tuesday & Wednesday: shipping and load out.

On Tuesday we observed and learned the processes of shipping. We learned that there are two different types (chilled and frozen) and that each type must follow specifications in order to leave the plant. On Wednesday we learned more about the meat as it enters the shipping room and assisted with non-lidded boxes. We learned the process of scanning orders into the computer system and the techniques used to keep the place organised for orders.

Participant 2: Thursday & Friday: Boning Room-

I began my time here with a tour of the whole process. I have learned a lot from my time in this room and my learning process started with my tour. I learned the cattle are allowed to run at certain times and must be done in order (allowing the EU cattle to go first). The boning process was explained to me from final trim to nothing left but the hind bones, and I learned how once the meat is cut, how it is packaged and sent to storage. After my initial tour, I worked heavily with the supervisor, learning the process of the trim area. He taught me about chemical lean, finely textured meat, chemical lean rationing of meat and how they run through the 'Eagle' to be scanned for components in the package. On Friday, I learned about tendons and the rest of the ends and pieces in the trim.

What were your initial impressions upon entering the plant?

Participant 1: The plant is extremely sanitary. I like the fact that employees are required to thoroughly wash before you enter and when you leave. The plant is also smaller than what we are used to in the U.S. but seems like what they are doing is working well for the size. The people are nice and would help where ever they can. Also the technology is very "up to date".

Participant 2: I felt the plant is very up to date and modern. It is very similar to the USA and feels as clean and productive as the U.S plant.

Is there any areas you spent time in this week that you would like to spend more time in and why?

Participant 1: I would love to spend time fabricating carcasses. In the states I have become pretty good with a knife but not knowledgeable enough to break down a full carcass. I am fascinated at how fast the guys use their knives. I understand the general knowledge of the boning room, now I would like to learn what makes it happen.

Participant 2: I would really like to spend time learning how to break down a carcass like it is done on the line. I would also like to spend some time checking the specifications that the floor is supposed to run on (such as water temps, making sure final trim is up to par, etc). I would also like to spend some time learning about other stations of the boning room, I have enjoyed what I have learned, but I would like to expand and do more.

Is anything you have seen this week similar to what you have seen in the states or different?

Please comment on how.

Participant 1: In the states we fabricate carcasses a little differently. We break the carcass down into 4 primals – round, loin, rib and chuck. From there the 4 go to separate lines where they are further broken down. Here the carcasses stay on the same line and is broken down into sub-primals “in the air” and passed to the slicers below who further process the cuts. Other than that the processes are extremely similar.

Participant 2: From what I have noticed the general concept is the same. The differences in the boning rooms in the states are set up in a different order in which the carcass are halved upon entry and the hind quarter is sent one way while the fore quarter is sent another. Also there is a difference the overall carcass breakdown process (how bones are kept in or not, pre boning carcass ribbing and just general line differences). I feel that both systems provide a good systematic way of doing things. However, I feel the U.S way is slightly more organised but the Australian way involves more craftsmanship, skill and knowledge of the carcass. I actually prefer the Australian way, other than boning, the packaging and shipping is very similar just on smaller scale.

Comments on Project Work completed; challenges and how you overcame them. Draw from previous experience or just observations and comments.

Participant 1: The grading system? I would like to learn the grading system soon and how it ties in with the different styles of boning (if there are any)

I do not know who to ask the question to but I would like to understand a little more about the bone/lean machine. How the lean is removed without any bone left. I think its amazing how that happens and I am not sure we have that in the states

Participant 2: Mainly my questions have been answered. I would really like to learn about the Australian grading system. We spend a lot of our time in the states doing our U.S style of grading and I feel its impossible to truly understand a meat industry until you understand its grading system. I think learning the system and spending time doing it would make the time spent in other places more valuable.

Week: 2

From what you saw this week, what drew your attention the most?

Participant 1: The difference in cattle than what we have in the states. The cattle in QLD relate similar to the cattle in the deep southern states, mainly Brahman influenced. Aside from the live end, the beef grading is much different than how we grade in the US. Parts being the same but overall different.

Participant 2: The areas that I have been in this week have shown that they are unique to each country. At the sale I learned that the cattle fed for slaughter are quite different (fatter cattle have a stronger market in America and breed variations and genetics are different) and the scale system (holding facilities, pen set up and animal treatment conditions are different). In the chiller assessing part of my week, the grading system drew my attention. There are similarities such as marbling scores and muscling scores but the MSA systems bring in many more steps such as pH and fat colour that make it a more complex and for industry standards a better system.

What areas did you spend time in this week? And what did you learn from each of these areas?

Participant 1: On Monday we went to Toowoomba and saw the cattle sale. We learned about the difference in cattle, the market, and what kind of cattle we are looking to buy for the plant or feedlot. Tuesday I learned a little bit about chiller assessment. We learned the difference in AUSMEAT grade and MSA grade and the differences in those than the USDA grades. Thursday Nick and I visited Eagleby school. We met with the kids and teachers and explained what it is we do and how much agriculture is beneficial to society. Friday we worked with the chiller assessors again and did a correlation test, a test to see how close we were to them. A few more days and we should be good.

Participant 2: Monday – Cattle sale in Toowoomba. This was a valuable experience in seeing the live side of the cattle industry in Australia. I learned about the steps a cattle seller does through in order to obtain cattle for slaughter at the plant and to feed at the yard. It also gave me a good look into the holding, transport and preferences of cattle in Australia.

Tuesday, Wednesday and Friday – Chiller Assessing. Began learning about the process of grading cattle in Australia. This is probably the most valuable experience that I have gone through. So far it has taught me about the steps a carcass goes through to be graded and what each grade's specifications are. Grading has given me a much better look into the preferences and standards of the Australian beef industry.

Thursday- We mainly spent the day on a trip to a Teys sponsored school. It was a great experience to see a school in need and what a company can unselfishly do to help. I enjoyed participating in giving back and it taught me that a big corporate company can still give back in these times.

Is there any areas you spent time in this week that you would like to spend more time in and why?

Participant 1: I would like to spend more time grading both on the kill floor and in the chillers. I feel like that is the area I can learn the most and is also the area that differs the most from the US system. By learning the system I feel like I would understand more about the industry, fabrication, buying and marketing.

Participant 2: I would like to spend more time in the chiller assessing position. I would like to gain a more in-depth knowledge of this area and be able to fully and confidently grade carcasses (the MSA way) by myself. I feel that gaining this knowledge would give me the best understanding of the Australian beef industry and a better idea of what the Australian consumer wants.

Is anything you have seen this week similar to what you have seen in the states or different?

Please comment on how.

Participant 1: The cattle in Australia are sold at live weight similar to the US. The difference is the types of cattle marketed to the plants in the US are generally younger, fatter, higher quality cattle rather than higher yielding cattle. Also the ageing and grading systems are different. In the US the ageing is done by the thoracic vertebrae not by the teeth. USDA has one set grading system that works for all cattle not select cattle. The system is also easier to understand by consumers (broader).

Participant 2: In the American cattle industry the sale structure and techniques are the same. The differences lie in the variations of cattle: America has a market for fat cattle, America probably has a more in depth genetic basis in its cattle and the ages of cattle that are sold and fed calves that have already been finished on grain.

Participant 2: Our grading system has similarities to the one here. Taking marbling, ageing and colour into account. However there are some more in depth features such as pH, fat, colour etc. that provide for a more in depth grading system in America. I feel our system is set up to provide maximum profits from the middle meats (rib and loin) and results in a majority of the rest to be used in trim; the Australian system does a good job for export trade utilising more muscles.

Highlight of the week:

Participant 1: The highlight of the week was going to the sale in Toowoomba and learning which type of cattle to buy. Also being in the coolers learning the different grades and how to assess them. Also enjoyed visiting the school and teaching the young children.

Participant 2: Chiller accessing was definitely a highlight of my week. It is one of my favourite areas and gives a good overview of the industry here. Being able to go to the Eagleby school would have also be a highlight. It is good to see a company that gives back and proves to me that it is a beef plant that is of high quality.

Week: 3

From what you saw this week, what drew your attention the most?

Participant 1: What drew my attention the most is the amount of research and different projects that are presented. Its good to see people set aside to generate ideas and improve ways to operate. I never realised the amount of work and time a new idea or project can consume.

Participant 2: This week involved the formation of many new projects. During the HGP history review I was shocked to see the wide variation at which HGP's are used to being completely left out in cattle. In one cooler you can see carcasses that have been nil on HGP use and grass fed to carcasses that are doubler HGP and 120 grain fed.

Appendix B- Intercollegiate Meat Judging Competition (ICMJ)

The interns travelled to Wagga Wagga for the Intercollegiate Meat Judging Competition (ICMJ), hosted by Teys Australia, Wagga Wagga.

They were assigned as assistants to the organisers and as mentors throughout the competition. Providing help to both organisers and the participants of the competition.

From what you saw this week, what drew your attention the most?

Participant 1; The thing that I was most surprised to see this week was the co-operation between everybody involved in setting up the contest. The talks were very well organised and the contest was enjoyable to be a part of. Also, the level of participation from all the students from the universities was outstanding. I enjoyed hearing all the professional talks and learning about the different businesses and organisations with in the Australian meat and livestock industries. I also learned the different projects that are taking place right now all across the world from some of the top scientist in Australia. I was also glad to see the ties Australia had to foreign countries. I enjoyed visiting and learning with the students from Japan, Indonesia, and Pakistan.

Participant 2; What really drew my attention this week was learning about many facets of the Australian meat industry. Our week in Wagga was very beneficial from a learning standpoint, especially after experiencing the plant production side of the beef industry. I definitely enjoyed listening and learning from many leaders of innovation in the meat industry.

What areas did you spend time in this week? And what did you learn from each of these areas?

Participant 1; I helped MLA and the organisers of ICMJ with whatever they needed help with. We spent time at the plant helping set up the classes for the contest and group leading during the contest. We also helped cook for a consumer tasting professional talk put on by Rod Polkinghorne and Linda Farmer. On Wednesday we actually taught during the judging work shop on how to judge pork primals, lamb carcasses, and how to write reasons. Friday and Saturday was devoted to the contest and setting up for the banquet. I learned how much it takes to set up for a contest and a week full of workshops. The experience I have gained from this week will help me be organised and prepared if I ever have a similar task to perform.

Participant 2; A majority of our time was spent assisting with the sessions and contest where we were fortunate enough to meet many influential people such as the ICMJ president. I was actually fortunate enough to be able to teach a portion of a section over writing reasons. I was able to work with and instruct students not only from Australia, but also Japan, Indonesia, Korea, and Pakistan. I was able to help the students with their format on writing reasons in the contest and in the process learned a lot from working with all different types of students. I gained a better perspective of the meat industry and meat judging practices around the world. We also spent much time listening to lectures of many knowledgeable and influential members of Australia's meat industry. We were able to sit in a lecture and listen to Rod Polkinghorne who gave us a better comprehension of the MSA grading system.

Were there any stand out universities at the ICMJ Competition?

Participant 1; Some of the outstanding universities that participated in the contest were The University of New England, CSU Wagga, Murdoch University and The University of Melbourne. I was glad to see that so many schools were interested in what ICMJ had to offer. The presence of the international guests was also a pleasure to see. The international guest included students and teachers from Japan, Indonesia, Pakistan and Kansas State University.

Participant 2; After spending time with students and faculty from numerous universities I can say that everyone I met at the contest seemed to be very intelligent individuals that showed

extreme passion for the advancement of the Australian meat Industry. However schools that seemed to stick out were CSU Wagga, Murdoch, and UNE. The students and Professors I encountered from these universities seemed to really excel in terms of knowledge of the industry as well as industry experience.

Did you meet anyone at the week that you would like to remain in contact with (in a professional capacity) and why?

Participant 1; Linda Farmer, one of the leading researches of taste in the world and Dr Alex Ball who is one of Australia's leading scientist and project developer for MLA. People like this would be great contacts to have for help in future projects. While I am pursuing my Master's degree in meat science, I intend to have great assets to the industry and scientific world. By knowing and managing contact with these people, I will have some of the best contacts in the world.

Participant 2; I would certainly like to stay in contact with Dr. Alex Ball, I was able to speak with him after dinner one evening and he further explained some concepts they were working on at MLA. They are doing a substantial amount of work with consumer perception and I am interested in doing similar work later in my career so I definitely hope to stay in contact with him. I also had the privilege of meeting Dr. Linda Farmer who is one of the world's most renowned meat flavour scientists. I also was able to speak with Dr. Farmer after dinner one night and she informed me of some flavour work she was conducting and it really sparked my interest. She informed me that she occasionally does some of her work at Texas Tech University so I will hope to be in contact with her again in the future.

Is anything you have seen this week similar to what you have seen in the states or different?

Please comment on how.

Participant 1; The Wagga plant was similar to the Cargill plants in the U.S. I was surprised to see how animated the boning room was and how it represented the way we do production in the states. The difference I saw this week was definitely in the contest. Our contest is set up with ten classes five of which we write reasons on of how we placed the classes. Also I have noticed that our primals and sub primal's differ from the Australian cut method.

Participant 2; When we went on the tour of the abattoir and feedlot I was very surprised at how similar it was to the states. Almost all of the practices are the same just on a smaller scale. During the lectures about problems facing the beef industry I also recognised many similar challenges that our industry is facing in the states. Both of our countries industries are trying to become the absolute most efficient about raising and processing their beef, but also they are taking different approaches to getting there. I was extremely interested in the differences in our grading systems and how complex the MSA model is compared to ours. I feel the USDA system will soon be challenged to acquire more variables to allocate different grades to different cuts in order to get the most value out of every carcass, much like the MSA system.

Is there any areas you spent time in this week that you would like to spend more time in and why?

I really enjoyed spending time listening to the lectures about the Australian meat industry and new plans for innovation that were going to be soon implemented. I certainly would like to spend more time learning about the MSA grading model and how the equations that go into that model came into being. I would like to learn more about the development of the model and all of the research that went into creating it.

Highlight of the week and what would be the top 3 things you would communicate back to Texas Tech upon your return?

The highlight of the week would be all the professional talks and learning about Australian agriculture as a whole. One event I would enjoy having at Texas Tech would be bringing in local business men to talk about the agriculture business and what effects are present in American agriculture. To go along with the professional conference, I would like to see Tech hold agriculture career fairs in order to help students try to find the job they would be most interested in and the requirements that are needed for that job. The third event I would communicate back to Texas Tech would be the importance of inviting international students to learn about American agriculture. I think it is of most importance to hold strong ties with international affairs especially in the agricultural field.

- I think the way they set up their meat judging contest has much to be desired. Not only did they hold a contest but they had multiple sessions where students were able to get hands on experience in areas such as fabrication of carcasses and consumer perceptions of meat attributes. I feel this can be extremely beneficial in sparking students interest in meat science and urging them to pursue a future in the meat science industry.
- I also think that inviting international guest to participate to in their contests and attend their sessions is very beneficial. Not only does it allow international students to experience many facets of the Australian industry but it also allows for the sharing of ideas between students from many different countries and environments.
- The fact that there was a career fair at the contest was very interesting to me and I felt that it was an excellent opportunity for the students that attended to pursue future jobs available for them in the meat industry. This allows the industry a chance to acquire knowledgeable and dedicated students that want to make difference in the industry.

Do you have any questions or any other comments?

I just want to express what an excellent experience this was for us to attend the contest and be introduced to many influential industry leaders. During our time in Wagga Wagga we were able to experience what a University campus was like in Australia, see many different industry practices, and learn about the Australian meat industry as a whole. This was an excellent opportunity for us to not only meet fellow students and inquire with them about agricultural challenges facing our generation, but also to meet many professors and industry leaders to give us a better perspective of numerous aspects of Australian meat science. It was an extremely beneficial week it terms of industry experience away from working in a plant.

Appendix C - Exit Interviews

What is your current level of knowledge of the Australian Meat Industry?

- Current experience covers all aspects from paddock to plate.
- Attend cattle sale and observe process.
- Feedlot visits (Condamine / Jindalee) observe comparisons between the US and Australia.
- Experience Beenleigh and Wagga Manufacturing Plants, evaluating both Boning Room and Loadout Departments, as well as Chiller Assessors on Oscan and carcass grading which has helped to assist in his research section of Australian Visit.
- Attend ICMJ contest which has better developed tools in public speaking and compare the difference between the US and Australia in Meat Judging.
- Further knowledge in Processing after hands on experience in production areas,

covering Boning Room (Different methods, products and Safety Procedures) and what it takes to run a meat plant.

- Further knowledge surrounding Australian Feed-lots and is very different to US methods.
- ICMJ contest in Wagga and the difference between the two countries, difference being there is a lot more practice before contest, even months before hand in the US compared to Australia, most of the students don't have complete ideology of what a meat judging contest is until they show up
- We have more exposure to pork than Australian Students. Australian Students had limited knowledge of pork / primals of which is common practice for US Students.
- In the US Meat Judging contest involve multi species (Beef, Pork & Lamb) and in Australia the majority of Meat Judging contests involve beef only, but are starting to incorporate pork in to these contests and should see it fully integrated in years to come.
- Able to attend a High Risk fully cooked facility (Tey's Australia Food Solutions) More aware of the challenges facing High Risk – High Care furthering processing facilities.

What are your views on the Australia meat industry

- Australian Meat Industry is not as labour intensive as the US.
- A lot more Bos-Taurus cattle depending on region - higher grading in the US than Australia which is entirely climate driven for logical production.
- Northern Plants require a higher Bos-Indicus content due to climate compared to southern higher Bos-Taurus content (British Breeds)

How has the experience shaped your opinions of the Australia Meat Industry

- Very exciting to speak and experience some of the Australian Industry Leaders and a lot more work moving forward between the two countries and problems surrounding our industry and feeding the world as a whole instead of keeping research domestically.
- Expected the Australian Meat Industry to be similar only on a smaller scale with a different type of cattle, same productivity and same efficiencies and this was confirmed.
- Australian Exports of Beef is substantially higher than that of the US, being that US has higher volumes of beef for the domestic market.
- The US do not have a collective of peak industry bodies that drive unified standards (MLA)
- Our experience of the US program is grow them quick with only a few quality parameters which we now understand are likely to lead to reduced eating quality.

Can you comment on Meat Standards Australia Grading systems (MSA)

- MSA grading systems are more advanced than US system in terms of variables that even though are very similar Australian standards incorporate more grading characteristics i.e. hump height.
- There is no consumer testing with the current US system.
- There is rarely a case that HGP's in the US are not used and have learnt that there are positives and negatives, if you are trying to produce more total pounds of beef at a faster growth rate it is definitely the way to go, but if you want to

produce better eating quality beef then the use of HGP needs to be off-set to negative eating quality result due to HGP use.

- We have different cultural impacts on the way the beef is consumed, not a specific cook method as there is in Australia.
- Over 70% of US consumers are oblivious to meat quality is in terms of MQ4.
- In the US compared to Australia, Meat Colour is our gauge of pH and the level of pH is not a determining factor and is based on visual assessment.

What do you believe are current key global issues affecting our industry

- Attended lectures from industry leaders in Australia, many seminars over data and future problems facing the Australian Cattle Industry and some similarities between the US and Australia.

What do you believe are the benefits of fully integrated supply chains?

- You are going to capitalise on your profit, you get to customise things the way you want.
- Vertical Integration is crucial to maximising profit, covering basically paddock to plate and the benefits of owning your own feed-lot to be able to customise your cattle the way you want them to or the way the market is driving and capitalise your profit.

What involvement have you had with technology that may assist the Meat Industry as a whole

- Exposure to a Cargill Beef Plant and educated on video imaging analysis relating to marbling to get a more consistent and accurate determination of marbling
- Real time ultra sound, helping to assess carcass composition of the live animal.
- Participated in harvest at local meat laboratory.
- Exposure to the latest Kill Floor technologies currently being developed.

What work will you complete once you return to the USA.

- Would like to obtain doctorate in Meat Science, working for a University on research projects as per project performed whilst visiting Teys Australia, further develop people surrounding industry as a whole.
- Get into the genetics developing a so called perfect breed of cattle that would be used in a small scale meat works from raising our own cattle, basically from paddock to plate.
- Be presented with a problem industry based and have the knowledge and background to solve them.

What benefit has MLA been regarding you being able to achieve your desired goals

- Being able to participate in this MLA/TA/TTU program.
- Completing project work in specific areas to identify opportunity and recommend possible solutions based on project outcomes.
- Solidified our desire to pursue a TTU faculty positions in our chosen fields.

How can what you have learnt be used by industry to improve food safety,

manufacturing, quality control, environmental concerns, carbon footprint, other

- Different cattle represent a different carbon footprint and it is not necessarily the feed-lot as it is maintained and has no variation and to keep these variables at a minimum. (Organic Programs)
- Nobody wants to produce beef that doesn't have a high standard of food safety, both countries have a very high standard of food safety and are both very successful industries.
- Quality Control represents the same high standards