A Nuffield Farming Scholarships Trust

Report

Award sponsored by

The Worshipful Company of Butchers

How beef production can adapt to changes in global demand and global food culture

Ed Green

July 2013

NUFFIELD UK

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"Leading positive change in agriculture. Inspiring passion and potential in people".

Title	How beef production can adapt to changes In global demand and global food culture
Scholar	Ed Green
Sponsor	The Worshipful Company of Butchers
Objectives of Study Tour	• Where will future global beef demand come from and who will supply it? • How can the UK improve its ability to produce a consistent beef product that meets consumer demand ? • What beef supply chain structures operate most effectively? • What are the most effective methods of selling the whole carcass and maximising the fifth quarter? • What identification, traceability and database system is required for the UK beef industry to be effective in the global market?
Countries Visited	USA, Canada, Mexico, Brazil, Uruguay, China, Hong Kong, Australia, New Zealand, France, Northern Ireland.
Findings	• Beef production globally will gravitate towards the regions and nations where cost of production is lowest and most sustainable. • Global demand for beef is spreading to areas with rising affluence. • The EU is a long term net importer of beef and its affluent consumers are very much a target for beef exporting nations. • The UK beef industry needs to re-focus on native breed production to gain consistency and quality of production using well managed cost effective rotational grazing systems. • There are opportunities for UK meat plants to export fifth quarter products and add more value by further processing, together with more export promotion. • The beef industry can learn from the innovation, breeding programmes and integrated supply chains that exist in the poultry sector. • An effective cattle traceability system is a must for beef exports.

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Disclaimer

“The views expressed in this report are my own and not necessarily those of the Nuffield Farming Scholarships Trust or of my Sponsor, The Worshipful Company of Butchers, or any other sponsoring body”.

1. Personal Introduction

At the beginning of my Nuffield Farming Scholarship I was a fifth generation farmer managing the 900 acre family farm on the edge of the Mendip Hills in Somerset, half of which grew arable crops (wheat, barley, maize, oil seed rape, red clover), the other half being a mix of grass leys and permanent pasture for grazing and forage conservation. Around 1,000 fat cattle were finished each year, two thirds of which were Angus on premium schemes, with the remainder Holstein/Friesian steers. Around 300 ewes were lambed each year. I also retailed our own branded beef and lamb direct from the farm. The farm participated in Entry Level Stewardship and Higher Level Stewardship environmental schemes. The farm also opened up its gates for Open Farm Sunday to help educate the general public on how their food was produced and what was done to care for the animals and environment.

Off farm roles included positions on the National Farmers Union National Livestock Board, as the Somerset delegate on the National Farmers Union South West Regional Livestock Board, Chairman of the Wells National Farmers Union branch, member of the English Beef and Lamb Executive Progressive Beef Group and board member of Meat South West, which is currently tasked with gaining Protected Geographical Indicator (PGI) status for West Country Beef and Lamb.

Me, Ed Green

I had also recently completed an Open University degree in economics. I was captain of the local tennis club and enjoyed a good thrash around the courts once a week. Music has also always been a passion, and I enjoyed playing guitar and singing in a band with friends. The band performed gigs at pubs, parties and festivals, including the mother of them all, Glastonbury Festival. The farm also hosted its own music and arts festival most summers.

2. Background to My Study Subject

At the time of my Scholarship Award in January 2012, beef was in short supply globally with herd sizes also declining in the majority of beef producing nations. Population growth projections, together with increasing demand for beef meat in regions of the world (where increasing affluence was creating greater demand for an aspirational food like beef), were also increasing pressure on the shortage of supply. Regions like SE Asia were not only providing increasing demand for fifth quarter cuts, but also higher end cuts, as increasingly cosmopolitan urban consumers ate out at the steakhouses that were now appearing in the cities.

This scenario made me wonder what regions of the world were going to increase supply to meet this increasing demand, especially at a time when the beef herd was shrinking around the world. Beef production was also under attack for producing vast amounts of methane gas which damaged the environment. Increased ethanol production was sucking up grain maize that would previously have gone toward feeding beef cattle - particularly in the US - thereby increasing feed costs through increased competition. Chicken was increasingly becoming a cheaper, more convenient alternative form of protein for consumers, and was low in cholesterol.

The beef industry in the UK was experiencing a period of price rises as demand outstripped supply. There had also been a number of acquisitions in the abattoir processing sector that was rationalising the industry into fewer players, with an increasing influence of Southern Irish ownership. Dialogue in the industry was very much between processors and retailers, with suppliers largely left out of this communication loop. The supply chain structure was therefore fairly dysfunctional with price signals used as the main lever to draw beef into the supply chain. This meant predicting supply in both the near and distant future was in effect left to chance; the chance being that either beef producers would not be able to act quickly enough to meet demand or that they were ultimately going out of business due to lack of profitability and so wouldn't be there to supply beef anyway.

So my overall thoughts were:

- How does the UK beef industry fit into the new world order of increasing demand for beef?
- Do the regions of the world where new and increasing demand is occurring provide an opportunity for the UK?
- With the UK market providing one of the highest beef prices in the EU, will this draw in imports of beef, especially as we already aren't able to meet current demand?

These were questions that were constantly being debated in my capacity as a member of the NFU Livestock Board and Meat South West Board.

On a more personal note, how could my own farming business respond to these challenges and make the most of potential opportunities?

3. My Study Tour

On my study tour I visited the following countries:

CSC (London, Netherlands)	22 February- 03 March, 2012
USA (Pennsylvania, Washington DC, Colorado)	22-30 June, 2012
Canada (Saskatchewan, Alberta)	01-16 July, 2012
Northern Ireland (Moy Park, Dunbia)	13-14 September, 2012
France (SIAL, Paris)	21-23 October, 2012
China & Hong Kong (Beijing, Xiamen, Hong Kong, Shanghai)	01-08 November, 2012
Brussels (Halal Expo)	30 November, 2012
Global Focus Program (Australia, New Zealand, Canada, USA, Mexico, Brazil)	25 February -7 April, 2013
Brazil (Sao Paulo, Piricicaba)	08-12 April, 2013
Uruguay (Montevideo, Flores, Treinty A Tres)	13-18 April, 2013

I wanted to travel to countries where consumer demand was rising, like China and Hong Kong, and also to some of the main beef producing regions that were most likely to meet this demand, like North and South America. The SE Asia leg would also provide insights into how UK export opportunities for the fifth quarter could be best advanced.

The short visits to both the SIAL and Halal expos would help expose me to the overall beef industry and provide networking opportunities and build contacts. Halal is becoming an increasingly important growth sector.

I also wanted to investigate successful supply chains outside the beef sector and thought Moy Park in the poultry sector in Northern Ireland would be worthwhile.

Before my first leg of travel to North America began in June, I met with a multitude of different companies, organisations and individuals in the UK to both build up ideas and contacts and ensure I wasn't going to travel to the other side of the world to discover I had missed something significant on my own doorstep.

4. The Launch Pad

The CSC[1] in London and The Netherlands at the start of my journeys in February 2012 was a great launch pad for a Nuffield experience that was going to be something a bit special. It proved to be an intense but rewarding stimulus that was made all the more powerful by sharing this experience with sixty other like-minded individuals from around the world. For me, one of the best things was the buzz of discovering other people who immediately understood why you were undertaking a Scholarship, and the basic tenets of your thinking, without having to explain. This is powerful when in our everyday lives it can be isolating at times to think slightly differently from others.

I discovered fairly rapidly that extraordinary things happen to you when you're a Nuffield Farming Scholar. One of the first events of this nature to occur was an invitation from my sponsor, The Worshipful Company of Butchers, to join the Livery Companies of the City of London plus the Queen for the Diamond Jubilee luncheon in Westminster Hall in June 2012. This was a fantastic event and it was fairly surreal being let through the crowds to enter the Hall and be part of the fervour of celebrations that took part at that time.

Before embarking on my excursions to other countries, I decided it would be a good idea to arrange meetings with key players in the UK beef industry who were relevant to my subject matter. I took note when someone told me "*don't travel to the other side of the world asking questions only to be told that the leading expert in that area resides in the UK".* I also thought these meetings may well help provide some contacts for travel and ideas for places and people to visit.

My main contact at Butchers Hall, Bob Bansback, also proved, both at the outset and throughout the Scholarship, to be a fantastic fountain of knowledge and a great sounding board to stimulate a direction of travel. Bob also has the most extensive contact network I have ever come across! Wherever I went in the world, people invariably knew Bob from various connections in the past.

I took note when someone told me "*don't travel to the other side of the world asking questions only to be told that the leading expert in that area resides in the UK".*

I therefore arranged meetings with leading UK players in beef promotion, processing and exporting companies and organisations.

I had a series of on-going discussions with various members of the English Beef and Lamb Executive (EBLEX) including Peter Hardwick, Remi Fourrier, JP Garnier and in particular Phil Hadley, who between them possess great knowledge of the domestic and international beef trade. From these discussions certain themes emerged:

[1] The Contemporary Scholars' Conference (CSC) is a week-long programme held each year in a rotating location for all the new Nuffield Farming Scholars, internationally. It therefore mixes Scholars from Australia, New Zealand, Canada, the UK, Ireland, France and the Netherlands and provides a stimulating background for the subsequent individual study tours.

- the importance of branding UK beef well and the rise in demand for Halal

- the difficulties of gaining export licences to countries like China

- the difficulties of promoting UK beef on a small budget compared to the sums available to the larger exporting nations

The meetings I had with UK **processors** produced different themes. Their main concern was security of beef supply, the decline in consumer consumption and how to incentivise consistency and quality of supply.

Volume and efficiency were seen as drivers for success and the poultry industry was highlighted as a sector that the beef sector could learn from. The changing face of beef retailing and consumption in places like SE Asia was discussed, plus the export opportunities for the fifth quarter this provided.

I will now outline some of the highlights of my travels that bear the most relevance to the key areas of my topic.

I will then analyse, discuss and assess the key points I have learnt from this in the Discussion chapter that follows.

5. The United States

The US is a huge producer, consumer and exporter of beef, so my travels there looked at all three aspects of this.

5a. Pennsylvania

I began my US trip by looking at supermarkets in Harrisburg with my host, Graeme Goodsir, who had been hugely helpful in arranging much of my US itinerary. Graeme has been involved in the US meat industry for forty years and had an immense knowledge of the North American beef sector.

Irradiated beef burgers in Wegmans

The US is the largest beef consumer in the world so a look at what they consumed would prove to be fascinating. One store that stood out was "Wegmans", a high-end Waitrose-type supermarket. When you first walk in the store you walk into a blaze of colour from low level fruit and vegetable displays laid out on rustic looking wooden crates. The store had tasteful low lighting and high shelving, and the staff were considered to be well treated and had knowledge of what they were selling due to long term hands-on training.

Yellow footprints on the floor lead to $6 meal bargains and many food products had month-long price freeze promises. Ground beef was sold as 80, 90 and 95% lean. Steaks and roast joints were sold with no attached fat, but did have marbling. "Irradiated" beef was also sold as a safer option to combat *e.coli* risks, and some packs suggested meat should be cooked at certain temperatures for a certain length of time, also to combat *e.coli.*

Meat was not sold with a bright red colour - as in the UK - but in a darker, more natural colour. Meat was not sold in trays but in attractive shrink wrapped packs.

Washington DC

I had an interesting late supper in the Silver Diner in Washington DC. Promoting itself as "fresh, local and healthier", the diner worked with 15 local farmer suppliers. The menu included "nitrate-free bacon", "antibiotic- and hormone-free beef", "certified Angus beef" and "reduced sodium teriyaki".

Unverified Angus burgers on sale

I had various meetings in Washington DC. Whilst meeting with Bill Roenigk, Vice **President of the National Chicken Council,** he discussed how chicken price reporting is voluntary as contracts predominate with a minimum set price and bonuses for low level condemnations. GIPSA (Grain Inspection and Packers and Stockyards Agency) arbitrates disputes.

The chicken lobby is now working more closely with the red meat lobby over shared issues such as the use of grain for ethanol and animal welfare. This cooperation could increase if meat packers become more multi-species orientated.

Brazil is well placed to supply the extra pork and chicken demand in China. However, Brazil's currency is strengthening, its labour costs are rising and its domestic consumption demand is rising.

US consumers eat 87lbs of chicken and 60lbs of beef per capita. This is the lowest beef consumption per capita since the 1930s.

A new Farm Bill is legislated every five years. 80% of its budget, in the form of food stamps using an electronic card "Snap" program, goes to 40 million people below the $20k poverty line. This is paid on the first of each month. Recipients spend 97% of it in the first three days. Retailers know this and target their promotions accordingly.

I also met with the **AMI (American Meat Institute),** a meat packer's lobby organisation whose representatives were Jim Hodges (Executive Vice President), Dale Nellor (Senior Vice President Legislative Affairs), Bill Westman (Vice President International Trade) and Mark Dopp (Senior Vice President Regulatory Affairs and General Counsel).

They described how urbanised consumers and politicians are increasingly disconnected from food production, so, consequently, are increasingly unsympathetic with production difficulties and what it takes to produce food at a price.

The "pink slime" controversy turned into a huge issue and animal welfare and food safety will keep moving up the agenda. Issues include antibiotic use, anti-microbial resistance and animal welfare.

AMI see an increase in trade barriers coming as China becomes a battleground for exports. Ractopamine, a growth promoter, will remain an issue of dispute.

> Delivery time is almost more important than carcass confirmation.

Contracts between fatteners and meat packers are widespread. Most small fatteners and cow/calf producers are opposed to contracts and favour live auctions and spot trading. Ownership of fattening cattle is split between cow/calf producers, backgrounders, feedlot owners, meat packers (5%) and outside investors. Higher value, branded products are more likely to gain meat packer ownership with a "captive supply". Delivery time is almost more important than carcass confirmation and high grain prices are driving efficiency.

> ….. there is no compulsory individual tagging of cattle or traceable passport system.

The Certified Angus brand is 30 years old and accepts any black cattle without any form of verification as there is no compulsory individual tagging of cattle or traceable passport system.

AMI don't consider tenderness and eating quality as important enough to require a change to the current system of grading on confirmation and fat level. VIA (Video Image Analysis) is widely used and accepted. AMI consider schemes like Certified Angus are adequate to deliver tenderness and eating quality.

In 1998, mandatory price reporting law was introduced in the US, with prices reported to

the USDA and published every day. It is illegal for meat plants to discuss pricing with each other.

GIPSA (Grain Inspection, Packers and Stockyards Agency) supervises legal and commercial fairness. An audit oversees the livestock system. Smaller producers are less happy about pricing and lobby GIPSA. Most smaller producers sell through auctions, but larger feedlots sell forward on contract direct with meat packers.

HACCP (Hazard Analysis, Critical Control Points) was introduced in response to *e.coli.* The 'hazard analysis' relates to the production system, whilst 'critical control points' relates to checking and correcting. The government has protected meat packers during *e.coli* outbreaks, and the government is under pressure to ease rules by the beef lobby. The sources of *e.coli* outbreaks have been protected by the government with the batch recall system controversial due to the high financial cost implications. A recalled batch is cooked to kill pathogens, which then reduces the value of the meat.

'Irradiated' meat is much less popular now and there is consumer resistance to it as the name is, perhaps, unappealing. Consumer groups can put up petitions as part of their constitutional right to get rid of the practice of irradiating meat. The process originated to combat *e.coli* pathogens from dirty feedlot carcasses. 90% of beef is not irradiated. AMI consider it a costly and unnecessary process.

Another meeting was with Laurie Bryant and Phil Kimball, Executive Directors from **NAMA (North American Meat Association).** Possible imports from the UK into North America include veal, pork spare ribs and racks of lamb. Currently there are only 3,000 calves per day killed for veal in the US.

The recent trade agreement with the EU allows 48,000 tons of US and 32,000 tons of Canadian hormone free "high quality beef" into the EU in exchange for putting the EU on the same BSE footing as North America. The EU is a high value export market but has traceability and certification demands. The US uses cold storage facilities in Germany. The EU agreed to hot "carcass washing" with lactic acid prior to entering the chiller, to act as an anti-microbial. Following the recent trade deal between the US and EU, veal from Holland and France will be in demand but will have to be marketed well.

Inspections carried out on imports for *e.coli* are now much more intensive and time consuming. The availability of imported product is now much lower too, with the exception of that from Australia. Trade quotas are restrictive for some, with a 26.4% duty of deliveries above quota allocation. Countries like Uruguay also can't negotiate outside their Mercosur trade block. NAMA is arguing for some re-allocation of quota volumes.

On the issue of Country of Origin Labelling (COOL), retailers and meat packers are against this as they argue it adds cost and bureaucracy. However, producers in the northern US states are in favour of helping prevent Canadian imports coming down over the border. But US and Canadian markets are merging with Canada Beef interestingly one of NAMA's biggest members.

NAMA argues *e.coli* could be contained through vaccination at farm level using The Whole Melon Theory – it is easier to treat a melon whole rather than when in slices! A Public Health Information System was implemented in May 2012.

Another meeting included the **United States Department of Agriculture (USDA**) with Craig Morris, a Deputy Administrator. Part of Craig's

remit is the public procurement of food for schools. This totals $1.8 billion and feeds 31 million children per day. The State buys meat in bulk commodity form, which is then passed on to the local authorities to turn into meal options.

USDA facilitates the publishing of beef prices, covering around 70% of all transactions, with the smaller abattoirs making up the other 30%. These published prices are the actual prices paid to producers, not the "official" base price announced by the abattoir, so includes any bonuses larger producers can negotiate above the base price.

5b. Denver, Colorado

Further west, I met with the **Cattlemen's Beef Board (CBB)** in Denver, which oversees the Beef Checkoff Scheme and is the official link to the USDA. This scheme promotes and markets beef generically and is funded by a $1 levy *per animal transaction* (not point of slaughter) which accumulates an average total of around $2.50 per animal lifetime. Importers of beef also contribute levies and have places on the board alongside producers and meat packers.

96% of beef in display cabinets is of US origin. Canada and Mexico are against COOL, although it appears US consumers don't see COOL as a big issue.

As there is no compulsory ID for cattle, age is judged by dentition, although exporters do individually ID stock for the export market.

I also met with the **National Cattlemen's Beef Association's (NCBA**) Ryan Ruppert (Senior Director BQA) and John Patterson (Executive Director Producer Education). They thought beef feed yards and cow/calf herds will just keep getting bigger. On the subject of beef futures, they thought it wouldn't work in the UK as beef volume is too small to have enough liquidity. A global futures market in 90% lean beef could possibly work as this is the main hamburger and ground beef ingredient. Gourmet hamburgers are a growing trend e.g. in Red Robin outlets at $9 per lb and 90% lean. Lean beef competes against 99% lean turkey.

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In Denver, I also met with **Cattlefax** analysts Warren Prosser and Brett Stuart. This is a non-profit trade organisation focussing on analysing any data connected to beef. They also carry out market and custom forecasting and offer one hour webinars to leading producers to help their businesses. There are 5,000 members, most of which are cow/calf units, but most work focusses on the feed yards.

Beef consumption is down from 65 lbs per capita in 1990-2010 to 54 lbs in 2010-2012. The US beef herd is also shrinking but currency exchange rates have stopped imports filling the gap.

Next I met with **NCBA** Director of Market Intelligence and Veal Marketing, Trevor Amen. He is a Beef Checkoff contractor tasked with promoting and marketing beef in the retail and food service sector. One point of interest was a partnership with the American Heart Association to promote sales of lean beef; and also the promotion of sub primals for consumers to take home and carve up

themselves (Slice ‘n Save). On-pack recipe labels that peel back are popular as well.

Next I met the NCBA meat science department. Bridget Wasser (Senior Director Meat Science Technology) focusses on product enhancement to improve quality through research. This has included mapping the carcass for tenderness and muscle profiling. Certain "guaranteed tender" beef lines are now in-store. Samples are taken from a batch and tender stretch-tested. Grocery stores are up-scaling on quality with more branded product lines. Fast convenient steaks are increasing in popularity.

Irradiated beef is only 0.2% of sales and has to be labelled as such. The technology works but is expensive, so is only found in a few high-end stores.

Next I spoke with Mandy Carr, Executive Director at **REI Research,** about food safety. Feed and water additive has been developed to improve meat safety by cleaning the GI tract and specifically targeting bacteria like *e.coli* and salmonella, but needs regulatory approval. Orange peel has shown to be anti-microbial. There are also vaccines that target pathogens (more info on their website).

5% lactic acid solutions are approved for use at various stages along the slaughter line. They are versatile and simple to apply but water hardness, water temperature and changes in the water temperature, placement of nozzles for coverage and ambient temperature are all important factors. Some also work better depending on the season and the amount of faeces on the hide.

Then I spoke with Jessica Igo, **Director of Meat Science Technology**, about the nutritional aspects of beef. Beef is increasingly promoted as a healthy option, and offered in stores in increasingly lean forms e.g. 90% lean. It is a good source of iron and zinc and good for bone health, with research to back it up. Food guidelines undervalue the need for protein in diets. Both reactive and proactive messages are needed.

After that I spoke with Michelle Murray, Executive Director **Food and Nutrition Communication,** about consumer marketing using online and other media. The advertising budget is $9.5m to promote 29 different cuts of lean beef. There is an emphasis on names of cuts so consumers know what to ask for when in store. Information is provided on the nutritional value of beef and as a food that's good for you.

There is a focus on "millenials" - those born between 1980 and 2000 and now aged between 12 and 32. These have overtaken the baby boomers in importance as this generation has grown up with chicken as a favoured option over beef. BOLD - Beef in Optimum Lean Diet- is a research project looking at how people with high cholesterol can use lean beef by trimming off the fat, but leaving marbling as desirable.

I also held meetings at the world HQ in Denver of the **United States Meat Export Federation (USMEF**) and met with John Hinners, Assistant Vice President of Industry Relations. Half the USMEF funding comes from government, the other half from around 200 members, who include packers, producers, grain producers and soy bean producers. Market development is rolled out in 80 countries and focusses on marketing, trade servicing and market access.

USMEF have a five year plan to double beef exports. Factors driving growth are rising income, growing middle class, changes in diet, declining self-sufficiency in leading import markets, increasing market access, and USMEF initiatives. "Grain fed" is an important

selling point. The main exports/their destinations are:

Mexico - round, chucks, clods, offal
Egypt - livers
Russia - liver, heart, kidney
China - short plate and rib, tripe, intestine
Japan, S Korea - thin sliced beef, skirt, fingers, short plate, chuck, round, offal

Next at USMEF I met with Greg Hanes, Assistant Vice President, International Marketing and Programs, and Dan Halestrom, Senior Vice President Marketing and Communications. US cattle numbers are down. The biggest export growth is in China. The recent trade deal allows 20,000 tons (and up to 48,000) of hormone free US beef into EU at 0% duty. Costco, a US-owned wholesaler, has a presence in the UK. Most US beef exporters are small, niche operators, except for one big meat packer who is the exception. Trade back the other way includes possible veal exports from the EU to the US, but demand is very regional and concentrated on the east coast.

E.coli in ground beef is the biggest risk factor in the US due to volume and mixing of batches.

E.coli in ground beef is the biggest risk factor in the US due to volume and mixing of batches, with huge recall cost implications.

Japan is a big growth area for US exporters, with the age limit following the BSE scandal now lifted from 20 to 30 months. The US hopes to displace Australia in this market. Australia has however taken up the slack left by the pink slime debacle (Lean Finely Textured Beef LFTB), providing lean product to mix with fat. Hamburgers are mostly 80% lean.

I toured around retail outlets with Michael Igoe, an expat Irishman who edits USMEF Internet material. Wholefoods stores are extremely well presented with aesthetically pleasing, tasteful lighting and fruit and vegetables presented on wooden crates in a blaze of colour as consumers enter the store. Meat is sold with a colour coded "5-step animal welfare rating program", viz:

GREEN 5+: Animal centred, entire life on same farm
GREEN 5: Animal centred, no physical alterations
GREEN 4: Pasture centred
YELLOW 3: Enhanced outdoor access
AMBER 2: Enriched environment
AMBER 1: No cages, no crates, no crowding
RED: Not step rated: does not meet requirements

At the other end of the quality spectrum, the **Walmart** store I visited only had a mobile meat counter in the store every third Saturday. This was the only fresh meat on offer in the entire store, and the store was huge.

5c. JBS meat plant, Greeley, Colorado

Built in 1962, this huge meat plant employs 3,300 employees, slaughtering 5,400 cattle per day (1.8 million kg) over two shifts at 6am and 3.15pm. The lairage can hold 1,800 cattle. Cattle are drawn from all over the US. The line speed is 375 head per hour. Average liveweight of cattle is 580kg. Four FSIS vets are on site, and 23 FSIS inspectors. 36,000 boxes of beef are produced every day.

VIA cameras record fat and confirmation levels. A marbling camera measures the rib-eye size and marbling where the carcass is cut half way down. The carcass is weighed as it exits the chiller after a 36-48 hour period, and goes onto the cutting floor.

Cattle are bought either on farm as a truck weight, or as hot deadweight in the meat plant. This is audited by a producer organisation called **Packers and Stockyards (P&S),** who also check the trim if a problem arises. Truck load batches of cattle stay together, with carcasses sorted into Choice or Select as they enter the chiller. Daily price changes are based on the USDA graded weighted average as shown on the USDA website.

As cattle unload into the lairage, microphage sprays containing bacteria-seeking bugs are sprayed on the coats of the cattle. These bugs stick to the cell wall of bacteria and kill them, but are used seasonally only, when hides are dirty in winter.

When hides are dirty, the hair is clipped along the incision line along the belly, post stunning. "Pattern areas" where the knife cuts, are all sprayed with beef exide, which is a 65% lactic acid, 35% citric acid mix. Steam vacuum cleaners also suck down through the pattern lines. Once the hooves are cut off, hock suckers give the stumps a hot vacuum wash at +180 degrees F. Waste water is treated and discharged into rivers. A pre-evisceration (pre-gutting) cabinet also gives the carcass, and the head and tongue, another 180^{o} F hot wash. The gut contents are then processed, followed by the carcass split. Offal is sent straight off the slaughter floor for processing , down chutes treated with exide spray. A final inspection is given to the carcass before the carcass travels through a full pasteurisation cabinet at 180^{o} F for ten seconds to kill *e.coli* bacteria. Electrical stimulation is then discharged to the carcass to aid tenderness, before another beef exide wash as the carcass leaves the slaughter floor. The line travel time to the chiller from this point is 15-18 minutes so two more spray cabinet washes are given as, every 20 minutes, one log growth of bacteria can develop. After 36-48 hours in the chiller, the carcass is graded, then sent to the cutting floor for boning. Primals and sub-primals are treated with "inspexx" organic acid spray before being boxed and distributed. Pre-ground beef trimmings are core tested for *e.coli* 0157:H7 and also for the other "Big 6" *e.coli* strains. At JBS, there have been only two recalls in 30 years. Pallets carry one large box of mixed batch beef trimmings. The distribution area was highly mechanised with an impressive conveyor and stacking system before pallets left for truck loading.

This was a highly impressive plant, characterised by heat and moisture, in comparison to the dry, cold meat plants in the UK.

Formed in Brazil by Jose Batista Sobrinho, **JBS** is now the world's largest multi-protein company with 124,361 employees worldwide, operating in 23 countries. Overall production amounts to:

- 89,790 head of beef per day
- 48,500 head of pork per day
- 7,200,000 poultry birds per day
- 148,500 m^2 of leather per day
- 1,266 tons of dairy per day

5d. JBS Kuner Feedlot, Greeley, Colorado

This 98,000-head capacity feedlot on a 550-acre site underwent a million dollar overhaul in 2010 that has seen the implementation of a waste water processing lake, resurfacing and sloping of dirt yards to improve drainage, and an upgrading of the steam flaking feed mill. JBS own the feedlot, whilst the Batista family owns the cattle.

The feed mill processes 2.8 million lbs of cattle feed per day, including 30,000 bushels of grain maize per day. Cattle on arrival start on hay, with the full ration introduced gradually. The full ration consists of steam-

flaked grain maize, dried ethanol distiller grain (from Nebraska), forage maize (from 4,200 acres in a 20 mile radius), tallow, corn oil, finisher meal and rumensin. Tylan antibiotic is administered for the liver and kidneys. MGA is administered to stop heifers cycling. Zilmax beta agonist is administered as a growth promoter. The feedlot has 460 acres of its own farmland to grow feed. Five 28,000 lb feed trucks distribute the feed into concrete feed troughs. Two 60,000-ton pits store the maize, with another 110,000 tons purchased in. JBS has two PhD nutritionists on a staff of 750 across their eleven feed yards.

JBS Five Rivers Feedlot

The Continued Animal Feeding Operation (CAFO) utilises the cleaned water for drinking, dust control and for use in steam flaking the grain maize. Computer-controlled water sprinklers help manage dust control. Surface water rights mean for every one gallon used, the feedlot has to account for the waste water. A catchment lake has a 300% storm water runoff capacity. In 2011, 40 million litres of runoff water were reused.

In Colorado, water rights are becoming harder to come by, although it does have a good ground water system. Temperatures reach 110^{o} F in summer, and sink to -20^{o} F in winter. After run-off water has been used to irrigate crop land, USDA take lab samples from the fodder crops to measure nitrate levels. 400 water tanks are used in an overflow system that prevents freezing in winter. Two sand filters and a UV light chamber kill pathogens.

Nine pen riders (six Mexicans, three US) use 30 horses to check the pens of 350 cattle per dirt yard and pull out any ill cattle to move to the hospital area. The mortality rate is 0.27%, which equates to six deaths per day. Pens are scraped clean between batches.

30% of the cattle at the Kuner feedlot are dedicated to a “natural” program under the brand “Aspen Ridge”. These cattle have to be 50% red or black Angus, with no dairy or Brahman influence. Trace audits are implemented back through to backgrounders and cow/calf producers. Kuner is the only *JBS* feedlot, out of a total of eleven feedlots - ranging from 52,000 to 120,000 head in size - producing for Aspen Ridge across six US States.

Temple Grandin designed the layout of the processing barn. On arrival, cattle are weight-sorted. A “Temple Tagger” gives each animal its own lot number with the date of arrival, the buyer, the city/state source code and contract type (spot/contract). 1,800 cattle can be processed per day. On leaving the processing barn, cattle are drafted into one of seven chutes and put on hay and water. 8,000 arrive each week at 300-350kg, and 8,000 are slaughtered each week at 650kg after 150 days of feeding. Custom fed cattle are charged 30 cents per head per day.

Some JBS facts and figures:

- One farmer in the US feeds 129 people; in 1960 it was 25 people
- The carbon footprint of a pound of beef was 18% less in 2007 than 1997
- A ton of manure contains more energy than a barrel of oil

5c. Fort Collins, Colorado

At the **Colorado State University, Fort Collins** (see www.beefresearch.org) I met with Dr Dale Woerner and discussed meat safety and quality issues. Meat flavour is currently one of the top issues in research and meat safety has been a USDA priority since the Jack In The Box fast food outlet disaster in 1993 when a child died from *e.coli*.

Meat flavour has centred on grain feeding. Carcasses have been getting bigger due to better genetics and nutrition and the use of growth hormones. There are no signs of any human ill effects from the use of hormones, although the biggest criticism has been that girls enter puberty sooner. Hormones work best when animals have reached 80% of their mature weight. Hormones increase weight and, on that criterium, give a good return on capital, but reduce tenderness by 0.5kg of sheer force and reduce marbling by 30-50 marbling units. Certain hormone brands are more aggressive than others, and feedlots are still driven by weight.

Hormones increase weight and, on that criterium, give a good return on capital, but reduce tenderness by 0.5kg of sheer force and reduce marbling by 30-50 marbling units.

Growth hormones (oestrogen) have a range of multiple effects on the "switches" that affect animal growth that “cloud the system”, whereas beta agonists “directly target precise switches”, are fed in feed and give adrenergic responses (male characteristics). Beta agonists are a chemical compound that increase feed efficiency and give a weight gain in lean meat. There are 2 types: ractopamine hydrochloride is a type 1, and zilpaterol hydrochloride is a more aggressive type 2. Beta agonists are used in around 60% of cattle and have been approved for around 11 years. Growth hormones are used in around 90% of cattle and been approved for around 30 years. Approval is by the Food and Drug Administration (FDA). Consumers don't associate hormone use with loss of tenderness, but do align it with health and wellbeing issues.

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70% of consumers say they want natural beef, but only 3% buy it. Dr Woerner said he thought natural can give a “fishy, gamey or grassy taste”. Meat is categorised into Prime, Choice and Select. Supermarkets sell Select and low-end Choice. Food services sell Choice and Prime. Marbling categories for these are as follows :

- Select and low-end Choice (slight/small)
- Choice (modest/moderate)
- Prime (slightly & moderately abundant).

Rancher Reserve is a Safeway brand *(I am referring to the American Safeway chain*) processed through JBS and Cargill plants for the last ten years and guarantees tenderness. CSU are researching tenderness for Safeway, and Safeway also do their own testing in meat plants at a cost of $10 per steak. Certain cuts tenderise more effectively with age. The

tender-stretch machine[2] was developed by E and V Technologies in Germany. 160 days is an ideal length of time in a feedlot for tenderness and efficiency.

Irradiated beef is only 0.2% of sales. It is effective in reducing pathogens, but once the meat is sterile and outside of a pack it can be vulnerable to bacteria. Irradiation is most suited to ready meals. Cooking instructions on packs are mandatory.

There is more consumer resistance than scientific resistance to the use of lactic acids, with the build up of bacterial resistance cited as the biggest criticism. The ESTEC testing of the Big 6 *e.coli* strains is now mandatory. Salmonella is more potent than *e.coli*, but less of a problem in beef.

Carcasses are becoming increasingly lean, with the use of more continental breeds and the cutting off of more fat. Nutritional work is being carried out by CSU on individual steaks.

Individual cattle ID will probably become mandatory after some big disaster occurs in the future. R-Calf USA is an extreme group who are against this. Much of this resistance comes from the smaller sized cow/calf producers and links in with feelings about constitutional rights and not wanting to disclose information to government about their farming operation.

Individual cattle ID will probably become mandatory after some big disaster occurs in the future.

Land Grant Universities, such as CSU, were established in 1862 by Abraham Lincoln, in every State, for agricultural development to use "science to feed a growing population". CSU has 30,000 students with 1500 in agriculture.

Tender stretch machine at CSU

[2] A tender-stretch machine gauges tenderness by measuring the force required to stretch a piece of meat.

6. Canada

Whilst Canada shares the large beef production capability of the US, its domestic consumer base is small in comparison. Exports are therefore more of a focus and, with that, comes higher levels of traceability. The use of grassland is also more a feature.

6a. Saskatchewan

Neil and Barbara Dennis in Saskatchewan provided perhaps my favourite quote from my travels. It perfectly described the region: "*Our land is so flat, when my dog runs away, I can still see him for three days*".

> *"Our land is so flat, when my dog runs away, I can still see him for three days".*

They mob-graze 800 custom-fed beef cattle in four acre blocks and move them four times a day. Custom feeding is on a live weight gain basis. The paddock is then rested for 50 days.

Further north in Saskatchewan, **Lon and Kathy Slade** ran a grazing ranch and had recently sold twenty two sections of land to "Ducks Unlimited", an environmental and wildlife conservation organisation. The ranch still kept 35 sections, and leased back the sold land for grazing under certain prescriptive conservation measures.

A section is 672 acres. Sections are divided into quarter sections of 168 acres each. Canada has been grid mapped, with north/south "range roads" two miles long and east/west "highway roads" a mile long.

The Slades run a cow/calf operation of around 300 cows. Horses are heavily used for cattle work. In the winter, the Slades go to Arizona with the horses. Lon flies back every two weeks to check the cows. The cattle are high density grazed in one mob, moving every ten days, with paddocks rested for around three weeks. Alfalfa makes up around 30% of the grass sward.

Mob grazing cattle on the Dennis farm

180 yearling Angus heifers are also custom grazed over the summer for a fee of $18 per head per month on quarter section paddocks. Eight 18 month old Angus bulls run with the heifers.

The Slades were instrumental in helping to set up the **"Prairie Heritage"** brand which exports born, bred and raised Canadian beef to the EU under the guiding hand of Christophe Weader. This is a "Natural" beef brand with no animal by-products, no growth hormones, no rumensin and no steroids (sulphur is OK). It is not organic however, as ivomec wormer is used. Difficulties with the scheme included the logistics of some producers being geographically a long distance from the abattoir. A large area is needed to obtain enough cattle for the scheme under the prescriptions required. Also the pay day for cow/calf producers is a long time coming. Ultimately, the Slades pulled out of the

scheme due to their distance from the meat plant and the extra cost this put on production. The big abattoirs, like Cargill, find the Natural market too small and costly to become involved with.

Kathy told me an interesting anecdote about **Spitz Sunflower Seeds**. This food supplier had made multiple approaches to retailers to gain shelf space for their product, and had been rebuffed repeatedly. So Spitz organised a group of children to target 7-Eleven stores. The children went into every single store in a state region and went up to the till and said, "Have you not got any Spitz Sunflower Seeds? I can't believe you don't stock any! It's OK. We'll get them somewhere else." After about a week of the children going into every 7-Eleven store, Spitz were approached by a buyer from 7-Eleven who was desperate to get their product, and Spitz were able to get the product into store on their own terms in a prominent shelf position.

> In the US, around 80% of cattle are sold via real time online cattle auctions.

Two cowboys from Oklahoma were also staying at the ranch and we talked about real time online cattle auctions. In the US, around 80% of cattle are sold this way. Superior Livestock Auctions in Texas sell 130,000 cattle in once-a-month sales. Video footage of the cattle is filmed prior to the sale. Each bid sets off a 15-second timer. If no one else bids during the fifteen seconds, the cattle get sold, subject to the reserve being met. The buyer collects and the date of collection is advertised at the time of bidding. This date can be up to three months in the future. Cattle are weighed the day before the sale and “pre-sorted” into batches. A 3.5% shrinkage is taken off these weights for gut fill etc. Sales are by region, and mostly in Fort Worth, Dallas, Texas. Rural Farm Development (RFD) TV also runs sales.

6b. Alberta

Next up, I travelled west to Alberta where I visited **Ian and Carman Murray,** Shoestring Ranch, Acme. This ranch started retailing its own beef in 2001, both direct from farm and at farmers’ markets. Along with twenty other ranchers, the Murrays also supply Prairie Heritage. Three feedlots custom-finish the cattle at 950 lbs and are on feed for 120 days. The Lacombe Premium Meats meat plant kills the cattle. All the Angus are sold as "Heritage Angus Beef"' and are 51% verified Angus, cow or sire based, and include red Angus. An annual pool price is paid. There is a one-off membership fee and all profits are distributed. There are no assets, no offices, and no tax is paid as it is a zero net company. The Swiss founder member, Christophe Weader, manages all the sales and marketing for a check off payment of $40 per animal killed, consisting of $20 for his time and $20 for admin. At the time of visiting, the commercial hot weight was around $1.80 per lb. Prairie Heritage is currently the only Canadian exporter to the EU, and use the distributor Towers Thompson. Shipping containers supply the UK, Italy, Germany, Holland and Denmark. Both export and domestic sales are in primals. Domestic customers include "Quality Foods" in Vancouver Island. Sales increase 140% when a rancher is present in-store promoting the meat.

The Prairie Heritage website won the best agricultural website award. (www.heritageangus.ca.)

Ian is currently President of the Foothills Forage and Grazing Association. This is an innovative group of farmers trying new

grazing techniques and ideas to improve productivity and profitability.

The Shoestring Ranch benchmarks itself against other producers in Alberta Agriculture and gets its costings done by Agri Profits. On the 1,600 acres of owned land, milk vetch and brome grass mixtures are grown. Milk vetch does not bloat like other legumes. Grazing is rotated around the paddocks with 120 cows on 20 acre paddocks for five days at a time with a recovery time of 60 days.

Another interesting visit in Alberta was with Ed Miller at **Highway 21 Feeders**. This is a multi-faceted family business consisting of a 35,000 head feedlot, 6,000 suckler cows, 1000 breeding heifers, 400 bulls, other feeder cattle in five US States, a brokerage service to help manage risk on the Chicago Board of Trade (CBOT), 17,000 acres of crops (7,000 acres of GM canola, wheat, barley, peas for human consumption), a fertiliser, fuel and chemical company and a house building company.

Half the cattle are custom-fed and half are owned, with brokerage offered on the custom-fed cattle. Brokerage assesses inputs, currency and cattle factors on CBOT, which is open 22 hours a day, to mitigate risk and buy forward.

CBOT cattle contracts deal in lots of 40,000 lbs of liveweight cattle (around 30 cattle) which will yield at 63% (before trim) hotweight. So, a 1349 lbs live animal at 63% comes back at 850 lbs deadweight.

The BASIS is the amount of cost to subtract from the transaction, such as transport and meat plant charges. Transport and currency exchange are important if selling south of the border in the US.

Hedging forward the beef price on CBOT gives a spread between a futures price and the price actually paid, and helps to mitigate risk against a fall in the beef price as well provide an opportunity to make a second amount of money on a single animal. Various rolling sell options can be used. In 12 months there are usually three main major price shifts up and down. There are six main meat packers in the US and two in Canada, with weekly bidding system.

The yard at **Highway 21** can hold 20,000 cattle that can be turned over one and a half times on 160-day feed regimes. Bought-in stores range between 200 and 1,250 lbs in weight. Yearlings are fattened in 120 days. Suckler calves are fattened in 190 days. Most of the barley fed is bought in and most of the home grown crops are sold. The diet consists of tempered barley grain, wholecrop barley, a whiskey distillery protein by-product, and a canola/bean meal.

Beta agonist implants make the meat leaner and give a 1.5-1.75% yield increase. Growth hormones are also widely used. Implants are not used in the last 21 days.

Other feedlots in five US States offer ownership stakes of anything between 10% and 100% to Highway 21 on their cattle, depending on what futures hedging indicates is the best option. An annual deal is negotiated for around 75% of the equity required with the Farm Credit Corporation.

Highway 21 copied the **NW Consolidated Beef Producers** model by setting up a group of 160 primary producers in a membership club. They use an agent who calls the head seller in Strathmore to negotiate with meat packers on their behalf to get the best deals. This agent is an information professional who has experience in dealing with meat plants and has knowledge of meat packer and retailer margins. Between 2,500 and 10,000 cattle are offered each week (out of a national weekly kill of 60,000).

I paid a visit to **Doug Wray in Irricana**, who operates a mainly Angus 300-cow/calf operation on 2,000 acres (stocking density of 6 acres per cow). Grazing is all year round on ten pastures of alfalfa and meadow brome. Cattle are in two mobs of 220 and 75 cows respectively and moved every three days.

After entering a feedlot in August between 850-875 lbs and gaining between 2-2.25 lbs per day, fat cattle are killed between 16 and 17 months. Around a third of the cattle in the feedlot are owned. Those sold are valued on the three week Canfax average price. Finished cattle are sold on a grid to Cargill, with premiums paid on better quality carcasses. "Certified Angus" ear tags can be purchased to verify authenticity.

The farm uses **Cow Calf Health Management Services (CCHMS),** which is owned and run by vet Dr Troy Drake. This is a proactive management program with a mainframe login containing data relating to carcass information, pregnancy testing, bull fertility testing, feed analysis, nutritional analysis, health planning, calving information etc. Costs are $20 per head per year.

Graeme Finn in Crossfield is an ex-pat Aussie and holds various industry positions including director of the Foothills Forage & Grazing Association, and barn manager at the Calgary Stampede. Graeme is the North American manager for Agriplow cultivation and drill equipment, and runs 1000 yearling steers on grazing rentals and calves 300 cows on his own property. Rental agreements are done on a headage rather than acreage basis.

Innovative and progressive grazing and reseeding practices are used that utilise the Australian made Agriplow drill design with spearhead drill tips that create their own mini seedbed just below the soil surface. This can be used to overseed existing pastures with legumes such as alfalfa, a practice Graeme has successfully carried out at low cost.

We also discussed how progressive lending facilities were available in Alberta, especially for young producers with little or no assets. These include the Cattle Price Insurance Program (CPIP), the Agriculture Financial Services Company (AFSC) and DTN Progressive Farmer which involves share options.

I was fortunate to visit the Calgary Stampede during its centennial. This was an amazing jamboree heralded as the "greatest outdoor show on earth" that celebrates the cowboy way of life. Events include the famous chuck wagon racing, rodeo, bull riding, steer wrestling, blacksmith competitions and entertainment. On site were lots of trade stands where I had many productive conversations with various beef industry organisations. Key points learned from these conversations included:

- The Albertan government is very agriculturally focussed with good support and resource structures in place to boost production and trade of produce, including Alberta Beef and the "Raised Right" website.
- The Stampede had an impressive "Cattle Trail" display that "Tells the Story of Beef".
- Canadian Cattle Identification Agency (CCIA) - RFID is mandatory, multi species (cattle, sheep, bison, horses, llamas) and is backed by government funding. It has a "bookend" system of recording at birth and death, but not movements in between (feedlots with more than 1,000 head do report movements). Provides age verification, which is important for exporting under BSE controls. However, there are RFID readability

issues similar to the EID sheep experience in the EU.

- **Livestock Gentec** – scientific consortium based at University of Alberta that connects universities, research networks, government agencies, industry associations, and companies in the agri-food sector. Aims to enable producers to efficiently provide safe, nutritious, and affordable food. Focus is on meat quality, Feed Conversion (FC) & Residual Feed Intake (RFI), animal health, and educating tomorrow's agricultural leaders. The Canadian Cattle Genome Project (www.canadacow.ca) is sequencing and genotyping more than 10,000 bulls that define Canadian herds.
- Spoke to members of **Feedlot Health Management Systems. Dr Kee Jim** is a very influential figure in the Canadian beef industry. His profile can be found in the Appendix.

I met with **Canada Beef Inc (CBI), CanFax** and the **Canadian Cattlemen's Association (CCA)** at their offices in Calgary. CCA represent 65,000 beef operators. The CCA board is made up of 27 producers and is funded through check-off allocations from each member state. The CCA covers trade, animal health, environment and animal care, fiscal and monetary policy, and grading/inspections.

CBI is the marketing arm of the CCA. 86,000 primary beef producers pay $3 per animal transaction to the national "checkoff" scheme. $1 of this goes to CBI, and the rest to CCA. An animal is transacted around two and a half times in a lifetime giving a total per animal of around $7.50. 75% of Canadian cattle are slaughtered in Alberta.

In the US there is a 10-14% beef production gap, and the US exports 10% of beef production. 71% of Canadian beef exports go to the US, and this accounts for 4% of US consumption. Canada and Australia each have a 30% share of US beef imports.

Two thirds of the Canadian herd has Angus/Hereford Bos Taurus bloodlines. This is seen as a real selling point due to yield and quality advantages. Mandatory EID tagging at birth also gives both traceability and data for research. This is seen as a real advantage over the US, where tagging of any sort is not mandatory and food safety only really starts at the meat plant, rather than the farm.

Canadian meat plants use the same hot wash and lactic acid interventions as the US, and have formulated a marbling and meat quality grading system that can be used as a perfect equivalent to the US system.

Promotional **Canadian Beef Advantage (CBA)** software and marketing materials have been developed in a consultative approach with private companies in areas such as foodservice. CBA provide the content, resources, product development and recipes etc, and the private companies provide the other 50% of the equation by paying for the cost of physically producing the materials. A business plan is drawn up with targets for adding sales and value that will have to be met. Recent initiatives have included the "High River Angus" brand, a focus on pricing beef per piece rather than per kg, and "Slice n Save" where consumers are encouraged to buy larger cuts of beef and cut them up at home.

I also met with Andrea Brocklebank, the Research Manager at the CCA, and Dennis Laycroft, the Executive Vice President of CCA. Andrea works on the research side of the Checkoff system looking at animal health and safety. Money is leveraged with federal and

provincial funding. Canfax is the voluntary information gathering vehicle.

Characteristics of the Canadian beef industry are an increase in volatility, tight profit margins, and more direct sales with meat plants as banks require contracts. At the same time less price transparency is occurring as there are now only two main meat plants, Cargill and Tyson, who enjoy 95% of the Canadian kill. Unlike the US, price reporting is not mandatory. However, the Canadians argued that the US system still makes price discovery difficult due to the historical nature of the prices being reported. Some form of hybrid is needed with a code of conduct where cattle can't be stacked up. The COOL regulations gave the US meat plants a competitive advantage and were some of the reason XL were able to take over the Tyson meat plants. Managing the BASIS costs are key when deciding the destination of the cattle to be slaughtered. US imports have been greater in the past due to the weak US dollar.

50% of Canadian production is exported. Short ribs are important into Asia, Mexico, South Korea and Japan. Japan requires much greater marbling. Trim is exported to the US. Middle meats are coming into Canada. Canadian foodservice accounts for 20-25% of sales, whilst in the US this is higher at 40%. Mexico prefers over-30-month animals.

The EU quota is available to any exporting country worldwide. The US were able to gain an advantage by being first in. Due to the inefficiency this adds to production, It is considered difficult to give up the use of growth hormones in beef production in North America in order to supply the EU.

Beef Information Exchange System (BIXS) is a new system designed to facilitate information flow between breeder, feedlot and meat packer to improve animal health and production efficiency. The RFID tag is the backbone to this. Cow/calf producers will only get out of the system if they put into the system. BIXS work with the half a dozen or so private companies that also operate in this area e.g. **Kee Jim at FHMS**. (See Appendix)

The Beef Five Nations Alliance is a loose collaboration of countries consisting of Canada, the US, Australia, Mexico and New Zealand who work together to further their export trade routes. They use positive messages of environmental sustainability, carbon sequestration and scientific benchmarking as tools to influence international regulatory bodies. Their overall position statement is "To exceed global consumers' expectations while eliminating non-scientific and political trade restrictions". They view the key areas as trade reform, animal identification, animal health, competitiveness and profitability. The EU is very much on their radar and lobbying to open up this lucrative market is intense. Banning growth hormone beef is something they see as a political trade barrier.

When BSE hit the Canadian beef industry in 2003 it was disastrous, and this helped spawn their traceability system. Although the Canadian dollar is now stronger, it has been weak in the past and this focussed the industry on production efficiency. Barley is now cheaper than grain maize and so the predominant feed used.

Key areas now are to increase domestic demand in Canada and the US, and gain market access to China (through Vietnam and Hong Kong) and Russia. Additional key areas are improving competitiveness through productivity and innovation, streamlining regulation, improving labour availability and decreasing the government shadow. If Canada is not efficient, cattle move south into the US

(as happened during BSE). Managing volatility (insuring against changes in beef prices), climatic disaster (crop insurance, hail damage) and disease (BSE) are therefore crucial.

Verified Beef Production (VBP) is an assurance scheme that provides animal health and environmental plans etc. 65% of production is signed up to this, but only a minority of producers. In general, the cow/calf producers are not innovators and may be holding back progress to a degree. Other problems include the fact that the immense influence of oil in Canada has led to certain areas of farmland being bought up as a tax write off.

BIXS and VBP are important tools for online auction systems in providing information on animal ID, vaccinations, disease control and breeding data.

68% of feedlots have less than 10,000 head capacity. 23% of feedlot cost is feed, 57% is animal purchase, so the two combined represent 80-89% of total costs.

92% of meat packer capacity is with two packers; XL Lakeside in Brooks, Alberta and Cargill in High River, Alberta and Guelph, Ontario. 80% of beef is processed domestically, 20% exported as live cattle.

Beef production was down 14% in 2011. 45% of beef produced was exported (including slaughter beef). 26% of domestic consumption is imported beef, and increasing. Per capita beef consumption is declining.

I met with William Torres who is the Research Manager at **Cattleland Feedyards** in Strathmore. Cattleland Feedyards comprises a 25,000 head custom feedlot, 5,000-head capacity bull evaluation facility and additional backgrounding lots with a 2,500-head capacity. 11,000 acres are under cultivation and irrigation, including grain and silage, a 1,000 head cow/calf herd, and a trucking operation hauling livestock, grain, hay and sod. There is a staff of 37.

In the last three years, a breeders' alliance has been set up consisting of 1,000 head cow/calf units. Bulls from Cattleland can be sold to them, and Cattleland get first refusal to buy the calf crop with a package of free bulls, vaccines and a management protocol on offer. If a deal can't be done, however, a charge can be made and the bulls can be sold commercially.

The **Integrated Beef Research Station (IBRS)** runs exclusive and confidential trials to validate new pharmaceutical and feed ingredient products and protocols that enhance weight gain, have health benefits or reduce handling and stress. The current focus is on genomics and Residual Feed Intake (RFI). Size is important for research facilities to generate a big enough revenue stream to make it worthwhile.

There is an 18,000-head research facility capacity with 50 small pens, 8 RFID pens with GrowSafe feed troughs, 40 medium pens, 20 medium/large pens and 40 large pens. Research partners include Feedlot Health Management Services (Kee Jim), pharmaceutical companies, feed companies, universities, institutes and genetics companies.

The National Bull Evaluation Centre is the largest in the world with a 5,000 head capacity where genetics can be progeny tested and exposed to commercial projects. The facility offers marketing opportunities and the option to custom feed progeny in the feed yard.

Currently, for example, kelated minerals to reduce foot disease are being researched, and a feed diet that reduces manure production. Another trial involves castrating 5,000 bulls on

arrival,that are then put on 8 different diets over an 18 month period to research feed that reduces manure production. Research is expensive and time consuming, but profitable.

This is a turnkey operation where services can be either contracted in or out using sub-contractors where necessary. FHMS and Veterinary Agri Health Services from Airdrie are two of the main research partners. GrowSafe are also based in Airdrie, as used by JSR Farming in Yorkshire. Research projects usually run over three years. Cattleland procure research funding then sell the research to major drug companies, including Pfizer, Elanco, Scherling Plough and Novartis. The data belongs to the drug companies. FHMS put in the cattle and sub contract out the services. Two trials can run simultaneously with two companies and/or against a control. The research is confidential and transparent.

Risk Management Incorporated (RMI) is an arm of Cattleland that offers hedging and risk management options and services on beef prices, all inputs and more recently, energy. A jet engine manure drier to create energy was recently built using $2 million of city money, but went bankrupt. It has now been bought out by New York financiers. Commodity trading is at the core of RMI. Five full time accountants are employed. Oil companies own custom fed cattle to create losses for tax purposes, but in a legal transaction way.

Next up was another impressive feedlot business, **Western Feedlots Ltd in High River, Alberta**. I met with Dave Plett, President/CEO, Tom Plett, International Development and Dr Calvin Booker, Managing Partner, Feedlot Health Management Systems.

This hugely impressive company was started in 1958 as a feedlot based on the feedlot system in the US. Up until the 1970s, railroads were used but then the US grain fed system was copied during a period of rampant growth in the 1980s and 1990s. Diets are now barley based, as are most in the South Alberta region.

Western is Canada's largest feeder, with 100,000 cattle divided between three sites. Cattle are also owned on other feedlots and various complementary operations include a feed grain trading division, commercial feedlot software development (paraDIAM), cattle and feed finance facilities, commodity trading, extensive production research and consulting, crop farming, and development of their own Angus Black Gold brand.

In 15 years, Western has increased AAA grades from 30% to 70%. An individual animal management program has been implemented. A grid based system of incentives and penalties has been introduced. Cost per head per day is $3. Western hosts the largest research project of cattle in the world.

Attention to detail at Western Feedlots

Cattle arriving on site are weighed, measured in height, width and breadth, colour assessed, individually tagged, lot and pen tagged, and given a gut fill of feed. A research student at Western found that there were correlations between hair colour, especially white patches, and performance. This led to the colour assessing process on arrival to decide management of the animal. 70 days prior to

slaughter, animals are assigned a kill tag specifying the kill date and meat plant destination. The paraDIAM system program predicts the combination of factors that will give the best performance, and at what stage, to affect certain management changes e.g. in feed or hormone implants. With 100,000 cattle, a cost of one cent is significant so attention to detail is paramount.

Dr Kee Jim (see Appendix) set up **Feedlot Health Management Systems Ltd** in 1983. Dr Calvin Booker is the Managing Partner of this operation which now works closely with Western on research and development projects. The three main areas of FHMS work are:

1. Anti-microbial resistance
2. Industry development and adopting the best technology from other industries
3. Production strategies and techniques e.g. managing animals as individuals

FHMS charge on a per-head basis but share the data with the client. Data results could also be sold, and there are multiple levels of data sharing available. The paraDIAM system is key here.

Dave Plett discussed some of his business philosophy. He considered Schumpter's quote that "*what's new becomes old*" very much fits in with the Western philosophy. The 'crane of destruction' also dictates that larger firms are best placed to innovate and change. Development of systems is key and an emphasis on actual 'development' to actually use the research. Universities can sometimes be *"mostly research and not much development*" in his opinion.

A wide range of issues was discussed as Dave Plett is an energetic personality. Points of interest included:

- The Bill of Rights in the US prohibits traceability as individual animal identification intrudes too much on an individual's rights, in the same way that a US citizen has the right to bear arms. Canada is more closely based on the UK model of democracy.
- Only 25% of cattle are subject to mandatory price reporting in the US. In North America, power is held in the narrowest part of the hourglass i.e. meat plants. In the UK, this occurs at retailer level.
- Ruth ! Criss is a steakhouse in Calgary which sells prime US beef. Interestingly, 85% of the meat used comes from Holstein steers.

Interestingly, 85% of the meat used comes from Holstein steers.

- In China, the two main priorities are energy security and food. The one-child policy is also leading to population decline which could be a problem for them in the future. The Chinese have a growing appetite for Western brands and tastes. The EU will become a net importer again in beef as it is a politically driven system rather than efficiency based.
- Differentiation of product is important for high quality beef. Beef taste is subjective, however. Perception of quality differs.
- Cargill have been successful, not due to quality, but because their ability to compete and logistics are better than everyone else's (similar to when Ford started using mass production techniques).

My last visit in Canada was with **Larry and Callum Sears** at the **Flying E Ranch**. This great-

looking grassland ranch benefits from warm chinook winds off the Rockies. Larry runs 500 commercial Angus cow/calf units on 7,800 acres and 300 pure Angus cow/calf units on 5,000 acres. Maize is grazed at 5 inches high. Research is currently being done on the effects of hot branding and castration on animal performance. The first growth implant is given at weaning at 5 or 6 months. Creep feeding has been proved to improve marbling. Steers and some heifers are custom finished in his brother's feedlot and sold under the XL Lakeside and Cargill "Certified Angus" brand.

The TraceBack management system is used. This is operated by **Cow/Calf Health Management Services (CCHMS**) who charge a per-cow per-year fee. This is an online (not software based) management program developed by Troy Drake, a vet, and is managed using an iPad on farm, with around four regional vet practices licensed to act as TraceBack hubs. (www.cowcalfhealth.com)

We also visited Larry's brother, Dereck Sears, who owns a 36,000 head feedlot, plus other smaller 5,000 head feedlots under the name **Chinook Feeders.** The processing barns have two handling chutes with automatic push up gates that follow the cattle round a semi-circle and then slide back to their starting position on a geared chain. Two German-made VIA cameras have just been fitted above one of the crushes, one placed behind and

On-farm use of VIA cameras to assess cattle

one looking down the length of the back. Environmentally sustainable reed wetlands filter the waste water until clean.

The handling system is manufactured by Dereck's own company**, 2W.** This started in 1988 when a group of farmers bought out a failing engineering firm in Nanton. They now have 26 employees and "aggressively" search for new livestock equipment markets and product lines.

We also visited the engineering works at 2W. This was a hugely impressive operation that utilised high tech production processes copied from car manufacturers. This included a state-of-the-art-robotic welding facility, automated metal cutting process and automated paint spraying area, all imported from Europe. 2W products are exported all around the world, with the US the biggest market.

Mustering cattle at Larry Sears's ranch

7. Northern Ireland

7a. Moy Park

Following a study into the rise of poultry consumption over the last thirty years – made during my Open University economics degree a couple years ago - I was interested to investigate why poultry consumption had rocketed and beef consumption had flat lined. Moy Park in Northern Ireland is the UK's largest organic and free range poultry processor, so I arranged to meet with Eric Reid, their Senior Agriculture Advisor and one of its founder members.

Moy Park is now owned by the **Marfrig Group** and provides 21% of the group supply and is Northern Ireland's largest food processor. Thirteen sites employ 10,500 people across Europe with 1,500 products delivered to retail and food service. Moy suppliers are all within 30 miles of a plant. A full traceability system is in operation. Moy have gained success through adding value and good marketing and are now the sole supplier to Waitrose.

Crop accounts mean a producer is paid on performance, not on a management fee, with a tripartite structure of producer/Moy Park/bank. The crop account provides cattle credit, insurance, drugs and feed. At slaughter, the producer is paid the margin over costs.

Moy began in 1960 in Dungannon as Moy Gashel, turning flax into linen products, like parachutes, suits and table cloths. The company took on the debt of Marshalls of Scotland, which was a farmers' co-op dealing in old hens. The first broiler contracts were pioneered at this time. Courtaulds textile company then bought out the company in 1968, at which time the food farming division of the company made money, and the textiles did not. The cows were sold out of the farming division to pay for the first processing plant in Craigavon. At this time, 55,000 birds were killed each week and sold as frozen. In 1974 the first EU-approved plant was passed.

In 1980, fresh product couldn't be sold in England, so Q House was bought out in Stockport and a £1 million loss making company was turned around in six months. In 1984, Eric and three other directors with no agricultural experience then bought out the farming division. One director had sales experience, one had finance experience, and one had budget and shareholder liaison experience.

> English and Irish plants need different management structures due to cultural differences.

English and Irish plants need different management structures due to cultural differences. In Ireland, sites are sold to managing directors and inputs are supplied. In England, landlords own the sites and rent out the premises to Moy.

Eric Reid now farms 155 acres with a new build slatted shed that finishes 230 bulls per year and argues beef plants need to produce a blueprint and take more responsibility for house design, nutrition and animal health.

I also toured around the Moy Park processing plant in Dungannon where 1.5 million birds per week are killed. Birds arrive in crates, are weighed, the lorry unhitches the trailer, and

the crates roll onto conveyor belts. The crates pass through a gas chamber. The birds are killed and processed within 12 minutes. Rendering of waste takes place on site. The processing of the birds is highly mechanised. A camera takes a photo in less than a second to grade the bird into one of seven product channels. The plant has a single government-paid vet on site who is dedicated to the plant permanently. On-site training is available for other in-house quality standard personnel.

90% of product is sold as fresh. Meat can be injected for flavour e.g. mustard and honey, BBQ, smoked, sunflower oil, garlic. Stuffing and sprinkles and other value added extras can be added in-plant and packed.

Eric Reid considered the growth of Moy Park was down to:

- Innovation in production and processing methods
- Breeding excellence from improved genetics
- Low disease and high health status
- Striving for continuous improvement to be the best in the sector
- Improvements in bird growth efficiency
- Partnerships between farmers, processors and prime retailers
- Incentives for producers

Moy Park proactively manage and retain ownership of all aspects of the key production areas, including breeding, feed quality and quantity, and veterinary and health issues.

Moy Park proactively manage and retain ownership of all aspects of the key production areas, including breeding, feed quality and quantity, and veterinary and health issues. Inputs can also be bulk purchased to gain economies. Modern processing capacity is an on-going investment that provides efficiencies. A full traceability system is in operation. Moy has gained success through adding value and good marketing.

Moy has gained success through adding value and good marketing.

7b. Dunbia

Whilst in Northern Ireland I also met with Stuart Dobson of **Elmgrove Foods Ltd,** which is a division of **Dunbia**, a company that has done more than most to exploit meat export opportunities out of the UK. We discussed the difficulties involved in finding and establishing new export routes for offal into difficult trading regions around the world. Problems include debt retrieval and disagreements in specification on arrival thousands of miles from home. The cost of travelling to the export destination to resolve any disputes is prohibitive which plays into the hands of rogue customers.

Other problems include the volatility of demand for offal. Insatiable demand can be rapidly replaced by a complete shutdown. Even the slightest discrepancy in paperwork can also lead to a complete rejection of deliveries, or be used as a bargaining tool.

Dunbia was started in 1976 as a butchers shop by Jim and Jack Dobson in Dungannon and now employs 3,000 people. I had discussions with Jack Dobson over various meat industry issues. The grey channel routes for offal into

China via Vietnam and Hong Kong were closed down at the time. This may have been to manage the amount of variety meats on the Chinese domestic market to a level where home production and consumption is protected from increased prices. Dunbia have a trading office in Guangzhou promoting the Dunrich Collection. Another office is situated two miles outside Beijing. This deals with lambskins, cowhides and offal. Popular meats currently are: front pork feet, duck's heads and donkey meat.

Japan, likewise, is also closed to our exports currently due to BSE restrictions. Attention is therefore turning to South Africa and West Coast African countries like Angola, Ghana, Liberia and Guinea.

Dunbia think retailers in the UK will have to increase the price they pay for beef. The impetus for this has to come from primary producers accurately producing independently verified cost-of-production figures in a similar way that Promar have verified dairy costings for certain milk contracts. Tripartite meetings involving primary producers, processors and retailers can then take place to ascertain what price needs to be paid for beef to be produced. Margin percentages could then be negotiated.

Dunbia think driving efficiency by knowing the cost of production is a more viable way forward than looking at different models of cattle ownership. They think the Moy Park model only works because of the rapid return on capital.

8. China and Hong Kong

It's hard to look past SE Asia in terms of growing consumption demand so I left for Beijing last November to investigate for myself.

8a. Beijing

I met with David Huang at the Chamber of Commerce in Beijing. He told me beef and lamb consumption will increase in China, with the primary interest being lamb legs and beef tripe.

In the last 12 months, beef imports have been:

- Australia 11,000 tons
- Uruguay 10,000 tons
- New Zealand 3,300 tons
- Brazil 2,300 tons
- Argentina (figures n/a but growing from a low base)

Dr Huang said that extra beef demand would most likely be met by the existing five countries that have trade agreements. UK beef is barred primarily because of food safety issues i.e. BSE. Beef imports would also have to be under thirty months and boned out. Offal was also seen as "too dangerous" to import due to risk of medicine residues. However, Australia and New Zealand can export bone-in due to their clean image when it comes to BSE.

> UK beef is barred primarily because of food safety issues i.e. BSE

Around 600,000 tons of poultry meat is imported from countries including the US, Argentina, France and Chile. These imports do not have to be registered.

Pork, beef and lamb do need to register when imported. This is the first step in the process. Second, meetings are facilitated between import and export traders through an annual face to face meeting and regular web conference calls. Third, import traders are sent to exporting countries to liaise. Fourth, the legal team in China will formulate an agreement.

> China is trying to decrease reliance on exports of manufactured products as other nations, like India, will catch up and be competitive.

Next, I had a fascinating meeting with Rob Williams, the **Australian Agriculture Attaché** in Beijing. Rob has veterinarian training and is posted in Beijing for three years following a stint in Washington DC. There are twelve agricultural attaches posted abroad, each with two further assistants covering market access and technical issues. The posts in Washington and Brussels have recently been shut down and transferred to areas where there is more growth potential (the US and EU are seen as saturated markets). Chief posts are therefore now China, Indonesia, New Delhi, Bangkok etc.

China is trying to decrease reliance on exports of manufactured products as other nations, like India, will catch up and be competitive. Private enterprise is increasing, but the wealth gap is increasing also. The wealthy are now getting extremely wealthy and it is hoped

that general affluence will keep the population as a whole quiet. However, 125 million of the population are still in extreme poverty and there is no welfare state to act as a safety net.

China produces 50% of world pork production, and consumes 40% of world consumption. There are around 70 million pork farmers, but with herds of less than 10 sows. By comparison Brazil has 200 million cattle, 200 million people, and only ever exports 20% of its beef production.

In China, there is food service demand for more beef and lamb. This is on top of existing demand and is not displacing demand for other meats. This demand is for better quality cuts, like steak. There are currently 250 million members of the Chinese middle class now and there will be a predicted 280 million by 2020. Grey channel meat (i.e. illegally imported through places like Hong Kong and Vietnam) is openly advertised on menus in China.

China is sensitive to importers flooding the market and harming domestic production. This happened to some extent with New Zealand milk imports. However, if an agreement is made, production must be there to fulfil promises otherwise the arrangement will be cancelled.

Cattle Street wet market

Whilst in Beijing I visited a food market in the side streets of a Muslim area of Beijing near Cattle Street. The food in general looked really good and was fresh, albeit in rundown surroundings. The meat on offer was mainly lamb, due to it being a Muslim area, and feet and tripe were on offer alongside the main cuts. All meat was fresh. Fish were killed fresh out of tanks. Chicken were plucked whilst still alive and then killed for the customer by slitting their necks.

Large variety of offal on sale

Next I went to the **Cattle Street meat market.** Carcasses were mainly lamb, with offal including sheep heads, tripe and feet. Trim is rolled into rolls wrapped in plastic which are then thinly sliced by machines into ham-size sheets of meat which are then rolled into rolls in the traditional Beijing style for hot pots. *(See picture over page*). All meat was Chinese produced. Cattle cuts were from dairy heifers.

Then on to the opposite end of the spectrum, **City Shop**, based near some of the embassies and clearly aimed at ex-pat consumers and decked out with grand marble-floored shops with sections for organic and imports. Prices were high and comparable to anything in the West. Beef cuts were either from Australia (Kimberly Red) or China. Australian beef was labelled as "Natural & Safe", which implies organic. Steaks are stripped or cubed and

prices were very high. There was very little pork, and not much lamb. Beef is aspirational here.

Large rolls of meat on sale for hotpot

In the same complex, I ate in a fast food outlet called - almost unbelievably **- Fatburger**. JBS Australia were proudly displayed as the grain-fed beef supplier. Fatburger outlets exist in major cities across the world. Quality of food, however, was poor.

Then I went to another upmarket store called **Yansha Supermarket** in the You Yi Shopping Centre in Guamo district. Value added freeze-dried beef in attractively packaged packets sold for around 60 yuan, so price was very high and usually poorer forequarter cuts were used. Kerrygold also had butter stocked in this store.

Tesco in Beijing

Finally on to **Tesco** in the poorer district of Dangchendong. The store is price based and clearly aimed at getting consumers to shop there instead of in wet markets. Fresh meat is sourced from China (Kerchin Beef) and laid out in a similar format to that of wet markets. This Tesco store had a very grungy feel to it and was very downmarket. Discount prices were the name of the game. Poultry, lamb and pork were the main offerings with very little beef on sale. Fresh fish were picked live from tanks. In general this was a very disappointing store, which is surprising for Tesco.

In Chinese retail stores, "Natural & Safe" labels seen on beef *indicate* organic, but no-one is verifying certification and it is used in a suggestive way. Anything sold as organic would need Chinese certification, and imports would also need certification in the country of origin.

Lamb (and to a lesser degree, beef) is not eaten in summer as it gives the Chinese too much body energy which breaks out into face spots called "fare". In Mongolia, fried milk powder, salt and black tea are eaten to cool down this excess energy in summer. So certain foods are eaten at certain times of year: in spring, sweet foods: in summer, hot chilli: in autumn, sour foods: in winter, bitter foods. Early winter is when lamb and beef starts to be eaten. Muslims, however, eat lamb all year round but eat certain extra foods to balance the body (buckwheat tea, yogurt, black tea, green tea and fruit).

I met with Charlene Wang from Peter Bloxham Associates. We visited a **Jenny Lou's** store. There are ten of these stores in Beijing based in residential and embassy areas. Very much like a Co-op store in the UK and aimed at the middle ground. Jenny Lou's is owned by a Hunan businessman with a mixture of import brands for foreigners (embassies in the area) and other meats produced domestically. It has a good quality fresh meat counter of

Chinese, Brazilian and New Zealand origin and a good selection of beef, as well as the usual pork, chicken, duck and lamb.

> The preference of many "twenty somethings" is for beef over pork and chicken

We visited a lowbrow local supermarket food outlet just around the corner. All offerings were Chinese brands with a single pack of diced meat as the only beef on offer. There was more offal on offer than Jenny Lou's, such as pig trotters, chicken feet and tripe.

The most significant point of interest was that the exact same packets of attractively packaged freeze-dried beef and lamb were on offer as in the high end Yansha Supermarket I visited, but priced at 22 yuan instead of 60 yuan! The margin Yansha are achieving is therefore eye watering, and is maybe a good example of how aspirational a beef purchase is for affluent consumers. Charlene said her own and many of her generation's (twenty somethings) preference is for beef over pork and chicken, and her visits to the UK have accustomed her palate to a diet that includes beef on a regular basis. In comparison, her parents' generation is still inclined towards pork and poultry.

Finally, we visited a **WalMart.** This was positioned above Tesco but below Carrefour in quality. This is a much larger store than the previous stores visited and in more of a prime location, with bright and breezy hoardings and lots of choice on offer. Better quality products are on offer in comparison to the massive US store I visited in June: unlike Tesco where a visit was definitely a degrading experience in comparison with their UK stores. All meats are on offer, including donkey, with higher end beef cuts also available. Beef is still behind pork, chicken and duck in shelf space and importance for consumer and retailer alike in this store. All meat is China-sourced.

The next day I travelled with Charlene Wang to a frozen meat market near the Majaipu subway station in south Beijing. This area is more industrial with high rise flats interspersed with chimneys billowing out smoke from gas fired power stations.

Unstable load at a Beijing meat market

Based near a large road intersection, meat boxes were carted around on hand pulled trolleys. Inside the trading building, three storeys contained hundreds of traders selling any frozen meat imaginable from chest storage freezers from 4-10am and 1-3pm every day. The vast majority of meat was Chinese-produced with only one vendor displaying grey channel beef from the US. A very small amount of lamb and beef from Brazil, Uruguay and New Zealand was also on offer.

Seafood was in the majority overall, with pork and chicken also significant in volume. Lamb and beef were much less in evidence. Other weird and wonderful options included cattle feet, ostrich, pigeon, locusts, cicadas, rabbit and donkey.

Next we met Amei Qi, a trader at **Beijing International,** which is a meat wholesaler and trader. Amei's account covers Europe and

India and she was quite open in saying that she trades grey channel meat into China through Hong Kong. This includes Welsh lamb cuts that include flap, kidney, testicles, tripe and bones (breast, neck and fillet). She was a little more coy about the beef cuts, but said the blade and breast were the most popular in China and that offal demand was very changeable in terms of which types were wanted. Ox feet are popular with Muslims.

Marbled, grain fed beef is more desirable due to its juicy texture and less strong flavour in comparison to grass fed. More beef and lamb is eaten in this, the colder north, and a greater number of Muslims live here. Pork is more popular in the warmer south.

In the big cities, two types of steakhouses are emerging. The first is a typically Western style. The second is a Taiwanese style in south China where soda is used to manipulate and change the taste of rump steaks, rather than buying more expensive sirloin steaks.

The number of registered plants in the five countries exporting beef to China is:

Australia - 50
New Zealand - 38
Brazil - 36
Argentina - 34
Uruguay – 22

It is noteworthy that Argentina is all ready to go if they can sort out their economic problems. Amei said that Angus beef started arriving from Argentina in 2004 but BSE stopped the importation just as it got going. Angus beef is desirable in the big cities and star hotels. Uruguay also exports a large proportion of beef to China using many fewer plants in comparison to the other countries.

The Chinese are passionate about food, even when they are very poor, and I've seen fantastic food everywhere I have been in small alleys, with many traders cooking up offerings on the pavement with tables and chairs under awnings and in front rooms that open onto the street.

The Chinese government are worried their domestic producers will be destroyed if more beef imports are allowed in. They are also annoyed at David Cameron for meeting the Dalai Lama. The effect of this cannot be stressed enough. Amei couldn't understand why Cameron has done this when the Dalai Lama *"is just one person, what's all the fuss about him for?"* Whilst trade is only available through the grey channel, it is not easy to acquire as a licence is required to move the meat along the line.

Despite the licence UK pork now has for China, only offal has been traded as the meat is too expensive. Amei thought the UK do not understand the Chinese market yet. Affluence in many respects is not growing as quickly as expected and price is the priority over quality. However, she did say with a grin that she would be interested in *"the best quality at the lowest price",* but maybe what can be done is *"a reasonable quality for a reasonable price".*

Pork is imported from Denmark, Holland and Germany; lamb from Ireland and the UK; beef from Ireland, Germany and France. Amei deals with Vion, Dawn Meats and ABP.

What is most wanted is quality, marbled, grain-fed beef.

Halal is not an issue, especially for offal, as Shalal comes in readily enough from India. Organic meat is not in demand and authenticity would be dubious anyway.

What is most wanted is quality, marbled, grain-fed beef. Top of this list would be wagyu, followed by Angus and then commercial beef.

Amei also joked the English are always slow to react as they are always *"thinking and accounting",* the Irish are open to deal with, the US want to sell huge quantities and the Dutch are "*pirates*".

Carrefour, she said, are the best quality supermarket. They are also flexible and easy to deal with, they buy big volumes of high quality, treat staff well and provide individual quantities - in comparison to Walmart where multipacks are more common.

Pigmeat traceability station in Carrefour

I visited a Carrefour near Amei's office with Charlene Wang and it was reminiscent of an English Tesco store. For pig meat, a station was available to scan the barcode on a pack to see when the pig was killed and where it came from.

Next in quality is Walmart. They are cheap, provide large quantity packs and have a reputation for not treating staff well.

At the bottom of the pile is Tesco. They are not popular and it's easy to see why.

Amei thought Anouga was the best meat trade fair in the world. She also thought it was clever of Bigard to not attend SIAL as they concentrate on paying attention to their local markets and traders, and standing out like this makes traders come to them. She backed this up by saying "*the best alcohol is found in small places and is hard to locate".*

8b. Xiamen

Upon leaving Beijing, I travelled south to visit the **ECCO tannery and shoe factory** in Xiamen. First I met the Managing Director, Neil Clarke Perrin, an English ex-pat who once worked for Pittards before moving on to other plants in Asia. The Xiamen complex takes the hide from the wet blue stage right through to the finished product. Neil said China, having invested heavily in recent years, has great infrastructure now. This, together with abundant labour, makes Xiamen a good location, with ECCO now the only authorised tannery in the region due to its good credentials.

The Dutch owned **Leather Group** from Dongen, near Belgium, process the first initial stage of hide processing taking it through to the wet blue stage. Wet blue skins, once delivered, are in storage between one day and three years, with six months being an ideal maximum due to risk of mould and drying out.

There is a three month gap between an order and delivery. Forecasting requirements are around 23% accurate. The best skins come from Europe (Holland, France, Germany), followed by the US, Brazil, Argentina and Australia. Each batch of 200 skins requires 100 cattle. Veal skins come from Van Drie in Holland. Lower quality pig skin that stretches more is used less now. Products made include shoes, boots, bags, car seats and upholstery. The main ECCO distribution centre is in Thailand.

China has 21% of the world leather market. Main competitors are Thailand, the US and Italy. Most tanneries are privately owned family companies and are generally inefficient. In 2008 there were 6,000

tanneries, now there are 5,000. Global companies are increasingly involved as environmental issues become more important. Most pollutants are in the raw hide to wet blue stage.

China now represents 20% of all ECCO sales and with a middle class of 250 million now and a predicted 280 million by 2025, China provides a huge marketplace for a high end product in the coming years. Currently in the quality shoe market, ECCO have a 60% market share. The Xiamen plant runs for 24 hours using a triple shift. This leads to a large labour turnover as jobs are easily available in the region.

Processing hides at the ECCO tannery

The Xiamen plant has set up its own Research Academy to bring students through the ranks to develop new ideas and innovations. This was done due to difficulty in finding quality researchers from outside ECCO. The four current students have spent time abroad and are now due to submit a finished thesis on new innovations. Students have been working at the plant for around three years previous to their research.

8c. Hong Kong

The next stop was Hong Kong where consumption is the name of the game.

I met Emily Chan who works from home for **Chisholms**, a Canadian meat trader, and is now in charge of Europe and Australia on beef and lamb. Most of her customers are Chinese hotels. Price is number one over quality in the hotel market. Trade is slow currently, with many smaller operations closing. Port fees for storage are $1,500HK per ton for the first three days, then doubles after that. Independent surveyors will adjudicate on disputes. There are more traders and distributors now and it is harder to make a living.

Transport costs are high currently and there is instability in the trade. Grey channel trade means China loses out on tax revenue. Leadership changes in Beijing last year were holding up movements of trade. This should improve once the new regime has bedded in. Hong Kong trade changes quickly.

Beef bone marrow for Japanese soup noodles is popular. Currently in vogue are sushi, European wines and yogurt. Beef shin and shank is popular in the winter and people are moving away from offal. Frozen meat is the largest food volume traded through Hong Kong.

With Emily I visited a high end store called TASTE. US, Canadian, New Zealand and Australian beef was on display. Wagyu sold at $180HK per 100g. Australian Angus sold at $61HK per 100g. Dutch veal from France and Uruguay ox tail from Brazil was also on offer.

I met with John Lam from the **United States Meat Export Federation**. Like Emily, John was native to Hong Kong. The Ng Fung meat plant in the New Terratories kills around sixty Chinese cattle per day plus lamb from Mongolia. Theirs is a very powerful monopoly with no competitors. In the 1970s live cattle came in from Vietnam, Thailand and Australia, but now stock is transported in from the

mainland. Cattle are now in short supply as the mainland consumes more and imports have increased.

Highly marbled wagyu in TASTE, Hong Kong

We visited the wet market in Chai Wan. Street stalls sell fresh fruit, vegetables, live seafood in tanks and meat in open fronted street shops. Chicken are picked out live and killed and plucked on the spot. Pork, lamb and beef have all been killed within the past 24 hours and are hung on racks. In the main pork, chicken and duck are on sale. Beef is more abundant than lamb. Oxtails are left with hair on to keep them fresh. All produce looked fresh and of good quality, with shoppers coming most days or even twice daily.

Chai Wan wet market

Lastly we visited the Great Food Hall in the **Queensway Plaza**, an extremely upmarket shopping mall owned by the **Hutchinson Group** which has 250 stores in HK and 35 butchers' shops. Timothy Broderick is head of the food department and is a native New Yorker. He has specialised in high end, niche,

High class shopping malls are everywhere in Hong Kong

artisan produce from around the world with multiple choices of meat and cheeses. Most customers are Westerners and Western educated Chinese. Thirty per cent of customers are Westerners, but provide seventy per cent of sales.

Timothy is trying to better manage the supply chain by direct trading with producers rather than using traders. Carcasses, not cuts, are bought in and butchered on site. Organic and branding are important for expats. Welsh lamb was on display in the fresh meat counter. Key traits for this are the region, the PGI and being grass fed.

The US meat on the fresh meat counter had the same Five Plan Global Animal Partnership protocol as Wholefoods in the US, and was sold as Country Natural Beef. Higher standards for animal welfare are being introduced in California by 2015.

High quality meat counter in the Great Food Hall

Australian Rangers Valley beef sold as 300 day grain fed. Scotch Beef tenderloins were sold in store.

All stores have to sell meat under separate licences. Separate display cabinets are required for frozen and chilled.

Next John Lam and I visited **The Globe pub restaurant** owned and run by Patrick Barrett, an English ex-pat. HK has a population of 7,000,000 and 40,000,000 tourists visit each year, 70% of whom are Chinese. The US and Australia dominate the market with grain-fed beef. The Globe started to do in-house dry ageing for high end grass fed meat. Beef must be vac-packed, trimmed and dry aged. Australian kobe beef is used, with cuts of chuck and hanging tendon. Other cuts wanted are tripe, ox tail, kidneys, flank, hanging tendon, sirloin, rib eye and veal liver. Irish and Scotch beef are much more expensive than US, $280 versus $190. The profit for a restaurant is in alcohol, not food (the opposite of the UK), as there is no tax on alcohol.

You need an excellent product with a great story to tell.

Property prices are high, but inflation is low. Food is expensive. Salaries are static. You need an excellent product with a great story to tell. Welsh lamb is too expensive.

A water racker machine is used to cut lamb carcasses in Australia to make cleaner cuts.

Next we met with Angelo McDonnell, an Irish ex-pat who is the Director of **Culinary Development for Cafe Deco** which is the management company of 43 Watermark restaurants and Pacific Coffee outlets, plus others in Sydney and Macau.

30% of sales are beef, sourced from the US, Australia, Poland and Ireland. A dry age cabinet has just been installed. UK beef is becoming more in demand. High end sales consist of 60% ex-pat and 40% Chinese. Low end sales consist of 80% Chinese and 20% ex-pat. Beef is more popular than lamb in HK. Braised beef short ribs are popular. US, Canadian, and Australian beef is similar in price. Argentinian beef is the best of the South American beef and is of similar quality to New Zealand, but not as good as Australian. Scotch and Irish beef needs promoting to get people to try it. Wagyu has become saturated out of the market. There are lots of steakhouses now in HK, which also use hanging tendon, brisket and rump. Steakhouses are 80% US and 20% Australian.

Mono Sodium Glutomate (MSG) is a flavour enhancer found in soy sauce and oxo cubes and is sometimes used by the unscrupulous to enhance the flavour of poorer quality steaks. It is also addictive like caffeine.

Next John Lam and I met with Winson Chan from **Million (Far East) Companies Ltd,** a local meat trading company. Honeycomb tripe is imported for noodles, bleached and semi cooked omasum and tripe is imported for dim sum. Oxtail is imported from Argentina. UK ox tail is too expensive. UK brisket is reasonable

price wise. Other cuts wanted are plate, rib fingers, breast and blade. Topside and knuckle are wanted for stir fry. Winson prefers grain fed for high end cuts from the US, Canada, Brazil and Argentina.

There are limitations for domestic beef production in China. There is competition for land use. The government would rather subsidise other industries, like car makers. Technology and resources are not being channelled into agriculture in China. There is concern over the future of food supply in China, and its dependence on imports. There is not enough cattle feed produced to increase production. When faced with an opportunity cost, agriculture will lose out to other industries.

China is buying resources and farms in Australia. The US is the biggest external owner of land in Australia with a sixteenth of all land. In Australian abattoirs, three quarters of workers are Chinese, who after three years can apply for a permanent visa.

Adding value, re-packaging, and BTO (Billing to Order) are now seen as areas to pursue.

The margins are getting smaller in the meat trade due to greater transparency. Trading has become easy to get into so some with large financial backing have taken on high risk strategies. Adding value, re-packaging, and BTO (Billing to Order) are now seen by Winson as areas to pursue. Speculators are making trends unpredictable and hoarding of product can have a massive effect when released onto the market. Forequarters will become cheaper.

40% of Winson's trade is with the mainland. The main customers are catering groups in Macau and HK. Macau has a casino industry bigger than Las Vegas. Chinese behaviour is unpredictable. HK is more stable in general, but changes in demand are rapid and even more so in Macau. China wants to restrict trade with the US and Europe so they have a bargaining chip to play with.

Peter Fransson is a meat trader with Saison Food Group and mainly trades with US suppliers. He needs to find a current UK exporter with refrigerated warehousing near Heathrow, to collaborate with, in order to consolidate weekly or bi-weekly deliveries by freight air to HK of multi species chilled and frozen processed meats.

He tried to set up a supply with a Hereford-shire farm producer for beef, pork and lamb but couldn't make it work due to the higher prices on offer in London. An imported product needs to ride on the crest of supplying high end London stores.

Rhug Estate in Wales supplies organic into HK. Also supplying HK are Donald Russell, Randall Parker and Scotch Beef. Scotch Beef has a Royal Warrant and a PGI[3]. Heritage Angus from Canada is a good quality brand, but Peter can't sell it due to the high price.

Peter thought ParknShop in HK is maybe an unrealistic model (buying direct from suppliers). Shopping malls want restaurants to keep re-inventing themselves to keep things fresh and new. Steakhouses have boomed in the last five years but are now maybe passé. Spanish meats are the new fad in town and offer cheaper raw product. Rentals are increasing so restaurants are under pressure to cuts costs. Coffee and Italian food offer a

[3] PGI = Protected Geographical Indication. In 1993 EU legislation came into force which provides for a system for the protection of food names on a geographical or traditional basis. The EU Protected Food Name scheme highlights regional and traditional foods whose authenticity and origin can be guaranteed. PGI is one of these marks.

good markup on raw material cost. Water and pasta are cheap and are only 10% of cost. Red meats are 35% of cost. The HK economy could be under a little pressure next year.

The UK is mainly air-freighting in chilled product. Shipping frozen takes four weeks. Cross contamination in UK chillers is an issue as different product lines pass in and out. Shelf life of beef from UK abattoirs is three months, but higher in other countries due to EU demands for high standards for hygiene and preventing bacterial infection in order to import into the EU. South American plants can offer a shelf life of six months, and Australia now five months. This, ironically, gives them a competitive advantage over the EU importers.

I took a look at some other HK retail stores. **SOGO** is one of the largest Japanese style department stores. Originally Japanese owned, but now owned by Lifestyle International Holdings, a Hong Kong company owned by billionaire brothers Joseph and Thomas Lau. SOGO began life in Causeway Bay in 1985, and underwent major renovation in 1993 expanding its area from 120,000 to 400,000 square feet. All product areas are contained within a twenty storey building, including a food supermarket.

The Causeway Bay SOGO store is a high end outlet with an "event hall" for promotions. At the time, produce from Taiwan was on show, but why not an English beef promotion in the future? UK produce spotted on the shelf included Welsh Lamb and McClellands Cheese from Scotland. The Welsh Lamb was PGI stamped and supplied through Randall Parker and was competitively priced with the US, NZ and Mongolian lamb.

Beef is of US, Australian, Canadian, Japanese and Chinese origin. Cuts include short rib, rib fingers, rib eye steak, strip loin steak, sliced chuck for hot pot and mince. Angus is usually named. Japan and Australia each had Wagyu on the shelf.

City Super is another high end outlet in a designer label department store. Established in 1996 and employing 1,200 people, City Super is a lifestyle speciality store with four outlets. Its three components are Food Market, Life Division and Cooked Deli. The Food Market supplies international gourmet with a nod towards environmentally responsible products. Jazz plays over the speakers and the well-heeled walk on tasteful wooden flooring.

Local Somerset cheese maker Wyke Cheese is a supplier. Imported beef comes from the US, Canada, Japan, and Australia. Wagyu and Angus are named and there is an organic section of Australian mince, burgers and steak cuts. Cuts include rib eye steak, strip loin steak, roast joints, rib fingers, short rib and thin sliced chuck.

Wellcome Superstore is owned by Dairy Farm International Holdings Ltd and is a major Asian chain operating 5,250 stores that include supermarkets, hypermarkets, health and beauty stores, convenience stores, home furnishings and restaurants. 81,000 people are employed in the region and total annual sales in 2010 exceeded US$9 billion. Dairy Farm International Group companies include Wellcome, Market Place by Jason's, Oliver's, Threesixty, Maxims, Mannings, 7-Eleven, GNC, and IKEA.

A Wellcome store I visited was similar to a Tesco in the UK. English brands included Yeo Valley, McClellands Cheese and other Welsh cheeses. Beef cuts include Uruguayan ox tail, Australian stewing, mince and steak, US thin cut slices for hot pot and a Chinese fresh meat counter.

ParknShop is a leading Hong Kong supermarket chain, and a member of the AS

Watson Group, a wholly owned subsidiary of Hutchinson Whampoa Ltd. Since 1898, the Watson Group has evolved into an international retail and manufacturing business in 36 markets worldwide. ParknShop has 280 stores in Hong Kong, Macau and China. Under the ParknShop umbrella, the TASTE food galleries and Great Food Hall, stylish and speciality foods are sold from around the world.

DCH Trading has been operating for over sixty years and is a premier food trading company that covers import, export, re-export, wholesale, retail and distribution. 1,500 different food product lines include frozen and chilled meat, seafood, poultry, fresh produce, canned food, beverages, nuts, grocery as well as oils and agricultural products around the world. DCH distributes to wholesalers, supermarkets, retailers and caterers in Hong Kong, Macau and China. Catering sector customers include Chinese and Western restaurants, hotels, shipping, airlines, supermarkets, fast food chains, government institutions and canteens.

The Wan Chai and Kowloon stores were reminiscent of Spar in the UK. English product was duck tongue! Beef was frozen and chilled and originated from Brazil, Canada, China and the US. Cuts included sliced chuck for hot pot, short rib, golden coin muscle, rib fingers, diced boneless rib fingers, Cornish steak, rib eye steak, strip loin steak, braising steak and tripe.

Kai Bo Food Supermarket is a local chain store with 70 stores. Founded in 1991, this is a lower end outfit and all the meat I saw was frozen. Beef came from China, Brazil, Canada and the US. A small selection of cuts included rib fingers, short rib, rib eye steak and braising steak.

I then went on to visit Reynaldo Alfonso, Managing Director at **Sutherlands**. This meat trading company based in Chai Wan on Hong Kong island, began life as a commodity meat trader in the 1980s. Since Reynaldo's son, Romeo, joined, Sutherlands have now also moved into the quality branded end of the market supplying high end grocery retailers, airlines, hotels and retailers. Customers include City Super, SOGO, ParknShop and Wellcome. Trade is concentrated in Hong Kong, Macau and China.

Sutherlands look for exclusive partnerships with excellent meat products that can tell a great story. Sutherlands will do the market research, and it can take seven years to build a brand. Organic now works in retail, but not in food service. Beef is a year round product, lamb is more seasonal and directed to the colder months.

Products include Westaways sausages and Welsh Lamb. PGI is important here. Randall Parker are the meat packers involved. Sutherlands help design the packaging which includes a Halal label and shrink wrapped fresh packaging to minimise air content in the pack. Welsh Lamb comes in chilled and frozen and also has TV coverage on the TVP channel and has been used on cooking shows.

8d. Shanghai

From Hong Kong I flew north to Shanghai and attended an evening reception held by the Scottish Government in the Ritz Hotel to promote Scottish produce in China. Owen Patterson, the DEFRA Secretary of State, was present.

The next day I attended the **FHC Food Expo** in Shanghai. A speaker at a Scottish promotional event at FHC described how US grey channel meat at $180 gives it a poor image. However, legal Australian meat at $250 has a good reputation and is more sought after despite its higher price. The message is: be confident of your product. Take time to build a brand and tell a story. Bring samples to FHC to show off the product. By 2020, east coast China will be as expensive as Europe for consumer goods.

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Brand infringements are rife with huge numbers of patents applied for in China for like-named brands.

Brand infringements are rife with huge numbers of patents applied for in China for like-named brands e.g. Bad Bull, Adidos, Johnnie Worker Black and Red Labial. Make sure your brand has applied for trademarks, patents, copyright and design rights. Also, register your name in China to prevent someone else doing so.

Promoting Scotch Beef PGI at the FHC Expo

I spoke to a huge variety of people at the Food Expo. Ringo Wong from Wilson International Frozen Foods HK Ltd was promoting the Jamie Oliver product range. They would be interested in a breed branded beef product.

EBLEX had a stand at the show and there were various meat processors present from across the UK. The Scotch Beef stand was impressive and conveyed a strong message with quality, provenance and PGI credentials prominent.

9. Brazil and Uruguay

The focus of my trip to Brazil was their amazing beef production capacity and their importance as one of the world's largest beef exporters. Brazil has 200 million people, 200 million cattle, and only 20% of beef produced gets exported! Brazilians like eating beef!

9a. Sao Paulo

My first meeting was with Mathias Almeida who is the Sustainabilty Manager for **Marfrig,** one of the world's largest meat processors. 95% of Brazilian beef production is grass based, with only 5% of cattle supply coming through feedlots. The largest of these would hold 50,000 cattle. Abattoirs source mainly from feedlots in winter, and mainly from grass in the summer. The main breeds are Nellore and Angus. Often an Angus sire is put on a Nellore dam to cope with the tropical climate.

Nellore cattle grazing in Brazil

To add value, Marfrig are focusing on increasing the processing of foods, as it is hard to add value to chilled and frozen meat. Marfrig themselves only own a maximum of 2% of cattle in their supply chain, but do pay for the insemination of their suppliers' cows with an agreement to get the calf back. 150,000 cattle are inseminated in this way. Angus is 50% certified (sire or dam). The cattle need to be on a finishing unit for the last 90 days for the export market. Exports as part of the Hilton Quota require traceability for the last 10 months of life.

Customers are client orientated and food service based. 65% of these are domestic market based. Beef is increasingly seen as a luxury product. Rainforest Alliance beef is increasingly a focus for Marfrig to combat criticism of rain forest destruction.

Uruguay focusses on adding value, with Hereford and Angus the main breeds on extensive grass based systems. A small amount of chilled beef is exported to the US. Australia and Uruguay are organised, specialised and focussed on value adding and high quality. Uruguay has more cattle than people and beef is the largest contributor to GDP. Uruguay is characterised by large natural grassland based production units.

I met with Guilherme Bellotti de Melo from **Rabobank**. He considered there is room for greater production efficiency. The government has a 20% stake in JBS, as well as stakes in other meat processors like Minerva and Marfrig. This illustrates the importance of the meat industry to the Brazilian economy. There is room for consolidation for JBS and an opportunity for a foreign investor in a joint venture. Foreign land purchasers are now only allowed to hold a minority stake.

Distribution, storage and logistics are now a more important investment than land, and a large degree of Chinese investment is now evident in Brazil. Infrastructure is the biggest hindrance to progress for Brazil at the moment.

9b. Piricicaba

I travelled north from Sao Paulo to meet with Sergio de Zen at Cepea in Piricicaba. Cepea is the research centre for the University of Sao Paulo and is focussed on a diverse range of agribusiness issues such as market analysis and price discovery, international trade, macroeconomics, management strategies, environmental and social aspects, entrepreneurship and family farming.

Cepea comprises a group of well-trained specialists who have been collecting and analysing data from primary sources for more than 15 years. Cepea releases on a daily basis a set of price indices which are widely used by farmers, agribusiness agents and the government.

Cepea staff are made up of 140 professionals: PhDs, graduates and undergraduate students, plus specialists in communication and information technology. Cepea's work is based on close interaction between the researcher and the community being studied. Finding practical solutions to relevant agribusiness related problems is Cepea's mission.

Masters students are used to do data analysis which helps pay for their education. Teams of six work under a supervising professor. Teams cover all the different agricultural sectors e.g. input prices, cost of beef production, and the cost of coffee production. Data is collected from around 8% of producers. 4000 sets of data are collected monthly across 13 states.

Student work hours for Cepea are long:

- 8am-6pm Monday to Friday doing data analysis, with lunch break
- Evening studies are 7.30- 10.30pm
- Two afternoons a week are left for study.

Cepea are funded by private company sponsors and industry bodies, plus government funding that accounts for 9% of income. Companies can get back information to help their businesses.

Feedlots are decreasing in size and number due to increased costs. Rotational grazing is increasing. Salt minerals are used extensively. Irrigation is too expensive. Grazing braccia grass cover crops after maize harvest is also increasing in popularity.

Bos indicus (Nellore) beef is more popular with consumers than bos taurus (Angus) which they find too fatty.

'Carne' is carved off skewers in Brazil

9c. In Uruguay

From Brazil, I flew south to Uruguay and met with Pablo Caputi, Gregorio Dassatti, Jorge Acosta, Felipe D'Albora and Ana Paula Silva Ponchio from the **National Meat Institute (INAC),** who proved to be fantastic hosts during my time there. Uruguay is a very proud nation of some 200 years, that boasts a four-centuries history of cattle production based on natural grassland. Uruguay has 3.3 million people and 11.3 million cattle. Beef exports have jumped from 30% to 66% of production since the 1980s. Beef accounts for 83% of meat exports and accounts for 21% of all global exports. Uruguay is FMD and BSE free,

and has banned the use of hormones since 1962. The main breeds are Hereford and Angus. INAC has implemented an impressive traceability system that tracks all cattle with RFID tags from birth right through to the packing box. Uruguayans eat 60kg of beef per capita. The main export markets are Russia, NAFTA, the EU, Mercosur and Israel, with China growing rapidly.

Cattle production is stable in Uruguay, but beef profitability is marginal. The strength of the currency in Uruguay also affects the competitiveness of Uruguayan beef both on the international market and in relation to imported beef. 37% of meat plants are Brazilian owned. In 2004, there were 100,000 hectares of soy bean. Now there are 1,000,000 hectares and this is a challenge to the natural grassland systems used for cattle production.

Cattle grazing on natural grasses

I also visited the **INIA research centre** in Treinty A Tres. It was interesting that “social inclusion" is part of its mission statement due to the leftist government’s influence. The government also now requires a crop rotation plan from crop growers. Rain in Uruguay can be heavy at times, but most runs off, so there is a need to improve rainwater collection for irrigation in the dry periods.

I travelled with INAC to visit Eduardo Urgal, who runs **Frigorifico Pando**, a family owned national meat plant and packer. It is the tenth largest of its kind in Uruguay and kills 100,000 cattle per year. All Uruguay meat boxes have to carry the Uruguay beef brand logo, giving a good consistent image. The Pando boxes are attractively designed with good use of photographs.

The Black Box traceability system is used at the plant. Seven data points collect information in the meat plant. The paid weight to the farmer is given after trimming. Group live weight is also taken in the lairage area. Data is untouchable once in the system. INAC feed information back to the producer.

Next in Uruguay I visited **BPU Meats**, a UK-owned and operated state-of-the-art new build abattoir near Flores. BPU is run by Terry Johnson who set up St Merryn Meats in the UK. 450 staff are employed at the plant which has a kill capacity of 1,200, but only runs at 50% capacity currently. 60% of the kill is Angus and Hereford. Carcass weights are 260-300 kg deadweight usually. Smaller carcasses go to Chile.

At the time of the visit, the BPU base rate was $3.80 per kg and $3.85 for Angus. Per head cost to the abattoir was $0.92. Employees work eight-hour shifts. The labour unions are strong and once someone is employed for three months, it is hard to sack them. 80% of the workforce is therefore stable.

Export destinations include the US, China (frozen forequarter) and Canada. Europe is the most important target at the moment, with a particular focus on food service and retail. Frozen steak cuts in packs of six are sent to food service, primals go to supermarkets to butcher in store. BPU were finding it hard to gain export permits into the UK. 60% of product is exported, and this is the best meat. The domestic market uses cull

cows and asasado (centre cut of flank and ribs).

There are plans to use wind turbines and solar. Methane gas is already used and wood from eucalyptus is burnt in the boilers. There are also plans for wet blue processing.

Offal is further processed on a separate floor downstairs (e.g. tripe bleaching). Upstairs is an all-access area for maintenance. The kill line is straight. There is the potential for lactic acid applications to be implemented. The carcass is weighed three times, and VIA scanned. Five INAC (National Meat Institute) officials re-grade the VIA machine monthly. Producers are paid on meat yield. Most hit the base spec. The plant is Halal-accredited. Four procurement fieldsmen source cattle and there is one full time farm assurance officer. Temple Grandin designed the lairage. The plant is two years old and had good government and INAC backing, as well as local mayor support.

Temple Grandin-designed BPU lairage

Elsewhere in Uruguay I visited the **Estancia Ana Paula farm** in La Madrugada and met with the farm manager, Juan Antonio.

This is one of ten farms owned by a Brazilian, who came to Uruguay 20 years ago. He also owns farms in Brazil as well as a construction firm and slaughterhouse in Uruguay. In Uruguay, 100,000 hectares are owned in total, with each farm around 10,000 hectares each.

The Ana Paula farm is the only farm in Uruguay certified in entirety by CNMPU, which is a Global Gap certification program guaranteeing "natural" farming practices. This is not organic, but relates to the extensive grass based production system.

Rotational grazing beef cattle in Uruguay

75% of the farm is under cattle production. 25% is down to crops of rice, maize, sorghum and soy bean. Performance measurements are made in hectares per worker and kg of meat per hectare. 500kg of natural rock fertiliser is the only fertiliser applied in the last four years. Sprays can be used.

80% of the farm is wetlands, and 20% are dry (2,000 hectares) and in need of irrigation in dry seasons. A 650 hectare reservoir was therefore built to mitigate this. Land in the region is around US$4,000-6,000 per hectare, up from US$500 around six years ago.

90% of cattle production is grass fed. Supplements of moist sorghum grain and whole-crop are used at certain times of the year for finishing cattle. Around 80,000 cattle are on the unit, all Angus of Argentine bloodlines.

Since January, two 650-hectare blocks of a New Zealand rotational grazing system using 2

hectare paddocks has been introduced with no irrigation to improve grazing efficiency and management over large areas. Each paddock carries 500 Angus steers for one or two days, returning in around 40 days. Lotus legume hay is fed as a supplement. Lotus seed is scattered by spinner in the autumn to produce extra grazing the following spring and summer.

Steers are killed with two teeth at two years old at 420kg live weight. The company's own slaughterhouse is BUL. and 500 Angus steers from across the ten farms are killed on one day per week. The rest of the week, cattle from other farmer members of the slaughterhouse cooperative are killed. BUL started in 1994, and was bought out in 2010 by Minerva, but with its culture and practices retained.

A farmer receives payment in pesos, but inputs are paid for in US dollars. Inflation is driven by the US dollar. Farm prices are dependent on the export trade. Government tax incentives are given to foreign investors, but probably won't last much longer.

One of my favourite visits on my travels was with **Ross Houghton in Flores**. Ross is an extraordinary individual who came to visit family friends at the age of 21 and ended up staying. Now, six years later at the age of 27, Ross owns a 1,000 hectare farm with 700 Angus cows, 1,300 Angus stock in total, and 30 horses. Ross sells 30 bulls each year for between US$2,000-5,000.

Other breeders farm up to 5,000 hectares. Commercial farms can farm up to 40,000 hectares. There are many families with old money in Uruguay that have large holdings.

Crops grown are soy bean, sorghum, alfalfa, oak grass/rye grass mix for grazing, natural pastures and artificial pastures. A mainly min-till system is used. Artificial pastures last around 3 years.

Eucalyptus trees are harvested every three years and exported for paper pulp to Scandinavia. These regenerate three times, so last about 20 years.

Seven staff work on farm and there is a full time vet as farm manager. Ross is on farm around 9 months a year, with 3 months away in the UK or travelling. Ross now speaks fluent Spanish.

Checking cattle on horseback with Ross

10. Global Focus Program

Although not strictly part of my individual study, participating in the Global Focus Program, and being the only UK Scholar to do so, added an extra dimension to my Nuffield experience.

I left home in February 2013 for the start of the GFP in Canberra and joined seven Australians, a New Zealander and a Canadian. We travelled through New Zealand, Canada, the US, Mexico and Brazil over what was a truly remarkable and extraordinary seven weeks. It has surprised me just how much more I have gained from doing the GFP as well as the individual study. The Nuffield travel I had done individually previous to this was usually in three or four week blocks spread out through the year. One big thing about being away for seven weeks solid, is it gives you time and space away from England and your own business to really think about what you are doing, why you are doing it and where it will lead you, and your place in the world. It's almost impossible to do this as you go about the day to day rituals of your normal life and business at home.

Travelling with nine other people from different countries with different cultures is also a great experience. We were all different but each of us brought something of value to the places we saw and the people we met. In a way it was easier talking openly about our lives and our opinions because our roots were spread around the globe. It can be hard at times in England talking to near neighbours, or even your own countrymen, in any real depth because there is a set of norms in place together with pride and competitiveness. When you're squashed together with nine people for seven weeks, there's really nowhere to hide and the team unity we formed was amazing despite coming from four different countries.

One big thing about being away for seven weeks solid, is it gives you time and space away from England and your own business to really think about what you are doing, why you are doing it and where it will lead you.

We saw an incredible range of businesses and a vast array of people who all were doing extraordinary things across a broad range of agricultural sectors. When you then apply this to a broad range of countries, it gives an incredible leap in your knowledge of the world and the possibilities that are out there. Not doing a GFP is really missing out on a complete Nuffield experience and the Aussies and Kiwis have grasped this completely.

I wanted to cherry pick a couple things from my GFP that relate to my individual study. The first of these was a visit to see **Andrew Watters** in New Zealand. Andrew's company, **My Farm**, puts together a portfolio of outside investors to buy dairy farms in New Zealand and then manages those farms under a prescribed management protocol that has a proven track record. I began to wonder if this could be applied to the UK beef sector to gain some efficiencies of scale and consistency of product.

We had interesting discussions in the **US with Sharon Bomer Lauritson**, a US Trade negotiator with the EU. She talked about how the US wants to export to the EU products

with geographical reference e.g. Greek Feta Cheese. PGI status is getting in the way of this. The EU is targeting US government procurement in non-food areas. The US argues that consumers should be allowed to decide for themselves over growth hormones.

The Harris Ranch feedlot we visited in California fed 120,000 cattle on site and stood out because it had acquired its own abattoir to kill all its own cattle to supply its own restaurants and food outlets. This was the first time in the beef sector I had seen a company involved at all stages of the chain.

Superior Farms in California is a lamb processor with a difference. It is an employee-owned company where employees earn shares as part of a wage and after five years of employment become vested shareholders. This incentivises a good work ethic, turnover of labour and sick days are almost non-existent and the company is thriving. The knife men, not the CEO, are the main shareholders. The shareholders (i.e. the workforce) select the board, who are elected annually. Interestingly, employees took out a loan to acquire the company at the outset.

Heavyweight sheep carcasses at Superior Farms

One of my favourite visits out of all my Nuffield travels was the **Lechie Verge farm in Bahia State**, Brazil, led by a fascinating New Zealander, Simon Wallace. At the outset, Lechie Verge scoured the world for the perfect climatic and economic location to produce milk and decided on Bahia in Brazil. Here, there is rainfall, sunshine, land, labour and growing demand for dairy products in an under supplied market. Using the principles of 'islands of production in a sea of conservation', six 58-hectare irrigation pivots were established, each carrying 600 Friesian cross Jersey dairy cows and each with its own 40/40 herringbone parlour. These are operated as autonomous family run units and supply milk to an on-site processing factory that bottles UHT milk (so doesn't require refrigeration) under their own 'Leitissimo' brand and sold in the cities. Ice cream and yoghurt brands are being added to the product line and sold in their own boutique retail outlet in Sao Paulo. Lechie Verge has set up its own on-site school and community centre. Simon was an inspirational leader who was able to create profitability alongside maintaining a social conscience.

600 dairy cows on 58 hectare irrigation pivots

On another note, arable farms in the Bahia region were growing two crops of soy, cotton or maize per year! I will never forget looking out across a 1,000 hectare field of cotton. Temperatures are tropical by day and temperate at night, so everything just keeps growing!

The MAPA organisation in Brazil suggested around 15% of Brazil's land area is not suitable for farming. Brazil was a net importer

1,000 hectare field of cotton in Brazil

Eucalyptus trees with braccia grass

of food in the 1960s, but by 2010 was a net exporter. The EU accounts for 25% of Brazilian exports. This has decreased in the last decade and China has become increasingly important. There is an increasing surplus in trade balance and agriculture is very important. Growth has come from productivity gains and an increase in the area farmed. In the beef sector, cattle numbers, pasture area and productivity have all increased, although beef is losing out now to soy and corn production. Min till and zero till are common place on cropping land.

At the **EMBRAPA research institute,** we studied the (iCLF) Integrated Crop, Livestock and Forest Systems where corn is under sown with braccia grass, with a rotation of:1st crop soy, 2nd crop corn with braccia grass, 3rd crop cattle grazing.

These crops can be planted between areas of eucalyptus trees that can be harvested every seven years for three cycles. This provides shade for cattle and soaks up carbon.

The Global Focus Program crew at Golden Gate

11. Discussion

Having seen so much on my travels, how does the global beef consumption and production I have studied fit together, and what is the trend going forward? In this section I will attempt to analyse the situation a little.

11a. Global Beef Supply and Demand

In the global beef market, cost differentials (currency, labour, land) are narrowing. National boundaries appear to be less important now to enable food production to meet a growing population demand. A 6% increase in global beef consumption is predicted over the next ten years fuelled by a growth in population and affluence.

Import growth is predicted to be 955,000 tons in the next ten years:

EU	652,000 tons more
Japan	103,000 tons more
MENA	99,000 tons more
Russia	92,000 tons more
S Korea	27,000 tons more
Others	229,000 tons more
USA	247,000 tons less

South America is a voracious consumer of "carne", but is largely self-sufficient and consumers have a palate for the leaner, slightly tougher taste and texture of grass fed, domestically produced cattle.

Canada is currently making export inroads into Russia and Kazakhstan. Both Russia and China, however, are seen as problematic due to the large influence the state and army have on trade. China and South Korea offer better opportunities than Japan, which has an aging population. In general, the global recession is dampening export efforts. Eventually non-trade barriers will have to disappear for trade to flow where it is needed and food needs to be produced where the cost of production is at its lowest.

North America views the EU market as a net importer of beef, with a very attractive affluent consumer base. Beef may become a less frequent meal choice, but high quality will be demanded. Intense lobbying is taking place through the auspices of the WTO to lift what they see as "political trade barriers" that prevent the trade of beef produced with the aid of growth hormones.

The US is in the unique position of having a huge domestic market to balance carcass utilisation in tandem with exploiting export opportunities. An emphasis on lean beef is currently predominant in North America to promote beef as a healthy option, and marks the start of a fight back against the rise in popularity of poultry meat which is lean, low in cholesterol, easy to cook and lower in price.

North American consumers also seem accustomed to the large scale industrial food production systems, like feed lots, and don't on the whole seem to have major concerns over the widespread use of beef hormones. US exporters make the misguided assumption that consumers in other countries will also accept these practices. They will not. The EU's resistance to beef using hormones and Russia's resistance to ractopamine illustrate this. These are not political trade barriers but genuine consumer concerns.

The percentage of the carcass going to ground beef is also increasing, despite the innovations in extracting more whole cuts from the forequarter, like the flat iron steak.

Craig Morris at the USDA thinks there will be fewer beef options in the future, and more ground beef with a few steak cuts. Processed foods will also turn away from beef to cheaper animal proteins e.g. chicken sausages.

I wonder if the next stage is research on the nutritional value of a chicken meal (which is frequently covered in lots of other gunk which is not healthy), against a beef meal (which is more tasty than chicken so can be eaten on its own with a salad).

Beef in the US is still some of the cheapest beef in the world due to the high prices countries like Japan are prepared to pay. The US also has the huge advantage over other exporters in having its own massive domestic market to fall back on, so can sell specific cuts in boxes rather than whole sides.

The EU consumes 7,000 tons of poultry meat. China supplied 220 tons of this and is keen to export more to the EU and US. Perhaps this can be used as a bargaining chip to gain market access in China? Beef export figures to China are surprisingly low and show what potential there is for beef exports to grow. Most beef and lamb consumption is in northern China. Cantonese pork cuisine is more southern based. It is best to target regions when exporting to China, and primarily the more cosmopolitan cities where steakhouses have proliferated.

Australia primarily negotiates comprehensive cross sector Free Trade Agreements, rather than individual sector deals. China would rather agriculture was not included in FTAs. Australia is keen on gaining FTAs with Japan and Korea. China would gain confidence from seeing FTAs set up with Japan and Korea ahead of them and these markets could therefore be the key to unlocking the door for UK beef access to the SE Asian market. In the latter region, there is a basic lack of land resource to produce the food they need. This presents, therefore, a great opportunity for food exporting nations. Export meat plants would benefit from being halal-registered. Most Chinese abattoirs are halal registered.

A clear message from people on the ground in China like Holly Chen at the China Britain Business Council (CBBC) is that there is a lack of support and resources from DEFRA when it comes to trying to penetrate the Chinese market. Chinese authorities are also keen to protect their domestic producers. CBBC offer paid services to UK companies to grow their trade in the Chinese market.

The Dutch government has bilateral trade agreements with China so can export pork, chicken, flowers, plants, agricultural machinery and racing and jumping horses for breeding. The Dutch have been attempting to gain favour with China by donating equipment and collaborating where need arises to help facilitate trade agreements. This is also something the UK government should learn from.

Most beef demand in China is for grain fed, rather than grass fed, which is not an ideal fit for UK grass based production, but beef opportunities are evident for high quality branded products and products with a PGI label. Chinese meat packers described to me how chilled beef, air freighted in to order in a 1.2 tonne size to try, would be a good starting point. It is best to make a splash in retail before trying out food service to build brand recognition and build up demand. Retail cuts are needed in shrink wrapped fresh packaging, and there is demand for rump, strip loin and rib eye steaks, diced, boneless short ribs and short rib (not for mince or thin hotpot cuts as these would change colour in the packs due to their thin nature). The Food service industry is interested in all of the

above plus mince and oven prepared (OP) ribs with rib eye in. If frozen and sent by sea for four weeks, the supplier needs to test the thawed out product.

25-tonne shipping containers of offal and primals are also wanted. Sutherlands look to make a profit of HK$2,500 per container or HK$100 per ton. Items of interest are whole tripe, honeycomb tripe, paddy whack, omasum, tendon (achilles and flexon), aorta, testicles, pizzles, tongue, whole tail. Also individually wrapped (IWP) shin and shank (with coyne left in).

In the cosmopolitan urban areas of China and especially Hong Kong, there are many high end food outlets now where high quality cuts sell for prices comparable to those of Europe. This area requires a well branded product that exudes quality and provenance. PGI products are an ideal fit. Whilst the mainstay of this demand is for highly marbled, grain-fed beef, there is a growing trend for a grass fed product that has a great story to tell.

From conversations at the FHC Expo in Shanghai, it was clear air freight transport costs prohibit exporting small amounts of chilled product. Yetminster (ABP lamb), Dovecote Park, and Woodheads will have export certification soon for Russia amongst others, but mainly for offals. The UK has currently one of the highest beef prices in the world so it makes sense for UK primary cuts to supply the domestic market and export offal abroad.

UK meat plants are not export focussed these days due to high domestic prices and the loss of markets in 1996 due to BSE. However, lamb is also at a high price in the UK yet Welsh lamb is exporting, so why not beef? It is taking a long time to rediscover the knowledge, contacts and desire for the UK to become exporters again..

Some key points to consider include:

- Beef consumption in China is regional and seasonal, with more consumed in the north and in the colder months.
- The English beef trade is perceived as slow on the uptake of opportunities and failing to follow up on enquiries.
- English meat plants also have a reputation for shipping over product that is not up to standard. China is not a dumping ground for second quality.
- Whilst the UK domestic beef price is one of the highest in the world, exports will probably remain a secondary concern for UK meat plants.
- The in-house research facility to drive innovation at the ECCO tannery was impressive and showed foresight. Could UK meat plants implement something similar to drive innovation in the UK instead of exporting processes to the likes of Holland?
- Welsh Lamb is present in meat counters in Hong Kong, with provenance, PGI and grass-fed the key selling points. One sample of Scotch Beef found. No examples of English beef or lamb found on retail shelves.
- Wet markets are the ultimate short supply chain. Produce is fresh, of good quality and readily available within walking distance.
- High end food courts in upmarket designer label shopping malls have proliferated across Hong Kong and China and often cater for western and ex-pat communities at prices higher than in the UK.
- The last five years has seen a proliferation of US and Australian steakhouses in Hong Kong.
- Grain fed beef with high marbling makes up the bulk of imported beef demand. Wagyu is always on offer too. This type of

beef is not a natural fit for grass-fed UK beef production. However, a large proportion of beef is Angus so is not beyond reach with the right feeding regime in the UK.

- Australia has Wagyu feedlots supplying bulk orders of quality, highly marbled beef into China and Hong Kong.
- Australia is the most successful importer of meat into China and focusses on negotiating cross sector Free Trade Agreements rather than isolating agricultural products from other export sectors. There are 50 meat plants in Australia registered for beef exports to China.
- The Dutch government has negotiated bilateral trade deals where part of the package involves donating equipment and collaborating on projects to help gain market access.
- China has a general lack of land resource to produce the food it requires so imported food will be increasingly important for them. China has an increasingly expanding middle class of 250 million people.

11b. Effective Beef Supply Chains

So now let's move on to efficient and sustainable beef production and how to best supply the growth in beef consumption demand.

Food production globally may well gravitate towards the regions and nations where cost of production is lowest and production is most sustainable. South America ticks a lot of these boxes, but would need greater *bos taurus* influence to satisfy consumer palates in the EU. Uruguay does fit this bill with a predominance of mainly Hereford and Angus, disease-free status and an impressive traceability system to satisfy importer expectations. There are many efficiency gains still to be taken advantage of in South American beef production. Rotational grazing practices, for instance, are beginning to be introduced to improve grazing efficiency and productivity.

Brazil has good soils, rainfall, good temperatures, available labour and is sustainable in energy. Its biggest weakness is infrastructure. It needs investment in roads, ports, railways and waterways. This would improve distribution, storage and logistics.

Foreign investment in food production will increase as nations endeavour to secure food supply for their sovereign state - e.g. Chinese investment in Brazil - or to take advantage of a lucrative trade e.g. Argentinian investment in Uruguay. Tax incentives are currently available to foreign investors in Uruguay, but for how much longer? Land prices across South America have risen dramatically in the last six years. Paraguay could well represent one of the best opportunities now for foreign investors. Stable governments with good policies are important, however. Argentina is a good example of how things can go wrong economically, which can put off foreign investment. Private North American companies involved in the beef industry are investing in primary production in other countries, like China and Russia, where demand for beef is rising and domestic production is under developed.

Grain-fed beef production could well be under pressure in the long term due to its high cost of production and inefficient feed conversion ratio compared to fish and poultry production. Large scale grain based feed lots can argue efficiency due to their economies of scale, but grassland beef production has long term sustainability. In North America, grain farming is successful, but the feedlot is loss making. The days of cost-plus-feeding are

gone. Meat packer and feedlot capacity utilisation is decreasing. Equity required for cattle in feedlots increased by 19% in 2011. One thing that is impressive, however, on North American feedlots is their attention to detail and superb management on a huge scale.

Grain for beef production in North America is also under pressure from competition for ethanol production, extreme weather events, and competition for land and labour resources from oil and gas production. Much of the demand in SE Asia, however, favoured highly marbled grain-fed beef, so opinion on grass-fed beef would need to change here.

Currently, carcass and portion sizes are too big in the US. It seems to me strange then that growth hormones are used. Craig Morris at the USDA argued that growth hormones provide a good return on capital, do work and are efficient. Meat packers would not be concerned if growth hormones stopped being used but North American beef producers are apparently the ones who want them due to their effectiveness. The payment grid is geared towards size and quantity rather than eating quality.

When I met with Temple Grandin at Colorado State University, she suggested that instead of using growth hormones, why not use the genetics of "God's hormones" by leaving bulls entire and gaining double muscle. Tenderness would decrease, but it also decreases with growth promoters. There are, however, management issues involved with large scale bull beef production due to temperament.

There is no individual animal ID system in the US, and no desire or move towards one. The UK system was prompted by a big disaster (BSE), and it will probably take the same in the US. In general, the USDA appears to carry a light touch on farm inspections and tries to encourage areas of niche e.g. organic, farmers' markets. There seems to me to be a gathering storm of food safety issues in the US (*e.coli*, growth hormones, traceability) but all involved seem to be ignoring the warning signs. The pork and chicken sectors are ahead in this respect as they are export and consumer focussed and mainly very business-minded. The beef sector is more animal- and farmer-focussed and less aware that ultimately they are producing for a consumer. There are 800,000 cow/calf producers with an average herd size of 42; this is where most of the traditional thinking lies.

During various discussions with people from the Canadian beef industry, questions were mooted about the actual uptake of the information flow BIXS system by feedlots and cow/calf operations and what access and information was actually available. BIXS may need to be mandatory to succeed and participants need to be able to extract information to improve profitability. In contrast, there are half a dozen extremely profitable and focussed private research, software and management systems (e.g. FHMS) that are quite happy to see BIXS fail. These private research and development companies have hit on a profitable and effective business model and could well be an area the UK beef sector would benefit from adopting.

Traceability is an important selling point for Uruguayan and Canadian exports, and both have extensive natural grassland. The EU quota is taken up (in order of volume) by the US, Australia, Canada, Argentina and Uruguay. Canada is aiming to gain its own zero tariff quota through its own Comprehensive Economic Trade Agreement (CETA) with the EU. Exporters see the EU as a long term net importer and see EU subsidy becoming increasingly de-linked to production due to economic demands. The lack of mandatory

traceability in the US cattle industry is a weak spot. There seems to be an air of complacency around this due to issues of constitutional rights over private information. This could hamper their export ambitions and make them susceptible to further food scare events. Their mismanagement of the "pink slime" issue is also indicative of a disconnect in the US between consumers and the politically powerful beef lobby.

Trade-offs will probably take place between food and non-food production when international trade deals are negotiated. For instance, the UK may well agree to a trade deal with the US where car production from the UK is traded off against allowing in more beef cuts from the US. North America views the EU CAP framework as a shackle that, together with restrictions on growth hormone and GM technology, makes EU food production inefficient, uncompetitive and expensive. North America also thinks that the efficiencies that growth hormones provide can't for ever be ignored by the EU. *E.coli* is the number one issue in the US beef industry. Lactic acid interventions on slaughter lines are accepted practice and are now being contemplated in the EU processing sector.

Beef futures markets work in the US but they have significant volume to play with. Without this volume, hedging movements would have too big an impact on a small pool in the UK situation. It works if you're hedging against risk, but not if you start to act as a speculator.

The beef industry in both the US and Canada benefits from extensive backing from government, state, research, pharmaceutical and financial institutions due to the importance of the sector to the economy. The beef industry in Brazil and Uruguay also benefits in a similar way from substantial financial and political government backing. By comparison, the UK beef sector is small as a contributor to GDP and this is reflected in the way the UK government sees it as a low priority and fails to back it in the same way as larger beef producing nations back their industries.

The beef industry globally needs more innovation, better breeding programmes and a more integrated supply chain similar to the poultry sector to become more competitive. Since the 'horsegate' scandal in Europe, retailers in the UK have begun to make concerted efforts to establish dedicated and integrated supply routes from the farm right through to the retail shelf. Many of these schemes are also focussing on native breed cattle that offer quality and a readymade brand.

Organisations like EBLEX in the UK are also beginning to work harder with and direct more resources towards working with processors to improve the UK's ability to produce high quality fifth quarter products that are in demand in growing export markets like SE Asia. Hides and skins are another area where the UK has not worked hard enough to add value, instead opting to sell the low value raw product to a processor in another country who then profits from adding value. To survive, the beef sector needs to extract absolutely all the value it possibly can from each animal, and this is the challenge to be met.

12. Conclusions

1. Beef production globally will gravitate towards the regions and nations where cost of production is lowest and most sustainable. This favours grass over grain.

2. Global demand for beef is spreading to areas with rising affluence.

3. The EU is a long term net importer of beef and its affluent consumers are very much a target for beef exporting nations.

4. The UK beef industry needs to refocus on native breed production to gain consistency and quality of production using well managed rotational grazing systems.

5. There are opportunities for UK meat plants to export fifth quarter products and add more value by further processing, together with more export promotion.

6. The beef industry can learn from the innovation, breeding programmes and integrated supply chains that exist in the poultry sector.

7. An effective cattle traceability system is a must for beef exports.

13. Recommendations

1. The UK beef industry would benefit from adopting certain aspects of North American beef production. These include: greater consolidation of cattle numbers to increase economies of scale, greater integration of research and development on farm, better management of risk and volatility through hedging inputs, incentivising the eating quality of beef by picture grading the rib-eye for marbling and yield, more innovative arrangements of cattle ownership to increase the availability of equity in primary production, use of real time on-line livestock auctions, use of systems management frameworks to improve on farm efficiencies.

2. The EU should stand firm against US demands to accept beef produced with growth hormones, as plenty of beef is available from grass-fed South American beef where growth hormones are not used.

3. The UK, because of its high cost of production, is best placed to produce high quality value added food products together with diversified urban linked enterprises, like tourism and farm shops. If subsidies disappear, more commodity beef is bound to be imported from other areas of the world where cost of production is lower.

4. The UK beef industry needs to refocus on native breed production to gain consistency and quality of production using grass based systems. This product would also find markets in certain EU export markets and high end markets in SE Asia if well branded and linked to a PGI. Better grazing management in the beef sector is needed, similar to those rotational grazing methods now commonplace in dairy.

5. The beef industry needs more innovation, better breeding programmes and integrated supply chains similar to the poultry sector to become more competitive.

6. UK beef exports require more promotion and people on the ground in the countries where demand is greatest or has most potential, like SE Asia. This will require more resources, greater political backing, better coordination between exporters and politicians, and a more proactive approach when enquiries come in from potential customers.

7. Consolidation of cattle numbers is key, as well as knowing the margins of the retailer and meat packer as well as your own return on capital as a producer.

8. The EU should be highlighting the lack of traceability in the US livestock industry, use of growth hormones, *e.coli* recalls, disingenuous Certified Angus scheme, and disingenuous geographical product labelling. The US argues that consumers should be allowed to decide for themselves on the question of growth hormones. However, EU producers have to operate under stricter rules than their

US counterparts.

9. BIXS uptake in Canada is low at present, and maybe BIXS is trying to be all things to all people when perhaps private enterprise might be better placed to run an identification, traceability and database system. A multi species system is only really possible with RFID tags but the expense improves efficiency and would provide valuable information in regard to risk based trading and animal health status. This type of system is needed in the UK if we are to be an effective long term player on the export market.

10. For export licences to be granted into mainland China, the UK needs greater backing at government level and more awareness that politically sensitive actions will have negative consequences for trade.

11. More trade organisation resource and people on the ground are needed to promote English beef more effectively. The US and Australia have impressive networks.

12. UK meat plants need to re-learn how to produce the right quality and spec for the export market.

13. There are opportunities for UK meat plants to process hides and skins further and sell as a wet blue product into tanneries.

14. There is an opportunity to sell beef trim in condensed rolls ready for slicing and cooking in hotpots in Hong Kong.

15. Hong Kong is a wealthy market and is open for bone-in beef from the UK and should be prioritised over mainland China for both high end cuts and offal. Macau is also a casino-drenched wealthy outpost which offers great opportunity. Many I spoke to in Hong Kong were completely unaware that it had been possible to import UK boneless beef into Hong Kong since 2009. One major UK exporting meat plant I spoke to was unaware that bone-in beef exports have been permitted since June 2012. How can this be?

Hong Kong

14. After My Study Tour

In the broadest sense, the Nuffield experience has connected me to people and places that I would not have otherwise have had the opportunity to visit. This has deepened my knowledge and understanding of the beef sector, wider agriculture and the world in general. Having had a period of being distanced from my country, UK agriculture, and my family and friends has also as a consequence given me an enhanced perspective on the life I am living and a better understanding on how I can best use my time whilst I am alive on this planet.

I have witnessed how other people in other places have managed to organise their work/life balance to delegate to others what others can do just as well if not better, and spend their time doing what they are best at and that cannot easily be done by someone else. This then also frees up more time for family and friends. There are farmers I met who were away from their farms for several months each year and they still managed and maintained highly successful businesses with effective management structures. Whilst I am not quite at that stage yet, I have already largely delegated the tasks that others can do just as well, and focussed on other aspects of my business that can take it to another level.

I noticed on the large feedlots I visited in North America, that the life stories of the people leading these extraordinary businesses always involved a mentor who helped get them to where they are now. I have now come to an arrangement with a local pheasant shoot whereby they can come and shoot on my land and in return I will receive business mentorship and consultancy from some members of their group. Their group count among their members some top business people and entrepreneurs, including the man who makes all the coffee cups for Costa Coffee.

On a more tangible level, I have now implemented a stricter form of rotational grazing for the cattle on my farm after looking at the success of various cell grazing and mob grazing practices in New Zealand and North America. In Brazil, I met with John Landers who has been a pioneer of no-till cropping and undersowing of cover crops since the 1960s and I saw many examples whilst there of braccia grass sown under maize, soy and cotton. I am now experimenting with undersowing maize with westerwold grasses to improve soil matter, decrease winter run-off and provide winter grazing.

In North America, I studied a myriad of cattle ownership models and the relationships between cow/calf operations, feedlots, processors and retailers. I have now formed an agreement with one of the major supermarkets to custom-feed cattle for them and have set up Approved Finishing Units both with and without grazing that can take cattle for them from any farm in the UK whether under TB restriction or not. In New Zealand, My Farm used outside investors to buy dairy farms and then implement a management protocol across around 65 farms. The investors share with the management company an annual return on investment as well as the long term asset growth of the farm. I am in the process of doing the same but with the beef sector in the UK, which is in need of improving its production efficiency. This could then be rolled out in conjunction with other custom feeding agreements.

In North America and Australia, I noticed the success and popularity of real time on-line cattle auctions and I am now working with and have an equity stake in a project with an IT company that is looking to establish something similar in the UK.

I was impressed with the BeefPoint organisation in Brazil that had been set up by Miguel Calvacanti and will be keeping in touch with him with a view to perhaps establishing a UK and Europe sister branch.

I have gained much more knowledge from my travels on how PGIs and regionally branded products are traded around the world. As a member of the Meat South West board currently tasked with attaining a West Country Beef and Lamb PGI, this has helped guide and inform me on how best to use this PGI once granted, and the export opportunities this brings in places like Europe and SE Asia.

As a member of both the SW Regional and National NFU Livestock Board, pretty much all I have seen has a relevance to the on-going discussions that take place and hopefully this helps to make my contributions to these boards more informed and effective. I have also become a member of the NFU TB Eradication Group.

The conclusions and recommendations I have detailed in this report will be in essence the points I will be trying to move forward when participating at board level. For example, to compete long term in export markets and to effectively deal with disease issues like TB, the UK needs a multi-species livestock database backed up by mandatory EID tagging, and health status and breeding information for risk based trading.

I have also carried out some speaking engagements, including speaking to the National Pig Association in London and the Rural Enterprise conference in Scotland. I am currently booked to speak at the Butchers' Hall Luncheon, the EBLEX national conference and the British Cattle Breeders Conference.

Last, but not least, I now happily receive and welcome visits from Nuffield Farming Scholars and people I have met on my travels from all around the world, and have new friends both near and far to keep in touch with. I am also interested in playing a role in the future in the Nuffield Farming Scholarships Trust both in the UK and internationally.

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16. Appendix

Kee Jim : posted Feb. 1st, 2011 by Lee Hart

Note : Kee Jim is a massively influential figure in the Canadian beef industry. He is one of the largest owners of beef cattle in North America and has been a pioneer and innovator in developing management and research and development protocols for use by feedlots and cow/calf producers. This aspect of the Canadian beef industry was one of the most impressive things I saw and something we can learn from in the UK.

KEE JIM HASN'T ALWAYS BEEN the most popular person in the Canadian livestock industry, but he is well known and respected. He's a relatively young big-picture thinker, and over his 27 years of developing a successful feedlot consulting service, he has never shied from controversy. In fact, as the hint of mischief in his smile suggests, he may even like to stir the pot on occasion.

"But you can't take away the fact he is a smart, bright, successful businessman with a strong entrepreneurial sense and a sincere commitment to seeing the Canadian livestock industry do well. He not only helps others feed cattle, he has himself become one of the largest cattle feeders in North America. He still manages the family ranch in B.C., owns thousands of feeder cattle, has extensive grasser cattle holdings in Saskatchewan, and has several thousand head of sheep on feed, too. And he has been active in a number of industry associations. Overall he says, if the industry is well, that also helps his various business interests do well, which boils down to a win/win situation for everyone.

"Jim, who turned 50 last year and is looking ahead to the "second half" of his career, has never stood still or looked back, after being one of the youngest graduates from the Western College of Veterinary Medicine in Saskatoon, Sask. in 1983.

"He was born and raised on the family ranch at Little Fort in B.C.'s central interior. He still manages a cow-calf and purebred Hereford cattle operation from that location. But, soon after graduating as a large animal veterinarian, he launched a new business concept called Feedlot Health Management Services.

"The timing was right," Jim says. "The livestock feeding industry was just shifting to Alberta, and I saw an opportunity to provide management services to a rapidly growing industry." Using the tools of research and data analysis, Jim developed a management model which has evolved and expanded over the years to involve much more than just veterinary care.

With a focus on helping cattle feeders be as efficient and profitable as possible, he now has a staff of 15 professionals and 30 support staff spanning disciplines from animal science to statistics, epidemiology, nutrition and animal welfare. They work with dozens of feedlots across North America with an annual throughput of 1.5 million to 2 million head of cattle.

While the company works with feeder businesses ranging in size from 1,000 to 100,000 head of cattle, its services help well-managed feedlots to make incremental improvements in overall production and feeding efficiency. Rather than managing pens of cattle on an all-in/all-out basis, Jim's approach is to recognise the genetic potential of each animal, shipping cattle when they are

"finished," optimizing their marketability and reducing feeding costs.

But managing feedlots is just one component of Jim's far-reaching business interests. While he has partial ownership in a number of feedlots, his principle interest has been in cattle ownership. He is one of North America's largest cattle feeders with several thousand cattle on feed from Western Canada to Nebraska, Colorado and Texas. He won't say how many he owns at any given time, other than "there's a lot." He's not interested in owning bunks and boards and getting involved in the infrastructure side of the business.

Working within a North American marketplace, he buys cattle at the best price he can, and then has them fed on a custom basis where it is most profitable.

"I am a cattle investor," Jim says. "From the very beginning I made a conscious decision not to get involved in the farming end and owning infrastructure. I own cattle and feed them where they are the most profitable. I am not committed to any physical facility or geographic area. I may buy cattle in Manitoba and have them fed in Nebraska, or buy in Mississippi and feed them in Colorado. My business is based on owning cattle. I am a renter of infrastructure."

At one time his main focus was on owning cattle in finishing feedlots, but as the profitability of finishing cattle declined, he has put more emphasis on feeder cattle - buying lighter cattle, grass cattle, backgrounding. He runs his successful cattle-feeding activities through G.K. Jim Farms. "It is a very low-overhead operation," Jim says. "With a staff of only eight people looking after that many cattle, it is very efficient."

Aside from feedlots and feeding, Jim has served on the board of Alberta Livestock Identification Services Ltd. and was a founding board member of the Alberta Livestock and Meat Agency. He has served too with the Canadian Cattle Identification Agency, the Alberta Beef Producers, Alberta Cattle Feeders and Canadian Cattleman's Association.

In each case, he left his mark, often one that others have found hard to forget.

Another long time livestock industry player, also known for speaking plainly, Dr. David Chalack, one of the principals of Alta Genetics and chair of the ALMA board, praises Jim's contribution to agriculture:

"Canada and the ag sector and specifically the beef sector are very, very lucky to have someone like Dr. Kee Jim working on their behalf," says Chalack. "He is bright, innovative, entrepreneurial and he just makes things happen.

"He has been somewhat transformational in his approach to the feedlot business. He is not afraid to take risks, comes from those ranching roots in B.C. and he lives the life."

Chalack agrees that Jim has his critics. "That's easy to explain," he says. "Look, you can't be friends with everyone when you are making things happen. Some people stand around and look over their shoulder, and can't figure out why someone went past them… they're jealous."

Jim says he doesn't let controversy get in his way. In fact, he admits to sometimes seeking it out. "I like being told I can't do something," Jim says. "When I first came to Alberta they said I would never be a successful cattle investor, and I said I would. I like stepping into controversial issues."

"I am not committed to any physical facility or geographic area."— Kee Jim

17. Report Summary

The predicted increase of global population in the coming decades has given rise to a debate on how agriculture can rise to the challenge of meeting the growth in food demand this will create. In tandem with this overall trend, developing nations are rising in affluence and creating new demand for higher quality and more expensive forms of protein, such as beef. Despite this new demand for beef, the last 30 years has also seen demand for poultry meat soar upwards, whilst the popularity of beef has stagnated as consumers in developed nations have sought lean meat, convenience and lower priced options like chicken. Compared with poultry, beef has also been criticised for having a poor feed conversion ratio and for being an inefficient user of resources globally.

The goal of my report was therefore to determine how the beef sector globally can respond to this scenario, and how the UK fits into this jigsaw. I travelled to SE Asia where population and beef demand are growing rapidly to learn about what form this demand was taking and to investigate if the UK beef sector could supply some of this demand. I travelled to North and South America to look at different ways of producing beef (grain versus grass) and to learn who was most likely to meet the global demand for beef and what management and traceability framework is required. My visit to Northern Ireland looked at how UK beef processors are faring on the export market, and also how and why the chicken industry has become so successful in recent times.

In SE Asia there are opportunities for UK meat plants to export fifth quarter products and add more value by further processing. More export promotion, a focus on quality and better branding are required to meet this consumer demand successfully. Beef production globally will gravitate towards the regions where cost of production is lowest and most sustainable. Whilst much of the global beef demand is for grain-fed beef, the large industrialised feedlot systems that produce this in North America look unsustainable due to cost and competition for grain from ethanol plants. The grass-fed systems of South America and parts of North America appear more sustainable and cost effective.

As a grass growing nation, the UK too needs to refocus on native breed cattle fed on grass, using high levels of grazing management to be competitive. This can then be sold as a high quality branded product to affluent markets like the EU (which is very much a global target for beef exporters everywhere) and high end outlets in developing markets. An effective traceability system, innovation and integrated supply chains are a must for beef production everywhere if the sector wants to compete long term with poultry.