

*The findings of An Irish Nuffield  
Farming Scholarship Award*

undertaken by  
**MARTIN O'KEEFFE**

**International Beef Competition with  
Emphasis on Traceability, Quality Control  
And Competitiveness**

*This report represents my own findings and opinions which are not  
necessarily those of the Nuffield Farming Scholarships Trust, or any other  
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## **INTRODUCTION**

Background: The beef industry in Ireland has undergone many major shocks in the past 6 years, with the 1996 BSE Crisis crippling the industry at all levels. The 2001 Foot and Mouth outbreak and also the illegal use of hormones and angel dust have affected the industry greatly. A lot of other changes have also happened. The implementation of a new individual tagging system, backed by a computer traceability system, which tracks every event in an animal's life from birth to slaughter. This change which has placed a large cost on individual producers was to help put our Irish beef back up to the forefront in supermarket shelves, and improve prices at farm level, but this has failed to materialize.

This situation is combined with the rapid march towards globalization and the expansion of the E.U. The beef industry is demoralized and needs a fresh approach to not only survive but to thrive in the future.

Irish beef producers have had farm subsidies over the past 10 years in the form of suckler cow premiums, 10 & 22 month premium and slaughter premium and extensification. All of these are paid on a per head basis and have no links to quality beef production. A Holstein Friesian bullock will collect the maximum subsidies and can then be dumped on the beef market. This is compounded by meat factories paying for the cattle often on a flat price. Again no premium for quality beef.

Since 1984, I have farmed suckler cows and run a calf to beef operation on our home farm. Since 1997, I have worked with the Department of Agriculture in many beef processing factories giving me a bird's eye view of how our factories are operated from lairage to boxed beef. This has given me great insight into the beef business in Ireland.

In Europe, Ireland is by far the largest next exporter of beef with up to 85% of our beef exported to European and Third country markets. Our beef price at farm level lags 20% behind our European neighbours. In terms of international trade in beef, Ireland is a very large player. With Ireland locked out of many third country markets in recent times, who has rushed in to fill these markets? With this in mind I was anxious to see the opposition.

### **TOPIC**

With the above thoughts in mind I picked as my topic “The International Beef Competition with emphasis on Traceability, Quality Control and Competitiveness”.

I decided to travel to our biggest competitors on the International beef markets. In South America, I visited Brazil and Uruguay. I also visited the United States of America, which is a very large beef producer with a very sophisticated consumer base, similar to our own European market.

### **OBJECTIVES**

To study the beef supply chain in Brazil, Uruguay and the U.S.A.

I chose South America as this region is fast becoming a major player internationally. Many of our traditional markets e.g. Israel, Libya, Iran and

Lebanon are now being supplied by Brazil. In recent times this beef from Brazil also has appeared on supermarket shelves in the E.U. Many Irish restaurants and catering establishments are known to use Brazilian beef.

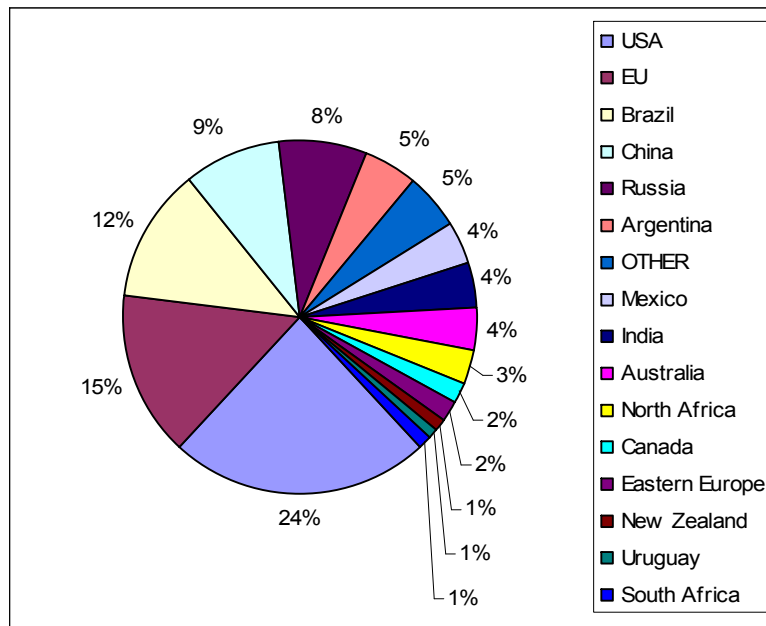
Many farm leaders and media commentators claim that this beef comes from sub-standard farms and meat factories with no traceability, abuse of hormones and antibiotics etc. I decided it was time to check out some of the facts for myself. I set forth with some of the following questions:

- How can they produce so cheaply?
- Do they have a clean, green image like us?
- How can we compete against them?
- Is there traceability?
- Are there animal welfare issues?

## **Some Facts and Comparisons in relation to World Production and Trade**

The following graph illustrates the importance of the main countries in terms of beef production. The USA produces almost a quarter of all beef world-wide, with the E.U. producing 15% and Brazil a close third at 12%. The USA, the E.U. and Brazil between them produce 51% of all beef world-wide.

USA	24
EU	15
Brazil	12
China	9
Russia	8
Argentina	5
OTHER	5
Mexico	4
India	4
Australia	4
North Africa	3
Canada	2
Eastern	
Europe	2
New Zealand	1
Uruguay	1
South Africa	1



Given the above figures I would have thought that the U.S.A. would be a net exporter of beef on the world market. To my surprise this is not the case.

The following table shows us the main net exporters and importers of beef on the world beef market.

Australia	1210	Uruguay	220
Brazil	744	Mexico	150
Ireland	500	EU	114
New Zealand	495	China	40
Argentina	390	UK	-250
India	310	USA	-265
Canada	285	Russia	-446

From the graph we can see that Ireland is in third position behind Brazil and Australia in terms of net exportation of Beef. This is extraordinary given the size of our country and our national herd. This graph shows us why the beef industry in Ireland is so important to our economy in terms of exports. The graph also shows that we are competing head to head in international markets with the likes of Brazil. In some markets (third countries) we are competing mainly on price. In the E.U. markets we are competing on price, quality and traceability issues.

The third table shows us key comparison figures in relation to farm-gate price index of beef.

Australia	100
Argentina	101
Brazil	85
USA	180
EU	177
Ireland	150

We can see that the US, E.U. and Irish farmers are receiving a far higher price for their beef in relation to Australia, Argentina and Brazil. This big difference in beef price is very significant when it comes to competing on inter-national beef markets. This will have a huge effect on Irish Farmers with the dismantling of export refunds and the agreement of a new Trade Agreement.

### **Per Capita Consumption:**

World	
Average	11
Russia	16
EU	19
Mexico	20
Canada	31
Brazil	32
New Zealand	34
Australia	35
USA	45
Uruguay	58
Argentina	65

This graph illustrates the huge difference in beef consumption between different countries. Argentina, Brazil and the USA consume large quantities of beef per capita in relation to the E.U. In Brazil it is felt that consumption would increase per capita if the economy improved.

### **Countries Visited**

#### **Uruguay**

Uruguay has a land area of 176,000 sq. km which is twice that of Ireland. It has 87% grassland and an annual rainfall of 1200 mm. Its population is 3.34 million with only 9% living in rural areas. Most of the land is in huge ranches which are owned by wealthy people living in the city. Rural Uruguay is in a poor state and is almost totally dependent on cattle and beef. The cattle population is 11 million, mostly Hereford. The average herd size



is 250 cattle, but many herds number several thousand head. Uruguay is also a major player in the export of beef internationally, ranking 9<sup>th</sup> in the world with about 250,000 tonnes exported. Uruguay has the worlds highest beef consumption at 65 kg/head/year.

## **Brazil**

Brazil is the fifth largest country in the world with 850 million hectares of land – almost as big as the USA – most of which is highly fertile, with plenty of rainfall. It has 120 times the land area of Ireland and has a population of 172 million people which gives a population density of 26 times less than Ireland at 2 persons/km<sup>2</sup>. The country has shown strong economic growth in recent years and has one of the fastest growing agricultural industries in the world. It boasts the 3<sup>rd</sup> largest beef producing industry. Brazil has 176 million cattle which is twice the E.U. total. The country has huge variations in climate, land use, technology, people and wealth. The country has many problems with huge extremes of wealth and poverty, urban overcrowding, violence and corruption is endemic.

### **Other facts:**

- The fastest growing beef export business in the world expects to top 1 million tonnes next year compared to 400,000 tonnes as recently as 1998.
- Grassland that has the capacity to produce double the dry matter output of Irish grassland, because of the tropical climate.

- Some of the lowest beef production costs in the world.
- Skilled workforce

In Brazil the 10 biggest export plants account for over 80% of exports. I visited 6 of these plants which had slaughter, boning, packing and cold storage facilities. Some had canneries, tanneries and other value added facilities. All plants were under Federal (Brazilian) Inspection, they were USDA and EU approved and had HACCP (Hazard Analysis Critical Control Point) systems in place. In all plants I was given unlimited access to all aspects of their facilities.

Overall, my impression of Brazil's processing industry is of very modern facilities, where much has been invested in training, research and development and new technology. Quality Control Personnel are present at all stages of production in all plants.

### **Some Points of Interest:**

- All cattle arrived in the factory 24 hours before slaughter, to allow gut contents to empty out, they are given water and rested and showered to remove any faecal contamination. This reduces stress and stabilises pH, which pays dividends in terms of meat quality.
- After killing carcasses are electrically stimulated to help bleeding. The hind gut is tied and sealed on the line.
- All carcasses and offal's are thoroughly examined by federal inspectors. Any problems found in the carcass or the offal's is

- documented and a report given to the farmer which helped enormously in management on the farm.
- Grading was carried out by federal personnel using a similar system to the Europ Grid in the EU.
  - I was very impressed with the emphasis and compliance with hygiene procedures by staff. Before entering the meat plant, I was requested to remove my own clothes and put on a laundered white trousers, coat and white boots. Before entering a production area hands had to be washed, boots washed and an alcohol steriliser applied to our hands. This was repeated when moving on from one section of the factory to another. On many occasions I observed hundreds of staff enter for e.g. the boning hall after a break and this procedure was religiously enforced. It was taken seriously by all staff. This procedure was not put in place for my benefit.
  - In one of the meat factories I visited, there were 15 HACCP control points along the kill line. All the staff both in the kill line and in the boning hall were aware of their roles. All details are carefully followed and monitored by specialised professionals. This eliminates possible contamination or health risk to consumers and results in total quality of its products.
  - Factories have invested heavily in research to prevent its activities from causing harm to the environment. Effluent quality is within strict limits and is monitored by the company's technical department and inspected by environment state office.

One of the factories I visited was owned by Independencia and was located in Mato Grosso Du Sud. This factory was newly built and was more like a

hotel complex than a meat factory. In the complex it boasted an air-strip and a large hotel like building to fly in meat buyers from abroad and entertain them and accommodate them on site. This factory employed 1,200 people.

In the boning area huge attention was given to customer specification and chilled beef was held for up to 3 weeks to improve tenderisation.

Many plants have standard hanging times to age beef. In the Bertin Groups factory all beef is aged for 15 days. Most of the beef is vacuum packed as primary cuts and is not hung on the bone. They use fully automated aging rooms which can hold 900 tonnes of beef each.

Most of the exporting plants package the beef under the importing companies own logo. I observed packaging in Brazilian meat factories identical to packaging I had seen in Irish Boning halls (European supermarkets).

### **Traceability & Food Safety Standards**

In Brazil and Uruguay cattle are not individually tagged and there is no national ID system. Therefore there is no way of tracing individual animals in regard to breeding or use of antibiotics etc. The country is to implement a full tagging system for cattle but given the logistics of the country it could take years to implement.

However, cattle are killed by farmers in large lots of between 100 and up to 400 cattle on the one day in a particular factory. This allows for traceability

back to an individual farm as these large lots are killed, boned out and packed on a lot (farmer) basis. In a typical factory killing 800 animals, you may have only 4 lots. These lots are bar-coded and the beef is traceable by this barcode. This allows for ease in tracing individual cuts back to the particular farm.

This is a major advantage over an average Irish meat factory which on average kills 400 cattle and may have up to 60 individual farmers supplying on the one day. Even with our excellent individual animal movement system (CMMS) it is difficult to trace cuts back to farm of origin.

All plants had chemical and microbiologist laboratories on site as well as highly trained technicians in their quality control team. Swabs were taken from carcasses on a regular basis and tested for E.Coli. pH was also checked.

At farm level, Brazil has huge farms of at least 1,000Ha and some are much bigger.

### **Advantages:**

- Excellent climate – plenty sun, regular rainfall and no frosts. This allows for large quantities of grass to be grown cheaply. The grassland because of the tropical climate has the capacity to produce double the dry matter output of the best Irish grassland. No need for expensive fodder, housing or wintering facilities.

- Soil fertility is excellent with many farms able to grow their own feed-stuffs.
- Cheap labour – the minimum wage is about €60 per month with factory floor wages reckoned to be about €120 per month.
- Lots of cheap land.
- No BSE scares in Brazil – grass based industry.
- Research on irrigation, grass re-seeding and fertilisation and rotational grazing which farmers are fast adopting. With this revolutionary method of central irrigation for pasture, it guarantees natural pasture even during the dry period of the off season.
- Zebu cattle are well suited to their climate and can match a good continental animal in Ireland for growth.
- Huge tracts of maize and Soya bean meal are available which will form the basis for the future of large beef feedlots which are starting.
- Low shipping costs  
The development of long shelf-life chilled meat has revolutionised the meat industry across the world. Our location beside the European market is not the large advantage it used to be. The following

example compares shipping from port to port in contrast to the Irish example which is from factory door to the final destination France.

<b>Cost of transporting Meat</b>	<b>c/kg</b>
Carlow to Paris – Lamb carcasses	13.7
New Zealand to UK – frozen lamb	13.5
New Zealand to UK – chilled lamb	16.5
South America to UK – frozen meat	9.8
South America to UK – chilled meat	12.4

*Source: International Meat Guide, 2001*

### **Disadvantages**

- Farmers are operating on very small margins of 2 – 4%.
- Farms are very isolated. There is no rural infrastructure, villages etc. Farm workers work on the farms but their families live in the nearest town or city.
- High interest rates – 20%.
- No government support and an unstable economy.

## **My Observations on the Brazilian Beef Industry**

### **Problems facing the Brazilian Beef Industry:**

1. Residue and veterinary medicine control is inadequate. It does not offer the same guarantees as provided for under E.U. legislation.
2. Some veterinary medicines which are banned in the E.U. are freely available in Brazil e.g. clenbuterol (angel dust) is approved for horses and is available without prescription.

3. Antibiotic feed additives which are banned in the E.U. are legal in Brazil and there is no residue testing of these products.
4. No record keeping of veterinary medicine use at farm level and the free availability of the majority of veterinary medicines.
5. From a marketing point of view, trust in a food source and traceability are huge issues for consumers. Brazil may have difficulty delivering in this area.
6. Inadequate Foot and Mouth disease controls
  - poor vaccination which is helping to spread FMD
  - border controls both internally and externally are not policed
7. Destruction of Amazon Rain Forest
  - There is clear evidence that the rise in Brazilian beef production is linked to the clearing of the Amazon Rain Forest. To put this in context in just 10 years the country lost an area of forest twice the size of Portugal.
8. Landless People
  - In many parts of the countryside I came across plastic shacks on the sides of the roads. Living in these shacks are Brazil's landless people. These people are campaigning to regain ownership rights of the land. In some cases they have invaded farms. The government have made some concessions to these people in that if a farm is not being farmed to its potential it could be confiscated and divided among these people. Some commentators feel this is a major problem for the future of the large factory farms. 1% of the population owns half the agricultural land in Brazil.



## **Brazil – future prospects:**

1. If Brazil was stocked as heavily as Ireland, it could carry three times its current herd. At the moment it has more cattle than the E.U.
2. Huge amounts of rain forest are being cleared which is affecting our world climate.
3. Tagging and individual animal identification are not on the agenda.
4. Administration of animal medicine is not supervised.
5. Foot and Mouth vaccination programme is a hit and miss affair.

## **United States of America**

The USA is a very large trading block which is similar to the E.U. It has a large affluent population and a heavily subsidised agriculture. In 1999 the U.S. produced 11,995 million tonnes of beef and exported 1,146,000 tonnes, but also imported 802,000 tonnes. Beef consumption in the US is 44.8 kg/head. The USA is also under threat from cheaper South American and Australian imports.

In the USA, I visited ranches, feedlots, a meat factory and many other small meat operations and trade organisations. Feedlots and big meat factories were not keen on visitors and photographs were not allowed. I would consider this to be a big issue facing the US meat business. The industry has major credibility issues with many Food Safety issues.

The USA is the largest producer of beef in the world at 24%, but they are not importers of beef.

The majority of beef is raised to weaning stage on cow-calf ranches and then sent to feedlots with as many as 100,000 animals. Cattle are grain fed in the feedlots with hormone implants given up to 4 times and are fed antibiotics in the feed continuously. Many of the feedlots are controlled by large corporations or meat companies.

In the USA the grain industry is heavily subsidised, which is an indirect subsidisation of beef farming.

Traceability of animals is very limited with no national ID system. The new US Farm Bill calls for a 2 year voluntary country of origin labelling program which becomes mandatory in the third year. It is felt that this will make an individual animal ID system necessary as a lot of live animals come from Mexico and Canada. In reality, I believe Animal ID is many years away in the US.

The industry is looking at many ways of implementing an individual animal traceability system. Electronic ID is seen as the most cost effective and efficient way forward.

Implants and stomach boluses seem to have been dismissed as they may pass undetected through the processing system. Micro-chips implanted in tags seem to be the best alternative to employ the technology across the industry as readers are currently available in the feedlots and packing plants.

A new system of Animal ID is being launched in the USA called Opti-

Brand. A photograph is taken of the animal's retinal vascular pattern. This is a pattern of blood vessels at the back of the eye. It is as individual as human fingerprints. There is virtually no possibility of misidentification. GPS information allows the date, time and exact location to be automatically encrypted with each image collected. This information along with management details can be fed into a national database. The advantages are it is tamper-proof and the opti-reader can be easily integrated into routine handling practices. This technology may have many applications especially with breed societies etc.

US agriculture is heavily subsidised with \$190 billion being spent over the next 6 years.

The scale of beef processing is enormous with 15,000 cattle per week being slaughtered in the Con-Agra plant in Greeley, Colorado, which I visited. Shortly before my visit this plant had history's largest beef recall of 19 million pounds of ground beef due to E.Coli 157 contamination. The media have revealed that there were 31 other violations this year. The USDA is coming under intense scrutiny in what is seen as lax handling of food safety. Health officials in 23 states blame the recalled meat for 47 illnesses and 1 death. This has a large effect on consumer confidence in relation to beef. The company was very suspicious of visitors which made access for me difficult.

Marbling and eating quality form an integral part of carcass grading in the US and a lot of research is being carried out to ensure consumers have a positive eating experience.

## **US Grading System**

The grading of beef carcasses in the USA is carried out by the USDA (US Dept of Agriculture) and the main difference between the USA and Ireland (EU) is that marbling is incorporated in the US system. The US grading system looks at marbling (inter-muscular fat) and this is measured in grades from 1. Prime 2. Choice 3. Select depending on the degree of marbling. Prime is the highest with select the lowest. In North America, it is strongly believed that marbling of beef has a major impact on taste, juiciness, tenderness and flavour. This grading system is used to promote cattle which are known to have good marbling qualities.

Breeds with marbling traits:

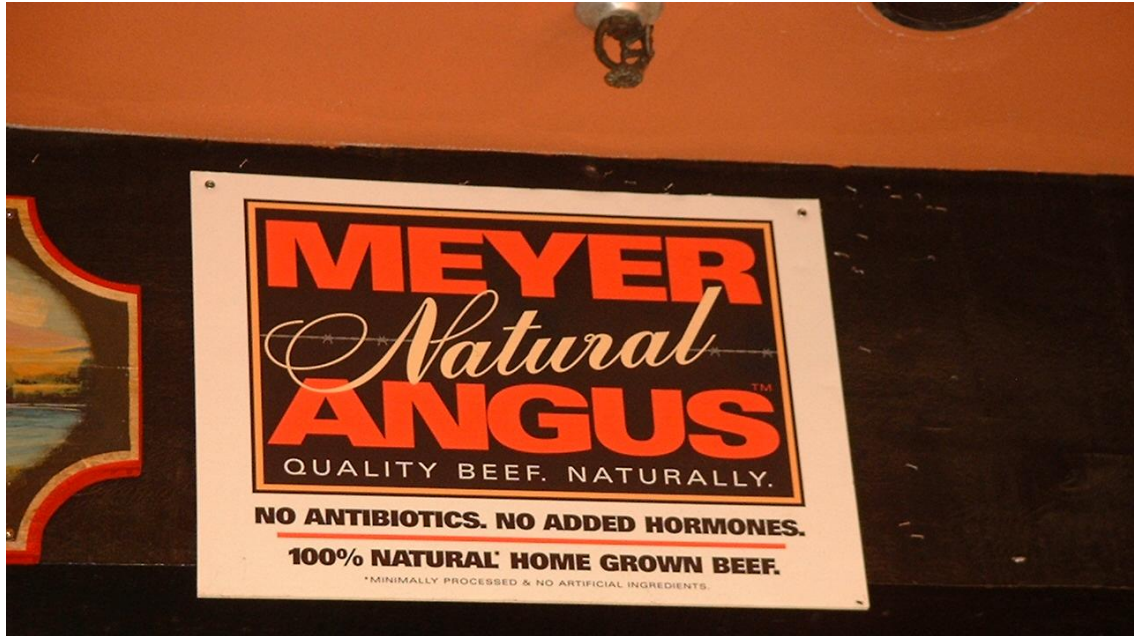
- Angus
- Hereford
- Shorthorn
- Holstein

Breeds without marbling traits:

- Charolais
- Simmental
- Limousin

## **BRANDING**

In the US, the grading system is used to add value to the Beef and this is branded.



One of the best examples in the US is the brand “certified Angus Beef”. This brand is considered to be one of the most successful in the world for marketing and selling beef. “Certified Angus Beef” was set up in 1977 by the American Angus society. It was set up in response to the influx of continental breeds of cattle. The Angus society felt that although continental cattle were more efficient in producing beef, this beef was of poorer eating quality. The continental breeds did not compete on taste, juiciness, tenderness and flavour because of the lack of marbling. The “certified Angus Beef” brand has an income of about \$10 million per year and their income is received by charging the meat factories a fee per lb

of beef sold through the scheme. The company which runs the brand is owned by the American Angus Society and all of its income is used to build the brand with consumers.

The “certified Angus Beef” brand has very strict criteria to qualify for the scheme.

The beef must be:-

- 51% Black hide
- A marbling score in prime or top third of choice
- Must be grade 1-3 fat class
- No blemishes, blood splatters, bruising or black meat (dark cutters)
- No Brahma ancestry

These criteria are so tight that only 20% of Angus cattle qualify for the scheme. This very strict criteria, is vital to maintain the brand as the very top for quality.

The consumer will pay a good premium for beef which is certified Angus Beef whether in a restaurant or in the supermarket. This premium then finds its way down to the primary producer helping to improve profitability on the farm.

In the US overall beef consumption is in decline, but “certified Angus Beef” is gaining market share every year.

Another issue of concern in the USA is a new disease found in wild deer and elk population called Chronic Wasting Disease. There is no evidence that the disease can be transmitted to humans, beef or sheep but there is an underlying fear of this disease as little is yet known about it. It has spread to large areas of the US and a large cull of deer and elk is underway.

### **Recommendations for the Future:**

1. Investigate modifying our grading system to incorporate marbling.
2. We must improve how we present and market our beef
3. Cooking methods for fore-quarter beef must be researched.
4. Develop branded products for the food service sector.
5. We need to engender trust and integrity in pricing mechanisms.
6. Animal welfare and good stockman-ship should be promoted at all stages of the animal's life. In recent times we have had many instances of farmers being prosecuted for cruelty to animals. Good animal welfare is very important supporting our green image as a food island. Bad animal welfare and cruelty to animals could deter consumers from eating beef and could affect our exports to large supermarket chains in our premium EU markets. Everyone must play a part in promoting good welfare from the farm organisations to Teagasc and the Department of Agriculture.
7. Urgent action required in Ireland to assess how animals are treated on the day of slaughter. Less stress = better quality meat = increase in value.
8. Branding of product. Superior taste, tenderness and nutrients.

9. To limit exports into the E.U., a ceiling on all South American beef imports should be set. This ceiling should apply to beef entering E.U. markets with payment of full tariffs.

### **Conclusions:**

In conclusion I was very impressed with the expertise, both management and technical which I found in Brazil. Their clear focus on markets and low costs is of course the product of an environment where there are few if any subsidies available to producers who must accept the prevailing world price. Moreover, the sheer size of their country and a favourable climate give them economies of scale which are probably unmatched anywhere in the world. There is no doubt that the combination of all of these factors, pose significant and competitive threats to Irish Agriculture, particularly in the context of trade talks between Mercosur and the E.U.

1. Farm organisations need to wake up to the future of subsidies. Instead of total opposition to proposals they should work out their own proposals. Subsidies are vital to the Irish Beef sector as our costs are huge in comparison to our South American competitors. The subsidies need to support the production of quality beef in superior welfare and environmental conditions.
2. Meat factories must change their focus away from market support mechanisms and concentrate on markets.
3. Quality Control – We must promote beef being hormone and antibiotic free.



4. Meat processing in Ireland must be rationalised.
5. Origin of meat in restaurants should be declared and inspections of documentation etc to insure compliance.
6. Payment for cattle to be changed in favour of quality carcasses regardless of market conditions.
  
7. More investment in beef research – cooking methods – tender and flavoursome meat. Eating quality – extra hanging – resting cattle – marbling – components of meat quality – carcass – composition & dimension.

The industry needs to respond to a changing market particularly providing for increased convenience and smaller meal occasions.

1. Encourage new beef products with consumer value.
2. Make beef more convenient and user friendly.

### **Perception – Marketing**

The future of the Irish Beef Industry is at a major crossroads with the mid-term review of the Agenda 2000 proposals.

Everyone in the industry needs to come together, farmers, meat companies, government agencies to put together an industry which is focused on the consumer, which produces a quality product every time and an industry which cuts our unnecessary costs along the way. This business is worth 1.2 billion pounds in exports to the Irish economy. This business is too large to lose.

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