CONCURRENT SESSION 1

Cooperative Research in Beef Cattle; Opportunities and Barriers

Moderator:
His Excellency
Mr Rubem Correa Barbosa
Ambassador of Brazil

Presenters:

• Professor Stephen Moore
  Director, Centre for Animal Science, QLD Alliance for Agriculture and Food Innovation, UQ

• Professor Dennis Poppi
  Professor of Animal Nutrition, School of Agriculture and Food Sciences, UQ

• Mr Don Nicol
  Principal Consultant, Breedlink
Cooperative Research in Beef Cattle; Opportunities and Barriers

Professor Stephen Moore
Director, Centre for Animal Science
QLD Alliance for Agriculture and Food Innovation (QAAFI)
The University of Queensland
The Australian Industry

It's not just one thing
• Branding Rate 71%
• Area per cow joined 34 (ha)

• Branding Rate 87%
• Area per cow joined 19 (ha)
The Australian Industry

2.1 Map of production

- *Bos indicus* and their crosses
  - Average farm ~22 000 ha

- *Bos taurus*
  - Average farm ~5 000 ha
What Do We Have in Common

*Let's talk tropics*

- Similar cattle
  - *Bos indicus* and their crosses
- A growing Similarity of Issues
  - Land Pressures and Environmental Impact
  - Product Quality
  - Parasite Resistance
  - Heat Tolerance
- Market Leadership - ranked top exporters
What are the Differences

• Pastures (water)
• Genetics
  • Nellore vs Brahman
  • Cross breeding vs Pure Breeds

• Latin America leads the world in Advanced Breeding Technologies
• Australia leads the world in managing in very harsh environments
What are We Doing?

- Multiple students from Brazil (UNESP, UFV)
- Parallel project on reproductive performance (2013-2016) (SWB Fellowship)
- Workshop and conference participation
Opportunities

*Pre-competitive research*

- Basic Genetics and Genomics particularly applied to *Bos indicus* cattle
- Genomics Applied to Cross Breeding
- Nutrition
- Reproduction
- Pasture management
- Parasite Resistance
Barriers (Challenges)

Are we competitors or partners

• What stops business activity across the regions?
  • Import/Export Protocols (non tariff barriers to trade)
  • No whole industry focus
  • Competition between beef producers (national and international)

• What stops joint R&D activity across the regions?
  • Lack of business activity
  • Lack of R&D funding in one or another region
  • Different R&D Models
Solutions?

*Can we do anything to answer the challenges?*

- Are we really competing in beef?
- Is the true competition other commodity meat products?
- Is commodity beef the future?
- Can we do better together?
- Can we streamline import/export protocols?
- Can funders (Governments and Industry) develop joint funding models?
Thank You
Cooperative Research in Beef Cattle; Opportunities and Barriers

Professor Dennis Poppi
Professor of Animal Nutrition
School of Agriculture and Food Sciences
The University of Queensland
Beef cattle production systems

• Beef cattle systems in the tropics and sub-tropics are very similar across both regions
• But there are also similarities and potential cooperation with
  ➢ sheep production systems in Uruguay, Argentina and Chile
  ➢ Dairy systems especially subtropical systems similar to Queensland (Brazil and Argentina). NZ dairy companies already operate large scale dairies in South America
Leitissima farm

Owned by 12 partners, being 9 from New Zealand and 3 from Brazil

Source: Revista Globo Rural
Beef cattle production systems

There is a similarity in the biophysical environment. There is a similarity in the production systems

• Tropical pasture based
• Opportunities for irrigation
• Pasture finished and feedlot finished cattle
• Sugar cane systems (whole crop, molasses) in Brazil and Cuba
• Crop-livestock systems
• Large range of grains and crop by-products: cereal grains, cottonseed meal, soybean meal etc
**Beef cattle production systems**

Brazil much bigger cattle population than Australia

Threat and challenge: lessons from the sugar industry

Large Domestic consumption Brazil vs large export proportion from Australia
- Biggest commercial herd
  (200 million head)

- 2004 – biggest exporter
  currently exports to more than 180 countries
  (MAPA, 2012)

- Second biggest meat production
  (9.3 million metric tons of meat)
  (USDA, 2011)

- 26 million head

- 2.7 million metric tons of meat
  (ABS, 2012)

- Second biggest exporter

Exports more than 60% of total production to more than 100 countries
  (MLA, 2012)
**Beef cattle production systems**

Research environment

Australia

- Largely government funded using farmer levies
- Small commercial company (feed companies, veterinary products etc) involvement
- International aid eg Australian Centre for International Agricultural Research (ACIAR)

Brazil

- Direct Federal and State government funding
- Large private company investments and partnerships
- Private sector attracts some of the best people
- Science without Borders
**Beef cattle production systems**

Research environment for young scientists

**Australia**
- Large investment in postgraduate training
- Well educated research community
- Opportunity for international travel and collaboration but not a strong direction towards Latin America

**Brazil**
- Large investment in postgraduate training
- Highly motivated and well educated
- Large number travel under various schemes to USA and Australia
**Beef cattle production systems**

Research environment for collaboration

Australia

- There is much talk but little funding opportunities
- Most opportunities have arisen from Brazil funding for Australian scientists

Brazil

- Various schemes for Brazilian scientists to come to Australia or to fund Australians to go to Brazil
- Funding schemes for collaborative research but difficult to get matching funds from Australia
Beef cattle production systems

Australia is very focused on export markets

- Developed grading schemes to promote high quality beef (e.g., Meat Standards Australia (MSA) and Pasturefed Cattle Assurance System, PCAS)
- Developed tracking systems for source of animal and quality assurance
- Feedback to producers on meat quality
- Altered growth paths to slaughter
- Need to meet regulatory requirements of many countries
- Large multinational meat processing companies e.g., JB Swift
Droughtmaster heifer – striploin
Beef cattle production systems

Latin American countries generally have much larger domestic beef consumption

• Usually bulls rather than castrates

• No consistent marketing scheme and feedback for meat quality

• Larger pyramid based companies (farms to slaughter to supermarket brands) meet international best practice but small producers (family units) struggle to supply these markets

• Common large multinational meat processing companies eg JB Swift
Researchable issues

- Production systems to meet new markets
- Environment
- International aid
Researchable issues

Production systems to meet new markets

- Australia was the world leader in pasture based systems research especially in pasture agronomy.
- But markedly reduced investment to such an extent that we are deficient in pasture science.
- Latin America expanded investment in this field and now are the world leaders. Australia looks to Latin America for new pasture species and agronomic work
  - CIAT, EMBRAPA, INTA
- Australia concentrated on high meat quality and niche markets
  - Lead the development of novel growth paths for younger animals to high quality market specifications.
**Researchable issues**

Environment: common environmental problems

- Methane and water use in beef production systems
- Better C sequestration under well managed pastures: groundbreaking work by CIAT
- Water use efficiency an international issue driven by poor accounting procedures
- Run down in soil N: mining the soil resource
- Growth paths and production systems vary markedly in methane/unit product. Feedlots an integral part of reducing methane/unit product.
- Australian Life Cycle Assessment (ISO) approach: reduced CO₂ emission of 14%/kg liveweight since 1981 (Wiedemann et al 2015)
Researchable issues

International aid

• Major initiative of Australia through Australian Centre for International Agricultural Research (ACIAR)
• Recognition that beef production is the major pathway out of poverty
• Strong Asian-Pacific focus
• Meet international aspirations of alleviating poverty
• Funds Australian research and employs Australian scientists (maintains research capability within Australia)
• Research mutually beneficial and UQ is largest recipient of ACIAR funds
• Also development projects through DFAT (former AUSAID activities)
• We have beef cattle projects in Indonesia, Myanmar, Timor Leste and Vanuatu
• FAO Director General is from Brazil
Our collaboration

- Invited speakers to conferences in Brazil at USP, UNESP, UFV (Vicosa)
- Brazil, Argentine and Chile postgraduate students funded from Latin America and Australia (4 PhD students)
- Students from Brazil (UG and PG) on 3-12 month exchange or internships (1-3 students/year)
- Sabbatical study in Australia: visiting Professor (P. Malafaia) from Universidade Federal Rural do Rio de Janeiro, working on P deficiency in beef cattle
- Collaborative research program (2 postdoctoral researchers at UNESP and USP) with a current collaborative research program at UNESP on growth paths and supplement strategies
Some other selected collaboration

Dr Athol Klieve:
• methane reduction, rumen microbiology and high throughput gene sequencing
• International Atomic Energy Agency meeting Brazil

Dr John Gaughan
• Heat stress in beef and dairy cattle
• Feedlot design and shade and sprinkler systems

Professor Mike McGowan
• Reproductive technologies (AI, Embryo transfer, stem cells, epidemiology studies)
How might evolve

- Similar problems and so great opportunities for collaborative research rather than competitive research
- Australia has been very focused on international peer evaluated research and recently Latin America has targeted that expertise in the collaborative programs
- Australia has focused on high meat quality markets and developed systems (nutrition, reproduction and genetics) to achieve that
- Latin America has better engaged and have more opportunities for significant private sector investment (bigger market and regulatory requirements). More interest in using Australia from Latin American companies
- Expand the exchange and collaboration of scientists. Australia needs to do more. Develop the alumni and network links that historically has served Australia well with the UK and North America
- **Money**
Australia: High Quality Supplier of Bovine Genetics to Latin America

Don Nicol
Director
Breedlink Pty Ltd
Beef Cattle Distribution in Australia

>85% of the beef cattle have Brahman content

80% of the beef cattle are temperate or crossbreds

~28 Million
Animal Health Status

• Cattle
  • Australia is declared by the O.I.E to be free from the following diseases:
    • Schmallenberg virus (SBV)
    • Rinderpest
    • Contagious Bovine Pleuropneumonia (CBPP)
    • Rift Valley Fever
    • Foot and Mouth Disease-Aftosa
    • Bovine Spongiform Encephalopathy (BSE)
Animal Health Status

- Cattle
- Australia has eradicated 3 major diseases:
  - Contagious bovine pleuropneumonia
  - Tuberculosis
  - Brucellosis
Animal Health Status

• National Livestock Identification System (NLIS)
  - Biosecurity
  - Meat safety
  - Product integrity
  - Market access

• Property Identification Code (PIC)
Import health protocols with Australia

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* From Centres Accredited in Colombia Only
Points of Difference – Australian Beef Genetics

- Different Bloodlines to USA and Canada
- Healthy National Cattle Herd
- Grass-based Selection
- Selected Under Low-input Systems
- Selected in Highly Variable Climate
- Excellent National System of Genetic Evaluation
Beef Breeds of Australia

Temperate Zone – in order of importance

• 7 main British Breeds:
  • Angus
  • Hereford
  • Murray Grey
  • Red Angus
  • South Devon
  • Devon
  • Shorthorns

• Other:
  • Japanese Black Wagyu
  • 20 rare breeds
Temperate Zone – in order of importance

• 7 main European Breeds:
  • Simmental
  • Limousin
  • Charolais
  • Gelbvieh
  • Blonde d’Aquitaine
  • Salers
  • Main Anjou
Beef Breeds of Australia

Tropical Zone – 7 main breeds

- Brahman
- Santa Gertrudis
- Droughtmaster
- Brangus
- Braford
- Belmont
- Senepol
Case Study: Australian Brahman

• Most popular breed in the extensive north of Australia
• Many different bloodlines to USA Brahmans
• Some high fertility lines
• Polled genetics
• Strong red Brahman bloodlines
Global Welfare Concerns about De-Horning

Polled genetics is the way forward. Australia leads this trend.
Droughtmaster - Australian Tropical Beef Breed

5/8 Bos Indicus, 3/8 Bos Taurus
Belmont – Australian Tropical Beef Breed

100% Adapted Bos Taurus – developed on the Tropic of Capricorn
Australian Beef Cattle Technology

Calf Crush for handling young calves for injections and treatments
Constraints to Trade

- Health Protocols
- Lack of a single group/cooperative that markets Australia genetic exports to the world
- Language/Custom Barriers
- Small Business to Small Business
- DAFF – SENASA costs
- 100 emails rule
- Breed Association Regulations for registration of seedstock in importing countries
Thank You!