

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*





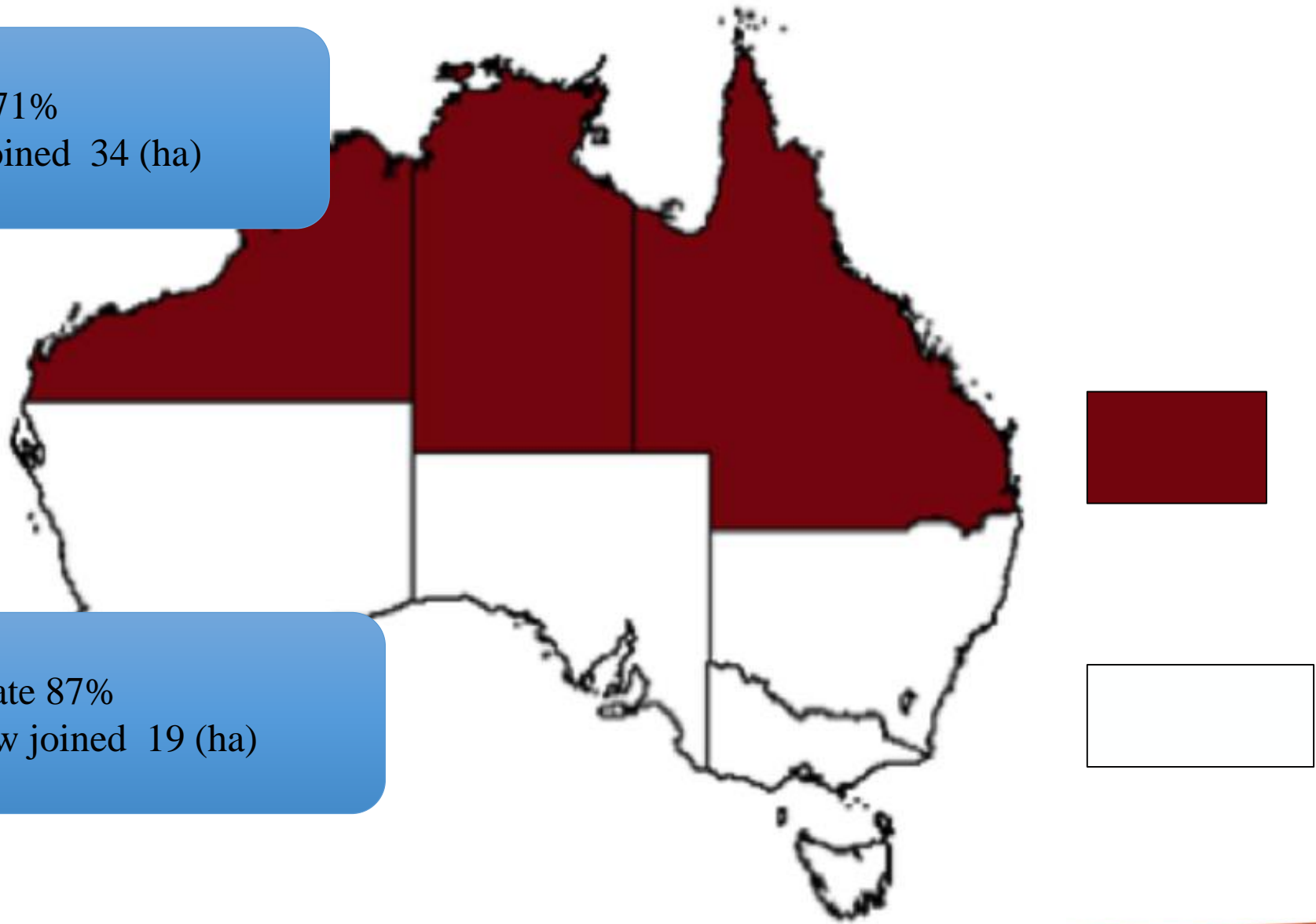
2015 LATIN AMERICAN COLLOQUIUM

The Australian Industry

Its not just one thing



- Branding Rate 71%
- Area per cow joined 34 (ha)



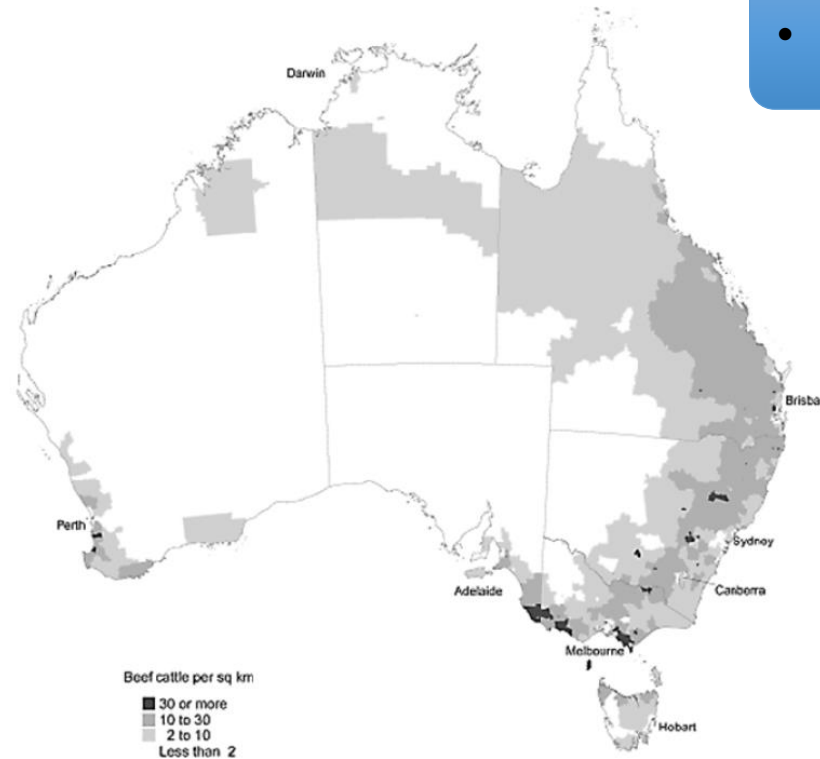
- Branding Rate 87%
- Area per cow joined 19 (ha)

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

Source: Australian Bureau of Statistics

What Do We Have in Common

Lets 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



2015 LATIN AMERICAN COLLOQUIUM

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 co-operation 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



Photo of centre pivots in Jaborandi, state of Bahia in Brazil

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





- **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)



- **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)

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 focussed on export markets

- Developed grading schemes to promote high quality beef (eg Meat Standards Australia (MSA) and Pastured 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 eg 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 focussed on international peer evaluated research and recently Latin America has targeted that expertise in the collaborative programs
- Australia has focussed 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

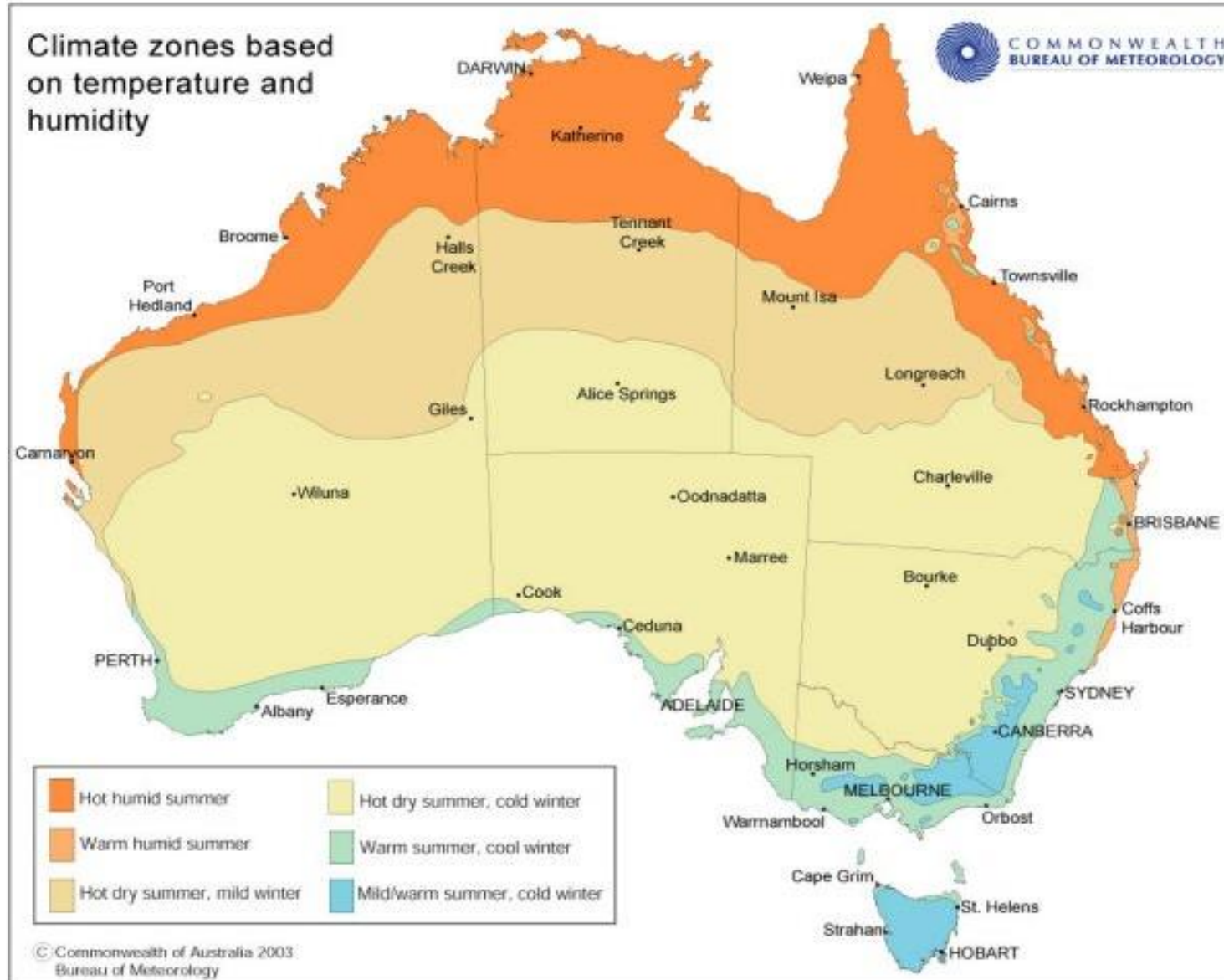
Don Nicol

Director

Breedlink Pty Ltd



Climatic Zones of Australia



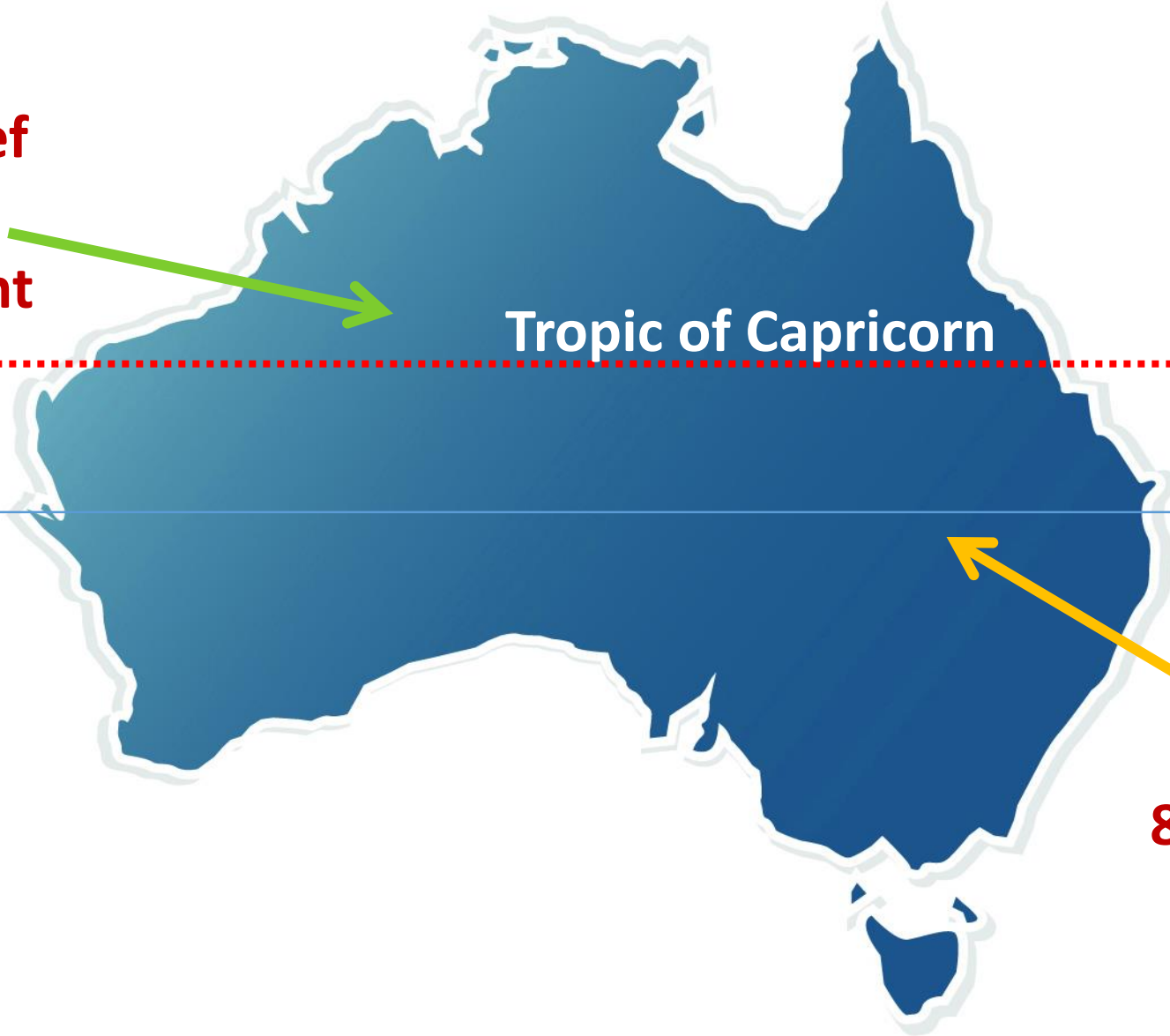
Beef Cattle Distribution in Australia

>85% of the beef cattle have Brahman content



~28 Million

Tropic of Capricorn



80% of the beef cattle are temperate or crossbreds

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

Country	Semen	Embryos
Argentina	√	√
Brazil	√	√
Chile	√	√
Colombia*	√	√
Costa Rica	√	√
Ecuador	No	No
Guatemala	√	No
Mexico	√	Pending
Paraguay	√	No
Peru	No	No
Uruguay	√	√
Venezuela	No	No

** 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

Beef Breeds of Australia

Temperate Zone – in order of importance

- 7 main European Breeds:
 - Simmental
 - Limousin
 - Charolais
 - Gelbvieh
 - Blonde d'Aquitaine
 - Salers
 - Main Anjou

Beef Breeds of Australia

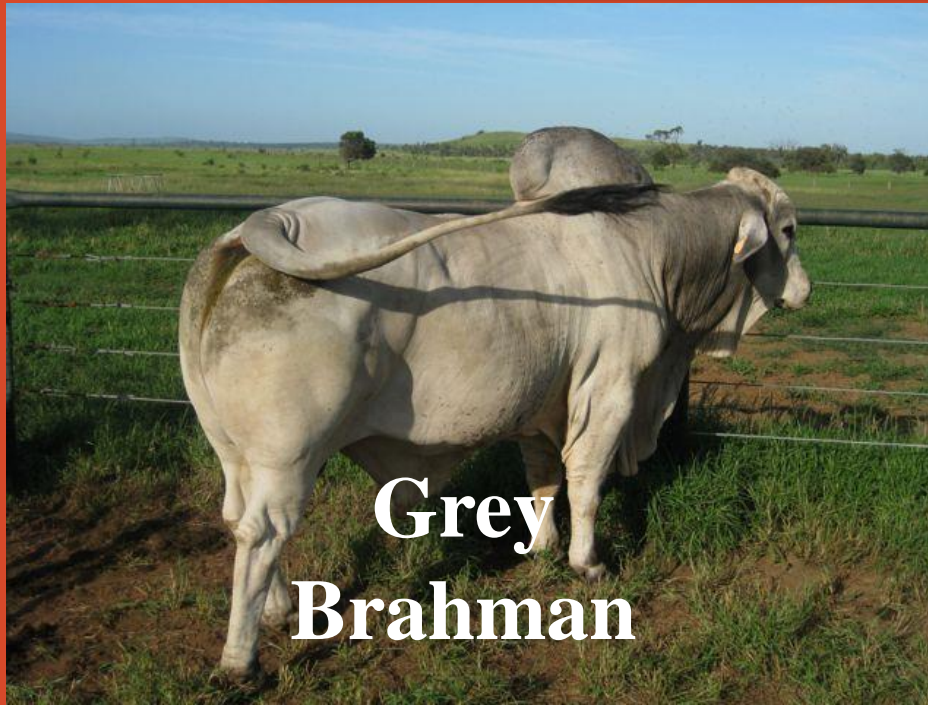
Tropical Zone – 7 main breeds

- Brahman
- Santa Gertrudis
- Droughtmaster
- Brangus
- Braford
- Belmont
- Senepol





Brangus



**Grey
Brahman**



Santa Gertrudis



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!

