AUSTRALIAN REPORT

Presented By: Dr. Arthur Rickards OAM
Business Development Consultant
Australian Cattle Population

30 Million Head

50% of Cattle with Bos indicus blood

50% of Cattle with Bos taurus blood
Where Output Goes

700,000* Live Cattle Exports

736,000 tonnes CWT Local Consumption (35%)

1,366,850 tonnes CWT Export Beef (65%)

* 115,000 exported for breeding
  585,000 exported for value adding & slaughter
Breed Distribution of Seedstock Herd

1) Angus  
2) Hereford  
3) Shorthorn

14% European Breeds
- 1) Charolais  
- 2) Limousin  
- 3) Simmental

33% Tropical Breeds
- 1) Brahman  
- 2) Droughtmaster  
- 3) Santa Gertrudis

53% British Breeds

Annual Registration 190,000
Australian Agricultural Company

No. of Properties: 23
Feedlots: 5
Area: 7.2M hectares (Almost the same size as Ireland)
No. of Cattle: 660,000 hd

Breeds:
- Wagyuu: 60,000
- Angus: 65,000
- Gulf Composite: 105,000
- Barkly Composite: 160,000
- Brahman Composite: 270,000

TOTAL: 660,000
BREEDPLAN® Genetic Evaluation

- BREEDPLAN® is the world’s most widely used genetic evaluation system for beef cattle
- Developed in Australia
- Used by:
  - 44 breeds
  - 100+ breed associations
  - across 15 countries
- Growth, carcase and fertility EBVs are evaluated together in a multi trait model + calving ease + others
- Database over 40 million animals
BREEDPLAN® Research Component

FUNDING
- National Government
- State Governments
- Producers through Meat & Livestock Australia

ANIMAL GENETICS & BREEDING UNIT
- 20 Geneticists
- Support Staff
  Undertakes genetic research which is represented in BREEDPLAN software that they write.

BEEF CRC
Research into meat quality and genomics since 1991

Science based BREEDPLAN Software
To ABRI For Commercialization
ABRI uses a 22-person software team to create a wide-ranging commercial software system called BREEDPLAN International that is licensed to over 120 breed associations.

(Service used by over 60,000 Breeders of 44 breeds across 15 countries)
# Traits For Which BREEDPLAN EBVs/EPDs Are Produced

<table>
<thead>
<tr>
<th>Growth</th>
<th>Fertility/Birth</th>
<th>Carcase</th>
<th>Other</th>
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</thead>
<tbody>
<tr>
<td>Birth Weight</td>
<td>Scrotal Size</td>
<td>Carcase Weight</td>
<td>Docility</td>
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<tr>
<td>Growth:</td>
<td>Days to Calving</td>
<td>Eye Muscle Area</td>
<td>Net Feed Intake</td>
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<tr>
<td>• 200 Day</td>
<td>Gestation Length</td>
<td>Fat Depth:</td>
<td>Flight Time</td>
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<tr>
<td>• 400 Day</td>
<td>Calving Ease</td>
<td>• Rump</td>
<td>Shear Force</td>
</tr>
<tr>
<td>• 600 Day</td>
<td>• Direct</td>
<td>• Rib</td>
<td>Structural Soundness</td>
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<tr>
<td>Maternal (Milk)</td>
<td>• Daughters</td>
<td>Intramuscular Fat</td>
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<tr>
<td>Mature Cow Weight</td>
<td></td>
<td>Retail Beef Yield</td>
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BREEDPLAN Is Producing Marker-Assisted EBVs

PEDIGREE
- Parents & Sibs
- Progeny

PERFORMANCE
- Own Records
- Correlated Traits

Marker Assisted EBVs

GENOMIC PREDICTIONS
- DNA Sample
- Prediction Equation
  - Pfizer 50K
  - Beef CRC

Making EBVs More Accurate
Routine Across-Country Evaluations

Analyses are run on combined datasets

- Australia and New Zealand*
- South Africa and Namibia
- Pan American Hereford - USA, Canada, Uruguay and Argentina
- Murray Grey - Australia, NZ, USA, Canada and UK

Comparable EBVs/EPDs to identify and more
Readily use the elite genetics

* Commenced in 1990
Suite of Genetic Improvement Tools

A number of complementary decision making tools can be interfaced with BREEDPLAN

- BreedObject
- TakeStock
- MateSel
- Quality assurance products
- GeneProb
- Internet Solutions
A selection index tool for formalising breeding objectives to assist in breeding more profitable animals

Creates a Selection Index to maximise PROFIT
Evaluates the **genetic progress** of a herd for a particular Selection Index

- **Benchmarks the progress** of the herd against the breed
- Identifies **Key Performance Indicators (KPIs)** that explain significant differences in the rate of genetic progress between herds

**Genetic Benchmarking Tool**
- **Mating selection** tool
- **Optimise genetic progress** with constraints -
  - candidate animals
  - breeding technology (AI/ET)
  - genetics (EBVs & MVPs)
  - inbreeding
  - genetic conditions
Quality Assurance Products

- **Data Audit**
  evaluates data quantity and quality

- **Completeness of Performance**
  - Provides information on data submitted to BREEDPLAN
  - Two components:
    - Completeness of Performance Reports
    - Star Rating System
GeneProb

- calculates probability of animal being a carrier for a particular genetic condition based on DNA plus pedigree
  - Genetic disorders
  - Horn/poll
  - Coat colour
Internet Solutions

Internet information system that provides access to:

- **Animal/Member Enquiries**
  - Animal lists (with sort criteria)
  - Pedigree display with photos/images
  - Performance information
  - Progeny lists
  - Graphs of performance
  - Membership details

- **Entry of registrations/inventory updates/performance data**

- **Mating prediction service**

- **Download electronic files/reports**

3 Million Pages Per Month
Services Include

- On-Farm visits
- Workshops
- Field Days
- Webinars
- Newsletters
- Technical Tip Sheets
- Consultation to Breed Association Boards & Technical Committees
- Training Breed Association Staff
- Industry interface with research groups

Cofunded by:
ABRI
Breed Associations
Meat & Livestock Australia
Conducting Genetic Evaluations in 15 Countries
BREEDPLAN International Summary

- Used by 100+ breed associations
- 44 breeds
- 15 countries serviced
- 60,000 users
- 460,000 beef registrations per year
- EBVs/EPDs produced on 22 traits
- Does across-country evaluations routinely
- Internet information system - 3 million pages per month
- DNA data included in marker-assisted EBVs
- Total database exceeds 40 million pedigree cattle
- R&D budget A$12M - $20M pa in period 2001 - 2011