Enabling genetic improvement of reproduction in tropical beef breeds

...Repronomics project update

MLA Project B.NBP.0759

Project leader: David Johnston
Increase numbers of animals with accurate reproduction EBVs in northern Australia enabling improvement in female reproductive performance via genetic improvement
Project brief

- 5 year MLA funded project (started Oct 2013)
- collaborative research (AGBU, DAFFQ, NTDPI&F, QAAFI, UQ)

How?
- intensive recording female reproduction
- full genomics testing
- drive new genomic selection in BREEDPLAN

What?
- 3 tropical breeds (Brahman, Droughtmaster, Santa Gertrudis)

Where?
- research station herds (QLD & NT)
- cooperator industry seedstock herds
Locations and breeds

Douglas Daly

Spyglass

Brian Pastures
Brian Pastures research facility

- QDAFF run (AgForce owned)
- Gayndah QLD
- 5000 acres (+2000 lease)
- 400 adult cows
- 220 replacement heifers
Spyglass research facility

- QDAFF owned and operated
- 120km NW Charters Towers
- 38,000 ha
- ~1000 project females
- 300+ replacement heifers
Douglas Daly research farm

- NTDPI&F
- Douglas Daly (220km S\textsuperscript{th} Darwin)
- 3,100ha
- 360 project females
- yearling mating
- heifer phase of selected Brahmans
A) Intensive recording

• Daughters on influential Brahman sires
  – high influence, few daughters recorded
  – current (high) usage
  – 15-20 daughters recorded

• Intensively recorded daughters
  – regular ovarian ultrasound scanning
    ➢ age at puberty & wet cow recycle interval
  – maiden heifer & first cow rebreed mating outcomes
    ➢ calving and weaning rates, days to calving
B) DNA genotypes

- Genotype key Brahman sires
  - high EBV accuracy sires
  - sires in Smart Futures Fund project herds
  - sires with daughters measured (RS & ABBA BIN)

- Add to existing Brahman recording
  - all fully recorded BREEDPLAN herds (adds linkage)
  - birth weight, GL, growth, scans, flight time etc
New AI sires 2015/16

- **NCC Diplomat** (Elmo son)
- **FBC Garth** (Mr Arnie son)
- **Fern Hills Kingston**
- **NCC Springbok** (S. Afr.)
- **Raglan Victory** (Beef 2015)
- **Sha Ann Wise’n’Up**

- 300 Brahman cows AI
- 60+ % first round (semen quality critical)
Natural mate genetics

Roxborough

Glengarry, Wandilla, Narrandra, CBV, Elrose, Lancefield

- ~300 Brahman maidens and 1st calvers
- progeny valuable for future work
...also new Santa and Droughtmaster genetics

Young Eidsvold Station

Top selling sire Rosevale 2015

Canowindra Jag

Glenlands genetics

Young Rondel bull

Rockdale bulls
New #16 drop

Key Sires

- CBV Aristavivo
- JDH Lincoln De Manso
- DRF15431
- Lancefield Elgin
- Mr V8 the Butler
- Lancefield Buster
- CRC & Bin links

- GL, BWT, CE, calf vigour & mothering scores, Cow BCS, teat & udder
- WWT, FT, horns, coat score
#15 heifers (& steers)

Key Sires

- CBV Poll Position
- JDH Mr Elmo Manso
- Lancefield D Robinson
- DRF15431
- Lancefield Elgin
- Elrose Petrie
- Lancefield Buster
- HK Magnetic

ABBA BIN sires
  - Lancefield Ambition
  - Mogul Yalumba
  - FBC Becker
  - Elrose Significantly

Puberty scanning
  - BP 3\textsuperscript{rd} scan (10%)
  - Start SG next week
#13 and #14 females

- currently in mating
- ultrasound body composition
- repeat ovarian scanning

13’s wet first calvers
- cyclicity, feotal ageing
  - start, mid, out of mating weaning (+ non beyond)

- BP ~ 50% cycling by mid-mating
- SG ~10%
DNA SNP genotyping

- Latest DNA SNP chip
  - all project 13, 14, 15 females
  - all project sires
  - high accuracy industry bulls
  - high accuracy cows
  - all ABBA BIN sires
**Very preliminary results**

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<th>P value</th>
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**age first CL**

- **2012 drop**
- **2013 drop**
- **2014 drop** (incomplete)

**Sire LSM for Lactation anoestrous interval (SG)**

![Graph showing lactation anoestrous interval for different sires](image)
Genomic genetic evaluation

- Project sires
- DNA sample
- SNP genotype
- Project progeny
- Field data
- Industry progeny
- Industry sample
- young selection candidate

Accurate EBVs

Project phenotypes

single-step
What’s next?

- continuing female recording
- continue puberty scanning of 15s
- wean #16s
- plan for upcoming mating
  - AI (possible new sires....$$ model + DAF)
  - large numbers of natural mates ....need 5 new Brahmans
- submit all data BREEDPLAN (drive new version)
- plan future with DAF and MLA