Building a fertile herd

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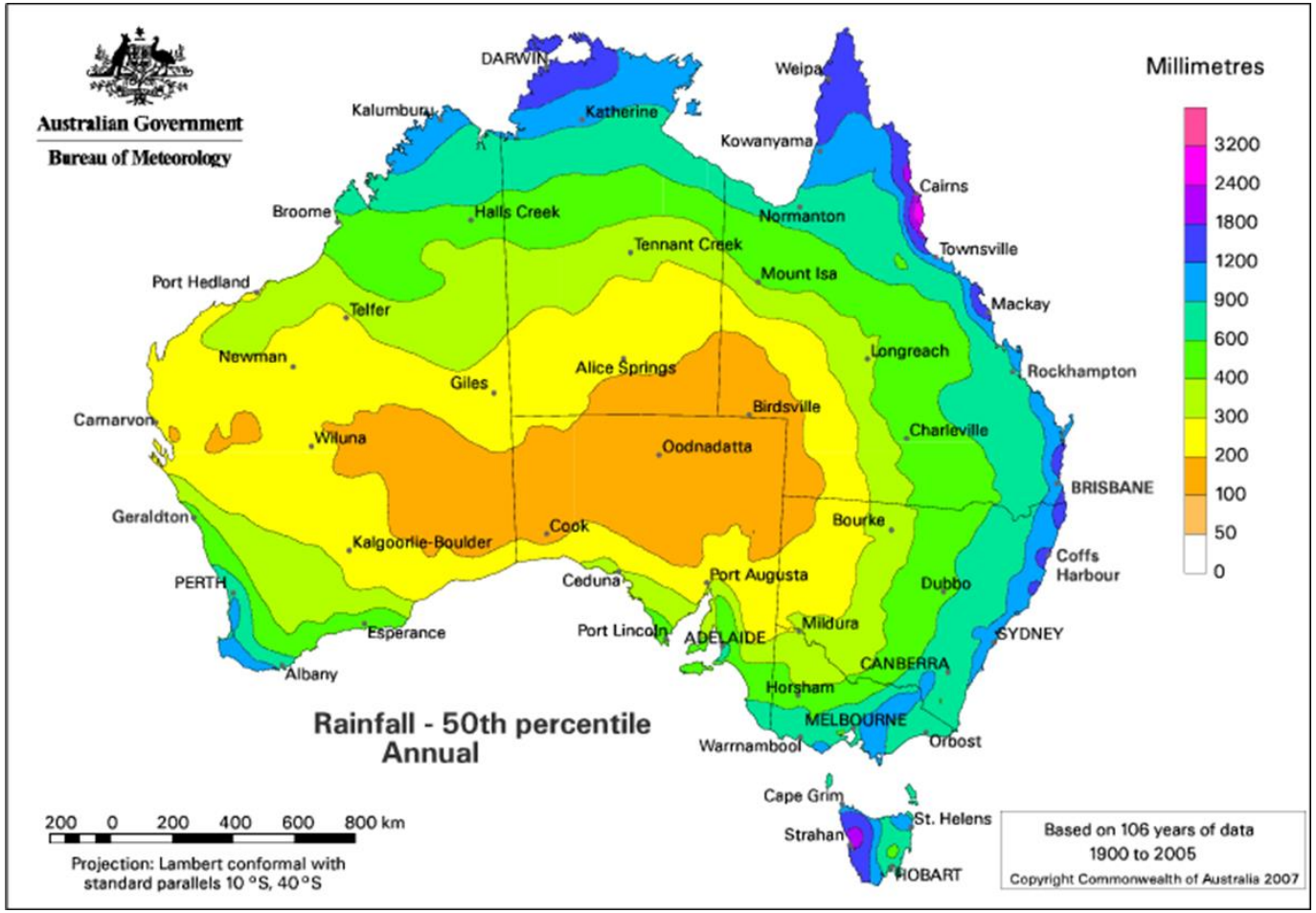
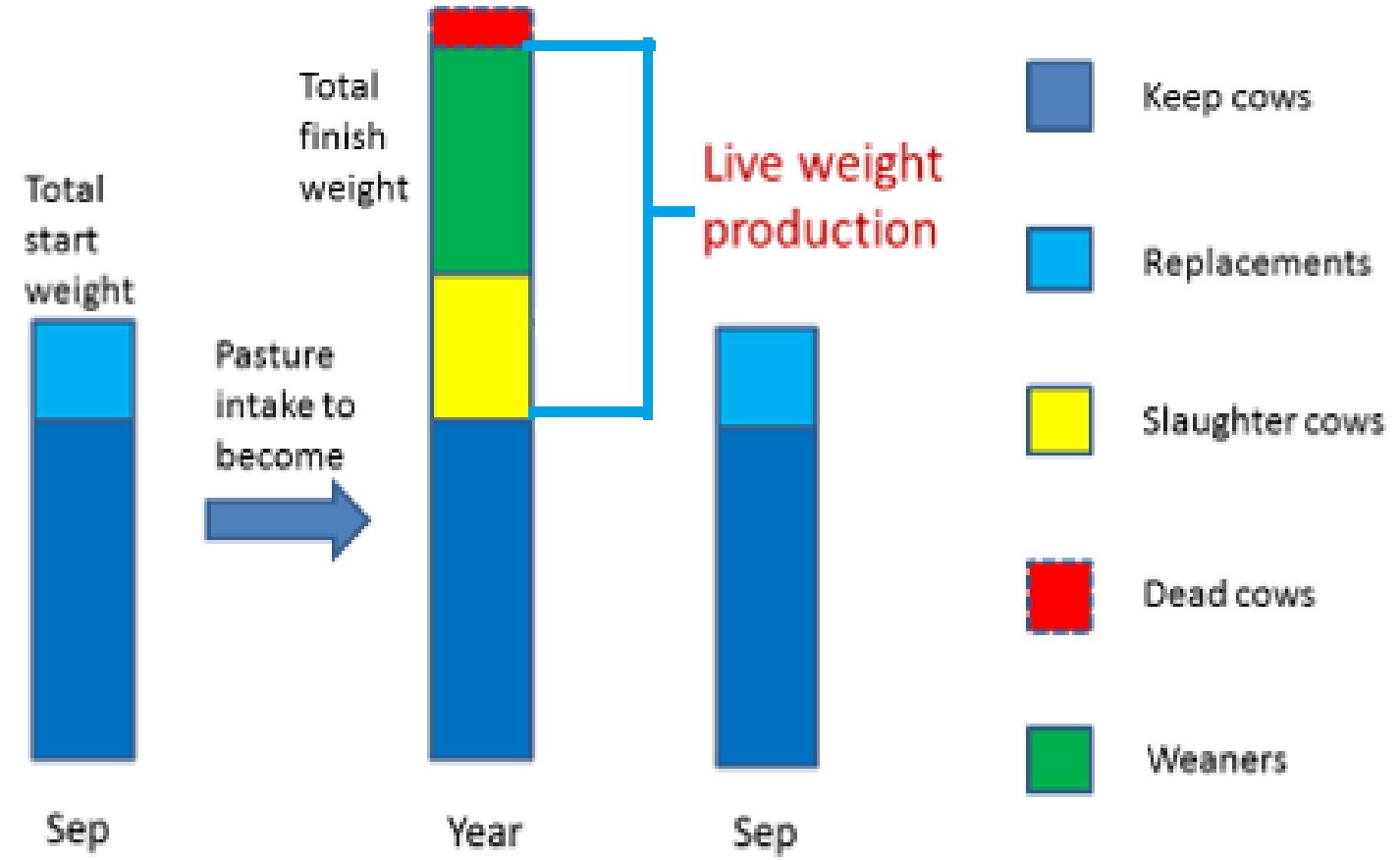
Outline of presentation

- Focus will be on beef production in sub-tropical-tropical environments
- Based on findings from 2 very large projects conducted in northern Australia over past 10-15years
- North Australian beef fertility project: the Cash Cow project http://www.mla.com.au/Research-and-development/Final-report details?projectid=15462
- Cooperative Research Centre for Beef Genetic Technologies www.beefcrc.com



Profitability = Production x value of product – cost of production



If a farmer puts 100 tonne of cows in a paddock after completing pregnancy diagnosis of their herd, then 12 months later how many tonnes of beef have been harvested from the herd (includes calves weaned and any cows and bulls sold)?

WHAT ARE THE MAJOR DRIVERS OF LIVE WEIGHT PRODUCTION OF A BREEDING HERD

- percentage of lactating cows that become pregnant within 4 months of calving (estimates the proportion of cows likely to wean a calf in consecutive years)
- annual total percentage of pregnant cows
- the percentage of foetal and calf loss between confirmed pregnancy and weaning
- average weight of weaned calves
- live weight change of heifers/cows
- percentage heifer/cow mortality

Using annual live weight production as a primary measure of “how a herd is going” encourages a more holistic approach to herd management.

WHAT LEVEL OF PRODUCTION CAN I ACHIEVE WITH THIS FEED RESOURCE?

Finding from a 4 year epidemiological study conducted in northern Australia (CashCow)

Mean annual steer growth (kg)*	No. of herds	Weaner production (kg/cow)#		
		25th percentile	Median	75th percentile
200	33	164.0	191.0	240.0
180	33	160.7	194.6	220.1
170	29	134.9	163.0	182.6
100	59	74.0	93.3	112.4

* This provides a good estimate of the typical quality and quantity of pasture available to breeding females

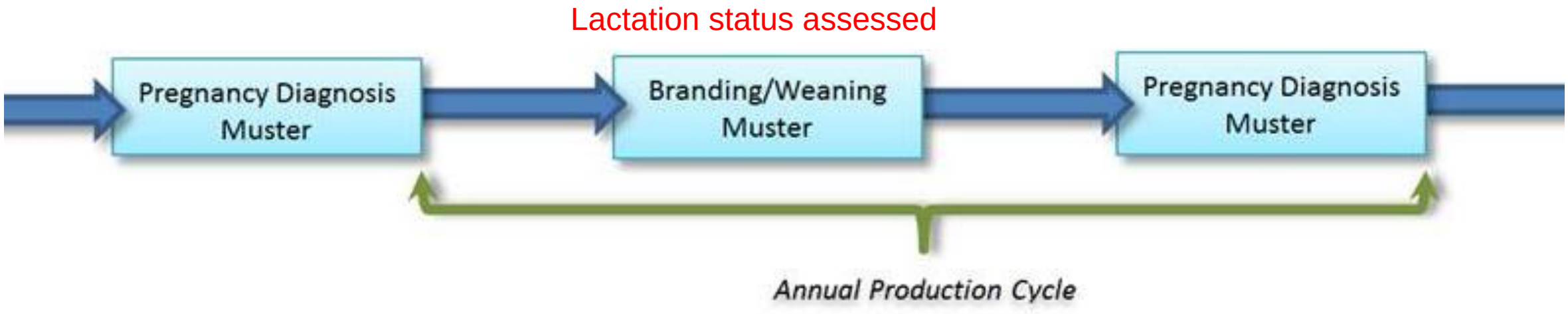
Weaner production = $\frac{\text{average weight of weaned calves X total number of calves weaned from herd}}{\text{total number of cows returned to paddock after pregnancy diagnosis}}$

Understanding what level of reproductive performance can be achieved

Reproductive performance	200 kg p.a	180 kg p.a	170 kg p.a	100 kg p.a
Pregnant within 4months of calving (%)	74 (39 - 85)	77 (56 - 84)	68 (60 - 76)	17 (7 - 31)
Annual pregnancy rate (%)	87 (77 - 93)	88 (79 - 92)	82 (75 - 91)	66 (56 - 74)
Foetal/calf loss (%)	5 (2 - 9)	6 (4 - 9)	7 (3 - 15)	14 (9 - 19)

To manage reproduction you must measure it – pregnancy diagnosis and foetal aging are critical

- In extensively managed herds determining timing of calving can be very difficult.
- Foetal aging can be used to derive month of calving and when combined with assessment of lactation status month of re-conception.



At the time of pregnancy diagnosis should assess:
body condition score, lactation status, udder/teat conformation, cow age

Strategies to improve herd fertility

- Implement a genetic improvement programme -

  long term improvement
- Implement specific changes in management -

  medium term improvement

Using genetic selection to improve fertility

EIDSVOLD STN ES/D648 DINGO

SIRE: GYRANDA GARWOOD G684 (PS)

GYRANDA E165 (P)

GYRANDA FORESTER Y512

DAM: GYRANDA B613

GYRANDA 545

Notes: The perfect animal to lead off the sale. Dead quiet; packing big growth and good fertility into a moderate frame. A clean coated poll scur bull, he has the character and the data to build an empire on!! Dam B613 was sold last year after weaning nine calves in nine years. Her dam, Gyranda 545 also had a perfect calving record to wean nine.

Dam: C.I. 370 days – 9 calves **Morphology:** 79%

Wt _____ Sc _____

GROWTH	200D	**+27**	**68%**
	400D	**+42**	**68%**
	600D	**+57**	**57%**
	MWT	**+71**	**64%**
	MILK	**+4**	**47%**
FERTILITY	SS	+1.6	68%
	DTC	-1.6	53%
CARCASE	EMA	**+3.7**	**53%**
	RIB	-1.2	59%
	RUMP	-1.7	58%
	RBY	**+1.2**	**46%**
	IMF	-0.2	52%
	RightTime	**+0.38**	**69%**
$ INDEX	DOM	**+33**	
	EXP	**+42**	

Male reproductive traits are genetically correlated with female reproductive traits

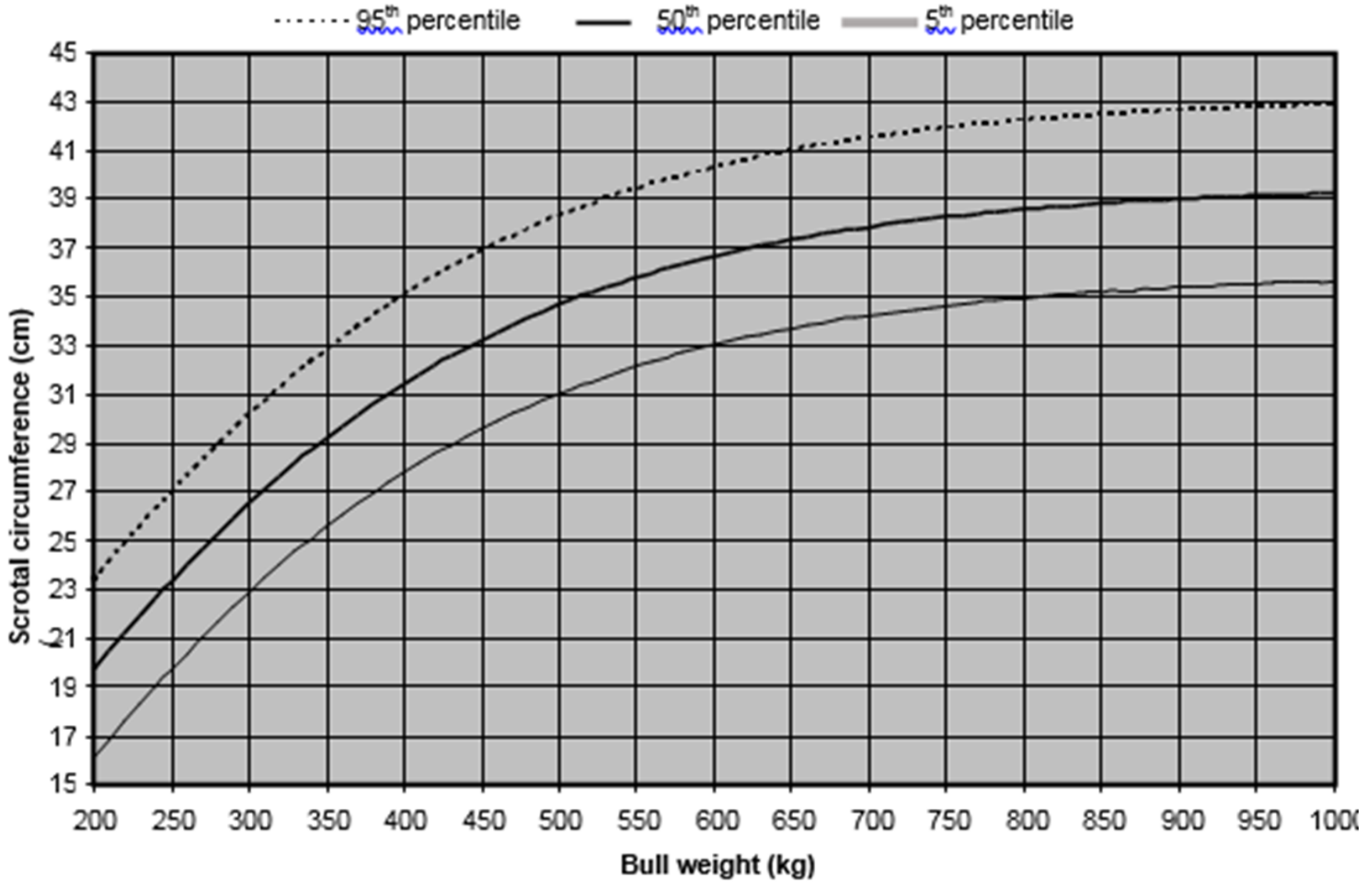
- Scrotal circumference between 6-24months is moderate to highly heritable and negatively correlated with age of puberty in females, especially in Brahmans
- Percent normal sperm is low to moderately heritable and negatively correlated with interval from start of mating to first ovulation, especially in Brahmans
- Scrotal circumference at 18 months and percent normal sperm at 24 months were positively correlated
- Interval from start of mating to first ovulation was negatively correlated with lifetime annual weaning rate

Conduct breeding soundness examinations to select fertile bulls

Findings from DNA typing calves from multiple-sire mated breeding herds (n=13):

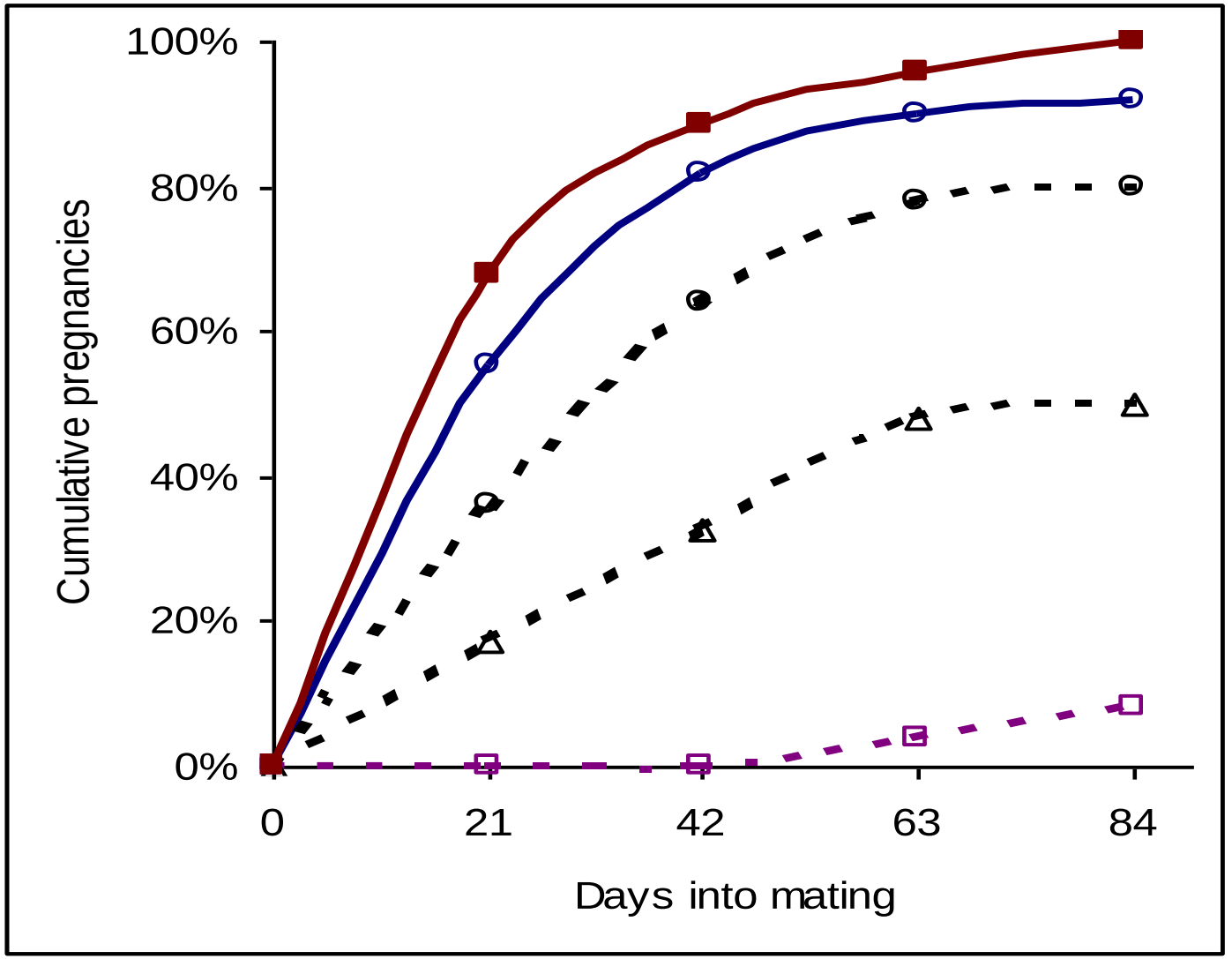
- 7% of bulls sired no calves
- 58% individually sired 10% or less calves in each of their breeding herds
- 13% sired over 30% of the calves in each of their breeding herds

Tropically adapted bulls with scrotal circumferences less than the lower 5th percentile have abnormal testicular development



Producers should be buying bulls which are producing semen containing ≥ 70% normal sperm. A good indication of both fertility and environmental adaptation

Mating results of Brahman cross bulls with greater than 70% normal sperm (solid lines) or less than 50% normal sperm (dashed lines)



MANAGING THE 4 MAJOR AREAS THAT IMPACT ON HERD FERTILITY

Nutrition

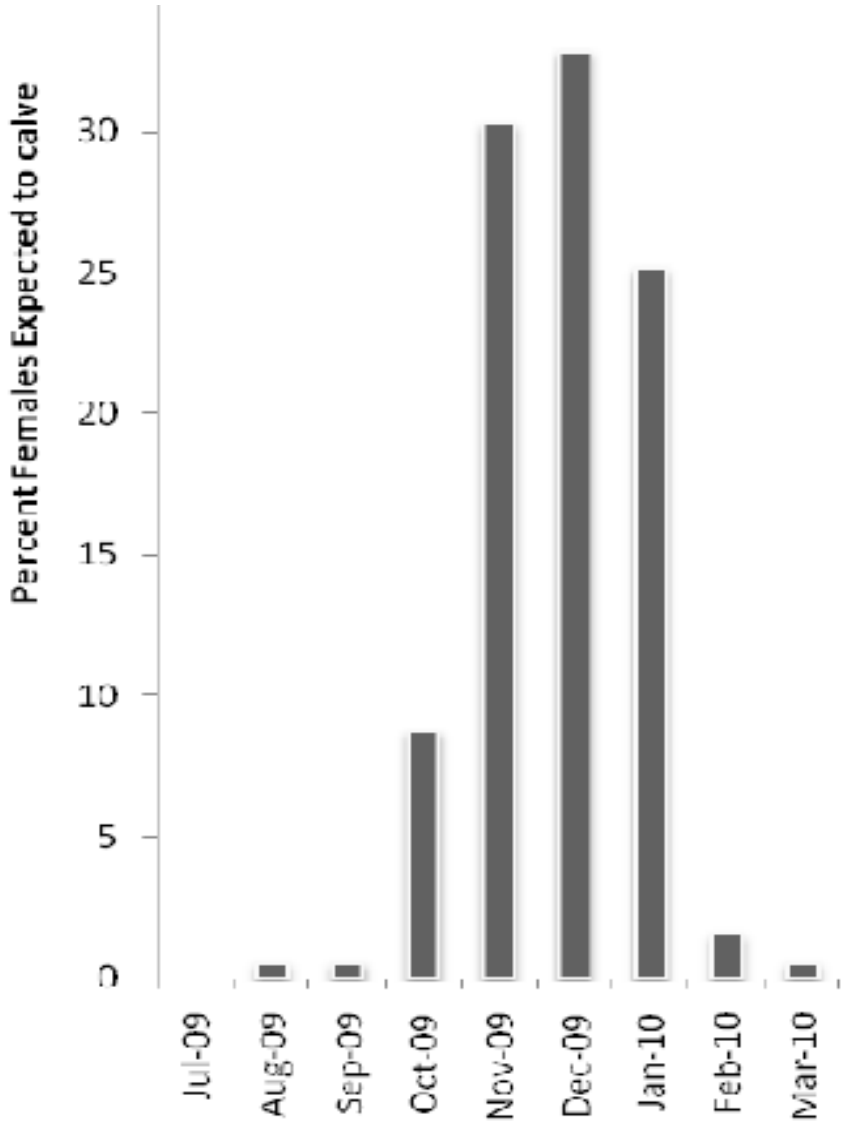
Lactation

Cattle health and stress

Breeding

Principles of good herd management

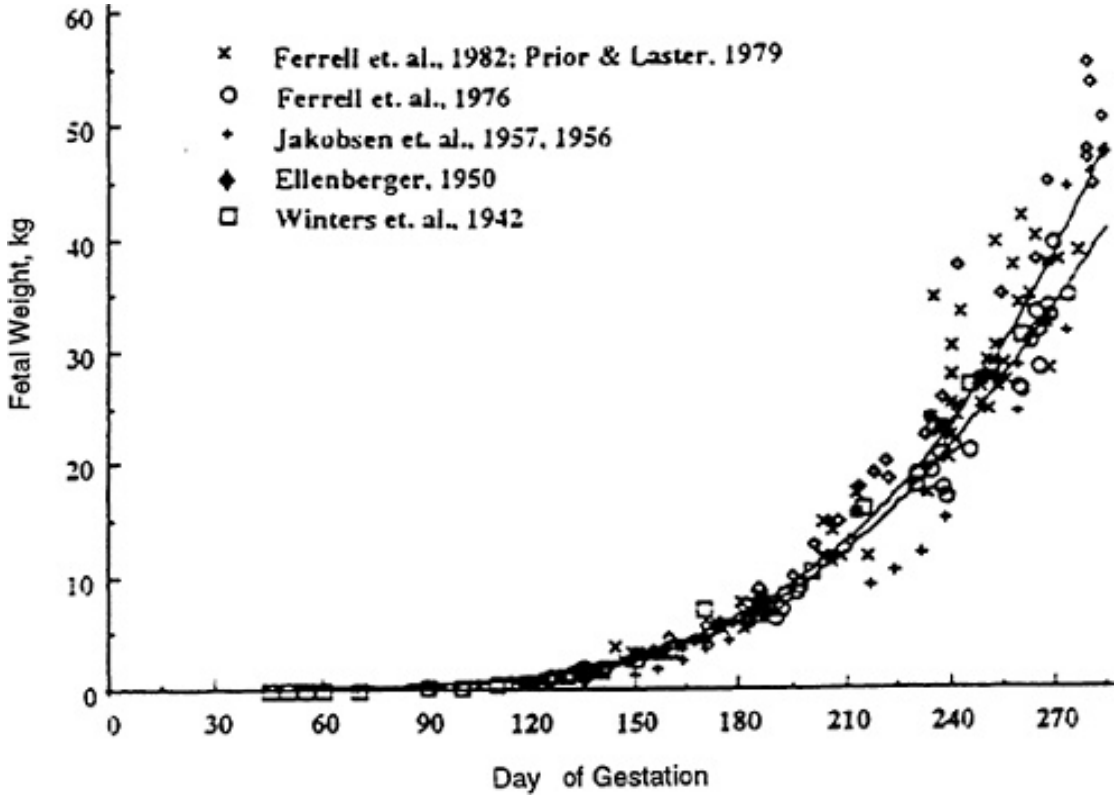
- Plan well in advance of when specific management interventions should be implemented. Foetal aging at time of pregnancy diagnosis greatly facilitates good planning.
- Know which animals require specific management interventions e.g which cattle need phosphorous supplementation most. Drafting according to lactation status and foetal aging enables the right cattle to get what they require.
- Remember you are managing a whole system. Be aware of both the positive and negative impacts of implementing specific interventions.



Managing the feed-base

Farmers should stock their country and provide supplements according to the nutritional needs of the heifer/cow at different stages of the breeding cycle.
Order of priority is:

1. Lactating, pregnant cows
2. First-lactation cows
3. Lactating, non-pregnant cows
4. Heifers from mid-trimester of pregnancy
5. Heifers from weaning to 1st joining
6. Non-lactating cows



Lactating cows requires 2 X energy of dry cow and 3 X protein

Stock paddocks according to long-term carrying capacity.

Managing lactation

- Weaning should be done before cows lose significant body condition
- Cows must have sufficient time, and access to sufficient adequate quality pasture to recover body tissue reserves before next calving

How much weight do these cows need to gain to improve one BCS

To increase BCS from 2 to 3 a cow needs to gain approx. 60kg

Managing lactation

Body condition score at the time of pregnancy diagnosis#	% lactating cows pregnant within 4 months of calving
1.0 - 2.0	31
2.5	39
3.0	45
3.5	49
4.0 - 5.0	52

#Cows were typically 4 – 5 months pregnant

In northern Australia study 25 to 50% of 1st lactation cows had a BCS < 2.5

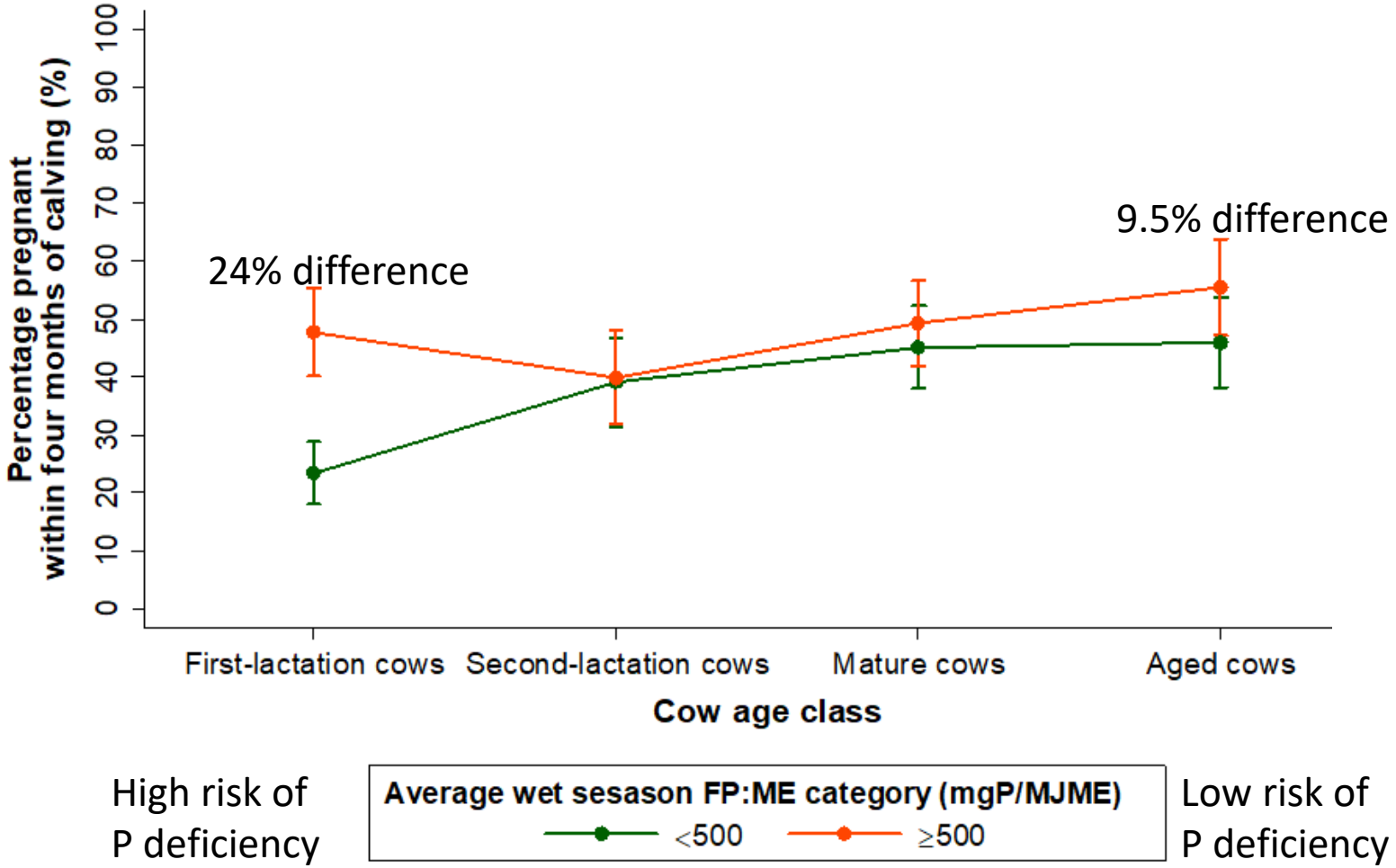
Managing lactation

- Wherever possible mating should be controlled to ensure heifers and cows calve close to the time when the likelihood of significant improvement in seasonal pasture quantity and quality is high.
- Segregating cows according to lactation status and predicted period of calving enables more targeted management of heavily pregnant and lactating cows.

How much milk do these calves need?
10% of their body weight especially in first 2 weeks

Managing lactation

- Critical importance of ensuring the right females get the right nutritional supplement
- 1st lactation cows are metabolically challenged, still growing + growing a foetus + lactating
- Segregation of heifers until weaning of first calf



Managing cattle health and stress

- Critical to identify heifers which will calve as 2 year-olds. Must ensure they grow adequately throughout pregnancy – need to be approximately 85% mature weight at calving to ensure they have grown a big enough pelvis to enable normal unassisted delivery of calf

Managing cattle health and stress

- Managing infectious diseases – main approach is to prevent outbreaks of infection at critical stages of reproductive cycle.
- Different approaches depending on approach to risk
- Whole herd vaccination v's selective vaccination of at–risk mobs
- Establishing a biosecurity plan critical

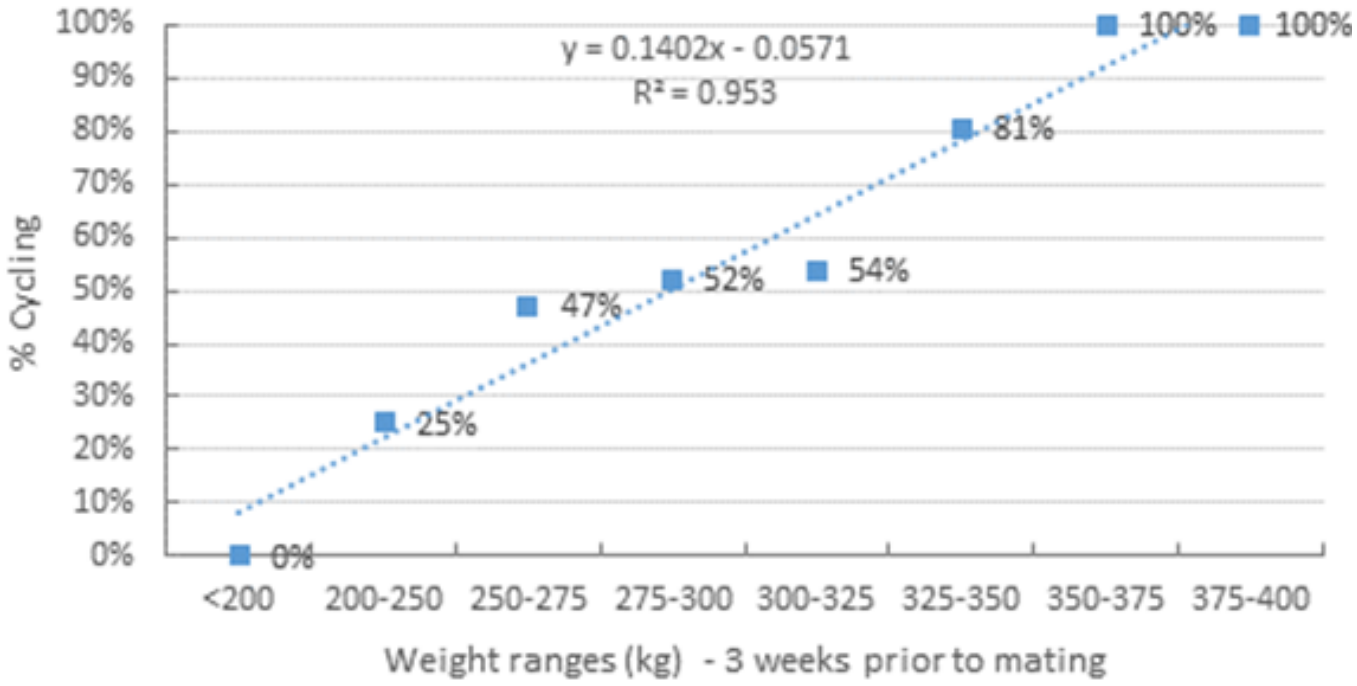
Remember if the cow dies the calf dies

Managing cattle health and stress

- Where possible conduct castration and dehorning when calves are young and according to best practice
- Vaccination to prevent clostridial diseases
- Genetic selection for polled cattle will have large impact on health and welfare. Also genetic selection against a range of heritable diseases e.g Pompe’s

Managing breeding

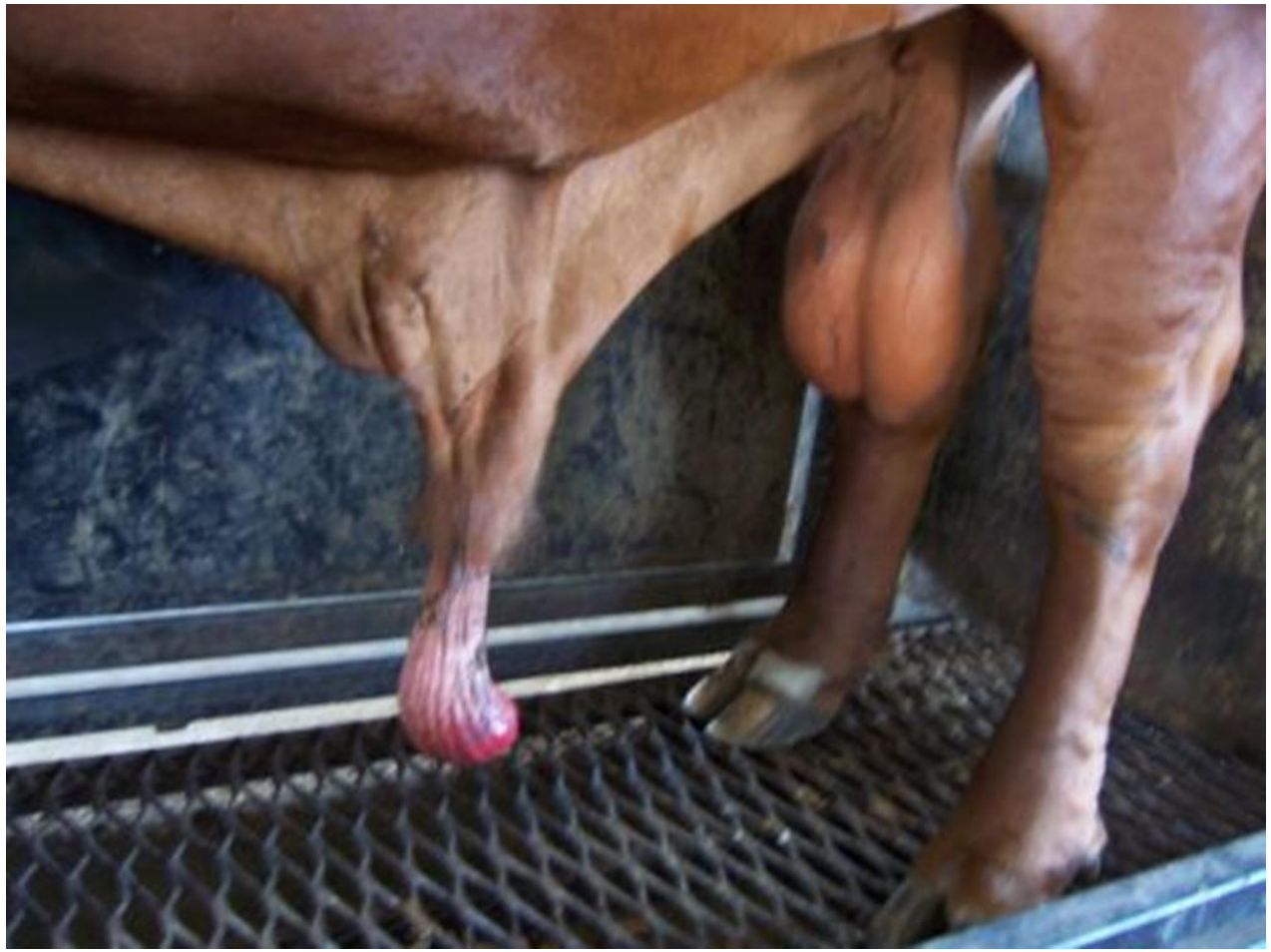
- Develop a replacement heifer management plan
- Manage nutrition to ensure heifers are at least 65% mature weight at start of mating. Phosphorous supplementation critical in P deficient areas.
- Use an overmating strategy and use foetal aging to select only those heifers which conceive within 6 to 9weeks.
- Consider use of artificial insemination of replacement heifers/cows to introduce improved genetics into the herd



Rising 2-year-old Brahman heifers in north Queensland

Managing breeding

- Manage the nutrition of purchased bulls to prevent rapid loss of body condition
- Vaccinate bulls for diseases known to cause fever/illness, death or venereal disease
- Relocate bulls during cooler months of year and allow 2 - 4months for bulls to acclimatise to their new environment before mating them
- Avoid mixing bulls, particularly different age bulls
- All breeding bulls should annually undergo a breeding soundness examination prior to use
- High bull percentages (> 4%) increase the risk of bull injuries due to fighting and do not improve detection of oestrus



Implementing changes in management
– critical to monitor impact of each change

Key take home messages

- There are no silver bullets - you don’t get anything for nothing
- You are managing risk – whatever decisions you make each will have strengths and weaknesses
- What works for one farmer may not necessarily work as well for another
- Need to manage the 4 main areas that drive the system (feed-base, lactation, cattle health and stress and breeding)

ACKNOWLEDGMENTS

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78 commercial beef farmers
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THANKYOU - QUESTIONS

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