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For the latest in red meat R&D

How to improve your sheep flock's reproduction rates to increase productivity and profitability

Gordon Refshauge

NSW DPI

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Heat stress

- Heat stress is the need for heat dissipation made by the ambient environment
- Sheep body temperature is normally 38.5 – 39.7°C
- Respiration rates is a great indicator

Breaths per minute	Severity of heat stress
40-60	Low
60-80	Medium
80-120	High
200	Severe

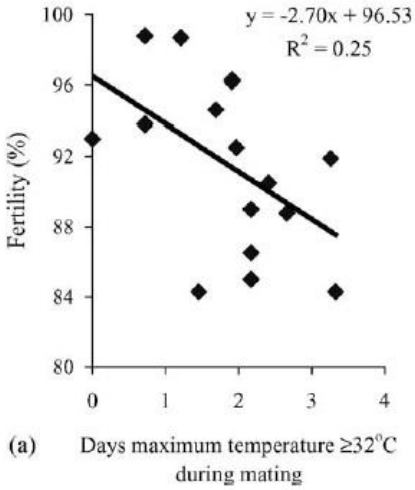
How heat stress affects sheep reproduction

RAMS

- >35°C leads to impaired spermatozoa
  - Increases % abnormal, % dead & lower motility
- 7 to 14-day lag in effects lasting 4-8 weeks
- Depressed sexual activity (both sexes)

EWES

- Follicle & ova
- 5 days pre-ovulation to 3 days post
- Restrictions to fetal development
  - Birthweight
  - Fleece production
- Lamb mortality
- Reduced milk production



Source: Kleemann and Walker (2005)

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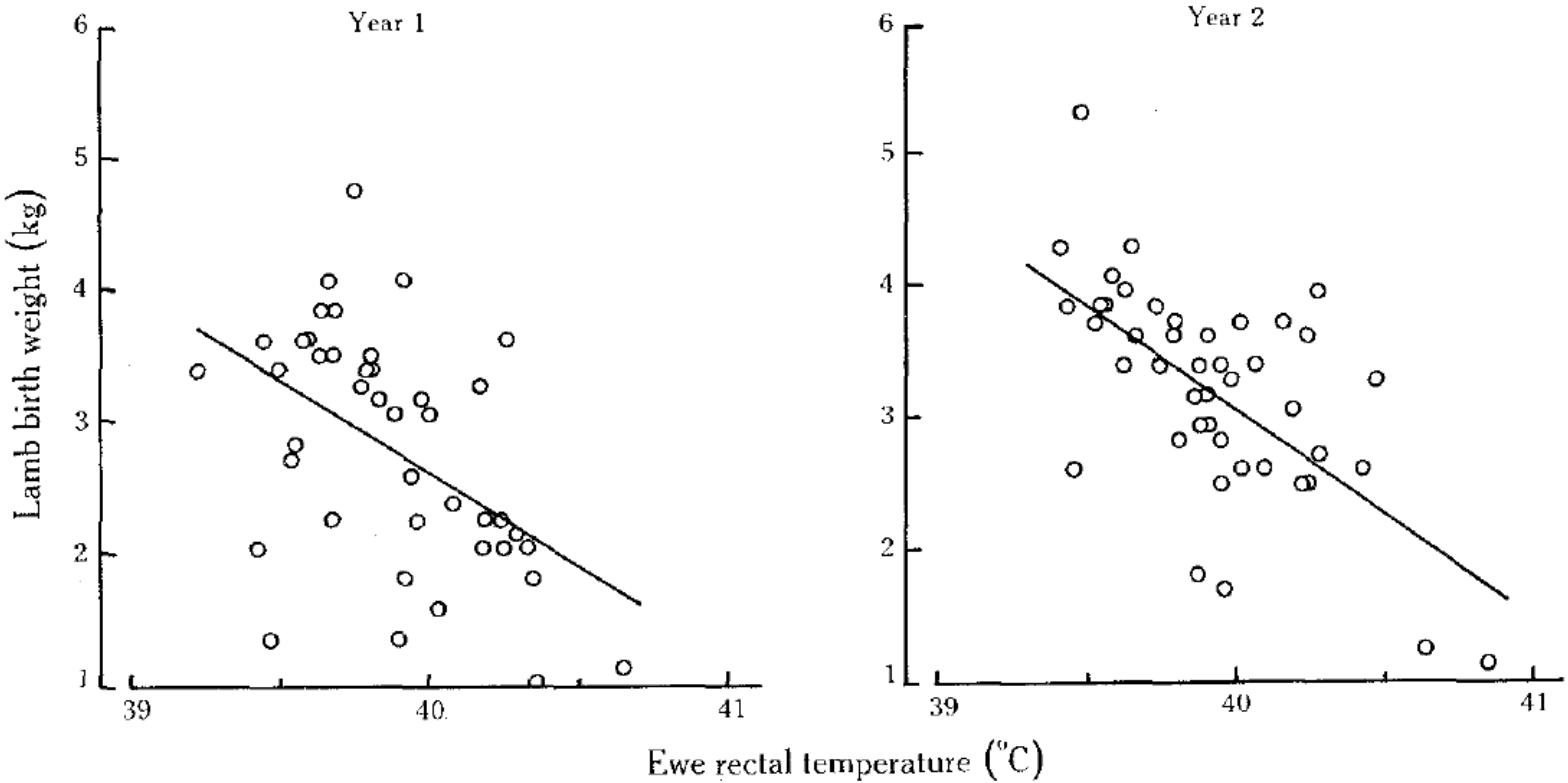
How heat stress affects sheep reproduction

- Impairment of hormone activity
  - GnRH, LH, oestradiol, inhibin, FSH
- Increased oxidative stress
  - Reactive oxygen species production

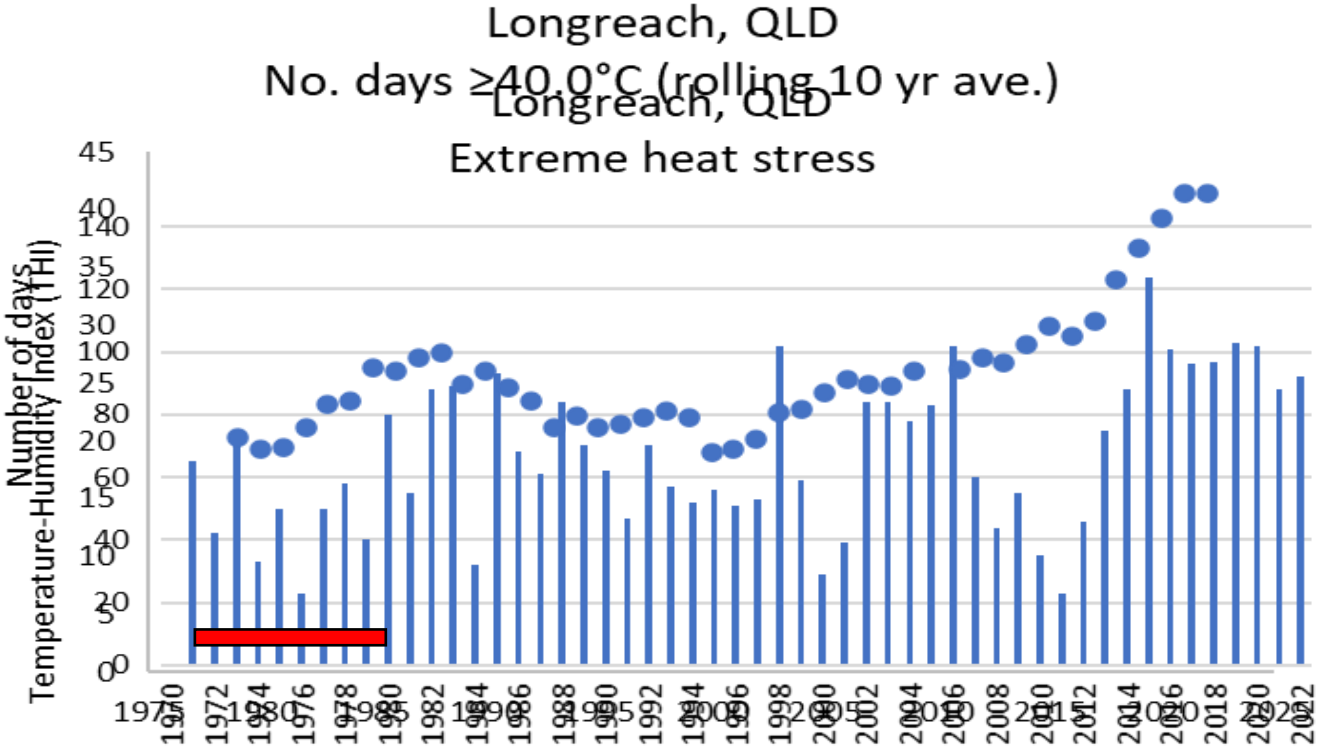
https://www.123rf.com/photo_741616_wooly-sheep-eating-ice-cream-cone-through-fence.html

How heat stress affects sheep reproduction



Source: Hopkins *et al.* (1980)

Our changing climate



https://www.longpaddock.qld.gov.au/silo/point-data/

What to do about heat stress

- Shade, quality water, minimal stock movements

- Increase shade options & availability – 0.7m^2/hd?
- Genetic selection? Rg? Surely, but how?
- Nutrition – antioxidant rich diets? Yes, but how?

- Seedstock breeders – class rams on sperm quality
- Everyone – cull ewes failing to rear lambs (udder inspection)

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Maximising flock reproduction

- Your ideal reproduction rate is subjective – the target is set by your goals
- Increasing weaning rate affects stocking rate
- Increasing lambing rate is easy, lamb survival not so
- Use pregnancy scanning & condition scoring to make decisions

Fundamentals

- Sheep are seasonal breeders
  - Fertility, pregnancy rate, ovulation rate, lambing rate each improve in autumn
- Reproduction rates are higher under better nutrition, heavier, older ewes
- When you join is decided by:
  - Pasture growth rate, grass seeds, shearing, green feed for weaners, sowing

Where are you now?

- Flocks with low weaning rates, or in expansion phase, have more older ewes
    - Older ewes (6 yr+) have more twins, but are also more likely to die

- Ewe lambs and hoggets have lower reproduction rates than adults

How to flock rebuild

- Strategy options:
  - Short-term supplementation (flushing)
  - Accelerated lambing (3 in 2)
  - Joining ewe lambs
  - Hormone manipulators & genetics
  - Lamb survival
  - Maximise your current cohort

Some strategies to rebuild may not be suitable long-term strategies

Short-term supplementation - Flushing

- Low body condition score ewes respond (BCS <3)
  - i.e. TARGETED FLUSHING

- Two weeks prior to mating, 1 week into mating
  - Lupins, corn, barley, fresh lucerne, cottonseed
  - 250-400 g/hd/day

Accelerated lambing (3 in 2)

- 3 matings in 2 years (or 5 matings in 3 years)
- 30-day mating (e.g. Feb, Oct, June mating)
- Re-breeding commences at weaning, teasing 2 weeks prior
- Must wean by 70 days
- Lower ewe numbers, sell wether & surplus ewe weaners

- NLW rates 170%+ attainable
- One mating/lambing per year will be poor

- Shedding breeds more suited (and goats)

Joining ewe lambs

- Age – 7 to 10 months, pregnancy rate is higher in older lambs
- Weight – target 35 - 50 kg, lighter in older lambs, younger must be heavier
- Growth rate during mating – 100 g/h/d
- Use quality grass if possible (tactical). Containment feed if using grain/pulse
- Beware low pregnancy rates, high fetal loss & high lamb mortality. Results are highly variable.

Hormone manipulators & genetics

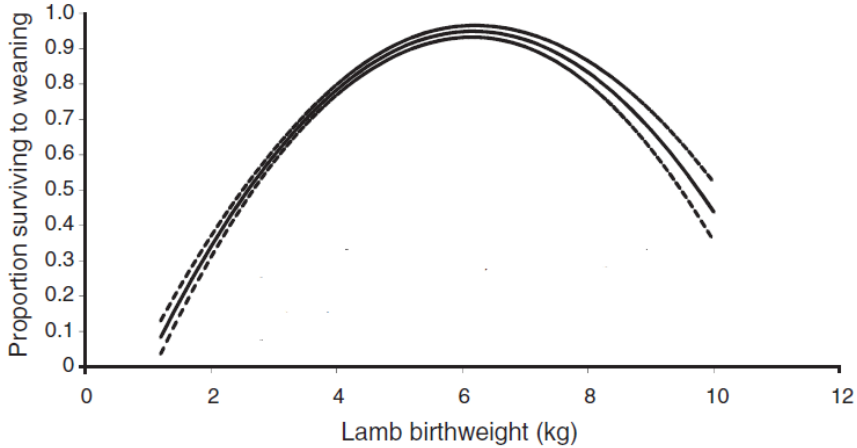
- Regulin implants
  - Mimics short daylength, best used in spring and early summer-mated flocks
  - Simple, one-off treatment, about 18% more lambs born

- Ovastim injection
  - Vaccinates against androstenedione, increases ovulation.
  - About 18% more lambs born, but more non pregnant ewes
  - 2 shots in year one, annual booster thereafter

- Fecundity genetics
  - Genes stimulating high ovulation rates
  - Technically free
  - Enables ewes to be held leaner (join BCS ≤2.5)

Lamb survival

- Single lambs (90%), twin lambs (70%)
- Scan & calculate marking rate
- Manage twin ewes to BCS 3 or better
- Preserve highest available feed for twins
- Wet/dry udders at marking



Lamb marking target =
(% single x 0.9 + % twin x 0.7)

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Maximise your cohort

- Focus on pregnancy scanning (L.LSM.0021 – MLA & AWI)
  - Scanning for fertility only: returns $3.30/hd (range -$1.40 to $8.45)
    - Most gain is cohort improvement & selling NP ewes soon after scanning
    - Low values are self-replacing flocks with low reproduction, unable to sell NP ewes
    - Scanning after feed shortage lessens the value in destocking by selling NP ewes

NP = Non pregnant

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Source: John Young, Farming Systems Analysis Service

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Optimise your feedbase & cohort

- Focus on pregnancy scanning (L.LSM.0021 – MLA & AWI)
  - Scanning for multiples: returns $5.75/hd (range $1.20 to $10.60)
    - Most gain is improved nutrition leading to higher twin lamb survival as well as paddock selection, better wool, more surplus sales
    - Lower returns in flocks with low reproduction
    - Sensitive to meat price, not wool or grain prices

Source: John Young, Farming Systems Analysis Service

Pregnancy scanning rules

- If your flock scanning rate is <100%, then scan for fertility
- Everyone else, scan for multiples
- Scan for twins & manage them to lamb in better condition on better feed
- Scan 80-90 days after the rams were INTRODUCED
  - 3-cycle mating flocks scan on Day 100

Incorporate body condition score

- Recommend all ewes are condition scored
- Score at **weaning**, premating, **scanning** & lambing
- Unique ID enables analysis
- Keep records of all scored mobs for retrospect

Source: Phillip Quin

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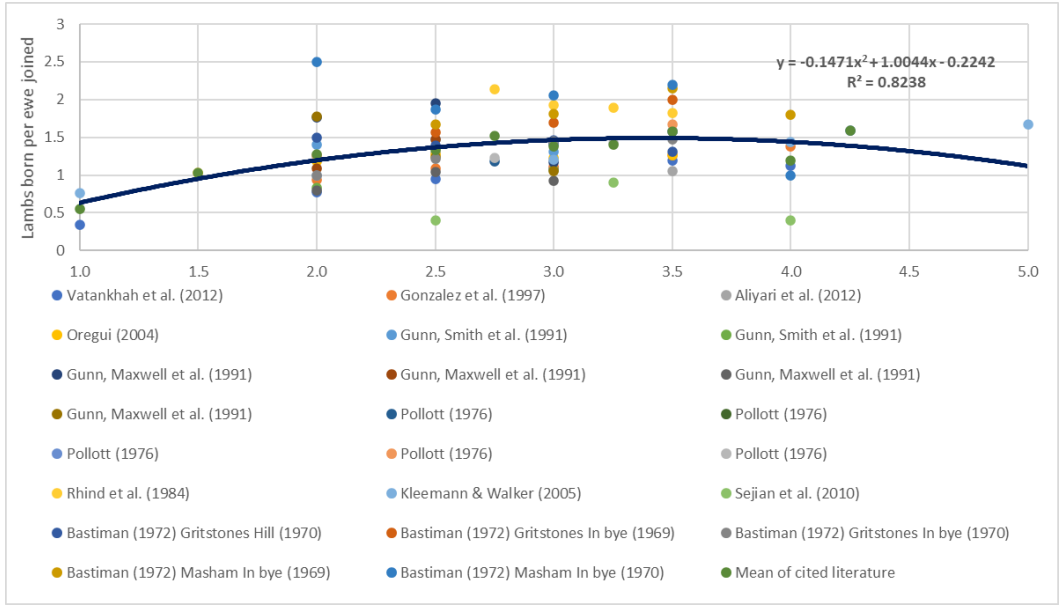
Use BCS in a targeted manner

- Best gains lifting to BCS 3

- <u>Ewe lambs & hoggets use LWT</u>
  - 70 to 80% of Mat LWT (lamb)
  - 90% Mat LWT (hogget)



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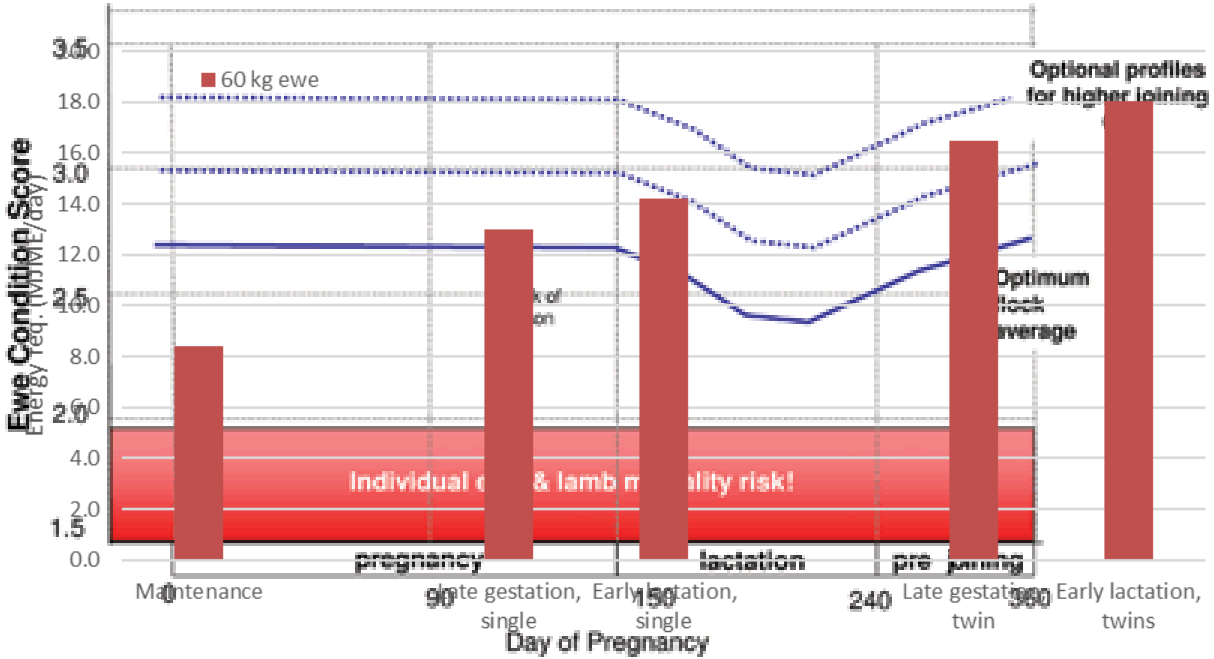
Use BCS to meet nutritional requirement

- Energy requirement increases with litter size and stage of pregnancy




Condition Score 1


Condition Score 2


Condition Score 3


Condition Score 4


Condition Score 5

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Take home messages

- **Select for fertility & rearing ability**. Sheep and goats are tolerant but not immune. Plant/maintain tree cover where possible. Heat stress is a threat and an active research area.

- **Be tactical**. Rebuilding the flock rapidly requires tactical use of nutrition, **be guided by condition scoring and pregnancy scanning**. Hormone manipulators and fecundity genetics are available for short- and long-term use.

- **Start condition scoring**, join a group, keep records for better learning.

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Tools and resources

- Join a Lifetime Ewe Management course
  - https://rist.edu.au/lifetime-ewe-management
- Request a Bred Well Fed Well workshop
  - https://www.mla.com.au/extension-training-and-tools/Bred-Well-Fed-Well
- Participate in local MLA PDS project

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