Leading Sheep MeatUp Forum

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Sheep, goats, kangaroos and cattle: What they eat, how much and implications for multi-species grazing

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Equivalency of sheep, goats, kangaroos and cattle

- The extent species are equivalent is crucial to setting optimum stocking rates for multi-species grazing enterprises
- Equivalency in relation to stocking rate should consider:
  - How much they eat
  - What they eat
  - Where they eat

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Equivalency of sheep, goats, kangaroos and cattle

Presentation today largely based on two journal papers

Literature reviews

- Pahl, L. (2020). Macropods, feral goats, sheep and cattle. 1. Equivalency in how much they eat. *The Rangeland Journal* 41, 497-518
- Pahl, L. (2020). Macropods, feral goats, sheep and cattle. 2. Equivalency in what and where they eat. *The Rangeland Journal* 41, 519–533

How much do they eat?

- Sheep were a range of breeds
- Cattle were *Bos taurus* and *Bos indicus*
- Goats were a range of breeds
- Kangaroos were Red kangaroos, wallaroos, Eastern grey kangaroos and Western grey kangaroos
- 100's studies fed the same forage to animals and measured how much they ate each day

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How much do they eat?

- The benchmark used for comparing intakes of these species of herbivore was a dry sheep equivalent (DSE)
  - 50kg merino wether or dry ewe at maintenance
- Based on how much dry matter is eaten daily:
  - a 50kg goat is 1 DSE
  - a 50kg macropod is 1 DSE
  - a 450kg steer (1 AE) is 8 DSE
- Kg for kg, they are largely equivalent in terms of how much they eat daily

How many kangaroo DSEs on your property?

- Total AE's or DSE's for livestock is calculated from classes, numbers and weights
- But you don't know these for kangaroos
- The average size of a kangaroo is 25kg
  - This is 0.5 DSE or 0.06 AE
- When kangaroos are at peak density, an 8,000ha property may have 10,000 kangaroos – 5,000 DSE or 600 AE.
- Now, it may have 1,000 kangaroos (500 DSE or 60 AE)
- Contact National Parks & Wildlife Macropod program

How much do they drink?

- Differences in water requirements are also important
- On a kg for kg basis, cattle require 50% more water than sheep, sheep require 60% more water than goats, and goats require 3 times more water than kangaroos
- Water is nearly always available, but the more water-efficient herbivores can travel further from water, find more and better-quality forage, and maintain adequate daily dry matter intakes

What and where do they eat?

- Sheep were merino
- Cattle were *Bos taurus* and *Bos indicus*
- Goats were feral goats of the Australian rangelands
- Kangaroos were Red kangaroos, wallaroos, Eastern grey kangaroos and Western grey kangaroos
- Studies reviewed were all from Australian rangelands

What do they eat?

Most studies reported diet composition as percent of broad plant groups:

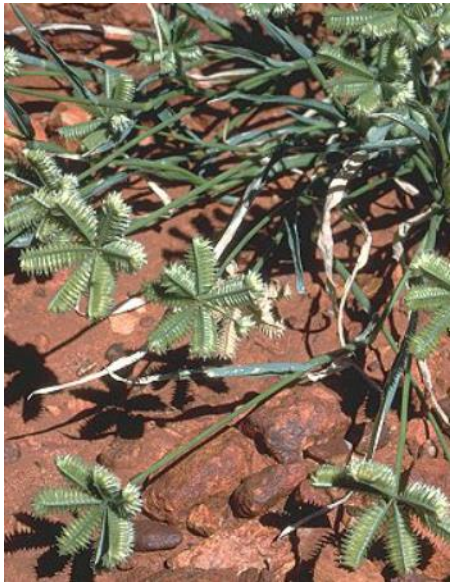
- annual grasses
- perennial grasses
- annual forbs
- perennial forbs (small shrubs)
- large shrubs and trees
- litter lying on the ground

Annual grasses

Red flinders

Downs couch

Button grass



Perennial grasses

Curly Mitchell grass

Queensland blue grass

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Annual forbs

Rhynchosia

Glycine

Daisy burr

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Perennial forbs

Sida

Goats head burr

Ruby saltbush

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Shrubs and trees

Wilga

Senna/Cassia

Mulga

Vine tree

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Litter

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What do they eat?

- Large number of studies done on what sheep, cattle, goats and kangaroos eat in Australian rangelands
- Overall – huge variability in what each species of herbivore ate at any one time or place!
- **Very little published work done in central west Qld**
- But there are trends in what these herbivore eat which are likely to apply in central west Qld

What do they eat?

- Herbivores eat the best of what is available to them
- Best – Plants that are highly digestible and nutritious. Small, growing, green, high in moisture and protein and low in fibre
- Sequence of best to worst plants are:
  - annual forbs and annual grasses
  - green perennial grass
  - new growth of perennial forbs
  - dry perennial grass
  - leaves of large shrubs and trees
  - litter lying on the ground

What do they eat?

- Generally, sheep, cattle, goats and kangaroos have the same order of preferences for the broad plant groups
- But the broad plant groups are not equally available to these herbivores – so diets are often different at any one time
- With increasing size of herbivores, there is decreasing availability of small and/or sparse high-quality plants
- This plays out over time as seasonal conditions change

What do they eat?

- Merino sheep progress through the hierarchy of preferred plants faster than red kangaroos and eat more perennial forbs and browse than red kangaroos
- Cattle progress through the hierarchy of plants faster than merino sheep and eat more large dry grasses, perennial forbs and browse than sheep
- Feral goats also prefer herbage to browse, but always eat more and a wider range of browse than all other species
- Wallaroos and grey kangaroos almost only eat grasses

What do they eat?

- Over time, as plants stop growing, dry out and are consumed or disintegrate, the diets of all these species of herbivore overlap considerably
- All herbivores potentially compete for annual forbs, annual grasses and green perennial grasses. These drive animal growth and reproduction
- Sheep, cattle, goats and red kangaroos potentially compete for perennial forbs, dry grass and browse. These are needed for survival

Where do they eat?

- At any one time, overlap in where sheep, cattle, feral goats and kangaroos forage is often low. However, over time, as climatic conditions change, overlap in where they forage is high
- On a kg for kg basis, cattle, sheep, goats and kangaroos have similar daily dry matter intakes, and over time eat much the same plants in much the same places
  - kg for kg, they are largely equivalent

Take home messages

- At any one time, multiple species will utilise more plants in more places. There is potential to run more DSE's in favourable seasons with a mix of herbivores.
- Sheep and goats are also likely to suppress some woody regrowth
- Sheep and goats last longer and are easier to supplement during droughts

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Take home messages

- Cattle can improve the quality and accessibility of forages for smaller herbivores such as sheep
- A mix of herbivores may reduce risks associated with high variability in market prices and climate
- Realising these benefits without losing production efficiencies and damaging pastures will be challenging given there are often deficits in forage quality and quantity

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Tools and resources

MLA EDGEnetwork workshops - https://www.mla.com.au/extension-training-and-tools/edgenetwork/

- Grazing Land Management EDGE
- Grazing Fundamentals EDGE
- Nutrition EDGE

Stocktake GLM

Future Beef - https://futurebeef.com.au/

Tools and resources

MLA tools and calculators - https://www.mla.com.au/extension-training-and-tools/tools-calculators/

- Stocking Rate Calculator
- MLA Feed Demand Calculator
- MLA Feedbase planning and budgeting tool

Making More From Sheep – online modules - http://www.makingmorefromsheep.com.au/

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