Herd Management Method

Carbon credits from cattle management

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Background

- >80% of GHG emissions from Aust. grass-fed beef arise from enteric methane[1]
- The emissions intensity (kg GHG / kg beef) is governed by **herd feed efficiency** – i.e. the total kg of dry matter consumed per kilogram of beef produced
- Key productivity measure – mainly governed by: weaning rate, average daily gain (ADG), mortality rate, sale weight etc.

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[1] Wiedemann et al. 2015

Method Overview

- The herd management method works by **avoiding** GHG emissions from cattle herds, i.e.
- Reducing **emissions intensity** of the herd compared to the **3 years** before starting a project
- Managers must implement **changed practices** (project activities) to achieve the improvements

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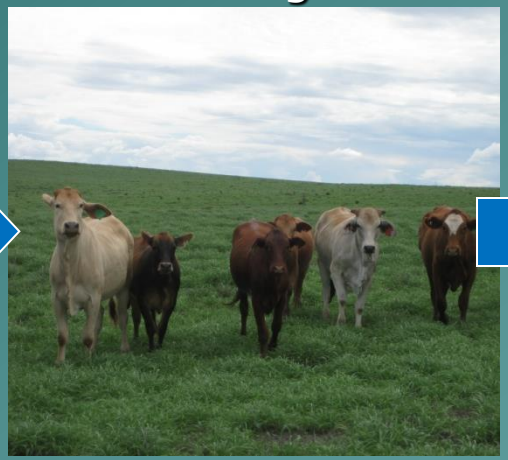
How it works:

Fewer unproductive animals:

- higher weaning rates
- younger joining age

Increased weight to age (increase av. daily gain - ADG)

Reduced turn-off age at same weight



Feedlots not eligible

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New management activities:

At least one practice must be implemented each year

Practices are:

- Shown to reduce emissions intensity (improve weaning rate, ADG etc)
- **New** (wasn't done in the 7 years before starting the project) **OR**
- **Different** (a variation of a practice done in the 7 years before starting the project)

Practices are not:

- Feeding non-protein nitrogen
- Just shifting cattle to a new block of land
- Feedlot finishing
- Relying on tree clearing to achieve better herd performance

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New management activities:

The options are wide open!

- **Improved feed quality**:

  Fodder crops,

  paddock feeding of grain / oilseed,

  pasture improvement,

  More water points / fences etc

  Reduced stocking rates

- **Feed supplements** – i.e. phosphorus
- **Improved reproduction management** - culling unproductive breeding animals, early joining or changed time of calving
- **A combination** of any of the above, or others that can be shown to improve herd performance

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Kimberley region case study

Herd: 10,000 breeders, Steers sold at 2 years and 315 kg for Live-ex.

55% weaning, 5% mortalities

Emissions intensity: 17-19 kg CO_2-e / kg LW

Project activity	Impact on productivity
Fencing and additional water points	1. Allows introduction of herd segregation and priority feeding of some herd classes 2. Reduces overgrazing near water points and improves access to better quality pasture, improving condition scores, pregnancy rates and weaning weights
Herd segregation / supplementation	1. Allows targeted supplementation of second calving heifers. 2. Reduces handling of herds with young calves at foot, reducing the incidence of mis-mothering and mortality in calves prior to weaning
Irrigation or forage cropping	Cropping and/or irrigation will: increase growth rates of steers, and reduce stocking pressure on rangeland areas, improving breeder herd performance
Increased selection pressure, culling and reduced breeder numbers	Culling unproductive animals should result in higher feed availability for the remaining herd and may contribute to higher fertility over time, resulting in higher pregnancy rates and higher growth rates in calves prior to weaning.

Kimberley

Estimated project herd performance and abatement:

Parameter	Pre-project	Scenario 1	Scenario 2
Breeders joined	10,000	9,000	9,900
Weaning rate (annual)	55%	70%	65%
Beef production (t LW)	1,589	1,862	1,929
Emissions intensity (kg CO_2-e / kg LW)	19	16.7	16.0
Abatement (t CO_2-e)		2,500-3,000	4,000-4,500
Gross carbon revenue at $13.95 / ACCU		$35-42 K	$56-63K

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VRD case study

15,000 breeders, producing weaner steers at 6 months and 175 kg for backgrounding.

55% weaning, 3% mortalities, steer ADG = 0.8 kg / d

Emissions intensity: 16-17 kg CO_2-e / kg LW

Project activity	Impact on productivity
Rotational Grazing	Improve feed quality for breeding cattle, with the aim of increasing condition scores, pregnancy rates and weaning weights.
Herd segregation / supplementation	1. Allows targeted supplementation of second calving heifers. 2. Reduces handling of herds with young calves at foot, reducing the incidence of mis-mothering and mortality in calves prior to weaning
Increased selection pressure, culling and reduced breeder numbers, and cross breeding to improve fertility	Culling unproductive animals should result in higher feed availability for the remaining herd and may contribute to higher fertility over time, resulting in higher pregnancy rates and higher growth rates in calves prior to weaning.

VRD

Estimated project herd performance and abatement:

Parameter	Pre-project	Scenario 1	Scenario 2
Breeders joined	15,000	14,500	14,000
Weaning rate (annual)	55%	65%	70%
Beef production (t LW)	2,185	2,456	2,667
Emissions intensity (kg CO_2-e / kg LW)	16-17	14-15	14-15
Abatement (t CO_2-e)		3,000-4,000	5,000-6,000
Gross carbon revenue at $13.95 / ACCU		$42-56 K	$70-84K

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Conclusions:

- Method due for approval in next couple of months
- Best opportunities are for large herds (>20,000 AE)
- Smaller herds may participate via aggregation of credits across multiple herds
- Biggest opportunity is where performance is currently lowest (i.e. annual weaning rate <60%, ADG <0.4 kg / d)
- Will require good record keeping – livestock numbers and weights, project activities (such as supplements purchased etc).

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References:

Wiedemann S, Henry B, McGahan E, Grant T, Murphy C, Niethe G (2015) Resource use and greenhouse gas intensity of Australian beef production: 1981 to 2010. *Agricultural Systems*, 109-118. open access: http://www.sciencedirect.com/science/article/pii/S0308521X14001565

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