

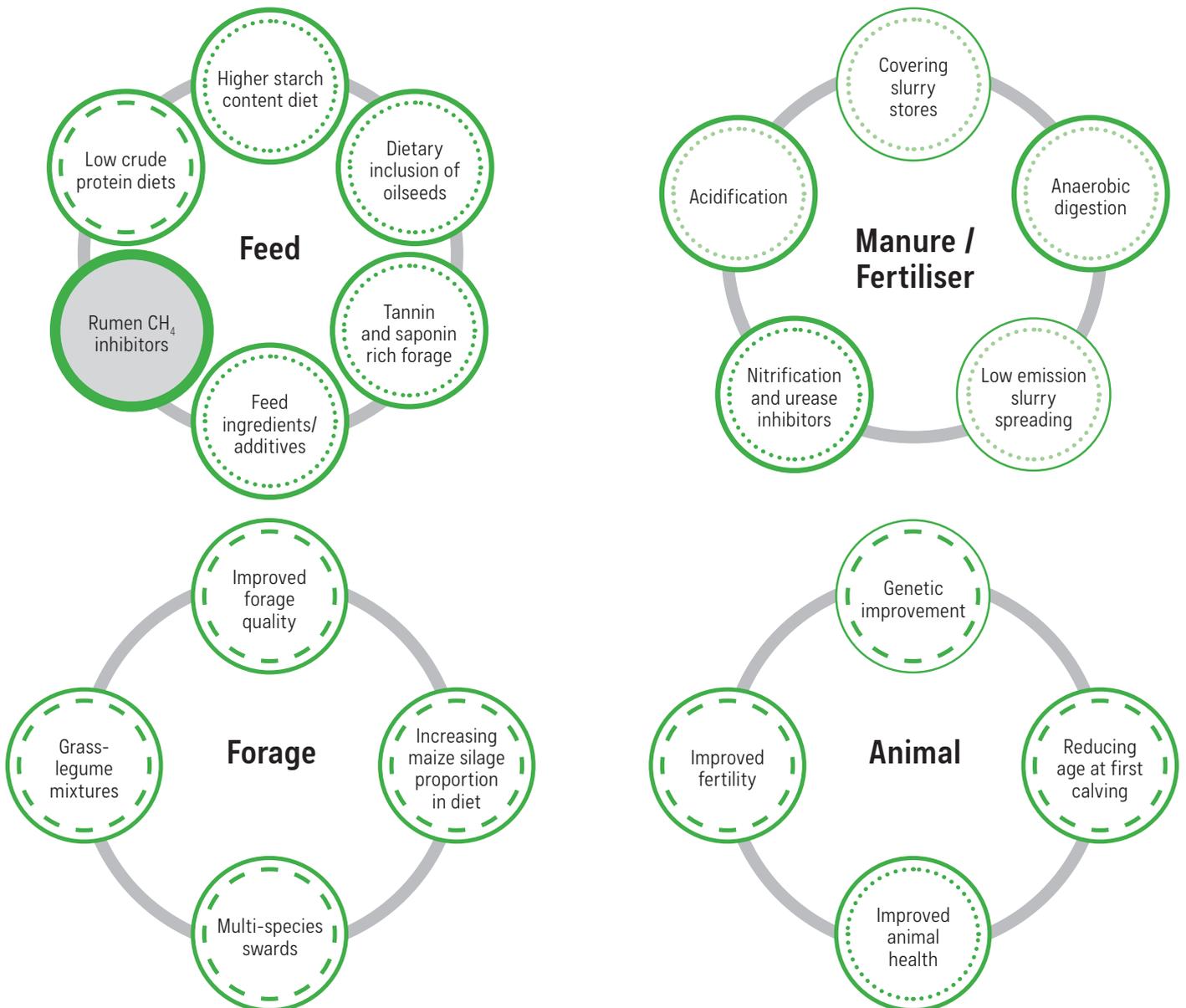


How farmers can reduce emissions: DAIRY

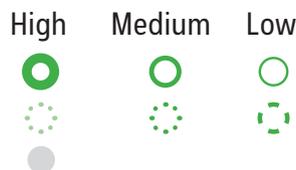
Current sector snapshot

- Milk Production £4.4bn 2020 (16.4% total agricultural output)
- Main GHG emissions: CH₄ (digestion and slurry) and N₂O (manure and fertiliser)
- Total emissions reduced by 16.1%*
- Dairy cow numbers down by 35%* Average annual milk production per cow up by 59%*

Potential for mitigating GHG emissions in dairy cattle



Key
 Impact on Carbon Footprint
 Cost
 Mitigation not yet widely available



Click or scan the QR code to download the full report



*Between 1990 and 2020

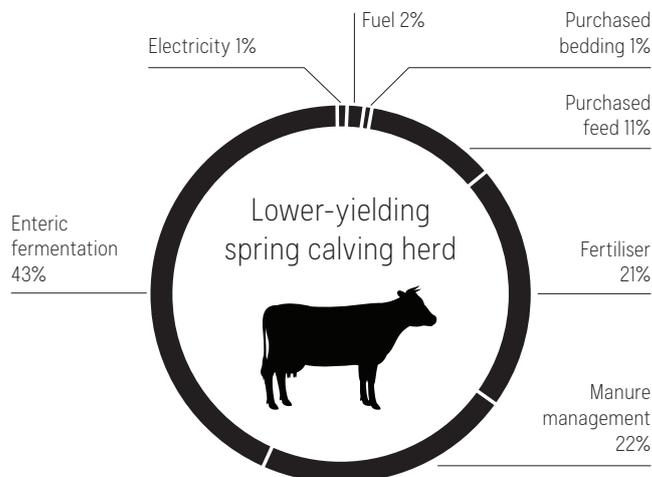
Putting it to the test: Lower-yielding, spring calving dairy herd

Using real farms to calculate emissions generated by specific scenarios that are indicative of the potential savings available in the sector.

Farm facts

- > 203.5ha grazing platform
- > 394 crossbred cows
- > Yielding 5267 l/cow at 4.50% butterfat and 3.67% protein
- > Age at first calving: 24 months
- > Stocking rate: 2.64LU/ha
- > 242kg N/ha fertiliser

Baseline emissions



Mitigations modelled

Mitigation	Carbon footprint (kg CO ₂ -eq/kg milk)	% Change
Baseline	1.46	
Sale of surplus followers and improved grassland; released land used for forestry	1.20	-17.8%
Application of fertiliser amendments protected urea and N ₂ O inhibitors	1.42	-2.7%
Inclusion of legumes in grassland	1.34	-8.2%
Employing methane inhibitor at 30% effectiveness	1.25	-14.4%
Combined effect (Sale of surplus followers + improved grassland + dietary methane inhibitor @30% effective + released land used for forestry)	1.00	-31.5%



The combined effect of the dietary inhibitor, selling surplus heifers, plus improved grassland productivity along with forestry sequestration resulted in a 31.5% reduction in associated carbon footprint.

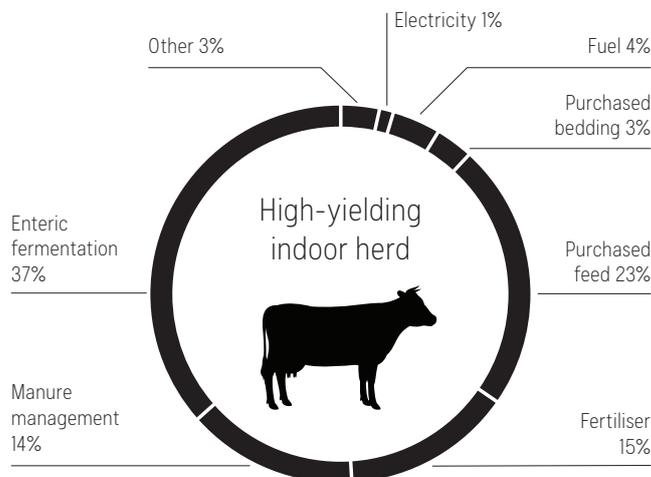
Putting it to the test: Higher-yielding, indoor dairy herd

Using real farms to calculate emissions generated by specific scenarios that are indicative of the potential savings available in the sector.

Farm facts

- > 251.6ha grazing platform
- > 410 Holstein cows
- > Yielding 10377 l/cow at 3.49% butterfat and 3.24% protein
- > Age at first calving: 25 months
- > Stocking rate: 2.27LU/ha
- > 159kg N/ha fertiliser

Baseline emissions



Mitigations modelled

Mitigation	Carbon footprint (kg CO ₂ -eq/kg milk)	% Change
Baseline	1.18	
Reducing age at first calving from 25 to 24 months; released land used for forestry	1.12	-5.1%
Application of fertiliser amendments protected urea and N ₂ O inhibitors	1.15	-2.5%
Inclusion of legumes in grassland	1.14	-3.4%
Employing methane inhibitor at 30% effectiveness	1.01	-14.4%
Combined effect (Reducing age cows first calf + dietary methane inhibitor @30% effective + released land used for forestry)	0.98	-16.9%



Improving age at first calving and use of a dietary methane inhibitor (30% effective) along with forestry sequestration resulted in a 17% reduction in emissions and associated carbon footprint in a high-yielding indoor dairy herd.

Taking practical steps towards net zero: **DAIRY**



Complete regular carbon audits using a reliable carbon calculator

- > Establish baseline
- > Identify hotspots
- > Monitor emission reductions and changes in carbon footprint.



Herd management whilst maintaining high animal health status

- > Reduce age first calving
- > Optimise calving interval, replacement rate, cow longevity
- > Optimise feed inputs to match animal need.



Focus genetic improvement on specific traits

- > Productivity relative to cow size
- > Feed efficiency
- > Fertility, longevity, or health.



Maintain or enhance sward productivity, reducing need for artificial fertiliser

- > Include legumes in pasture mix
- > Promote soil health and fertility.



Improve quality and utilisation of forage

- > Harvest early, increase grazing frequency, decrease regrowth interval, etc.
- > Increase maize silage proportion in diet.



Adjust diet and consider carbon footprint of feed components and farm nutrient balance

- > Increase starch & concentrate proportions within recommended guidance levels
- > Boost dietary oil and fat content
- > Consider low crude protein diets
- > Feed tannin- and saponin-rich forage
- > Explore solutions such as CH₄ inhibitors – 3-NOP; Nitrate; seaweeds
- > Make use of specialised feed ingredients/additives.



Adapt approach to storing and utilising slurry or manure

- > Cover slurry stores
- > Use additives to reduce emissions from stored manure
- > Practice low emission slurry spreading
- > Adopt precision application of manure and fertiliser
- > Carry out soil testing
- > Make use of nitrification and urease inhibitors, anaerobic digestion, acidification.



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