

# **Methane abatement strategies for beef cattle**

*Project in collaboration with UCD and DAFF*

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- **Underlying principles as for dairy cows**
- **Abatement strategies** ✓
- **Assessment tools** ✗ (absence of a life-cycle model)
- **Over 5m non-dairy cattle**
- **Wide array of production systems**
- **Will need an array of abatement strategies**

# Abatement strategies for decreasing CH<sub>4</sub> emissions from beef cattle

1. ***Ad libitum* concentrates to finishing cattle**
2. **24-month steers → 17-month bulls**
3. **34-month steers → 24-month steers**
4. **Coconut oil in finishing concentrate rations**
5. **Genetic improvement of beef cattle**
6. **Extended grazing**
7. **Increasing clover content of swards**
8. **Improving pasture digestibility**
9. **Maize or whole-crop cereals**
10. **Propionate precursors, probiotics, other compounds, etc.**

## *Ad libitum* concentrates to finishing cattle

- **Indoor finishing heifers (1/3) and steers (2/3)**
- **Increase rate of concentrates to *ad libitum***
- **Carcass gain + 0.19 kg/day**
- **Finishing duration -33 days**
- **No increase in capital facilities (?)**
  
- **3408 t CH<sub>4</sub> less = 78384 t CO<sub>2</sub> equivalent**
  
- **Farm profit reduced** (high cost of concentrates)

**24-month steers —————> 17-month bulls**

- **Spring-born male calves (100000)**
- **More concentrates; less grass (much) and silage; lighter carcass**
  
- **4324 t CH<sub>4</sub> less = 99452 t CO<sub>2</sub> equivalent**
  
- **Farm profit reduced (high cost of concentrates)**

## **34-month steers —————> 24-month steers**

- **Spring-born late-maturing steers (63500)**
- **Less concentrates; less grass; less silage; lighter carcass**
- **3809 t CH<sub>4</sub> less = 87607 t CO<sub>2</sub> equivalent**
- **Farm profit improved (cost reduction > revenue reduction)**

# Coconut oil in finishing concentrate rations

(Padraig Foley, DAFF/UCD)

- 24-month spring-born winter-finished steer
- Reduced duration to finish by 17 days
  
- 870 t CH<sub>4</sub> less = 18253 t CO<sub>2</sub> equivalent
- Benefit > cost (to farmer)
  
- Could apply this to other systems

## **Other??**

- 1. Genetic improvement of beef cattle**
- 2. Extended grazing**
- 3. Increasing clover content of swards**
- 4. Improving pasture digestibility**
- 5. Maize or whole-crop cereals**
- 6. Propionate precursors, probiotics, other compounds, etc.**

# Methane abatement 'beef' studies

- **UCD (AFSVM+BES) & Teagasc Grange**
  - DAFF funded
- **Life-cycle model for beef systems** – develop and apply
- **Selection of energetic efficient cattle**
- **Alternative conserved forages** – increased starch
- **Fish oil and Soya oil** to finishing cattle
- **Improved grazing management**
- **Simulated rumen fermentation** – concentrates, legumes, silages, additives
- **Microbial community ecosystem**

# Other 'associated' study

- Grass as an industrial input (GreenGrass – DAFF funded)
- Teagasc, Univ. College Cork and Queens Univ. Belfast
- Grasses X Fertiliser N X Harvest date X Ensiling
  - characterise fermentation products and fibre
- Separate into fibre and liquid fractions
  - assess fibre for construction purposes
- Digestion of silage and liquid fraction → methane → energy
- Assess opportunities for the system