Validation of equations to predict milk fatty acids in commercial Irish cows

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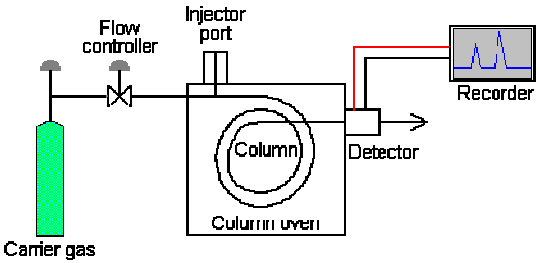
Background & Objective

- Equations to predict individual and grouped fats in milk using mid-infrared spectrometry developed
  - Belgium, Luxembourg, Teagasc Moorepark, Scottish Agricultural College
  - Holstein-Friesian, Jersey, Norwegian Red, Belgian Blue, Montbelliarde
  - Developed and tested on RESEARCH cows in Ireland
- Aim to roll these equations out nationally

How well will these equations predict the milk fat composition of the average commercial cow in Ireland?

Method - Sequence of events

n=143

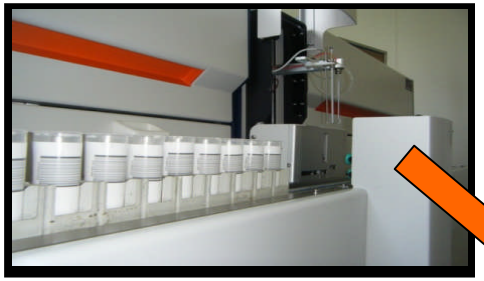


GC - Gold Standard

Cow ID	Saturates	Unsaturates
1	0.6	0.4
2	0.7	0.3
3	0.5	0.5
4	0.55	0.45
5	0.65	0.35

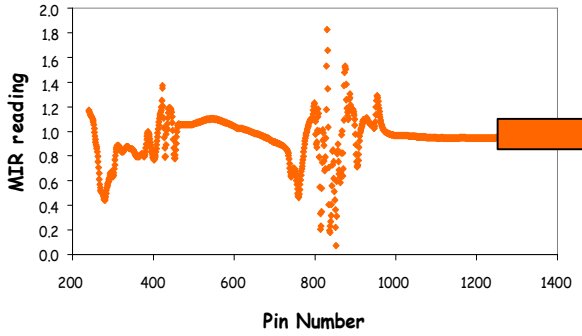
Actual Fats

n=143



CORRELATE
Actual with predicted

MIR- Predictions



Predicted Fats

Cow ID	Saturates	Unsaturates
1	0.6	0.4
2	0.7	0.3
3	0.5	0.5
4	0.55	0.45
5	0.65	0.35

Results – Individual Fatty Acids

Fatty Acid	r	Fatty Acid	r
C4:0	0.91	C16:1 cis	0.62
C6:0	0.96	C17:0	0.85
C8:0	0.97	C18:0	0.84
C10:0	0.97	C18:1 cis-9	0.87
C12:0	0.96	C18:2 cis9,cis-12	0.54
C14:0	0.96	C18:3 cis9,cis-12,cis-15	0.59
C14:1	0.72	C18:2 cis9,trans-11	0.59
C16:0	0.95		

Results – Grouped Fatty Acids

Fatty Acid Group	r
C18:1 trans	0.77
C18:1 cis	0.88
C18:2	0.67
Omega-3	0.63
Omega-6	0.69

Fatty Acid Group	r
Saturated	0.99
Monounsaturated	0.95
Polyunsaturated	0.83
Unsaturated	0.95
Short chain	0.97
Medium chain	0.98
Long chain	0.95
Branched	0.76

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