Genetic and genomic selection as a methane mitigation strategy in dairy cattle

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VERY limited data all over the world

Almost all Holstein

Very complex biology

Huge interest – political and from consumers

Geneticists vs Nutritionists



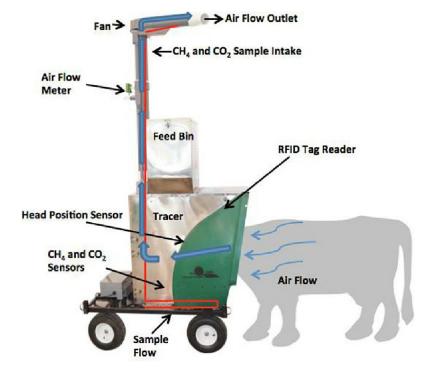
- Acceptance by both disciplines
- Accurate, repeatable measures
- High correlations between methods
- Same ranking of animals between methods





Laser





Good and bad



High capacity

Spot samples

Non invasive

No control of breath

Small investment

 Quantification is a challenge



Data available in Denmark

≪ 4000 HOL, 2400 JER and 500 RDC

- Measured for 4 weeks continuously in given lactation and lactation stage
- Continious recording scheme is not implemented
- Genotyping cows

Results



Heritabilites around 0.2

Substitution of the second second

Expected favourable correlation to RFI and saved feed

www.vikinggenetics.com

Genetic correlation to other traits

Trait	Rg	
Body condition score	-0.28	favourable
Body depth	-0.03	
Chest width	-0.20	
Height	0.01	
Dairy character	0.28	unfavourable
Calving to first insemination	0.17	
First to last insemination	0.28	favourable
Number of inseminations	0.07	
Udder health	-0.32	favourable
Other diseases	0.06	

Significant if nummercial greater than 0,2

Zetouni et al., 2017 JDS

Economic value





- Consumer driven
- Companies have sustainability strategies
- Cannot come without on farm documentation
- Who will pay?

www.vikinggenetics.com





Trying to attract money for projects

Current projects cannot drive a routine recording scheme

- No genetic evaluation without such a scheme
- No other country or AI has an evaluation based on methane measurements





An index as for other traits

Economic value? Take selection pressure from which traits?

Documentation method important for farmer and society





- You can select for lower methane emission through genetics in dairy cattle if registrations are available
- This will be a valuable mitigation strategy
- A positive effect is expected from using saved feed
- Cannot stand alone but will compliment improved feeding and management