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First Results of Body Condition Score Modeling for Walloon Holstein Cows

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Objectives

Since April 2006, **Body Condition Score** (BCS) is **monthly recorded** in 76 dairy herds of the Walloon Region.

Provide practical management tools to dairy farmers:

« Herd BCS Balance Sheet »

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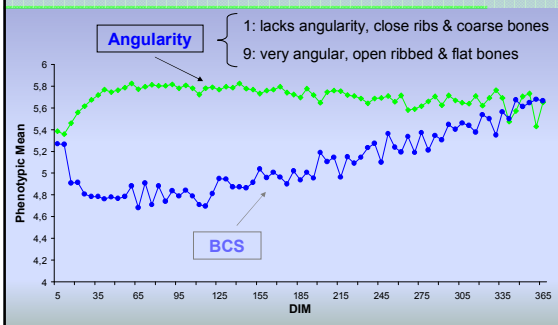
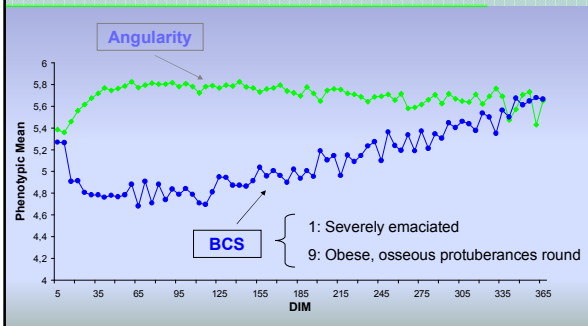
Provide **BCS Breeding Values**

Estimate BCS Breeding Values using a **two-trait model** for **BCS and Angularity**

BCS & Angularity



BCS & Angularity



BCS & Angularity : Data

- Only **first lactation** used

	BCS	Angularity
Number of records	23,293	68,552
Number of cows with records	2,132	67,867
Number of herds	76	1,311

1,070 cows with both Angularity & BCS records

Model Used

$$\mathbf{y = Xb + Hh + Q(Wc + Zp + Za) + e}$$

- Fixed lactation stage * age at calving
- Fixed { herd * test-day for BCS; herd * date scored * classifier * system for Angularity
- Random { recorder for BCS; classifier * system for Angularity
- Random permanent environment
- Random additive genetic

} Regression curves modeled with 2nd order Legendre polynomials

Results : Correlations

	Phenotypic	Genetic
Correlations	- 0.24	**- 0.54**

Genetic correlation between BCS & Angularity in the range of previous studies for first lactation:

from – 0.35 to – 0.71

[Veerkamp & Brotherstone, 1997; Dechow et al., 2003, Kadarmideen & Wegmann, 2003; Lassen et al., 2003]

Results: Breeding Values

Estimation of Breeding Values and **Reliabilities** (REL) for BCS was done on 3 data sets:

1) Using a **bivariate** system for BCS & Angularity
2) Using a **univariate** system for BCS

= without taking into account relationships between BCS & Angularity

Results: Breeding Values

Comparison of **Average Reliabilities** of **BCS 1st Legendre coefficients** computed with both univariate & bivariate models

	Number of animals	Average REL with bivariate model	Average REL with univariate model
All animals	143,556	0.11	0.06
Cows with records	69,133	0.15	0.08
Publishable sires	1,848	0.18	0.09

Average REL x 2 with the bivariate model

Results: Breeding Values

Number of **sires in each class of REL** with both univariate & bivariate models

Class of REL	Bivariate model	Univariate model
0.00 to 0.05	490	986
0.06 to 0.15	364	460
0.16 to 0.25	487	223
0.26 to 0.35	304	82
0.36 to 0.45	105	48
0.46 to 0.55	59	22
0.56 to 0.65	20	18
0.66 to 0.75	15	5
0.76 to 0.99	4	4

For a threshold of **0.45**, the number of **potential publishable sires increases** from 49 to 98.

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Breeding values estimates range from **-0.73 to 0.49 BCS units**.

Conclusions & Perspectives

- Big interest in **using correlated traits** in order to estimate sire Breeding Values for BCS and **improve reliabilities**
- Future research will **investigate others traits**

  e.g. strength, body size, etc.

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Thank you for your attention

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