Genetic associations between feed intake and conformation traits in two populations

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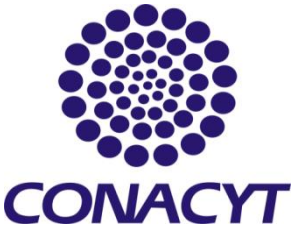
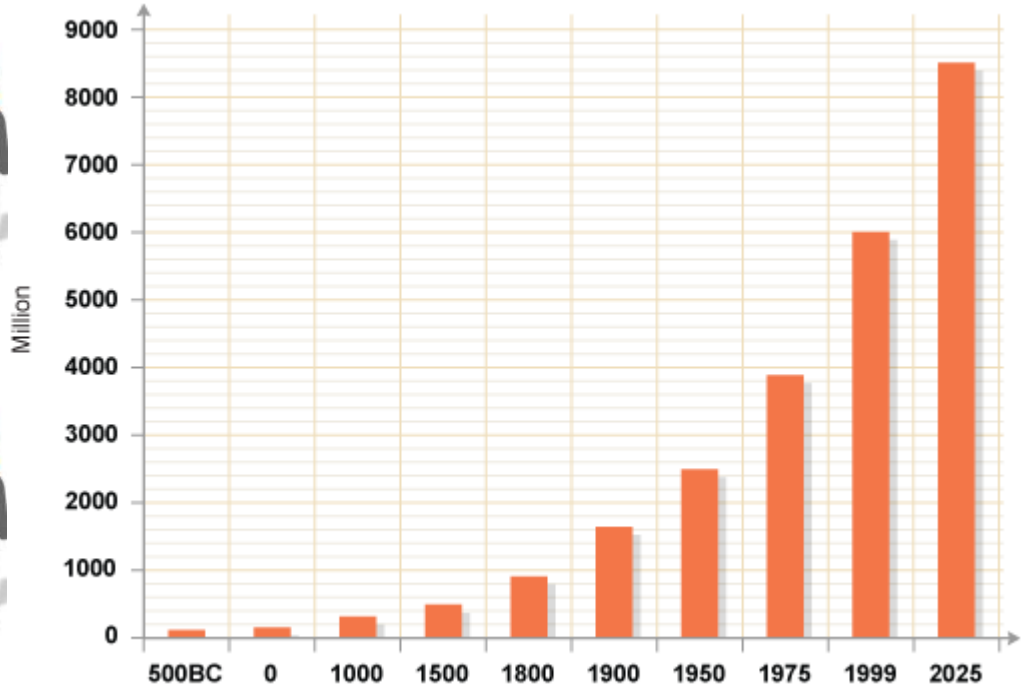
Acknowledgments



Global tendency



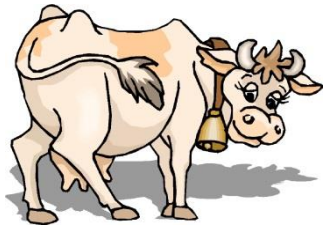
Production efficiency

Dry matter intake (DMI) is needed

Previous studies = Correlations DMI with

BW ⟷ DMI ⟷ MY

DMI ⟷ Conformation Traits

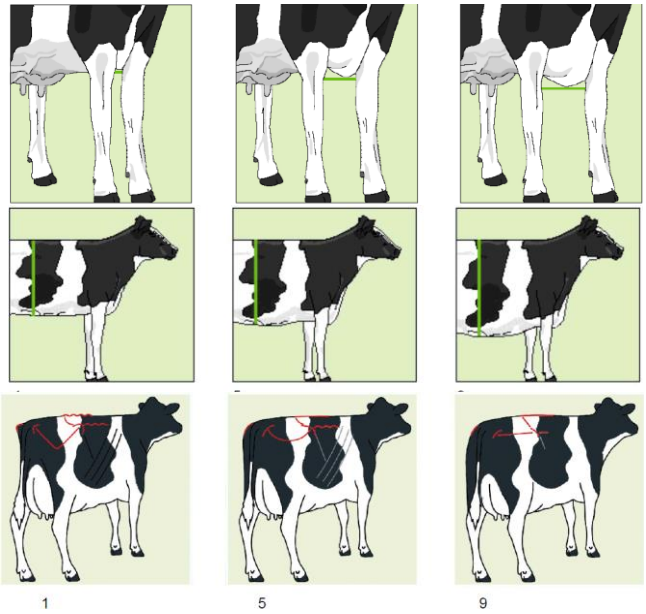


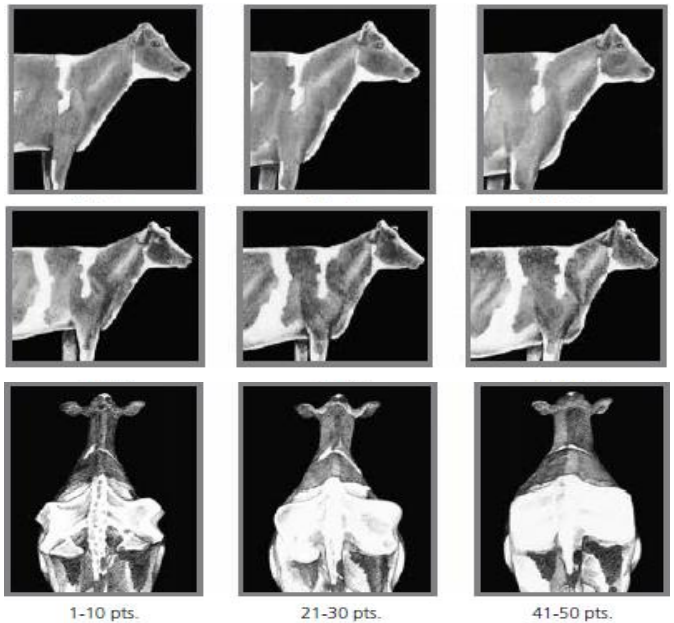
Objectives

- Which conformation trait are strongest correlated with DMI?
- How accurate can DMI be predicted?

Conformation traits (CT)

Trait	NL (1-9 scale) *except ST	US (1-50 scale)
Stature (ST) in cms		
Chest Width (CW) *Strenght*		
Angularity		
Body Depth (BD)		
Body Condition Score (BCS)		
Rump Angle		
Rump Width		



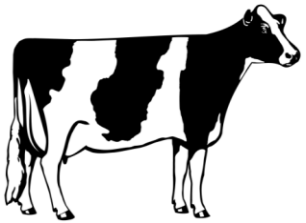


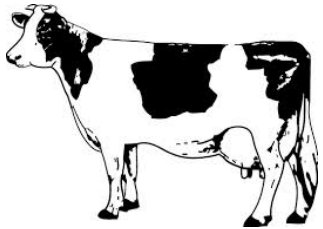
Description of the data

	Netherlands	United States
#FI records	1665	1920
Locations	4	7
Experiments	48	35
Years	20	4
#CT records	35,569	27,883

Feed intake traits

Trait	Unit	Netherlands			United States		
		mean	Sd	CV	mean	sd	CV
DMI	kg/d	20.7	3.2	15.4	24.1	3.9	16.1
MY	kg/d	33.5	7.7	23.1	42.7	8.5	19.9
BW	kg	574.8	72.4	12.6	605.1	76.2	12.6





Conformation traits

Trait	Netherlands			United States		
	mean	sd	CV	mean	sd	CV
ST	44.0*	4.0	9.2	33.0	8.9	27.1
CW	4.9	1.5	30.6	26.5	7.9	29.8
BD	5.2	1.5	28.4	26.9	7.5	27.7
ANG	4.8	1.5	30.8	25.6	7.9	30.8
RA	4.8	1.6	33.6	24.6	8.8	35.9
RW	4.8	1.5	32.1	25.3	7.8	30.8
BCS	4.9	1.5	29.9	26.3	7.4	28.3

Heritability estimates DMI

Trait	Netherlands	United States
	h^2	h^2
Dry matter intake	0.32	0.29

SE NL= 0.07 SE USA = 0.06

Heritability estimates CT

Trait	Netherlands h^2		United States h^2
Stature	0.60		0.40
Chest width	0.28		0.24
Body depth	0.32		0.28
Angularity	0.25		0.21
Rump Angle	0.42		0.20
Rump Width	0.34	SE = 0.02	0.18
Body condition score	0.34		0.17

Heritabilities are higher in NL than in US

Correlations between FI and CT traits

Trait	Netherlands ρ	United States ρ
Stature	0.33	0.57
Chest width	0.45	0.61
Body depth	0.26	0.49
Angularity	-0.02	0.15
Rump Angle	0.1	0.21
Rump Width	0.04	0.13
Body condition score	0.24	0.46

SE NL= 0.07-0.14

SE USA = 0.07-0.15

Genetic correlations are higher in US than in NL

Selection index

Predictor traits combined	Accuracy in Netherlands		Accuracy in United States	
		0.31		0.31
ST, CW, BD	0.43		0.64	
ST, CW, BD + Milke	0.74		0.95	

Conclusions

- Heritabilities of conformation traits are different between countries
- Correlations between DMI and conformation are genetically different between countries but with the same trend
- ST, CW and BD have the strongest correlation with DMI
- DMI can be predicted with an accuracy of 0.4 in NL and 0.6 in US using ST, CW and BD

ST, CW and BD can be used as predictors of DMI in both countries

Thank you

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