Claw health traits and mastitis in breeding of the Czech Holstein cows

Krupová Z., Krupa E., Wolfová M., Přibyl J., Zavadilová L.

Institute of Animal Science, Přátelství 815, 10400 Prague Uhříněves, Czech Republic
krupova.zuzana @vuzv.cz

https://www.researchgate.net/profile/Zuzana_Krupova

Background

Breeding goal (BG)

➢ complex of 10 production & functional traits

➢ clinical mastitis the only health trait

Selection of cows

➢ EBV for 15 traits

➢ no health, longevity and reproduction

Health in bulls´ selection designed *(Krupová et al., 2018)*

http://www.holstein.cz/

Material & Methods

Economic weights (EW) of BG traits

➢ for two-year-old cows by applying the gene flow in a bio-economic model of the program ECOWEIGHT *(Wolf et al., 2013; Wolfová et al., 2005)*

$$EW_{ijk} = EW_i + NDE_{jk}$$

Genetic parameters

➢ current traits from routine perform. testing

➢ health traits collected at farms by farmers & hoof trimmers

➢ claw diseases: overall (OCD), infectious (ICD) and non-infectious (NCD) *(Zavadilová et al., 2018)*

$$y_{ijklmno} = P_i + H_j + Y_k + S_l + AGE_m + pe_n + a_o + e_{ijklmno}$$

Genetic gain (ΔG)

➢ indirectly = based on the traits correlation

➢ directly = health (20%) in the new index

➢ general principles of the selection index theory

➢ the SAS IML procedure *(Přibyl et al., 2004)*

The Aim

Improve health status though cow selection

➢ new breeding goal:

  overall claw disease (OCD)

➢ *new selection criteria (health index):*

  clinical mastitis (CM)

  claw diseases incidence (OCD, ICD, NCD)

http://www.holstein.cz/

Conclusions

Current index

✓ **slight selection for udder health** (SCS, survival, exterior, …)

Health index

✓ **improved response in**
  ✓ health (CM & OCD)
  ✓ longevity
  ✓ reproduction

Results

EW of health traits

✓ **-193** and **-168 €** per case for CM and OCD

Current (indirect) **ΔG** for **udder health**

✓ **-0.001** case of **CM**/cow/year

Health index = ↑ **ΔG** for both, **CM** and **OCD**

✓ **-0.004** case/cow/year

	Genetic gain per trait in breeding goal (unit/cow/year)											ΔE (€/yr)	r²IND (%)
Index variant:	Milk (kg)	F (%)	P (%)	Conc (%)	ServP (d)	CalfL (%)	AFC (d)	MatW (kg)	ProdL (yr)	CM (case/yr)	OCD (case/yr)	ΔE (€/yr)	r²IND (%)
Current	65.27	0.012	0.011	0.004	-0.003	-0.009	-0.063	0.308	0.027	-0.001	-	29.11	52.9
Health	71.94	0.011	0.010	0.024	0.002	-0.009	-0.020	0.446	0.037	-0.004	-0.004	31.62	56.3

Milk = milk yield/lactation; F and P = milk fat and protein content; Conc = conception rate of cows; ServP = service period, CalfL = calf losses,; AFC = age at first calving; MatW = mature weight of cows; ProdL = productive lifetime of cows; CM and OCD = clinical mastitis and overall claw diseases incidence; ΔE = economic response; r²IND = reliability of the index.