Genetic evaluation models in Holstein Cows: genetic parameters for test-day and 305-days milk yield

Yosra RESSAISSI[1] and Mohamed BEN HAMOUDA[2]

[1] Institut National Agronomique de la Tunisie (INAT), 43 Avenue Charle Nicolle, 1082-Tunis- Citée Mahrajéne-Tunisie; [2] Institution de la Recherche et l'Enseignement Supérieur Agricoles de la Tunisie (IRESA), Tunis- Belvédère-Tunisie

Corresponding author : Yosra RESSAISSI : yos.re@hotmail.fr

Objective

Genetic analysis of milk yield in Tunisian Holstein flocks

Which is the most adjusted genetic evaluation model to be chosen for dairy cattle performances??

Introduction

Selection in dairy cattle

Identification of genetically superior animal

Ranking animals according to their genetic merit = ***Breeding values***

Genetic evaluation → ***Test-day model (TDM)*** / ***Lactation Model (L305)***

Methodology

Data of the official milk recording conducted by the Agency of Livestock and Pasture of Tunisia (O.E.P)

Phenotype observations + **Pedigree information**

- ***Daily milk yields (TDMY)***
- ***305-days milk yields (MY305)***
- ***Relationship between animals***

Statistical tool

BLUP animal model

Restricted Maximum Likehood Method

$$Y = Xb + Za + Wep + e$$

Breeding values

Comparing TDM to L305

- Genetic parameters (h^2, r)
- Distribution of genetic variability
- Spearman rank coefficient (ρ)

Results

Table 1. Genetic parameters for MY305 and TDMY

Model	L305	TDM	L305	TDM
Parameters	h^2		r	
FS = 50	0,02	0,04	0,27	0,38
50 < FS < 100	0,02	0,07	0,34	0,34
100 ≤ FS < 150	0,07	0,10	0,27	0,37
150 ≤ FS < 220	0,06	0,16	0,29	0,43
220 ≤ FS < 300	0,03	0,09	0,33	0,44
300 ≤ FS < 400	0,04	0,08	0,29	0,34
400 ≤ FS ≤ 600	0,06	0,09	0,20	0,34
FS > 600	0,02	0,08	0,38	0,47

FS= flock size classe; h^2= heretability; r= repeatablity

Table 2. Correlation coefficients of rank (ρ) between the breeding values

	TDM
L305	0,64
	0,71
	0,74
	0,81
	0,84
	0,88
	0,89
	0,94

- ***Repetablities (r) are higher under TDM***
- ***Correlations are positive and significant***

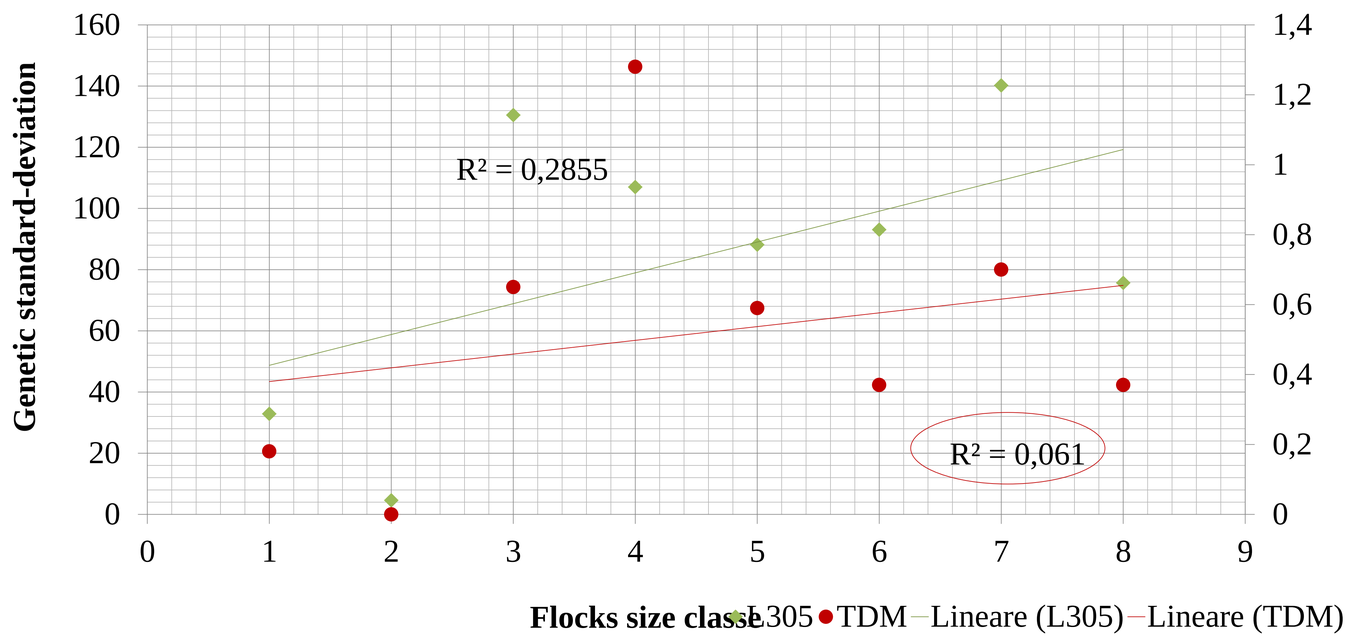

Figure 1. Distribution of genetic standard deviations between flocks for TDM (R^2 = 0.06) and for L305 (R^2 = 0.28).

- ***Genetic disparity by environment variations is more illustrated by TDM***

- ***Test-day model ensures better accurate analysis***
- ***TDM is a powerful and flexible genetic diagnostic tool***
- ***Random errors are minimized***