

# APPLICATION OF A BIO-ECONOMIC MODEL FOR ECONOMIC ESTIMATION OF LITHUANIAN DAIRY BREEDS

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## INTRODUCTION

Assessing the economic importance of traits is crucial for defining appropriate breeding goals in dairy cattle breeding. The objective of the present study was to calculate economic values (EV) for the two dairy cattle breeds Lithuanian Black and White (LBW) and Lithuanian Red (LR).

- For each trait, two scenarios were simulated with the respective trait at different phenotypic levels.
- To obtain the EV, the scenarios were compared with each other in terms of their economic outcomes.
- In order to avoid double counting of effects, the economic outcome was corrected using a multiple regression analysis.



Lithuanian Red (LR)

Lithuanian Black and White (LBW)

Fat: **4,43%**

Fat: **4,31%**

Protein: **3,50%**

Protein: **3,35%**

Average no of cows: **36 449**

Average no of cows: **105 325**

For this purpose, the stochastic bio-economic model SimHerd was used, which simulates the expected monetary gain in dairy herds.



## RESULTS

Trait complex	Trait	EV PER MARGINAL UNIT (€)		
		Unit	LBW	LR
Production	ECM	kg	<b>0.16</b>	<b>0.16</b>
Direct health	Mastitis	%	<b>-1.82</b>	<b>-1.73</b>
	Lameness	%	<b>-1.27</b>	<b>-1.22</b>
	Ketosis	%	-1.30	-1.13
	Milk fever	%	-1.26	-1.26
	Metritis	%	-1.00	-0.95
Calving	Dystocia	%	-1.31	-1.23
	Stillbirth	%	-2.19	-1.87
Calf survival	Early calf mortality	%	-1.70	-1.14
	Late calf mortality	%	-3.51	-3.49
Cow survival	Cow mortality	%	<b>-10.77</b>	<b>-11.44</b>
Fertility	CR heifers	%	0.81	1.04
	CR cows	%	<b>3.82</b>	<b>1.95</b>
	HO heifers	%	0.37	0.59
	HO cows	%	<b>2.74</b>	<b>1.63</b>

The EV were derived for traits related to production, fertility, direct health and calving traits. The results showed high economic importance of functional traits in the cattle breeds.

## CONCLUSIONS

- The bio-economic simulation model SimHerd appeared to be a suitable tool for the EV derivation of the functional traits of Lithuanian dairy breeds.
- Overall, the results of this study allow to set up new breeding goals for the all breeds.

305-day performance	LWB	LR
1. lactation. kg	6741	6907
2. lactation. kg	7648	7596
3. lactation. kg	7526	7469
ECM (energy corrected average milk yield)	7549	7760