

The impact of selection on milk production on the lactoferrin content of milk in Irish Holstein-Friesians



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Key Messages

- Lactoferrin is an immune protein found naturally in milk
- Lactoferrin is heritable and genetic variation for lactoferrin exists within the population studied
- Genetic correlations between lactoferrin content and protein percent and between lactoferrin content and casein yield of milk were evident in this study

1. Introduction

- Lactoferrin is found in several natural excretions including bovine milk and has known anti-microbial and anti-viral properties
- Currently breeding goals do not account for the lactoferrin content of milk
- Are there associations between the lactoferrin content of milk and other milk constituents?

2. Materials and Methods

- Milk samples were collected from Holstein-Friesian cows stationed at 5 research centres in Ireland
- Samples were analysed for lactoferrin content (mg/L milk) using the Bovine Lactoferrin ELISA quantification kit
- Only a single sample / cow from between 3-305 days in milk was retained
- 580 milk samples were used in the analyses

3. Results

- Heritability of milk lactoferrin content is 0.30 (s.e. = 0.10)
- Coefficient of genetic variation for milk lactoferrin content is 6.5%

Genetic and phenotypic correlations between Lactoferrin content and other milk constituents

	Genetic	Phenotypic
Milk (kg)	0.07(0.246)	-0.16(0.046)***
Fat (kg)	0.24(0.277)	-0.11(0.045)*
Protein (kg)	0.30(0.247)	-0.06(0.046)
Lactose (kg)	0.00(0.260)	-0.20(0.044)***
Fat Percent	0.21(0.305)	0.01(0.045)
Protein Percent	0.43(0.191)*	0.26(0.043)***
Lactose Percent	-0.37(0.237)	-0.30(0.042)***
Urea (kg)	-0.31(0.308)	-0.09(0.044)
Casein (kg)	0.38(0.196)*	0.21(0.045)***
SCS	-0.36(0.326)	0.29(0.043)***

* p < 0.05, *** p < 0.001

Only the genetic correlations between lactoferrin content and 1) protein percent and 2) casein yield differed from zero

4. Conclusion

- Genetic selection for lactoferrin content is possible
- Selection for milk yield will not have a correlated response in milk lactoferrin content

Model to investigate lactoferrin content:

Lactoferrin = Treatment + Parity + Stage of Lactation + Milking Session (AM/PM) + Cow

