

IgG content and bacteriological quality of colostrum from Dutch HF and Belgian Blue cows

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INTRODUCTION

- ▶ Adequate transfer of passive immunity is essential in the bovine species and can only be achieved when good quality colostrum is used.
- ▶ Colostral immunoglobulin G (IgG) concentration and bacterial contamination of colostrum have been shown to vary between cows, but comparative data on different breeds are scarce.

OBJECTIVE

The objective of this field study was to investigate the IgG concentration and the total bacterial cell count in colostrum from Dutch Holstein Friesian (HF) and Belgian Blue cows.

MATERIALS AND METHODS

Colostrum samples (n= 162) were collected from 88 commercial farms:

- ▶ **Belgium: Belgian Blue cows** - 76 colostrum samples
- ▶ **The Netherlands: HF** - 86 colostrum samples

All samples were collected within the first 6 hours after parturition and frozen at -20°C until further processing.

Colostrum quality evaluation:

- ▶ **Direct IgG concentration:** commercial competitive ELISA-test kit (BIO K420, MonoScreen QuantELISA Immunoglobulin Easy, Bio-X Diagnostics S.A., Rochefort, Belgium)
- ▶ **Total solids (Indirect IgG concentration):** digital Brix refractometer (Milwaukee Refractometer MA871, Milwaukee Instruments Inc.,USA)
- ▶ **Total bacterial cell count:** bactoscan automatic bacterial count reader (Bactoscan™ FC+, FOSS, Denmark)

Comparison of results for samples from both breeds was performed, with values considered as significantly different for $P \leq 0.05$.

Belgian Blue cows have significantly higher colostrum quality and lower bacterial load in their colostrum in comparison to Dutch Holstein Friesian cows.



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RESULTS

- ▶ Significant differences in the IgG concentration and total bacterial cell count were observed between colostrum samples from Dutch HF and Belgian Blue cows (**Table 1**).
- ▶ Using established cut-off values for the measured quality indicators, the proportion of colostrum samples considered to be of poor quality was defined for both breeds of cows (**Table 2**).
- ▶ Applying both the IgG concentration and the total bacterial count as criteria for good quality colostrum, 13,7 % of the colostrum samples from the Belgian Blue cows and 38,1 % of the colostrum samples from the Dutch HF cows were inadequate to be fed to new-born calves.

TABLE 1. Colostrum quality indicators for samples from Dutch HF and Belgian Blue cows

Colostrum quality indicator	Dutch HF cows	Belgian Blue cows	P value
Mean IgG concentration (g IG/L)	53,19 ± 17,61 (range: 14,4 - 99,07)	81,24 ± 24,90 (range: 22,41 - 150,00)	tWelch; p ≤ 0.001
Mean Brix refractometric value (%)	21,10 ± 4,21 (range: 9,33 - 29,27)	25,27 ± 4,05 (range: 16,77 - 36,40)	tWelch; p ≤ 0.001
Median total bacterial cell count (CFU/ml)	9.000 (range: 4.000 - 1.000.000)	5.500 (range: 4.000 - 390.000)	Mann-Whitney U; p ≤ 0.001

TABLE 2. Proportion of colostrum samples from the Dutch HF and Belgian Blue cows considered to be of poor quality using established cut-off values for key quality indicators

Colostrum quality indicator & cut-off value	Percentage of samples considered to be of poor quality	
	Dutch HF cows	Belgian Blue cows
IgG concentration. Cut-off: 50 g/l	34.5%	8.22%
Brix refractometric value. Cut-off : 22%	52.4%	17.8%
Total bacterial cell count. Cut-off: 100.000 CFU/ml	14.3%	5.48%

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