EPIDEMIOLOGY

Calf-level risk factors for neonatal diarrhoea in Belgian Blue beef calves.

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INTRODUCTION

Neonatal Calf Diarrhoea (NCD) represents one of the most important causes of morbidity and mortality in calves.

NCD is considered to be a multifactorial disease, caused by a complex interplay of pathogens, environmental factors, and risk factors at the calf-level.

OBJECTIVE

The aims of this study:

- To assess different factors that influence the risk of NCD in Belgian Blue calves.
- To estimate the prevalence of failure of passive transfer of immunity in Belgian Blue calves.

MATERIALS AND METHODS

Prospective study conducted on a Belgian Blue farm (November 2017 to October 2018) with total of 221 calves followed during their first month of life.

RECORDED PARAMETERS:

- Occurrence of diarrhoea.
- Calf-level factors: birth weight, sex, dam parity, season of birth, colostrum IgG concentration, volume of colostrum consumed, time of first colostrum feeding, use of colostrum replacers, tube feeding of colostrum, suckling versus artificial rearing, and transfer of passive immunity.
- Transfer of passive immunity (serum radial immunodiffusion measurement of immunoglobulin G in calf serum, approx. 48-72 hours after birth).

R (R Core Team, 2017) multilevel regression techniques were used to assess the association between calf-level risk factors and the occurrence of NCD.

Low birth weight, use of colostrum replacers, colostrum feeding > 2h after birth, being born in autumn & winter and serum IgG concentration < 10g/L significantly increased the risk of neonatal diarrhoea in Belgian Blue calves.

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RESULTS

The prevalence of NCD: 15,38% (CI95% [10,90 – 20,83%]).

Transfer of passive immunity varied significantly among calves **(Table 1)** with only 29.86% of samples classified as good to excellent[1].

Significant predictors of an increased odds of NCD were birth weight, use of colostrum replacers, time between birth and colostrum administration, season of birth and serum IgG concentration **(Table 2, Fig. 1)**.

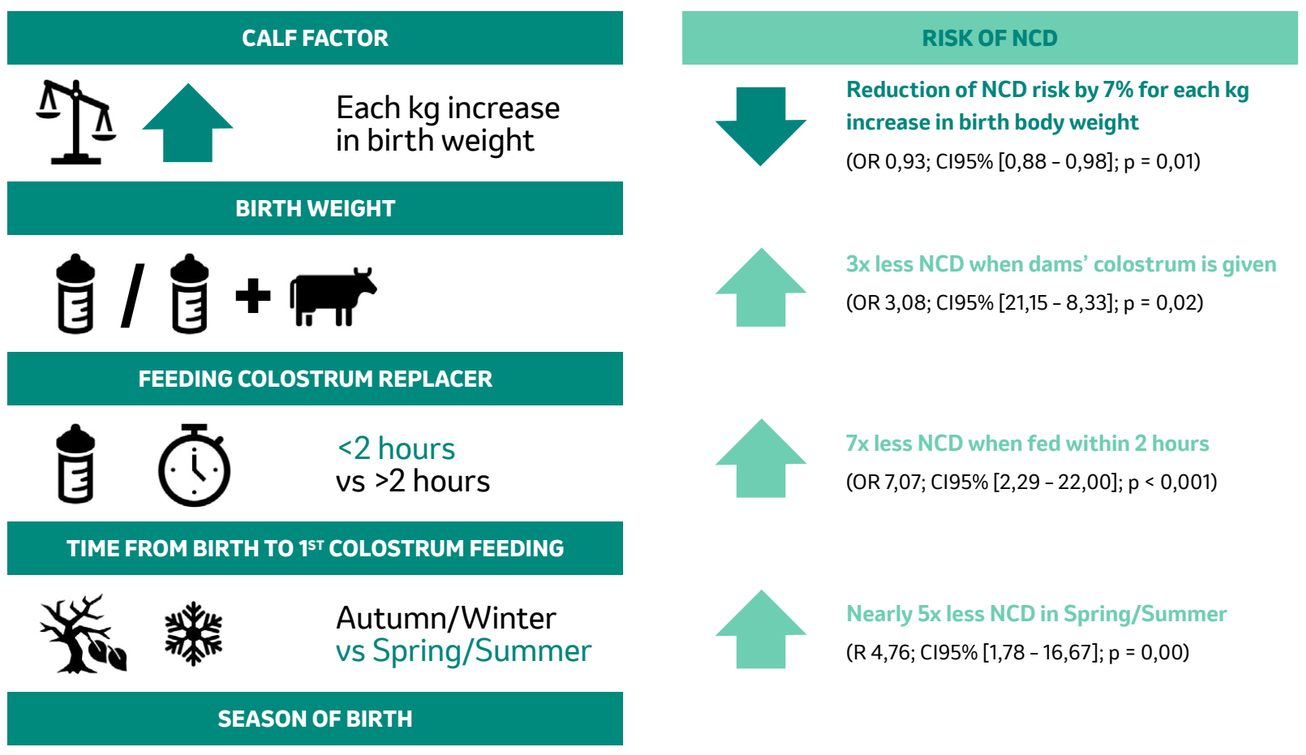
TABLE 1. Classification of the calves according to their serum IgG concentration based on Lombard et al. 2020[1].

Serum IgG concentration (G/L)	< 10 Classified as poor	≥ 10 - < 18 Classified as fair	≥ 18 – < 25 Classified as good	≥ 25 Classified as excellent
Number (%) of calves	54 (24,43%)	101 (45,70%)	52 (23,53%)	14 (6,33%)

TABLE 2. Influence of serum IgG concentrations on risk of NCD in Belgian Blue calves.

Serum IgG concentration (G/L)	≥ 10 - < 18	≥ 18 – < 25	≥ 25
Odds ratio of NCD compared to reference serum IgG concentration <10g/L (poor transfer)[1]	OR 0,26 CI95% [0,09 – 0,70]; p = 0,009	OR 0,21 CI95% [0,05 – 0,75]; p = 0,022	OR 0,62 CI95% [0,11 – 2,74] p = 0,5

FIGURE 1. Impact of risk factors on the likelihood of NCD in Belgian Blue calves.



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