

Prevalence, biosecurity and risk management of bovine coronavirus infections on white and rose veal and dairy source beef calf farms in Europe

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INTRODUCTION

- ▶ Bovine Coronavirus (BCoV) is part of the calf neonatal disease complex and is a pathogen part of the Bovine Respiratory Disease Complex.
- ▶ There is lacking information on the prevalence of BCoV in farms rearing dairy-source calves for veal or beef in Europe and the management and biosecurity risk factors that are associated with BCoV infection in calves.

OBJECTIVE

To obtain an estimate of the farm prevalence of Bovine Coronavirus (BCoV) in dairy-source beef cattle and veal calf production in Europe, and to characterize risk factors in management and biosecurity that are linked to BCoV infection in newly arrived preweaned calves and weaned calves (or those more than 8 weeks for veal calves).

MATERIALS AND METHODS

- ▶ A cross-sectional field study of 70 farms raising dairy-source calves for meat in Europe.
- ▶ From 10-20 newly arrived preweaned calves and 10-20 weaned calves/or calves more than 8 weeks on the farm for white veal farms, nasal and faecal swabs and one slurry sample per farm were collected for BCoV detection using RT-PCR (Kylt). Serum samples were obtained from all calves and were evaluated for BCoV antibodies using ELISA (BioX) (expressed in % Optical Density (OD) from 0 till 100).
- ▶ A questionnaire included various husbandry and management factors and biosecurity was scored using the Biocheck (<https://biocheckgent.com/>).
- ▶ Multiple logistic regression models with random effects of herds will be used to evaluate relationship between BCoV shedding in neonatal and weaned calves with herd health, productivity, husbandry, management, and biosecurity (results pending).

BCoV is commonly present in both the respiratory and enteric pathway in most white and rose veal and dairy source beef calves in Europe, with on average 90% of all newly arrived preweaned calves and 70% of weaned calves or over 8 weeks of age calves shedding virus.

The shipping/translocation/comingling stress of these calves are evidently creating a super-shedding event on the farms.



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RESULTS

- ▶ The study currently includes: White veal farms in Belgium, the Netherlands, Italy and France.
- ▶ Rose veal farms in Denmark, Spain, France and the Netherlands,
- ▶ Dairy source beef farms in Spain, Hungary, Norway, Romania, Sweden and United Kingdom.

FIGURE 1. Geographical locations of the currently described 52 dairy source calf farms in Europe



RESULTS

- ▶ In all European countries, except Norway and Sweden, there were more than 50% and closer to 100% of all newly arrived calves that have BCoV positive PCR samples. The amount of BCoV positive samples was lower in the weaned calves or those longer than 8 weeks on the farm. Slurry samples were 70% positive for BCoV.
- ▶ 64% of calves had BCoV-positive nasal swabs, 61% of calves had BCoV-positive fecal swabs, and 47% of calves had BCoV-positive fecal and nasal swabs.
- ▶ BCoV was not detected in only one Norwegian farm.

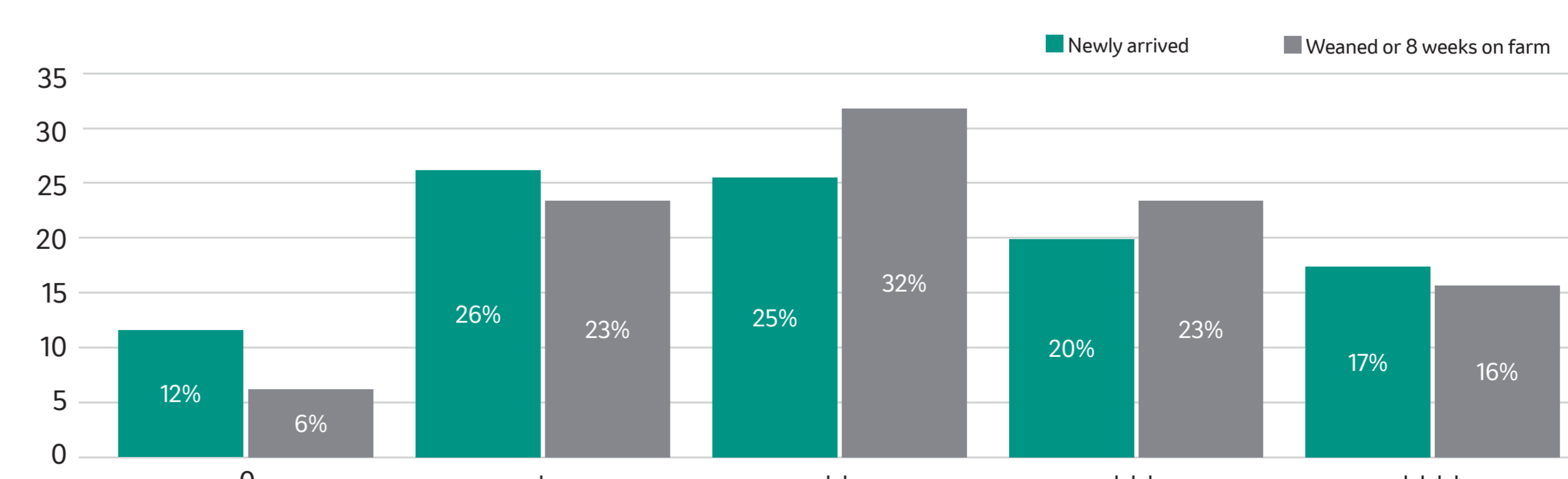
FIGURE 2. Mean Percentage calves where BCoV was detected in either nasal or fecal samples in newly arrived calves (NC) and weaned calves/> 8 weeks on farm (WC) in 11 European countries

Country	Farms #	NC #	NC%	WC #	WC%	Slurry #	Slurry%
BE	5	94	98%	88	24%	4	100%
DK	6	75	95%	78	68%	4	75%
ES	9	117	99%	109	91%	8	100%
FR	1	19	53%	19	32%	3	100%
HU	5	93	94%	89	81%	2	50%
IT	10	169	91%	148	44%	18	44%
NL	4	71	87%	73	56%	2	50%
NO	1	10	0%	10	0%	1	0%
RO	5	100	96%	98	56%	5	80%
SE	2	20	20%	20	40%	2	100%
UK	3	32	94%	29	59%	5	80%
Total	51	800	90%	761	57%	54	70%

RESULTS

Median antibody levels (measured by optical density) were 40-60 (++) in preweaned calves and 60-80 (+++) in weaned/older calves.

FIGURE 3. Percentage of newly arrived and weaned calves/> 8 weeks on farm with BCoV antibody categories 0- +++++



* BCoV Antibody Elisa optic density (OD) measures; OD 0-20=0, OD 21-40=+, OD 41-60=++, OD 61-80=+++; OD81-100=++++

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