

PREVALENCE OF THE NEW IBDV STRAIN UK2019 IN SLOW-GROWING BROILERS IN THE NETHERLANDS

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INTRODUCTION

Infectious bursal disease (IBD), also known as Gumboro disease, is a highly contagious disease that occurs in young chickens, resulting in clinical or subclinical infection, both of which are responsible for immunosuppression. In the Netherlands, clinical outbreaks of IBD are rarely seen. However, signs of immunosuppression are observed in numerous flocks which could be related to subclinical infection. Control efforts are complicated by the fact that the causative agent, an avibirnavirus consisting of two segments of double-stranded RNA, is subject to frequent genetic mutations, reassortment of genome segments, and genomic recombination events that can potentially alter virulence and antigenicity, potentially reducing the effectiveness of current vaccines.

Since 2016, genetic changes have occurred in a well-known very virulent IBD field strain (vvIBD DV86), defined by Hipra as IBDV UK2019 strain after its isolation from a farm in the United Kingdom. Despite being a vvIBD strain, the disease appears with no clinical signs of Gumboro. The flocks showed increased mortality, wet droppings and reduced growth. There are indications that the UK2019 strain has spread to several EU countries. For this reason, this study was carried out with the aim of having an indication of the spread of the UK2019 strain in the Netherlands and to investigate whether there is a correlation between its appearance and the type of vaccine used.

MATERIALS AND METHODS

A total of 66 slow-growing broiler farms were randomly selected with different vaccination strategies (non-vaccinated, recombinant HVT-IBD vaccine, intermediate and intermediate plus live vaccine) (Table 1). Seventy-six imprints from bursal samples on FTA cards were sent at the end of the production cycle to Laboratory Diagnos (HIPRA) in Spain. Samples were taken from vaccinated birds at least two weeks after the application of a Gumboro vaccine. A RT-PCR test was performed on the samples by amplification of specific IBDV partial genome (VP2 gene) and, in the case of a positive result, a nucleotide sequencing was run following the Sanger methodology and compared with both IBDV reference strains (Genbank) and field strains.

A descriptive study of the PCR results was carried out, and a proportion test was performed to compare the type of strain obtained between the different types of vaccines. The statistical analysis was performed using the R software v4.0. A p-value of <0.05 was chosen as the limit for statistical significance.

Vaccine classification	Number of samples
No vaccination	5 (6.6%)
Intermediate strain	24 (31.6%)
Intermediate plus strain*	38 (50%)
Recombinant	9 (11.8%)

Table 1. Type of vaccines and number of samples studied.

* 2 samples out of the 38 intermediate plus strains were from immune complex vaccines (2.6%) and 36 from drinking water vaccines (79%).

RESULTS

Overall, 89.5% of the samples were positive (vaccine or field strain), with 31.6% positive for the field virus UK2019. The positivity of UK2019 field virus by vaccine classification was 80% for the samples from non-vaccinated flocks and 41.7% for the intermediate live vaccines. Similarly, the recombinant vaccines showed a proportion of 44.4% for field virus UK2019. A significantly lower proportion of field virus strain was detected with intermediate plus vaccines (15.8% of the samples) compared to non-vaccinated flocks or those vaccinated with intermediate strain vaccines (p-value = 0.001) (Fig. 1).

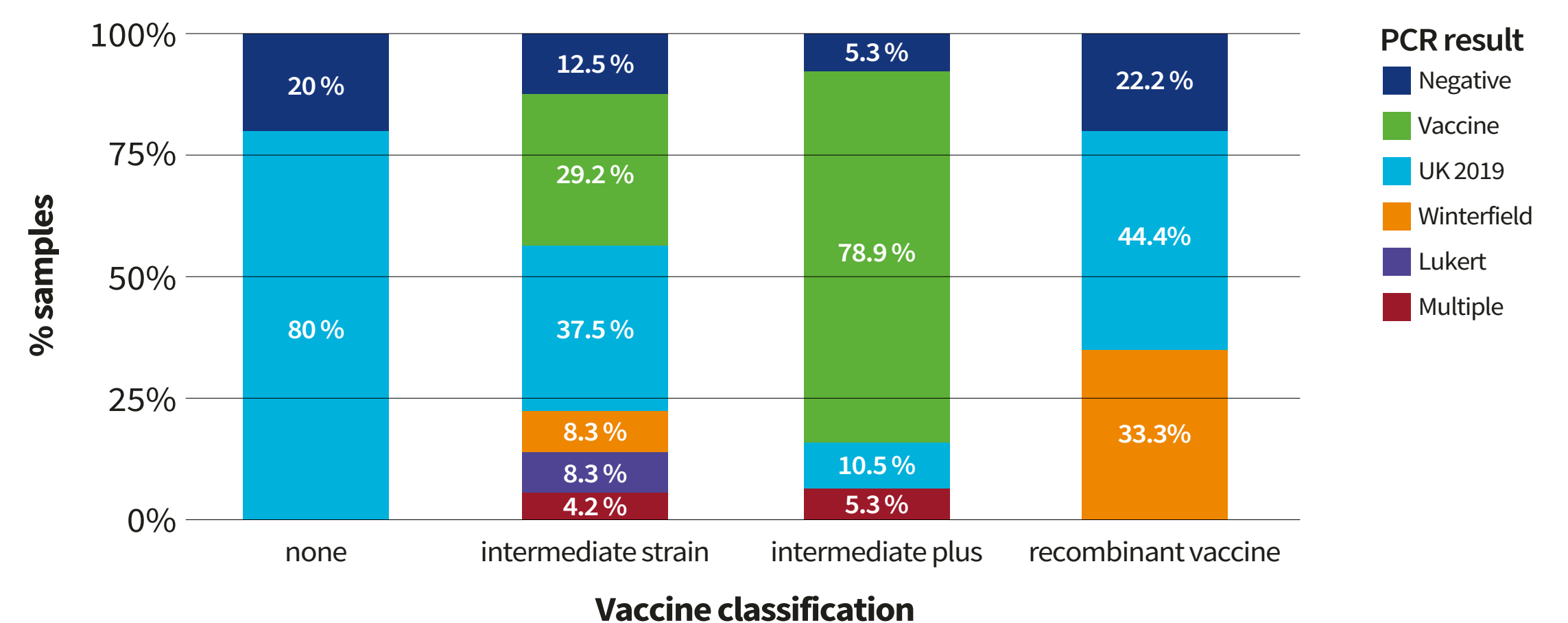


Fig. 1. Field virus positivity by vaccine classification

The positivity of field virus by type of vaccine was 21.7% for the drinking water vaccines, 44.4% for the recombinant vaccines and 0% in immune complex vaccines (Fig. 2), although more information is required from the last group to draw conclusions (only 2 samples were collected).

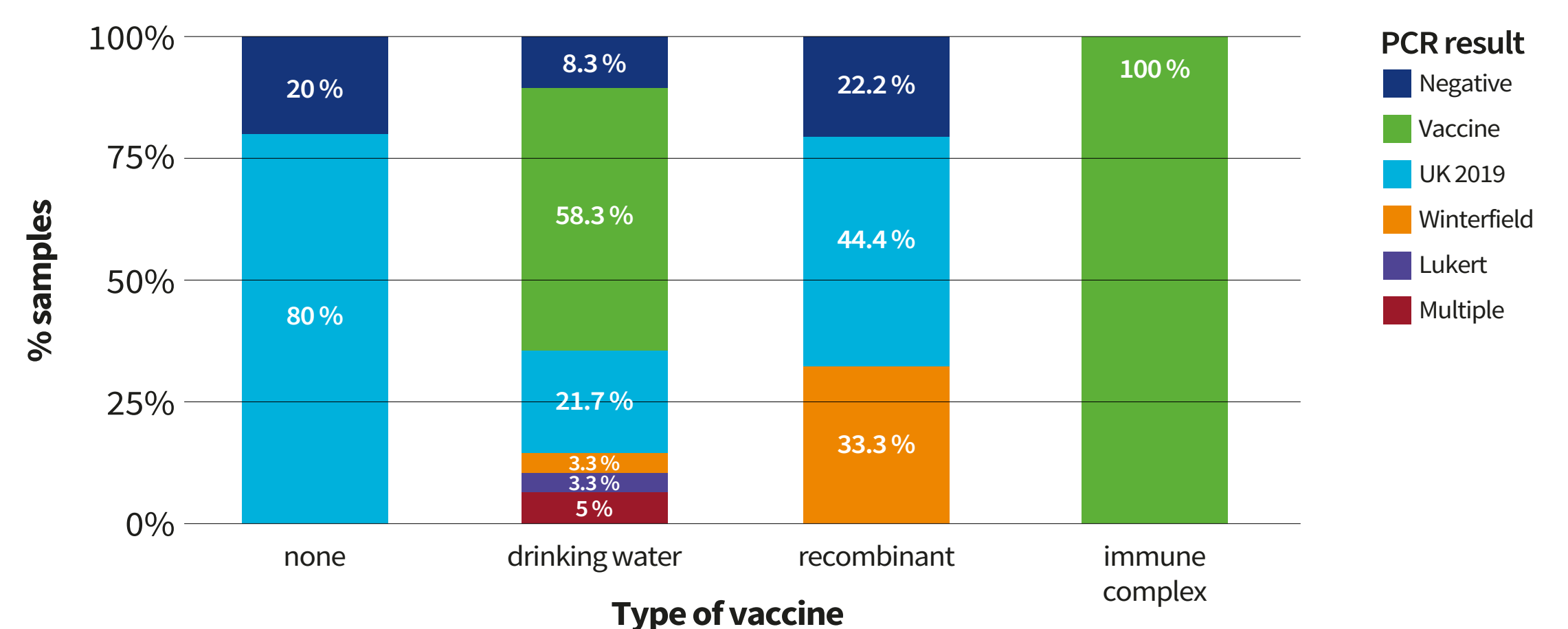


Fig. 2. Field virus positivity by vaccine type

DISCUSSION

This prevalence study confirmed the circulation of the new IBDV strain UK2019 in the Netherlands and demonstrated a correlation between the positivity of the field strain detected from bursal samples and the type of vaccine used, indicating that intermediate plus vaccines are the best option for controlling field circulation on slow-growing broiler farms.

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