INFECTIOUS DISEASES

Efficacy of a live bovine herpesvirus type 1 marker vaccine under field conditions through total herd vaccination

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INTRODUCTION

- On the 30th of June 2023, 1620 herds were still infected by the Bovine Herpes Virus type 1 (BHV-1) in France.
- Each year, 1 of 5 BHV-1 positive herds has an active circulation of the virus in the non-vaccinated animals as most infected farms only vaccinate the gE+ cattle(1).
- Marker vaccines, deleted for the BHV-1 gE protein, enable serological differentiation between antibodies induced by vaccination and those resulting from infection with wild-type virus. Despite this advanced technology, most French herds infected with the virus vaccinate only their infected animals. Total herd vaccination is rare, and when it is introduced, it is often discontinued after 2 years.

OBJECTIVE

The objective of this study was to evaluate the efficacy of a live marker vaccine against bovine herpesvirus type 1 (BHV-1) in the field on a BHV-1 infected farm.

MATERIALS AND METHODS

A dairy farm infected by BHV-1 virus since 2007 trying to eradicate unsuccessfully the virus for 13 years. At the beginning of the study (September 2020), 270 animals older than 12 months were present on the farm. The seroprevalence for BHV-1 was 60 % (animals > 12 months old). Every 12 months, the sera of the animals older than 12 months were analyzed by the Center for Diagnostic Solutions (MSD Animal Health, Boxmeer, The Netherlands). A commercially available ELISA that is specific for antibodies to gE of BHV-1 (HerdChek IBR gE Antibody ELISA; IDEXX) was used to detect animals infected with field virus.
In addition of culling of the gE BHV-1 positive animals, the following vaccination schedule with a live IBR marker vaccine (Bovilis IBR Marker Live; MSD Animal Health) was implemented from September 2020 to September 2023, with monthly veterinarian visits :

- One intranasal vaccination of the calves older than 15 days
- One intramuscular vaccination of the calves older than 3 months, with a booster 6 months later
- Twice a year (spring and autumn) intramuscular booster vaccination of the heifers and cows.
- Within 15 days post-arrival: Intramuscular vaccination of the purchased cattle

Total herd vaccination with a live IBR marker vaccine including culling of the infected animals, resulted in the eradication of BHV-1 under field conditions in a herd that has been infected for years.

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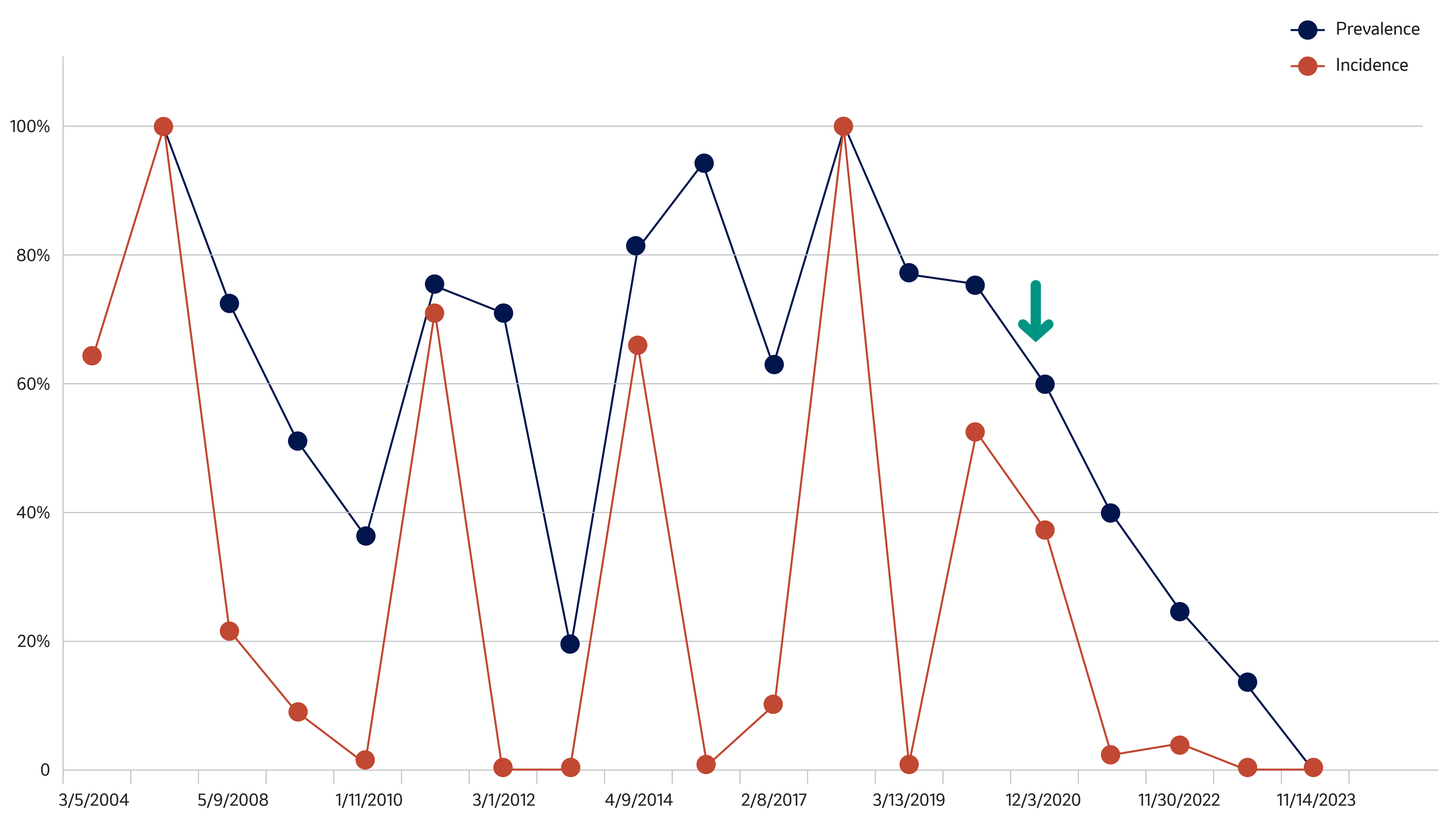
RESULTS

- During the first three years after implementation of the control program in September 2020 (culling and total herd vaccination), the incidence of new seroconversions decreased from 36,6% to 0% **(Fig 1).**
- As a result, the herd seroprevalence decreased from 59,7% in the fourth quarter of 2020 to 24% in the fourth quarter of 2022 and 0% in the fourth quarter of 2023 in the lactating herd (≥ 12 months old) **(Fig 1)**.
- In March 2024, three and a half years after the vaccination program was installed, the herd was certified free of BHV-1.

FIGURE 1. Prevalence and incidence of the wild BOHV-1 virus in the dairy farm



Implementation of the control program (total herd vaccination) in September 2020.

AUTHORS' AFFILIATION

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