

A cross-sectional observational study on the vaccination protocols recommended by veterinarians in Québec dairy herds

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Introduction

Vaccination is a biosecurity measure aimed at preventing contagious diseases, minimizing production losses and reducing drug use in animal production.

There are two types of vaccines, and their differences are shown in Table 1.

The diseases primarily targeted by vaccination vary in the life of the animal (Figure 1). Immunization of calves for neonatal diseases is achieved by direct vaccination of the calf or via colostral antibodies from its vaccinated dam. No scientific literature on vaccination in the Québec dairy industry is available.

Better understanding the vaccination practices may identify opportunities to improve infection prevention and control

Table 1: The main differences between modified and killed live vaccines

	Type of vaccines	
	Modified live	Killed
Length of immunity	longer	shorter
Sensitivity to colostral immunity	shorter	higher
Risk of allergic reaction	lower	higher
Risk of abortion	Possible (ex: BVD)	Nul

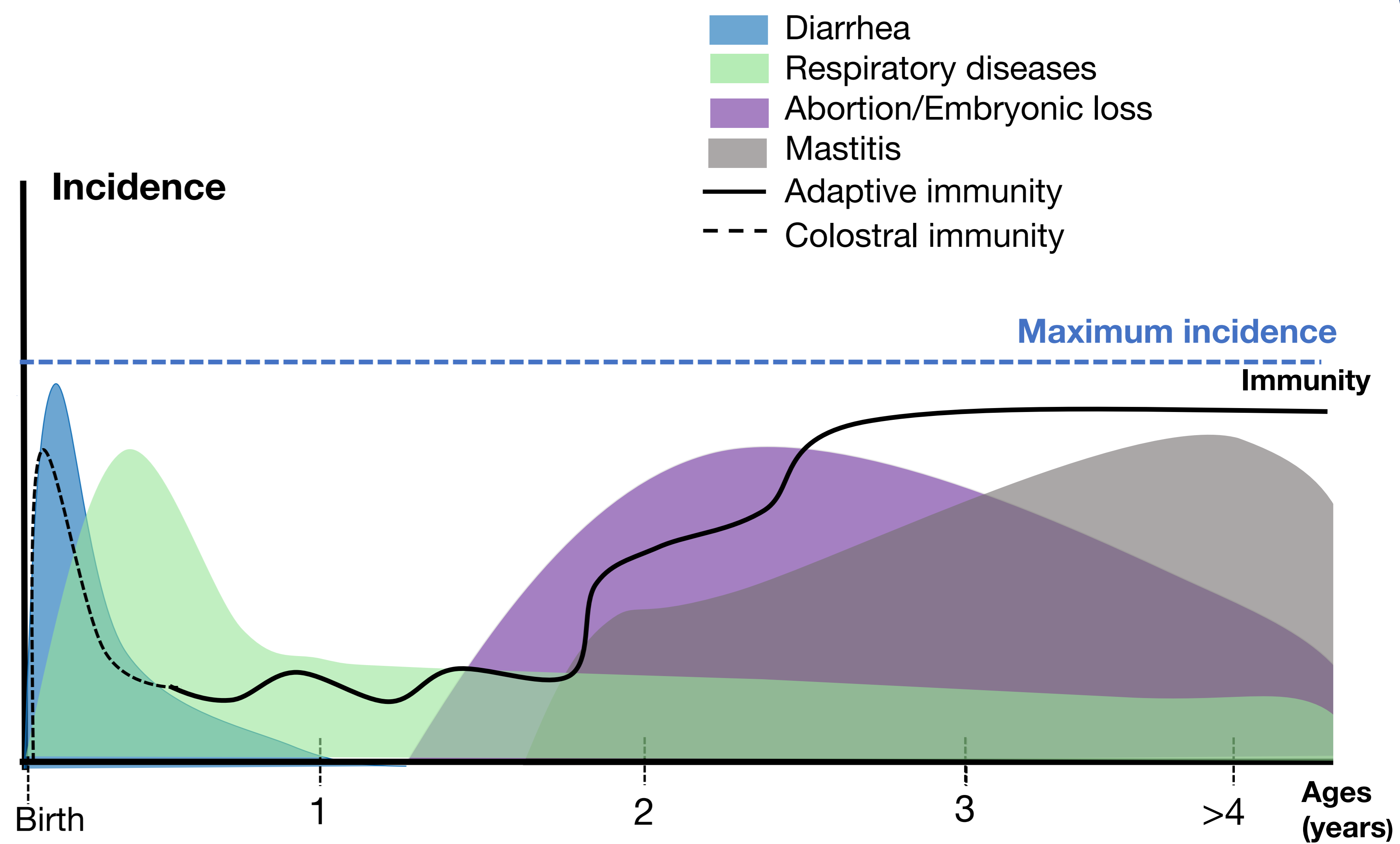


Figure 1: Incidence of major diseases in the life of dairy cattle (from Baillargeon, 2014)

Objective

Describe the vaccination protocols recommended by veterinarians to Québec dairy producers

Protocol

A retrospective cross-sectional study was conducted using the vaccination protocols recommended by veterinarians to Québec dairy producers. These vaccination protocols were obtained from the Vigil-Vet biosecurity software used by most Québec producers and veterinarians to complete the biosecurity component of the mandatory Canada-wide certification program (ProAction). Vaccination procedures completed between December 2016 and January 2021 were extracted. The most recent vaccination procedure was selected to have one procedure per producer. Descriptive analyses of the pathogens targeted by vaccination according to the age of the animals were performed.

Results

We collected 4879 vaccination protocols.

We observed that 92% of producers were recommended to vaccinate for at least one pathogen.

- 49% recommended vaccination of pre-weaned calves
- 91% recommended vaccination of post-weaned calves (3-24 months)
- 96% recommended vaccination of adult cows.

Abortion/embryonic loss

Percentage of vaccination of pathogens involved:

- Infectious bovine rhinotracheitis (Figure 3)
- Bovine viral diarrhea (figure 2)
- Leptospirosis: 30% of producers vaccinate
- Campylobacter fetus: <3% of producers vaccinate

Respiratory diseases : 85 % of producers received a vaccination recommendation

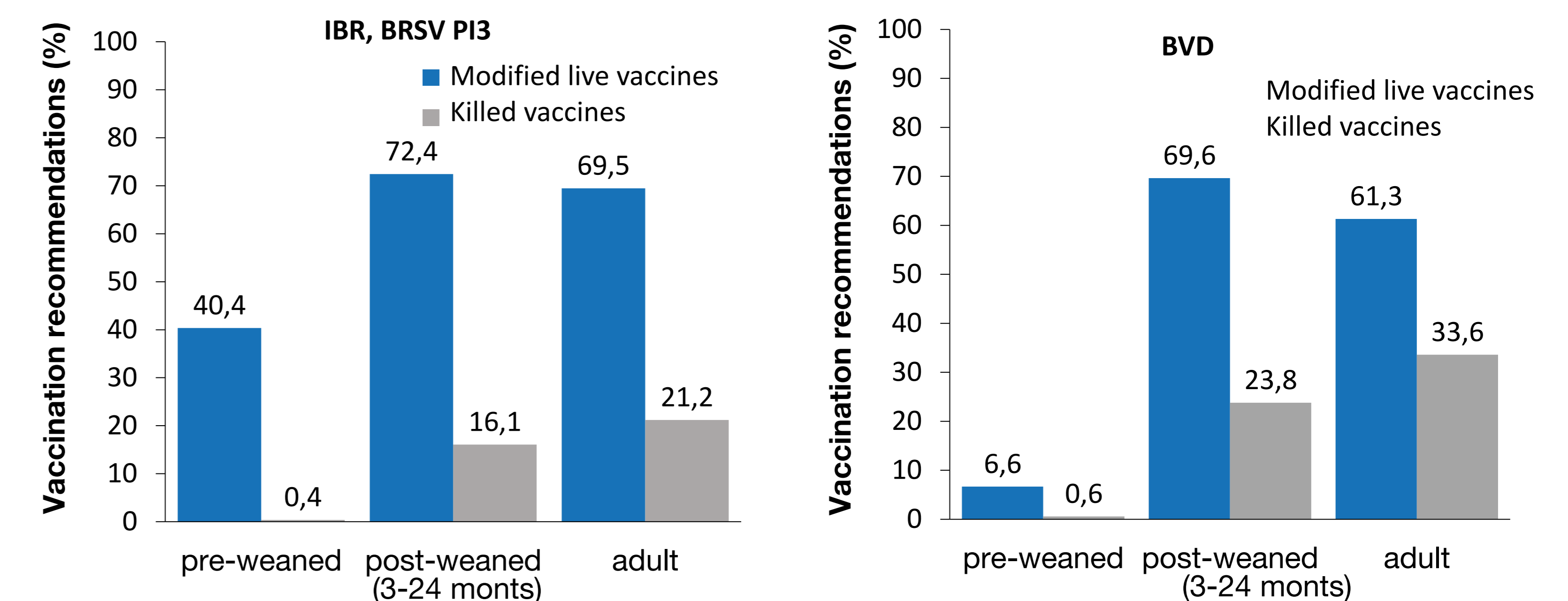


Figure 2: Percentage of vaccination protocols recommendations by veterinarians against pathogens involved in respiratory diseases: A. Infectious bovine rhinotracheitis (IBR), Bovine Respiratory Syncytial Virus (BRSV), Para-influenza 3 (PI3) B. bovine viral diarrhea (BVD)

Diarrhea: 23% of producers received a vaccination recommendation

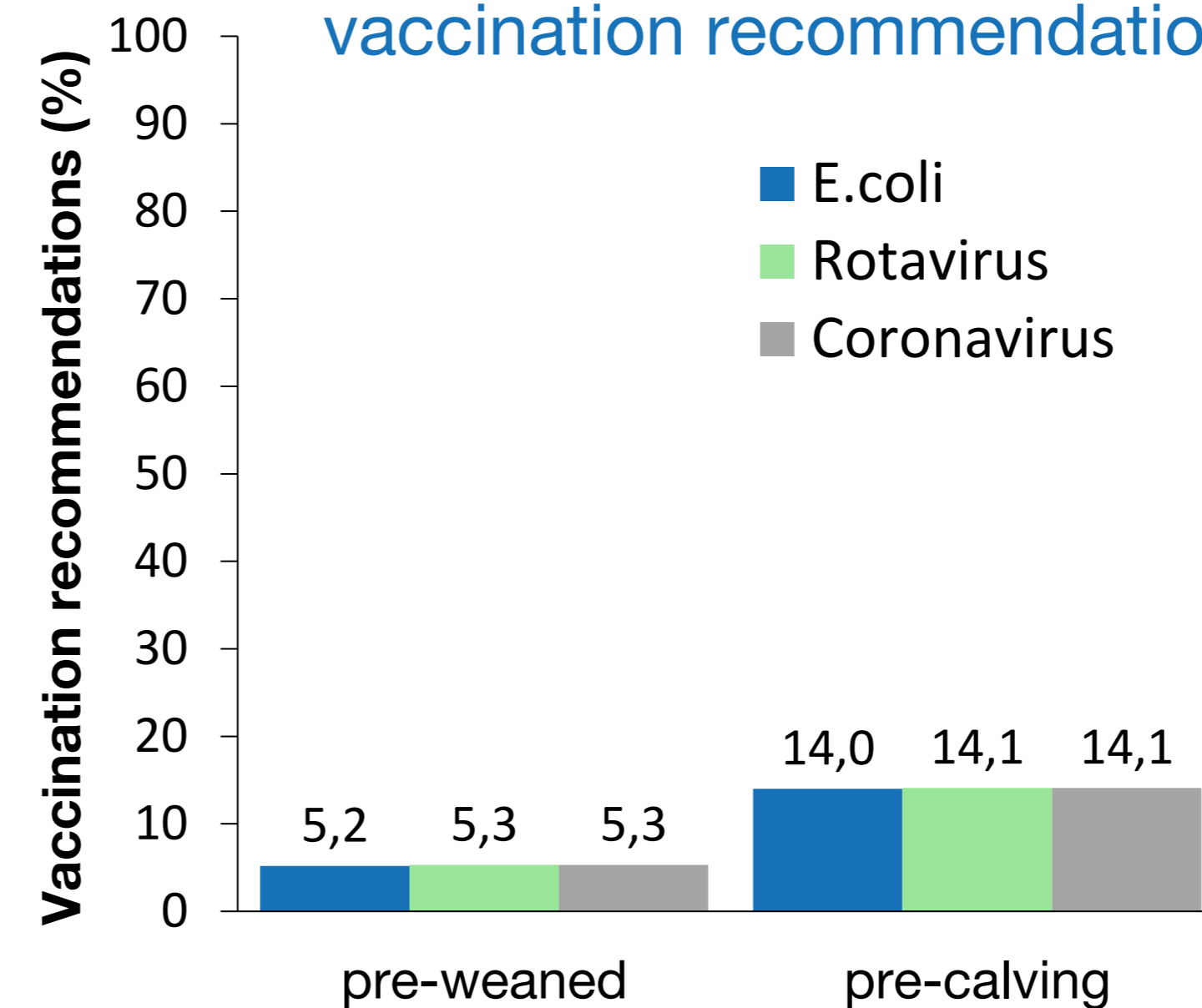


Figure 3: Percentage of vaccination protocols recommendations by veterinarians against pathogens involved in neonatal diarrhea

Mastitis : 22% of producers received a vaccination recommendation

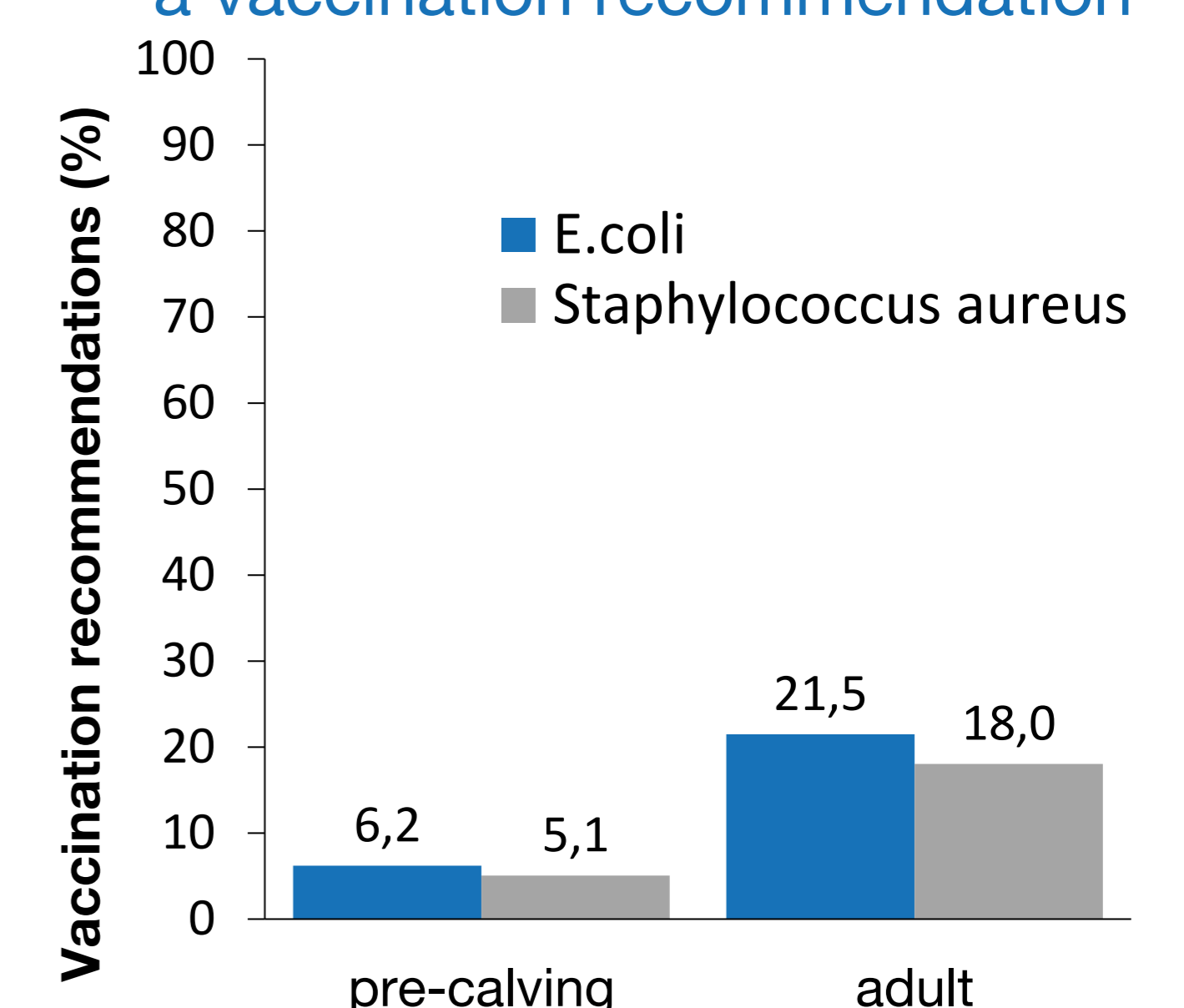


Figure 4: Percentage of vaccination protocols recommendations by veterinarians against pathogens involved in mastitis

Conclusion

We estimated that 85%, 23% and 22% of dairy producers were recommended to vaccinate for respiratory disease, neonatal diarrhea, and mastitis, respectively. The results of this study provide insight into vaccination practices in the dairy industry which provides benchmarks to motivate change among producers who have not yet adopted these vaccination practices. In fact, it will help to find solutions to improve prevention and control.