

EFFICACY OF ICTHIOVAC® VR/PD AGAINST *Listonella anguillarum* IN SEA BASS UNDER UNFAVORABLE CONDITIONS.



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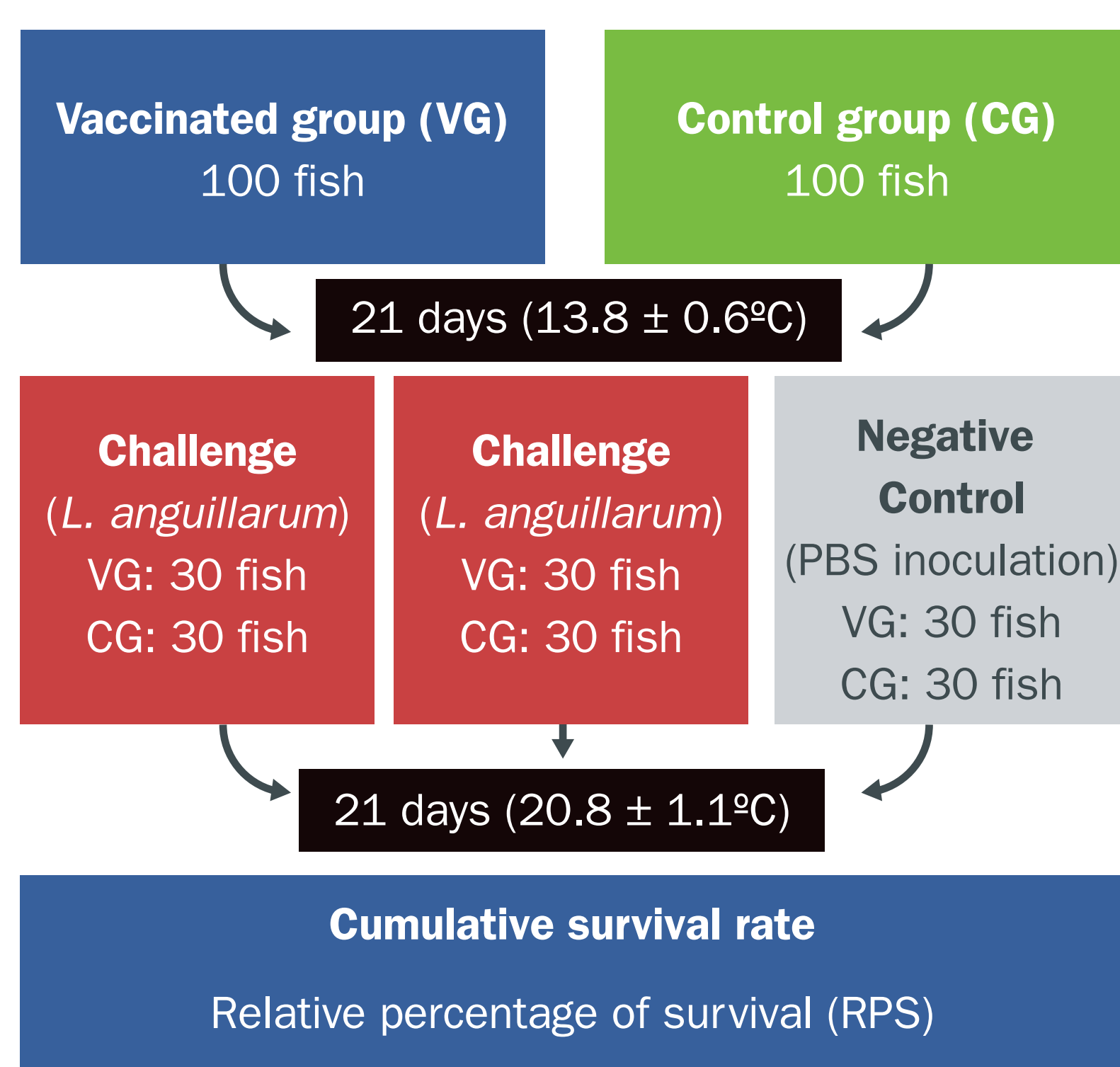
INTRODUCTION

Vaccination is one of the key preventive measures against one of the most important diseases in Sea Bass production farms, Vibriosis caused by *Listonella (Vibrio) anguillarum*¹. However, fish rearing conditions vary between farms, making the evaluation of vaccine efficacy at farm level necessary. This is particularly relevant when vaccines face unfavorable environmental conditions for the stimulation of the immune response and there are chances of outbreaks happening². The aim of this study was to evaluate the efficacy of ICTHIOVAC® VR/PD at low water temperatures (<15°C), and with a short time interval between vaccination and challenge (21 days post-vaccination).

MATERIALS AND METHODS

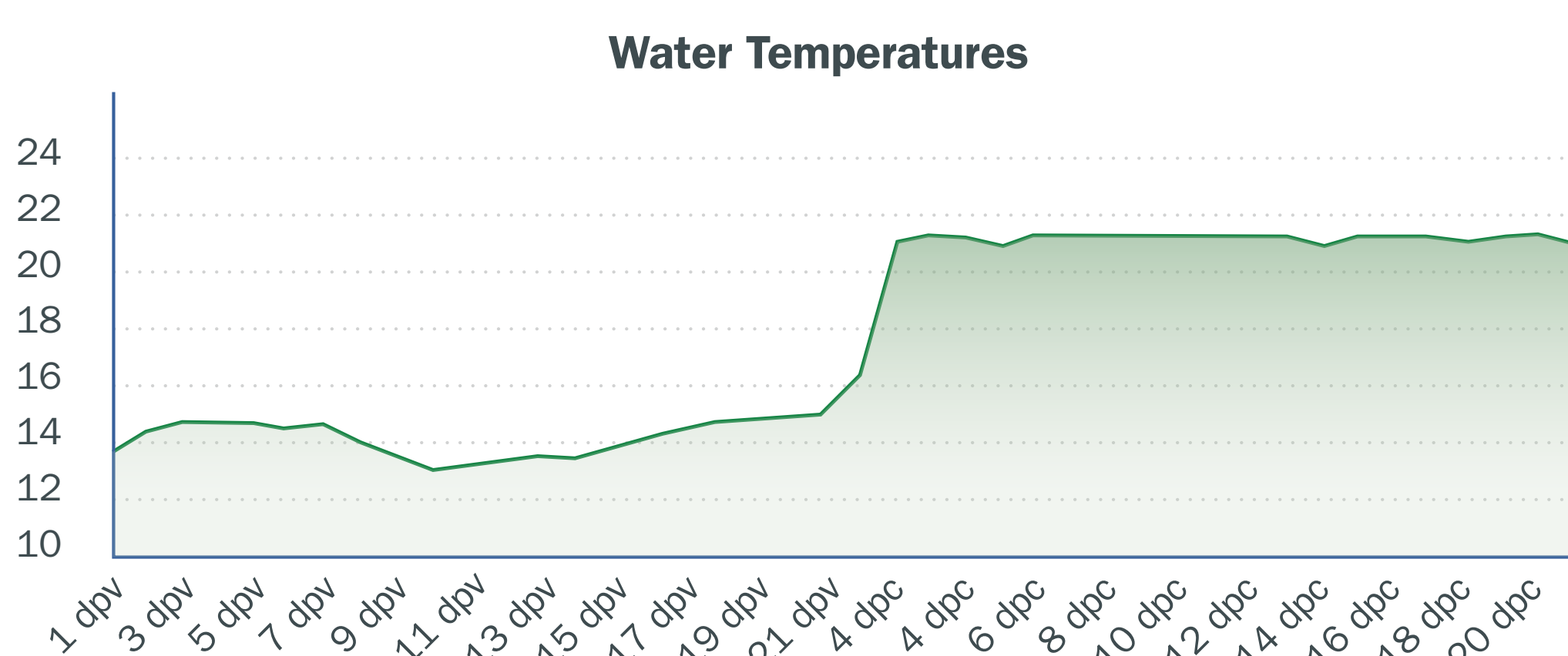
A blinded and controlled trial was conducted as shown in Figure 1. Two hundred sea bass (47.1 ± 11.3 g body weight), were appropriately randomized to receive the vaccine (vaccinated group [VG]) or the placebo injection (control group [CG]). The challenge was carried out 21 days after vaccination (dpv) in duplicate using a virulent heterologous strain (serotype O2β). The post-challenge observation period lasted 21 days (dpc). Vaccine efficacy was assessed based on the cumulative survival rate and the relative percentage of survival (RPS).

Figure 1. Experimental design of the efficacy study of ICTHIOVAC® VR/PD against *L. anguillarum* O2β.



Fish husbandry conditions were 13.8 ± 0.6 °C during the vaccination period (ambient temperature), while the temperature during the challenge period was 20.8 ± 1.1 °C (Figure 2).

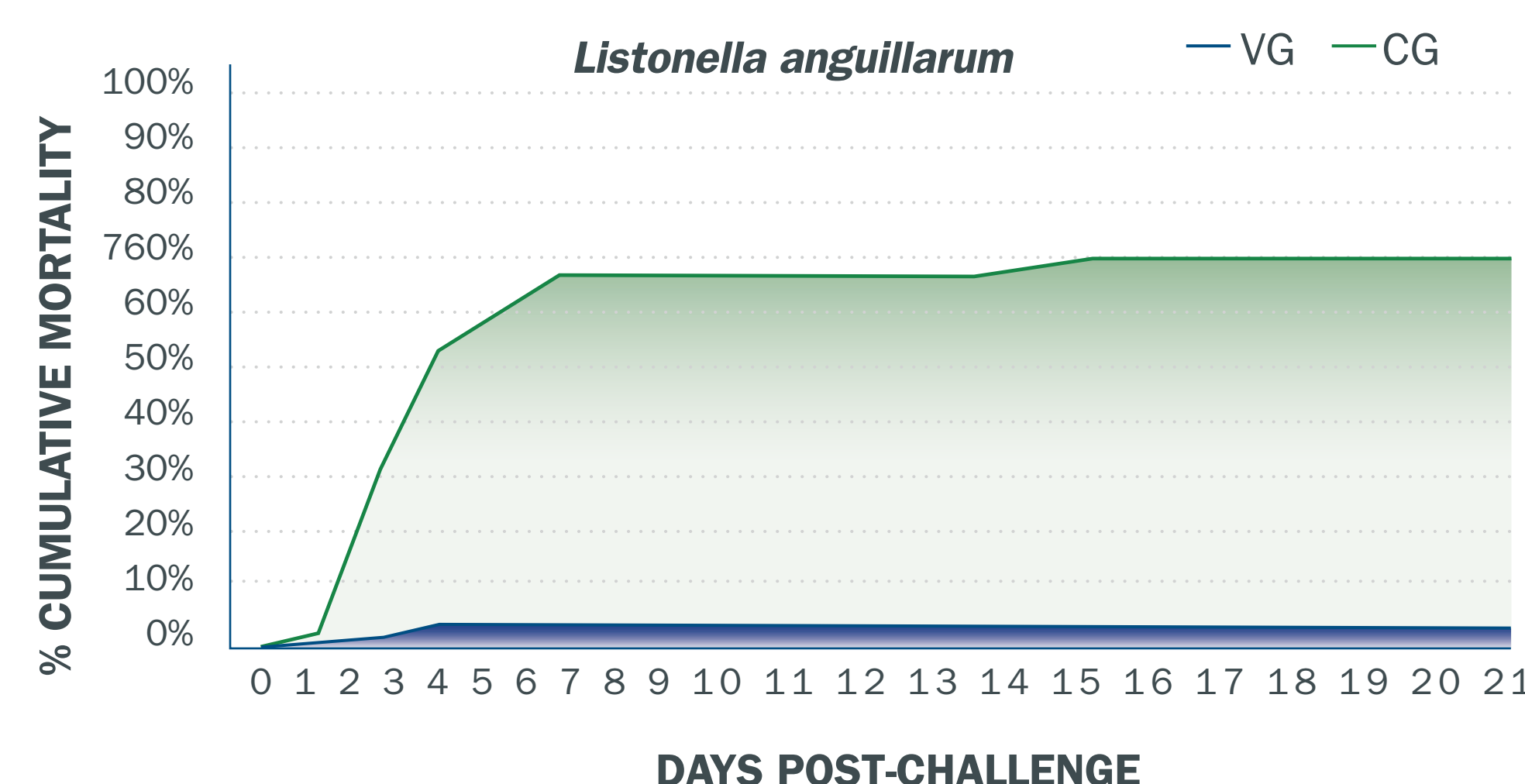
Figure 2. Daily average water temperatures during the trial.



RESULTS AND DISCUSSION

During the study, any adverse effect after the vaccination and after the PBS inoculation was recorded. However, deaths occurred mainly between 2 and 5 days after *L. anguillarum* O2β challenge (Figure 3).

Figure 3. Cumulative mortality after challenge with *L. anguillarum* O2β (mean ± standard deviation).



The mortality rate in vaccinated fish was 1.7 ± 2%, whereas in the CG it was higher, reaching values of up to 68.3 ± 7% (Figure 3). The results obtained show that the cumulative mortality rate was significantly lower in VG than in CG (Fisher's Exact Probability Test; *p*-value < 0.001).

Table 1. Cumulative mortality and Relative Percentage of Survival (RPS) after challenge with *L. anguillarum* O2β in the different replicates.

REPLICATE	GROUPS	CUMULATIVE MORTALITY	RPS
1	Vaccinated group	3%	94,7%
	Control group	63%	
2	Vaccinated group	0%	100%
	Control group	73%	

The mean RPS value obtained was 97.6% (Table 1). This demonstrated the efficacy of this commercial vaccine against a virulent heterologous *L. anguillarum* strain under unfavorable conditions in accordance with the European Pharmacopeia criteria (RPS higher than 75%)³.

CONCLUSION

Overall, the results obtained here demonstrate that ICTHIOVAC® VR/PD is effective in conferring immunity to Sea bass against virulent *Listonella (Vibrio) anguillarum* O2β strain, even under unfavorable conditions such as low temperatures (<15°C) and a shorter post-vaccination time (21 days).

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¹ Frans I., Michiels C.W., Bossier P., Willems K.A., Lievens B. and Rediers H. (2011) *Vibrio anguillarum* as a Fish pathogen: virulence factors, diagnosis and prevention. Journal of Fish Diseases 34, 643-661.