

Supplementary information for

Coinfection takes its toll: Sea lice override the protective effects of vaccination against a bacterial pathogen in Atlantic salmon.

Carolina Figueroa, Paulina Bustos, Débora Torrealba, Brian Dixon, Carlos Soto, Pablo Conejeros, José A. Gallardo

Table S1. Comparison of vaccines against infectious pathogen authorized to be used in Chilean salmon aquaculture between 2006 and 2017.

Figure S1. Frequency distribution of the abundance of parasites per infected fish across all tanks.

Figure S2. Box plot of louse infection intensities in each test tank.

Figure S3. Spearman correlation of number of sea lice against bacterial load.

Supplementary Methods

Table S1.

species	Pathogen classification	Pathogen	Number of vaccines	
			2006	2017
Atlantic salmon	Bacteria	<i>Piscirickettsia salmonis</i>	3	32
		<i>Vibrio ordalii</i>	6	21
		<i>Aeromonas salmonicida</i> atypical	1	5
		<i>Aeromonas salmonicida</i>	3	4
		<i>Flavobacterium psychrophilum</i>	-	2
		<i>Vibrio anguillarum</i>	-	1
	Virus	Infectious pancreatic necrosis virus (IPNV)	17	36
		Infectious salmon anaemia virus (ISAV)	-	14
	Parasite	<i>Caligus rogercresseyi</i>	-	2
Rainbow trout	Bacteria	<i>Piscirickettsia salmonis</i>	2	18
		<i>Vibrio ordalii</i>	-	7
		<i>Aeromonas salmonicida</i>	-	2
		<i>Flavobacterium psychrophilum</i>	-	1
		<i>Flavobacterium columnare</i>	-	1
	Virus	IPNV	8	20
Pacific salmon	Bacteria	<i>Piscirickettsia salmonis</i>	3	14
	Virus	IPNV	6	14
Chinook salmon	Bacteria	<i>Piscirickettsia salmonis</i>	1	7
	Virus	IPNV	2	7
		TOTAL	52	208

Figure S1.

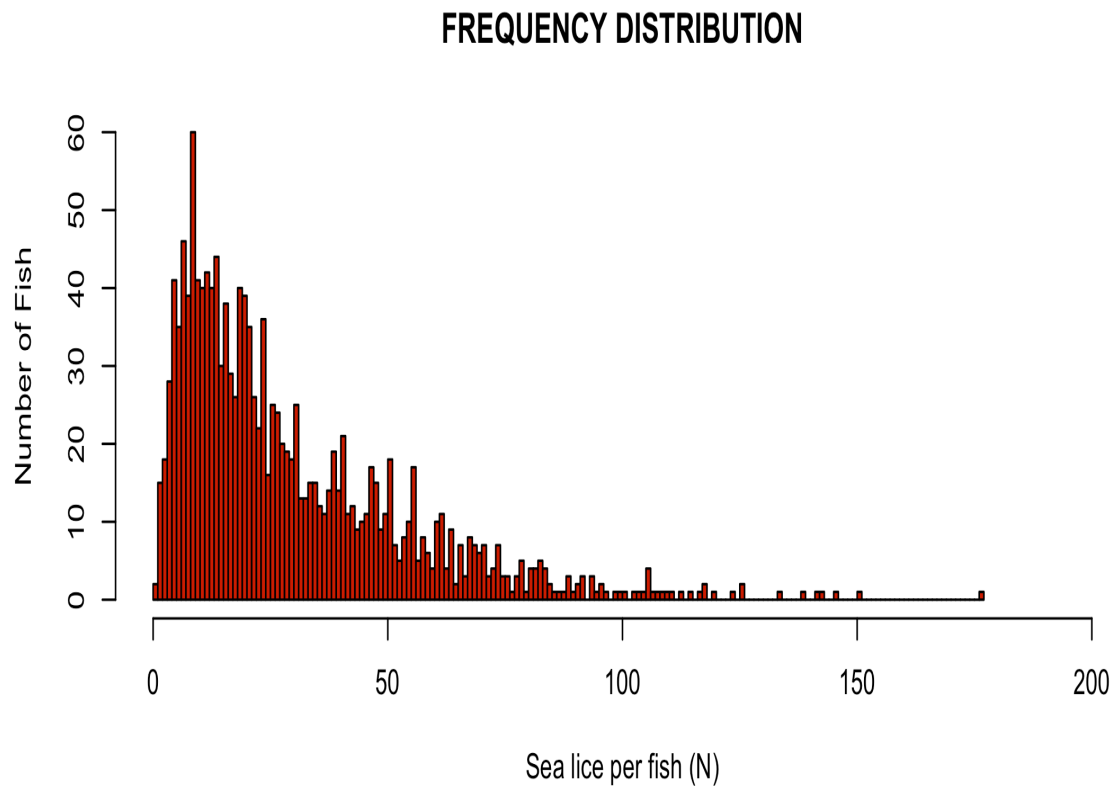


Figure S2.

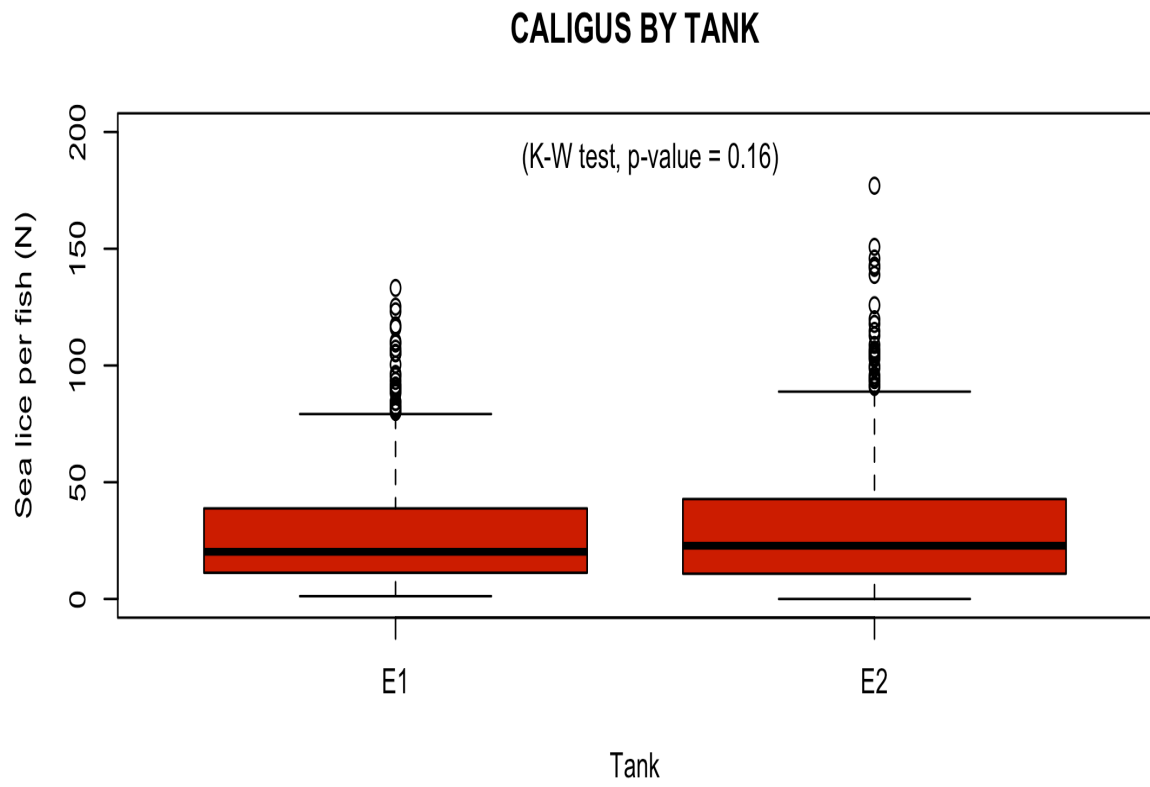
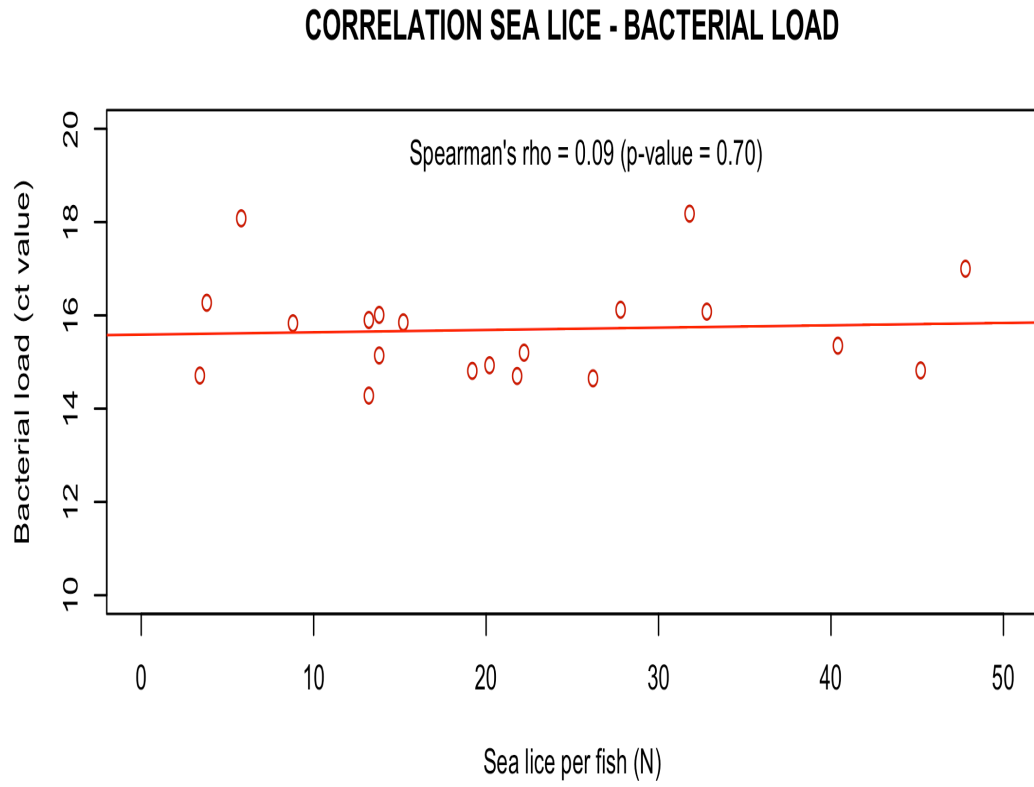


Figure S3.



Supplementary Methods

Infection intensities between tanks and correlation analysis of parasites as a function of bacterial load. To compare differences in louse infection intensities between tanks a non-parametric Kruskal-Wallis Rank Sum test was performed. Spearman correlation was computed between number of sea lice successfully settled on the fish as copepodites and bacterial load (Ct value) on a sample of 20 moribund fish sampled when 50% mortality was achieved in the coinfection treatment.