

Program for Health Management in Aquaculture (PGSA), historical public-private collaboration in favor of the sustainability of national aquaculture.

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Introduction

Salmon farming is an activity of particular relevance in Chile because it is, among non-mining exports, the third most important economic activity in the country and the first in the southern zone. According to the Food and Agriculture Organization of the United Nations (2017) accounts for about 30% of the world's production of farmed salmon and second largest producer in the world, and according to the Ministry of Foreign Affairs, 2019 revenues from Chilean salmon exports reached USD 4.664 billion free on board. However, the growth of salmon farming has been associated with various diseases, with piscirickettsiosis and *Caligus* sea lice currently having the greatest impact on the health status of the fish, given the high cost associated with their management and control. Piscirickettsiosis has been estimated to generate annual economic losses of approximately USD 450 million, while caligidosis generates increases in production costs of an average USD 1.4 per kilo of salmon produced.

Methodology

The National Fisheries and Aquaculture Service (Sernapesca), was awarded financing by the Strategic Investment Fund (FIE), of the Ministry of Economy, for the development of the program called "Program for Sanitary Management in Aquaculture", which also had funding and collaboration from the Chilean Salmon Industry Association AG and was carried out between the years 2016 and 2019.

The PGSA corresponded to a public-private initiative, executed by the National Fisheries and Aquaculture Service. The PGSA carried out 47 research projects focused on piscirickettsiosis and caligidosis, and which involved the participation of 40 institutions and 194 researchers both nationally and internationally. These research projects focused on epidemiology, pharmacology, genomics, microbiology, parasitology, and host response.

Results

The results are materialized in 19 final reports and 6 manuals, available to the general public at the link pgsa.sernapesca.cl, with an impact on the number of national scientific publications related to piscirickettsiosis, rising from a median of 5 per year to 16 annual publications (fig. 1) and generating more than 20 events to disseminate results. In this context, a significant number of *P. salmonis* strains were sequenced and the genome of *C. rogercresseyi* was deciphered; the bases were proposed for the development of new treatments for piscirickettsiosis, such as phage therapy and iron chelators; guidelines were generated to improve practices in the use of antimicrobials and antiparasitics; and the epidemiology and the factors that affect the life cycle of both pathologies, among others, were studied in depth. This information has been the basis for the improvement of practices at the industry level and for the modification and elaboration of normative tools aimed at optimizing the use of antimicrobials. This is how the results obtained from the PGSA have contributed to a sustained decrease in the consumption of antimicrobials from 2015 to date (fig. 1 y 2).

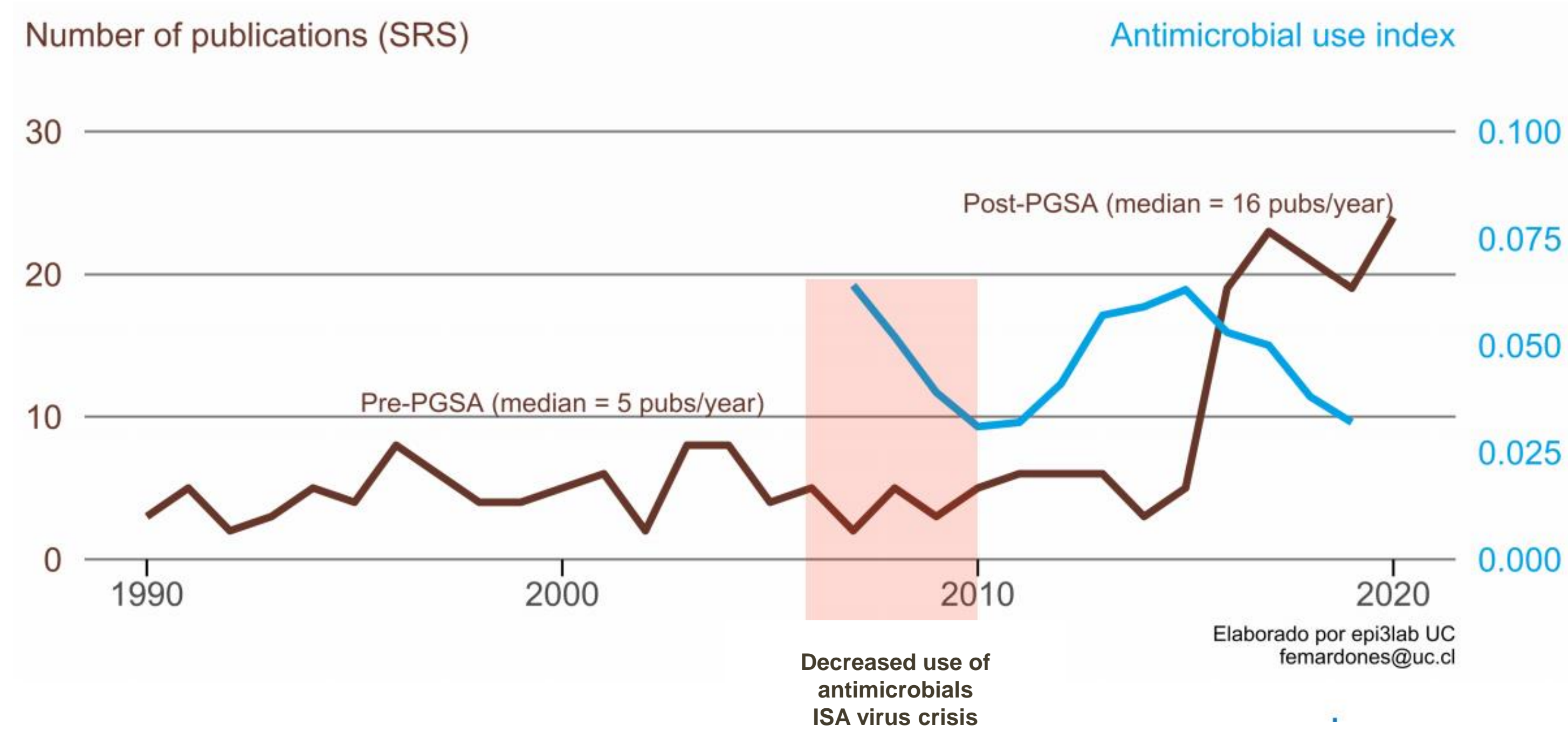


Fig 1, Publications on piscirickettsiosis 1990-2020.

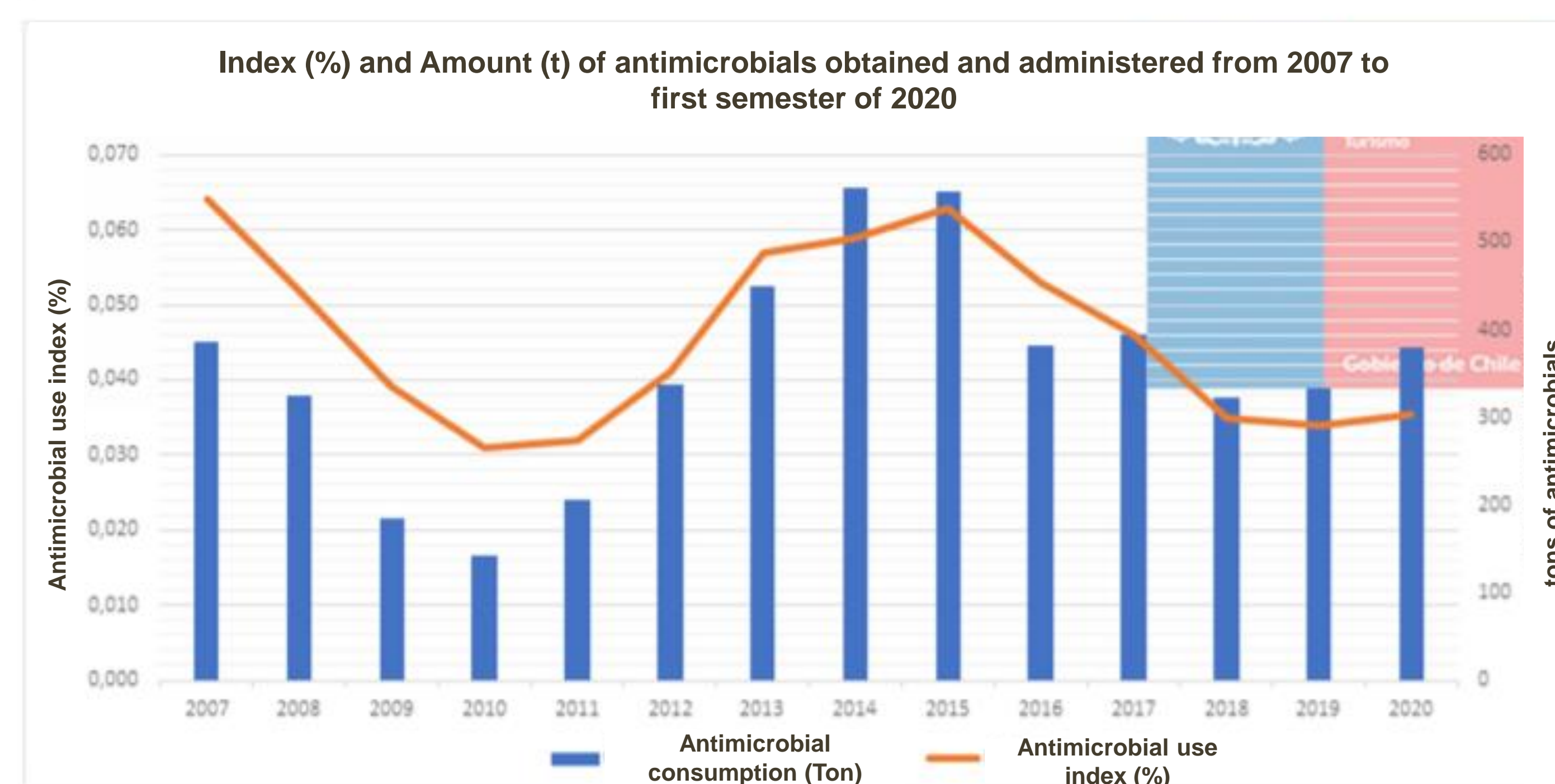


Fig 2, Antimicrobial consumption 2007-2020.

The results of the PGSA also laid the foundations for the PROA (Program for the Optimization of the Use of Antimicrobials) certification, a certification granted by Sernapesca to those farming centers that meet a series of requirements for the prevention, diagnosis and early treatment of piscirickettsiosis and that manage to use a quantity of antimicrobials lower than limits determined by species. Currently more than 150 centers have applied for certification.

Conclusions

The PGSA is constituted as a milestone of public-private collaboration, which through applied research projects, managed to generate management tools both at the industry and public administration levels in favor of the sustainability of the aquaculture sector in Chile, as well as a impact on the investigation of the main pathologies that affect salmon farming in Chile.

References

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