

# POLICY BRIEF

## REGULATING ANTIBIOTIC RESIDUALS IN CHILEAN SALMON AQUACULTURE IMPORTS

### SUMMARY

Salmon aquaculture is one of Chile's most important industries. The South American nation has been a producer of salmon, a non-native specie in Chile, since the 1980's[1]. Rapid growth, combined with poor oversight and regulation, has led the industry to become a major source of pollution. The over-application of antibiotics to combat infection is common and perilous for marine life, as well as human health. This brief will introduce the issue and highlight recommendations for the FDA to enhance regulations for Chilean salmon imports.

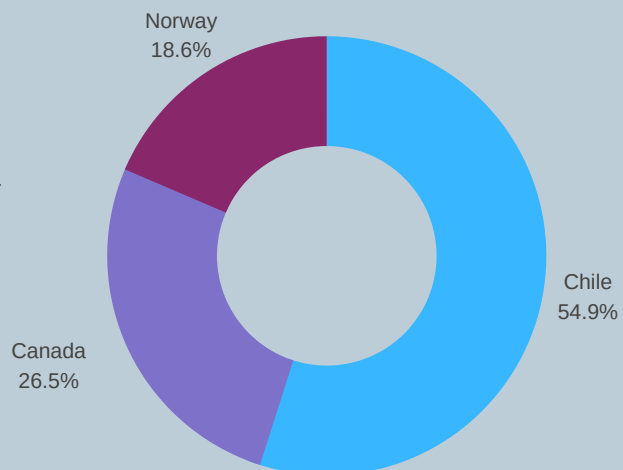
### ANTIBIOTICS IN CHILEAN SALMON AQUACULTURE

Chile is the worlds second largest salmon producer, but the largest user of antibiotics[4]. In 2007, **Chile accounted for roughly 24% of global salmon production, but nearly 95% of global antibiotic use**[4]. Today, Chilean producers continue to apply hundreds of thousands of kilograms of antibiotics to prevent infectious diseases amongst salmon[2]. Large amounts of antibiotics threaten the **rise of resistant bacteria**, which could devastate the industry. This over use of antibiotics in Chilean salmon production has cascading effects. Antibiotic residues may affect the diversity of phytoplankton and zooplankton, and can cause antibiotic resistance that can threaten the marine environment, as well as humans who consume salmon products[2] [4]. There are concerns that **antibiotic use in aquaculture can increase bacterial resistance to antibiotics used in human medicine**[2]. Considering the scale of antibiotic use in Chile, these concerns for the environmental and human health are certainly warranted.

### SALMON AQUACULTURE IN CHILE

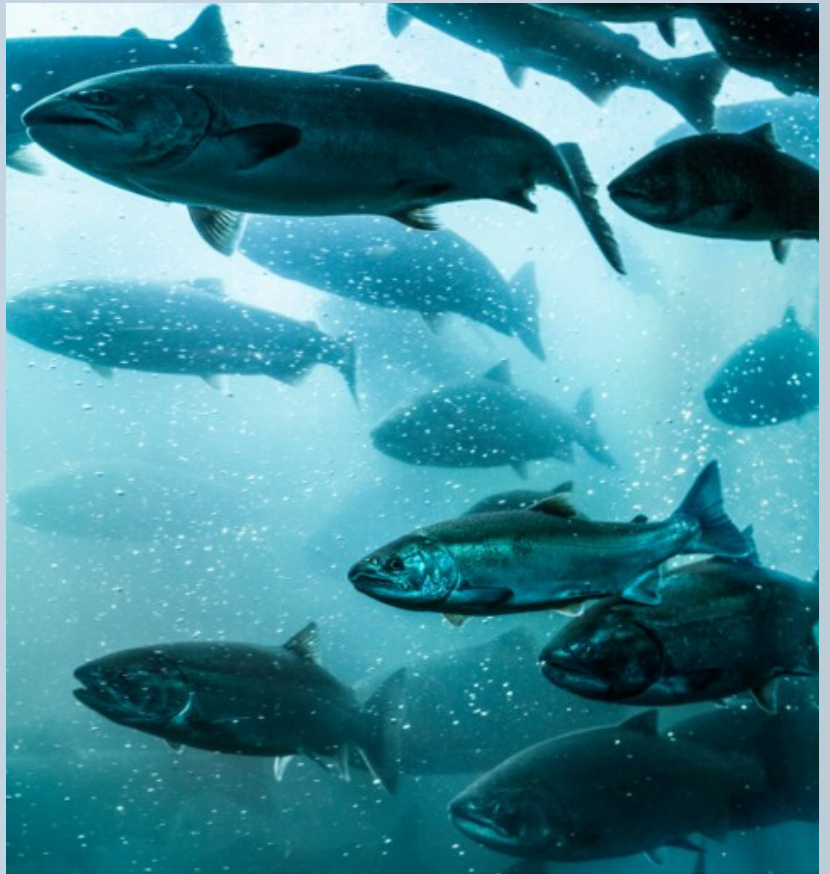
- Many Chileans, **nearly 45,000, are employed by the industry**[2]. Perceptions of the industry in Chile are mixed, and many consumers have come to associate Chilean salmon with pollution[6].
- Three species of salmonid are farmed in Chile: Atlantic Salmon, Coho Salmon, and Rainbow Trout[2].
- 2008 saw a devastating viral infection that shook the industry. Production plummeted and nearly 20,000 jobs were lost[3].
- Many current regulations were designed in the 1990's and so are inadequate for an industry that has more than double in size since[1].
- Chile is the **largest importer of salmon to the United States**[9].

US Atlantic Salmon Imports (2018)[9]



## ANTIBIOTICS USED IN CHILE[4]

- FLORFENICON
- AMOXICILLIN
- TRIBRISSEN
- OXOLINIC ACID
  - Banned in Canadian, Scottish and US salmon production
- FLUMEQUIN
- OXYTETRACYCLINE
  - Most common antibiotic in Chilean salmon aquaculture
- ERYTHROMYCIN
  - Banned in Norway, Scotland and Canada



## REGULATIONS

The Chilean National Fisheries and Aquaculture Service oversees regulation of the industry. Currently, **regulations on antibiotic use in Chilean salmon aquaculture are lacking in scale and substance.**

- Antibiotics can only be administered after a certain percentage of the fish population is tested positive for a given infection, and then a registered veterinarian must approve antibiotic applications[5].
- Experts argue that not enough studies have been done regarding the correct dosage and efficacy of antibiotics to accurately devise regulations[5].
- In terms of environmental impact, testing of the benthic sediment directly below salmon aquaculture operations is required, but such tests are inadequate because they fall short of examining the entire water column and therefore all possible environmental impacts[1].
- Many nations, including the United States, voluntarily test imported seafood for chemical residuals[7], but more formal agreements on Maximum Residual Levels are needed to ensure compliance.



## RECOMMENDATIONS

Considering knowledge gaps, the inefficacy of regulations in Chile, and the fact that Chile is the top salmon supplier to the United States, action must be taken to regulate antibiotic use. To date, **the FDA has not defined residual tolerances** for any of the listed antibiotics used in salmon production in Chile[8]. Establishing acceptable tolerances for antibiotics used in imported Chilean salmonid aquaculture is highly recommend. Additionally, the FDA should pursue formal **Maximum Residual Level** agreements for Chilean salmon imports[8]. Regulating the residuals of antibiotics can help to ensure that appropriate levels are being applied and would be consistent with regulations for other aquaculture imports.



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