

# Probiotics against fish pathogens

University of Chile has developed a fish-derived probiotics with immunomodulatory activity and its use in prophylaxis against pathogenic microorganisms in fish

## THE CHALLENGE

The formulation described here provides a novel alternative to antibiotics, which is in line with the current sanitary requirements in the aquaculture industry. Furthermore, the technology is applicable to a wide variety of fish species of interest for the Chilean and international aquaculture industry. The use of these immunomodulatory probiotics significantly contributes to reduce the use of antibiotics in fish, and problems in commercialization in the international market. Additionally, since these probiotic formulations derive from intestinal microbiota of fish, there are no restrictions in its applications in terms of sanitary regulations related to the use of GMO's.

## THE TECHNOLOGY

The technology comprises immunostimulatory formulations for fish, made with different combinations of indigenous bacterial strains. These probiotics formulations have applications in prevention, treatment and prophylaxis of infections caused by pathogenic microorganisms, such as *Flavobacterium psychrophilum*. Additionally, the formulations have beneficial complementary properties, such as production of exo-enzymes that can help to a better nutrient digestion.

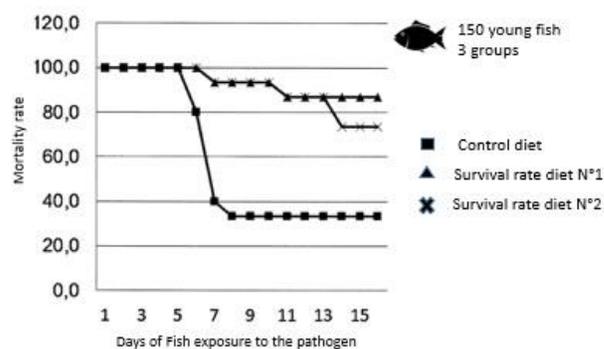
## STAGE OF DEVELOPMENT

- Challenge trials of probiotic bacteria against a pathogenic microorganism, *Flavobacterium psychrophilum* (n=150 young fish, 3 groups).

## COMPETITIVE ADVANTAGES

- The use of these probiotics contribute to the balance of the intestinal microbiota and strengthens the immune system of fish, reducing the mortality of fish and the need of using antibiotics.

- The use of fish indigenous microorganisms in the formulations has the advantage that the microorganisms are capable of surviving the digestive tract of fish and have the proper conditions to develop and express their probiotic activity. Also, issues related to GMO's use are avoided.
- Formulations are easily administrated since they can be used as a food additive (oral administration).



**Figure 1. Increase Survival rate of two probiotic diet compared with control.**

## APPLICATIONS

- Applicable to a wide variety of species of interest for the Chilean and international aquaculture industry.

## OPPORTUNITY

University of Chile is searching for industry partners for out-licensing.

## INTELLECTUAL PROPERTY/REFERENCES

- Chilean patent application 201603149
- Ecuadorian patent application 2017-20822