

The University of Maine

DigitalCommons@UMaine

Annual Maine Aquaculture R&D and Education
Summits

Conferences and Summits

3-6-2017

Super-Chill A Collaborative research project between ARI, USDA and Cooke Aquaculture

Deborah A. Bouchard

Ian Bricknell

Follow this and additional works at: https://digitalcommons.library.umaine.edu/ari_rd-ed



Part of the [Aquaculture and Fisheries Commons](#)

This Presentation is brought to you for free and open access by DigitalCommons@UMaine. It has been accepted for inclusion in Annual Maine Aquaculture R&D and Education Summits by an authorized administrator of DigitalCommons@UMaine. For more information, please contact um.library.technical.services@maine.edu.

Super-Chill

A Collaborative research project
between ARI, USDA and Cooke
Aquaculture

Debbie Bouchard and Ian Bricknell



The Problem

- When the water temperature hits -0.7°C marine Atlantic salmon suddenly die.
- Seawater freezes at -10°C
- This happens because they increase the level of sodium chloride in the plasma
 - This prevents thermal damage
 - Until it reaches a critical level and the fish suddenly die of acute hypernatremia
- They do not die of the cold



A Mad idea?

- Can we use biological antifreezes to protect salmon from Super chill
- Happens in lots of other vertebrates
- Especially frogs and Icefish
- Cod for example have natural antifreeze proteins in their blood



A functional feed approach

- Anecdotal evidence suggested that feeding common salt helped to prevent super-chill
- This work looks at
 - Screening a wide range of potential antifreeze in the Lab
 - Then adding them to diets to see if they are taken up via digestion
 - If they are, does this help prevent super-chill?



Where are we

- Two potential natural antifreezes have been identified from laboratory trials
- These have now been formulated into feeds
- These are currently undergoing fish trials at the USDA NCWAC in Franklin Maine



Thank you!

Questions?