

# TRINATION

Viral Myopathies  
Irish update  
Bergen 2024

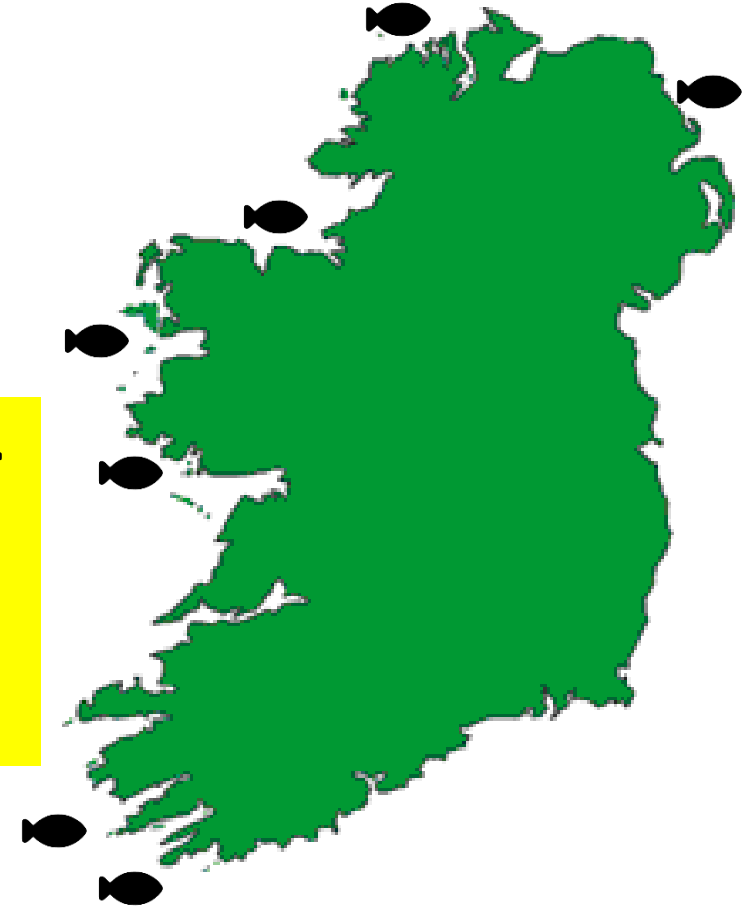
Susie Mitchell

Pharmaq Analytiq

# Atlantic salmon – 2022 S0 / 2023 S1 generation

- Small organic industry in Ireland
- 12 inputs – 6 S0, 5 S1 and one mixed S1 / S0 site
- Some movements so 14 sites in use over generation
- Number of fish to sea: 5 million
- Main health challenges:
- **Piscirickettsiosis**
- **Tenacibaculosis**
- Gills (severe AGD, jellyfish, algal blooms,
- **Cardiomyopathy syndrome**
- **Salmonid alpha virus infection**

Best year for  
lice in 20  
years!





# SAV in 2023 generation

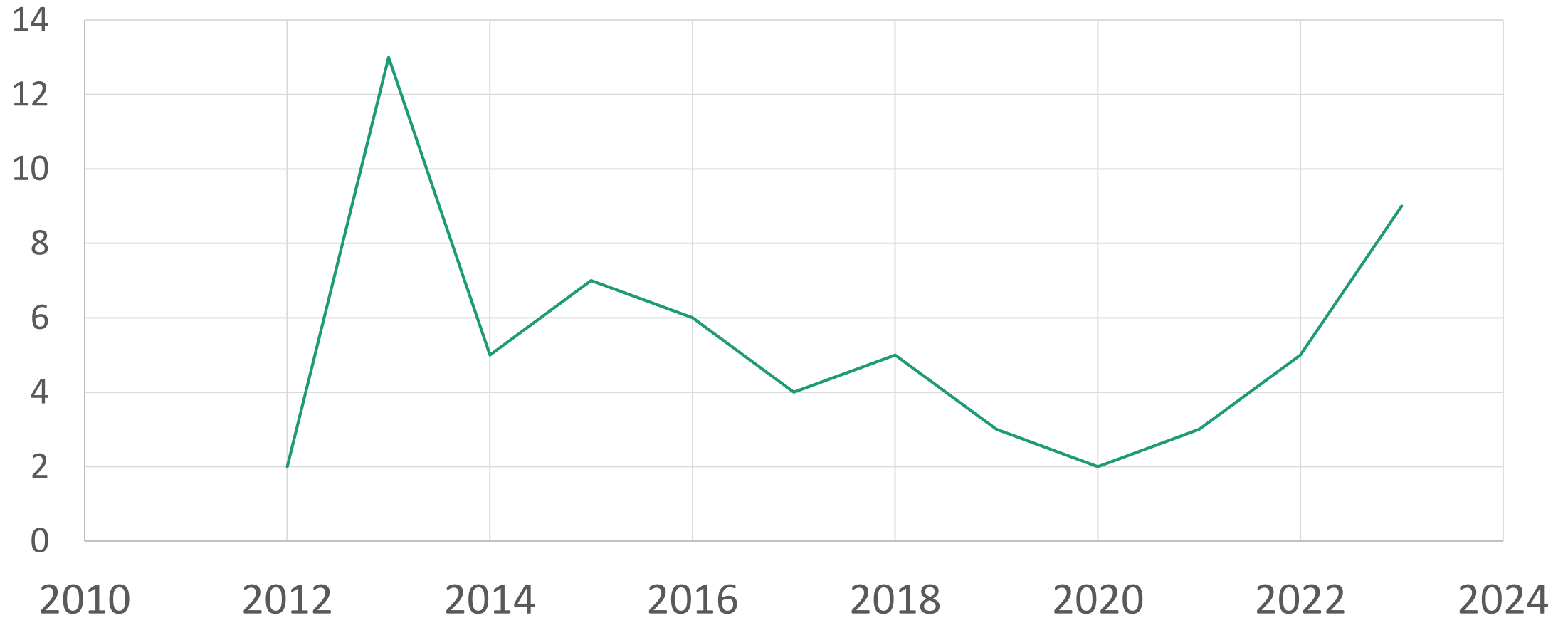
- 9 / 12 were confirmed SAV positive
- Two subtypes identified this generation – SAV 1, and one site with SAV 4
- Very difficult to classify mortalities accurately as so many concurrent diseases – in particular AGD and Piscirickettsiosis

Low	Medium	High
6	1	2

- What was the TRUE impact of SAV?

Mortality class:  
Low: <2%  
Moderate: 2 – 10 %  
High > 10%

# Average % mortality to SAV in Ireland – 10 years





# SAV Vaccination

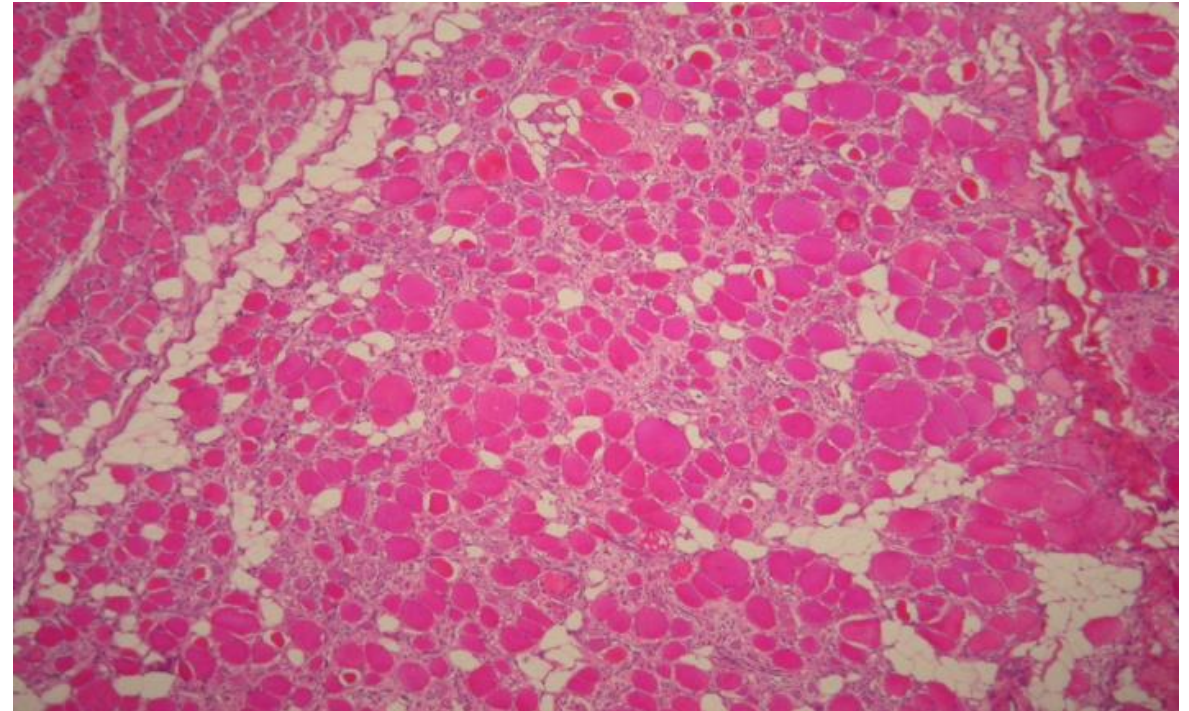
- 9 / 12 sites vaccinated for SAV
- Three different SAV vaccines used
- Recombinant DNA vaccine performed best
- Confounding factors?..

PD impact vaccinated fish	PD impact unvaccinated fish
No SAV – 2 Low – 2 High – 2	No SAV – 1 Low - 1 Moderate – 1



# Clinical presentation of SAV in 2023

- Increased cases presenting with significant muscle pathology
- Increased presentation of poor-doers / PD runts
- Why? Vaccination effect?
- Change in tropism of virus?
- Less dramatic cardiac pathology observed
- Pancreatic pathology similar – mostly just loss of active acinar and some peri-pancreatic infiltration





# Sampling strategies used to assess SAV in Ireland

## Widespread use of blood sampling for virus neutralisation and serology

- All sites use both for initial detection and also to track progress of infection through different pens on site

## Histology

- Initial confirmation and assessment of severity of impact over infective period

## CPK Levels

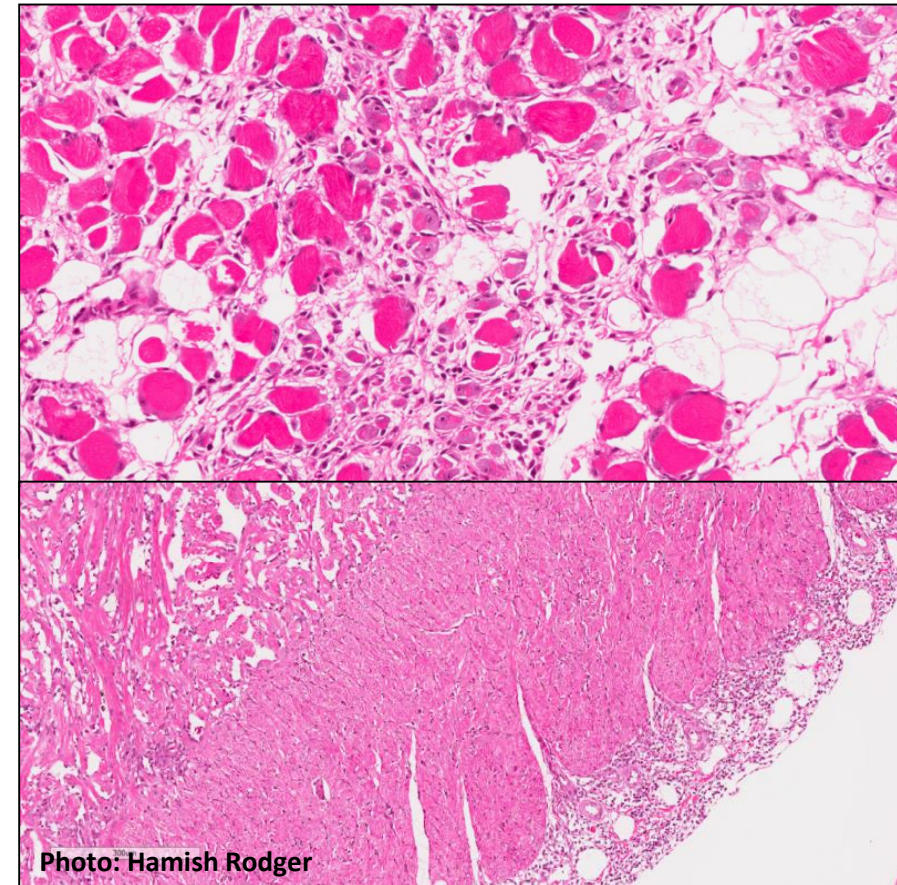
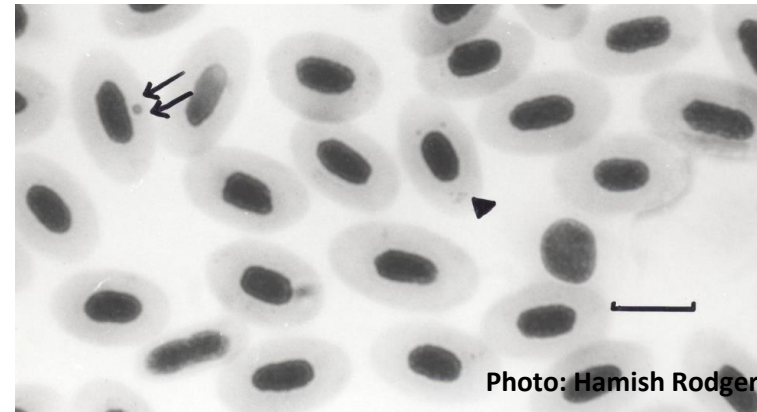
Occasionally use to assess severity of muscle pathology



# PRV in Ireland & HSMI



- Piscine reovirus very widespread in Ireland
- Generally PRV viral load is low
- Still only one outbreak of clinical HSMI identified to date (2015)
- Mortality was low on affected site (<2%)
- Have seen some heart pathology in same site since but no muscle pathology
- Other sites - Non-specific mild heart pathology in fish with PRV is frequent finding – coincidental or cause?







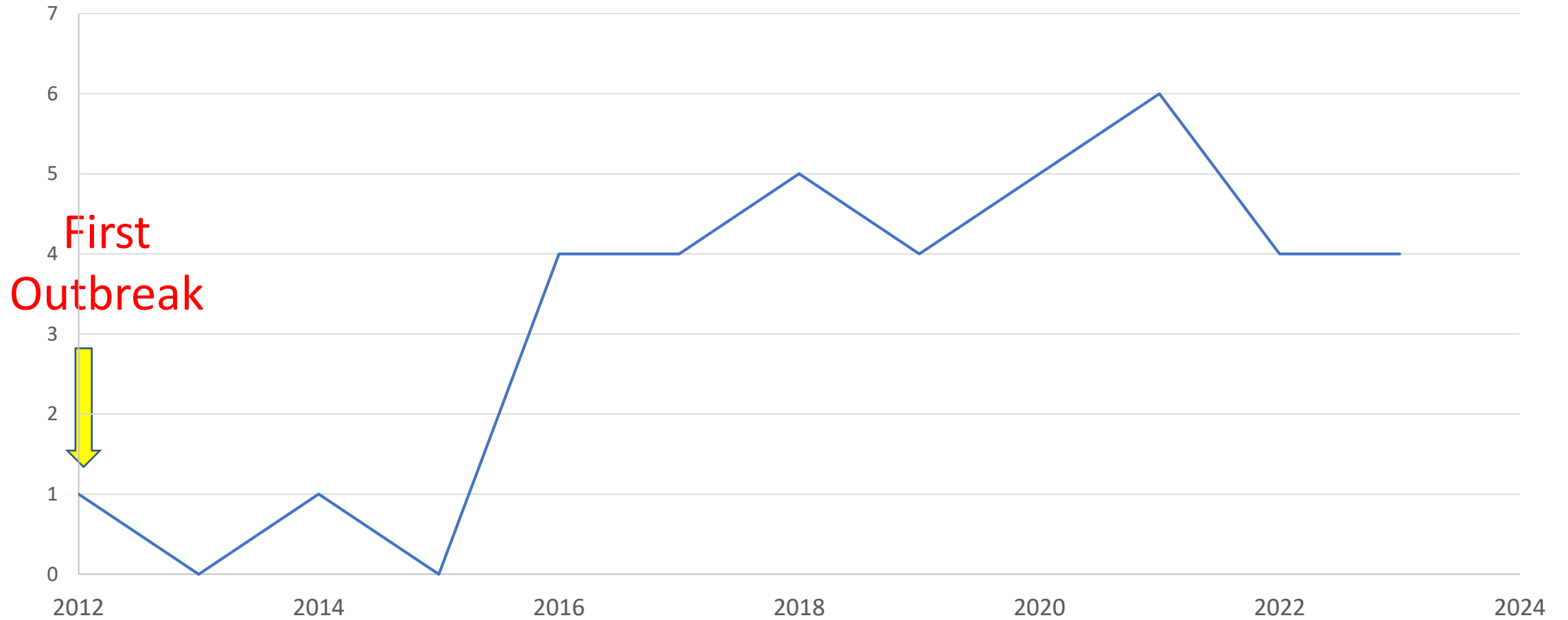
# CMS in 2023 generation

- 2023 - very few significant clinical outbreaks
- Occasional fish with clinical signs developing on positive sites
- Age cohorts affected currently just harvest sized fish

2023 fish - PMCV detected	Percentage mortality
4 / 12 fish inputs	Impact is currently low – very few clinically affected fish

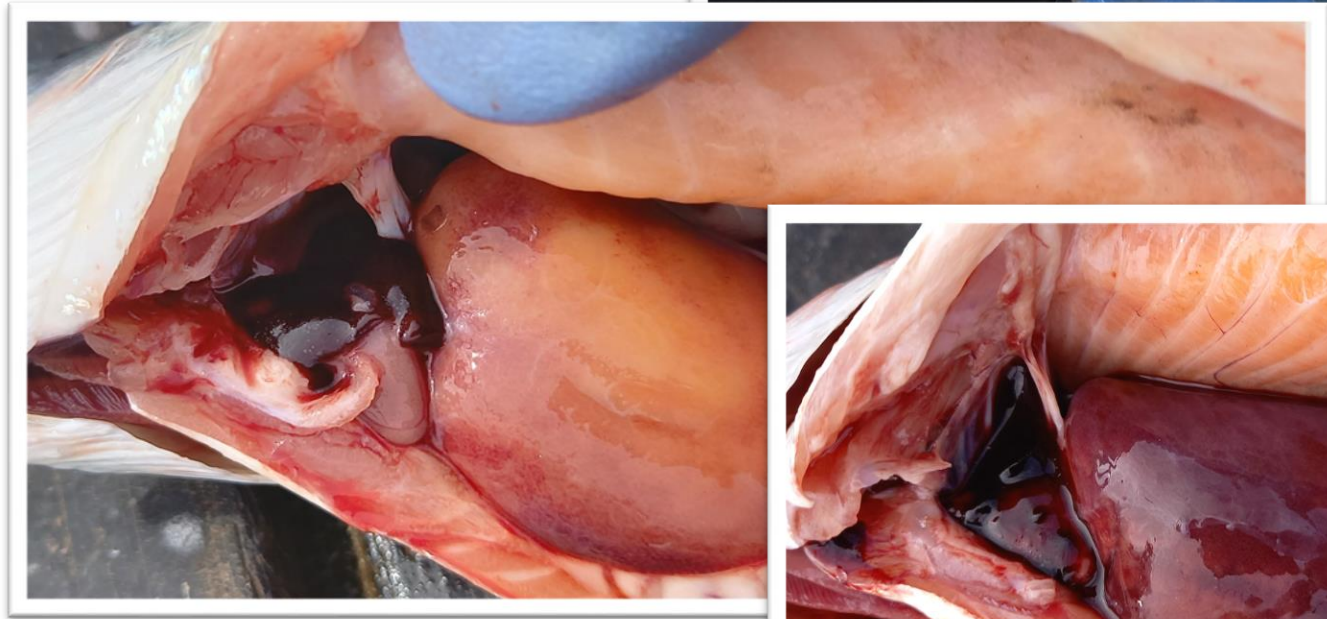
# CMS outbreaks since 2012

30% of sites affected



# Clinical presentation - Ireland

- Initially CMS affected harvest size fish only
- 2016 onwards – fish from 4 months post transfer
- Younger fish often had more acute presentation
- In last two years the picture has reverted to older fish
- Why?



# Epidemiology of CMS in Ireland

- Virus is usually detected in several pens on affected sites BUT only get clinical CMS developing in certain pens
- Once it becomes clinical, mortalities tend to be ongoing until harvest
- Clinical signs and histopathology seem to be correlated with viral load
- Mortality levels fluctuate and increase with any stress e.g. handling or strong tides
- No real evidence of any recovery in affected fish



# CMS in Ireland – Management strategies



- Accept that when CMS is present on site it is likely that early harvest will be a reality, therefore the plan involves:
  1. Regular monitoring of viral loads
  2. Quantifying severity of clinically affected fish
  3. Identifying when CMS - specific mortality becomes an issue
- When pens become clinically affected with significant increased mortality expedited harvest proceeds
- This is on a pen-by-pen basis – allows maximum growth of fish with minimum losses due to CMS mortality
- Selective breeding of resistance to CMS
  - genetic marker for CMS resistance
  - Mowi will have 1<sup>st</sup> generation CMS resistant fish going to see this year
  - Anecdotal evidence that there is a significant decrease in clinical effects and mortality in infected fish

# CMS - knowledge gaps?



- Better understanding of the epidemiology of disease
  - How can we minimise the clinical impact during an outbreak?
  - What is the true risk posed by vertical transmission?
- No effective treatments or vaccines
- What effect will selective breeding for CMS resistance have?
- Would it be more beneficial to breed for general robustness and resultant disease resistance?
- A lot of other new disease challenges out there..



**TRINATION**

Bacterial diseases of salmonids

# Questions?



Thanks to the following companies:

Mowi Ireland

Bradan Beo

Mannin Bay Salmon Company

Curraun Blue

Ocean Farm Ltd.

Glenarm Organic Salmon Ltd.

