

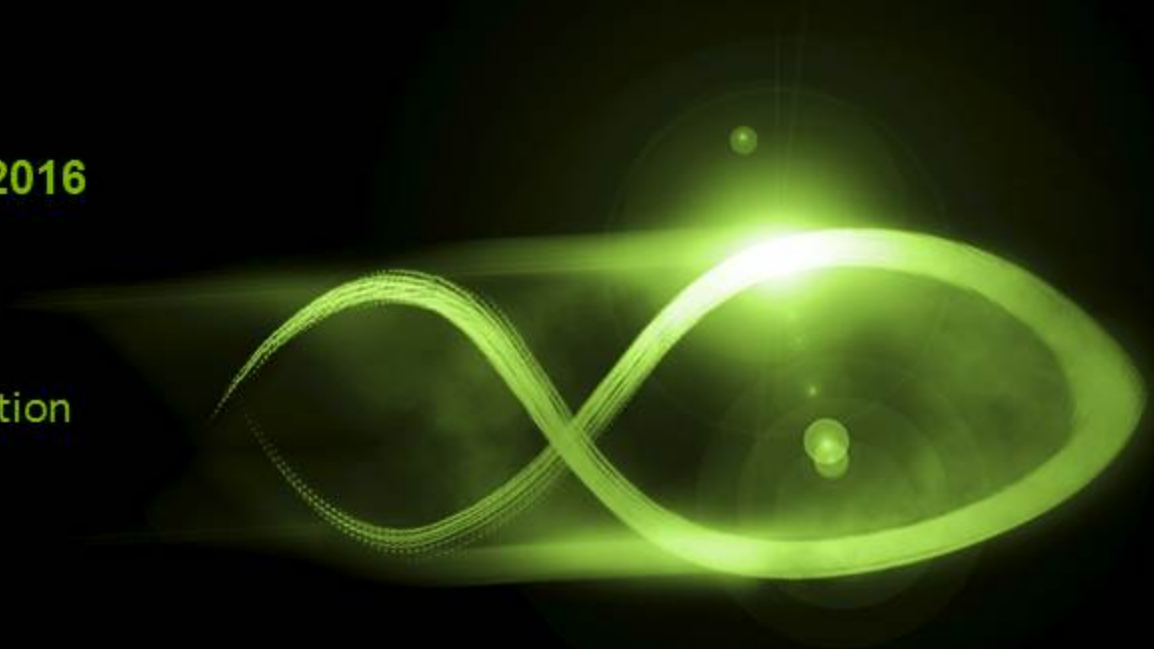
Rainbow trout, a risk for PD in Atlantic salmon?

PD TriNation

12th and 13th October, 2016

Rodrigo Belmonte

MSD Animal Health Innovation

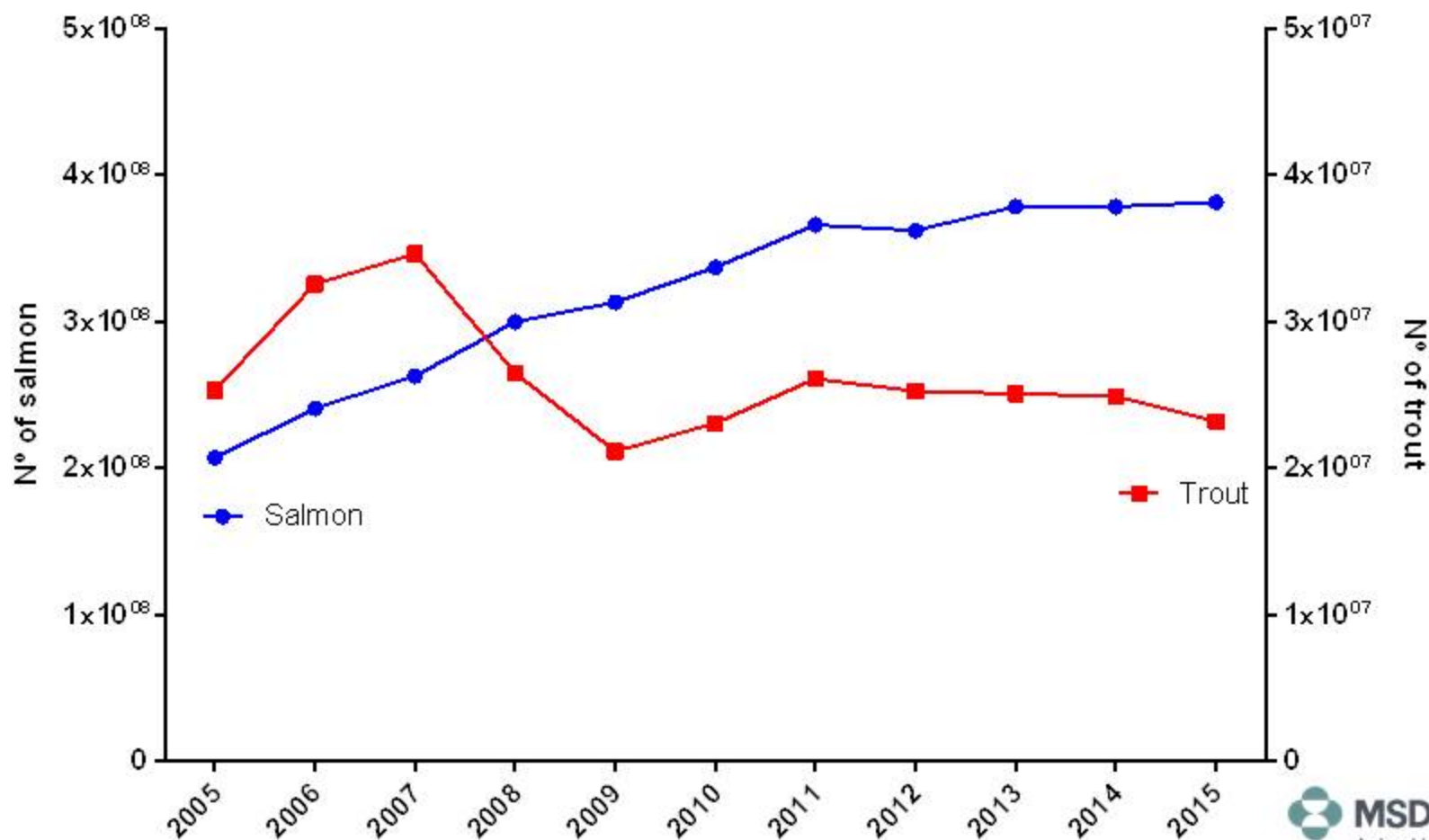


Salmonid farming in Norway



Salmonid farming in Norway

Norwegian salmonid production



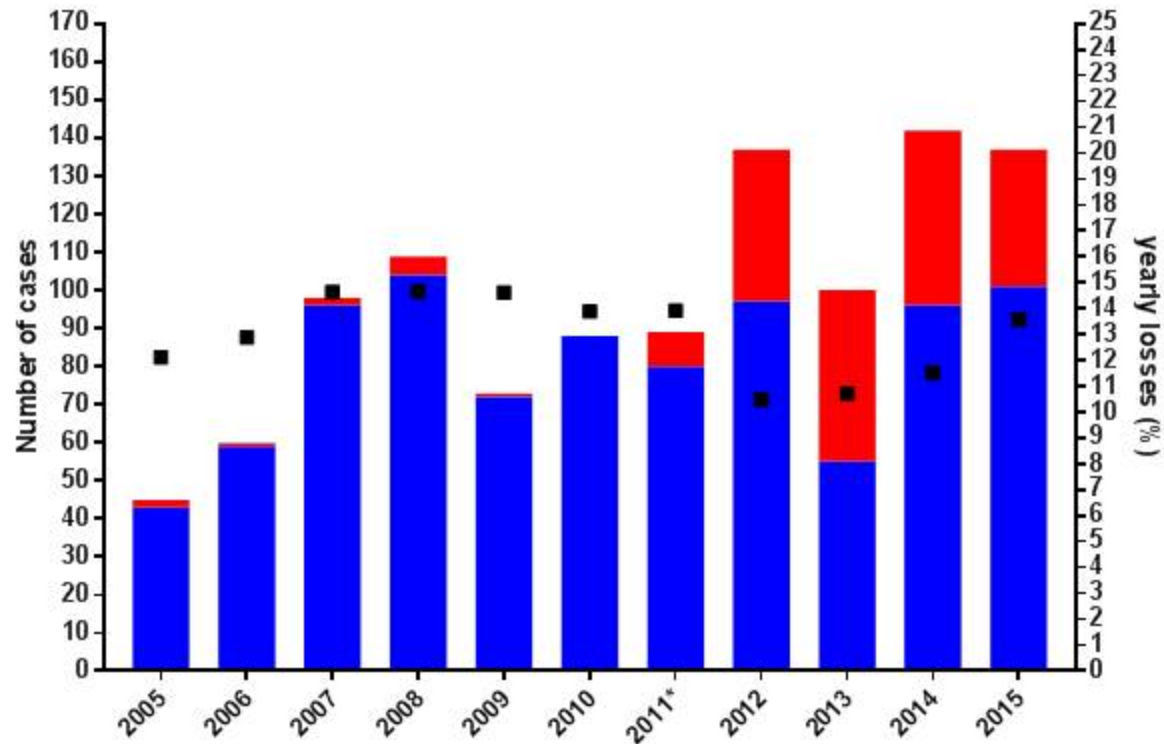
Pancreas disease (PD)



- **SAV infects both rainbow trout and Atlantic salmon in the sea-water phase.**
- **Both rainbow trout and Atlantic salmon develops the same disease (PD) but rainbow trout appears to develop less severe clinical disease.**
- **Outbreaks occur majority during summer and autumn.**
- **Several studies point out that water contact to an infected site is the major factor for transmission.**
- **Challenge pressure level affects severity of disease**

PD in Norway

PD cases in Norway + losses

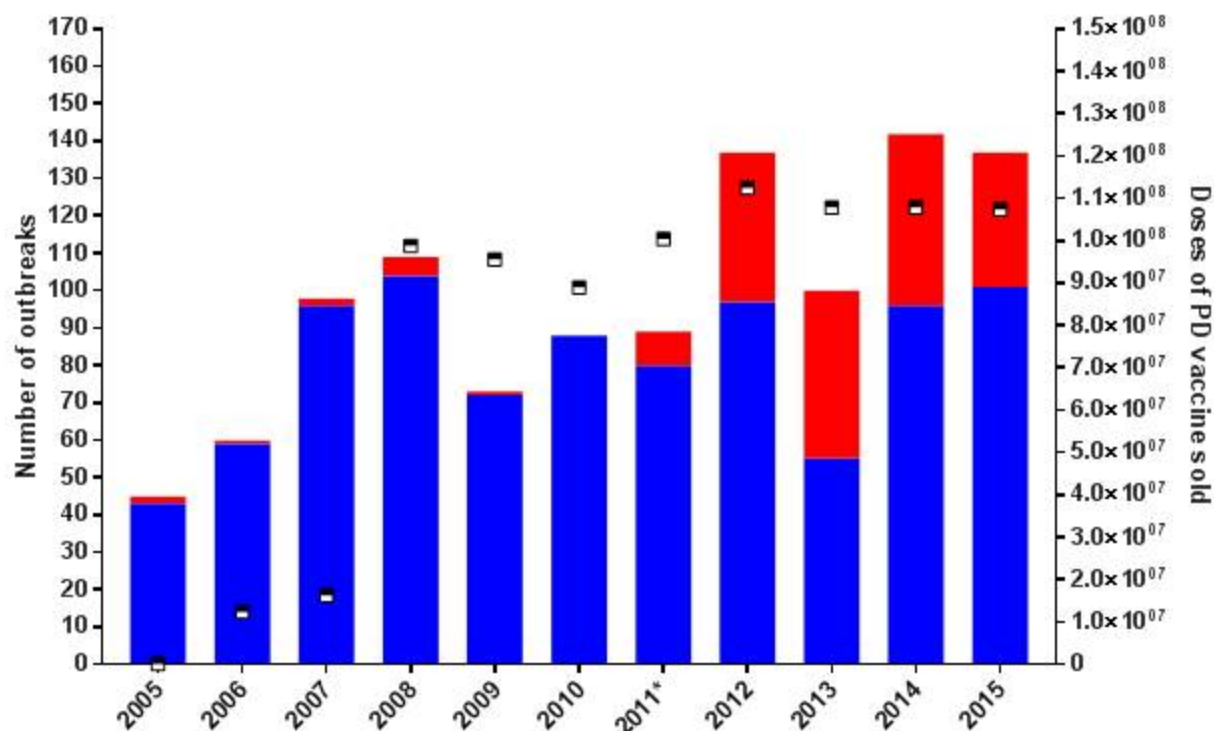


- South of Hustadvika [PD vaccination]
- North of Hustadvika [no PD vaccination]
- Total salmon losses (%)

* 2011 data is an estimate based on the Fiskehelse rapporten 2012

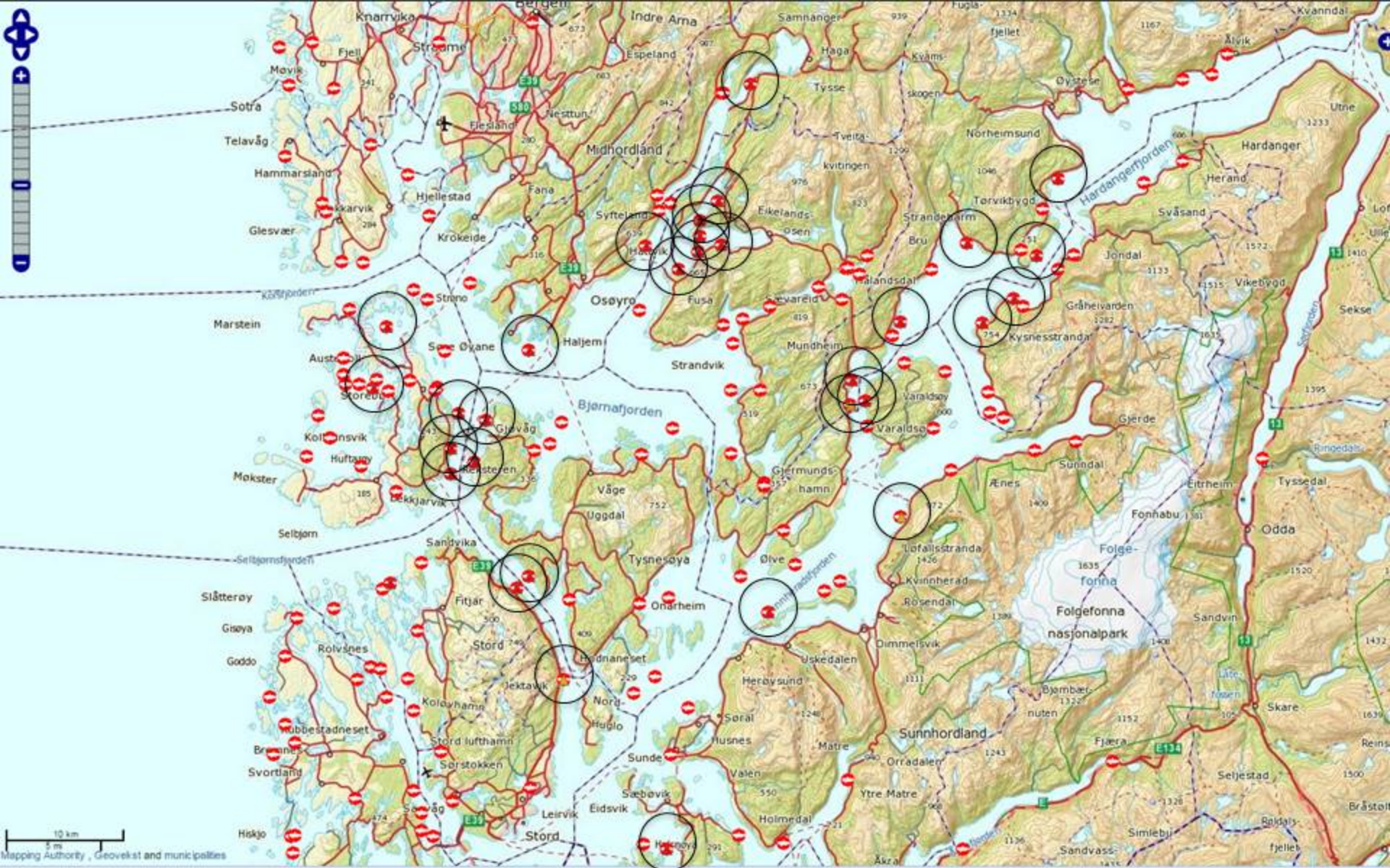
PD in Norway

PD cases in Norway + PD vaccination







- South of Hustadvika [PD vaccination]
- North of Hustadvika [no PD vaccination]
- Doses of PD vaccine sold

* 2011 data is an estimate based on the Fiskehelserapporten 2012



PD situation as of 25th August 2016

-  Salmon or trout farm
-  Suspected PD case
-  Confirmed PD case
-  5 km diameter

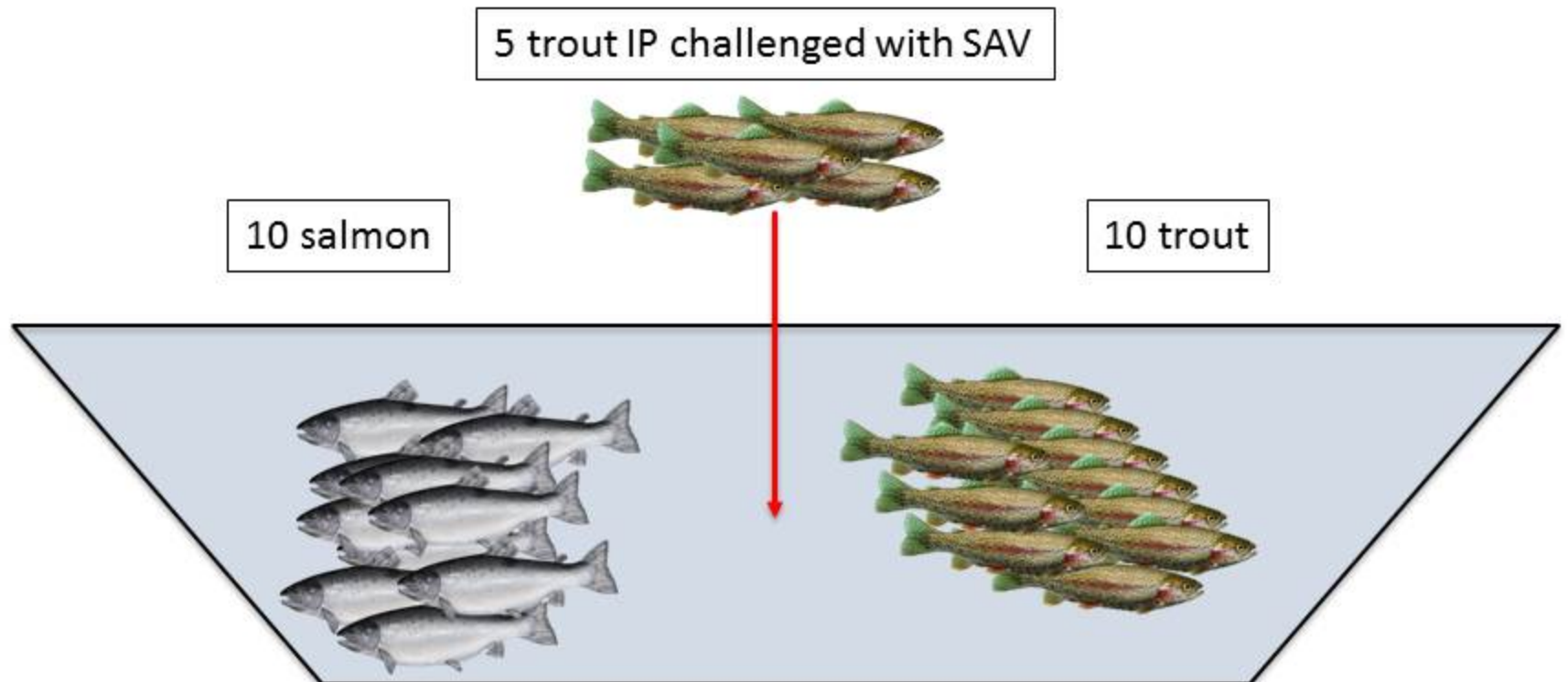
Key points

- **Almost all the Atlantic salmon in the endemic zone are vaccinated**
- **Rainbow trout are not vaccinated against PD**
- **Trout are farmed in close proximity to salmon**
- **In some regions trout farms represent 20% of total farms**

Is there a risk of transmission?

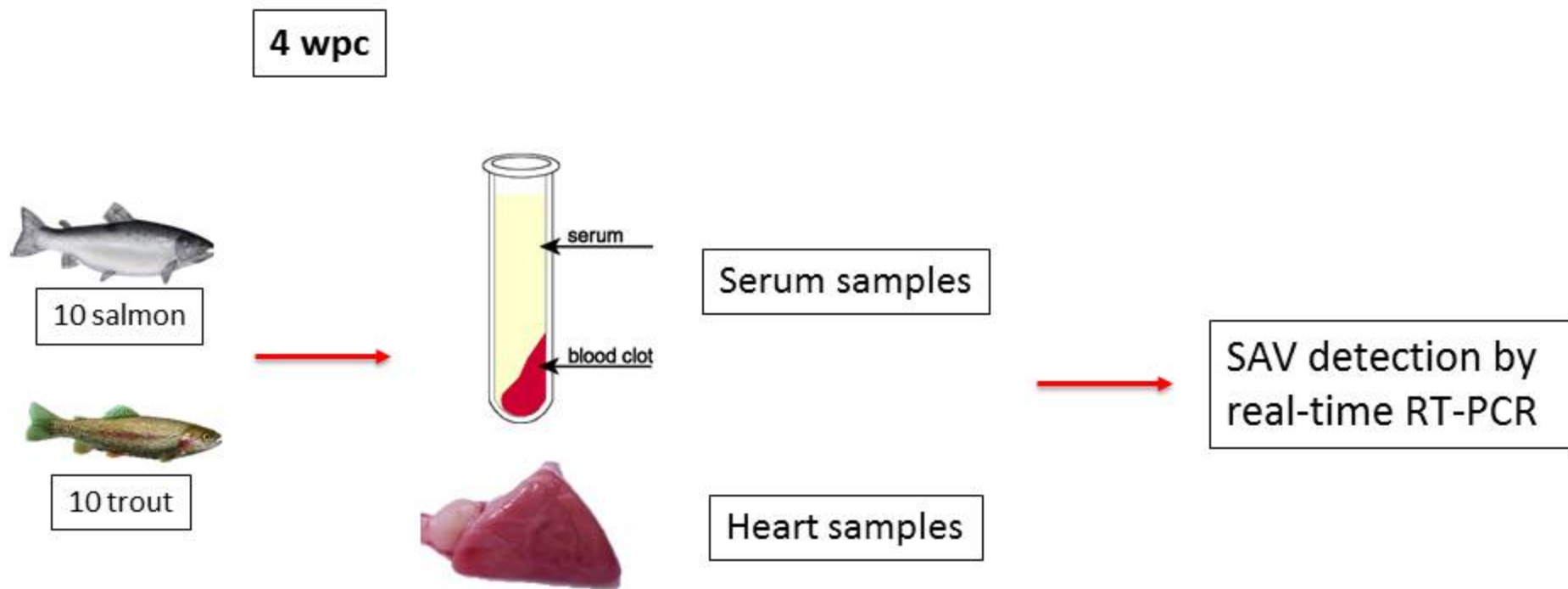
Transmission of SAV from trout?

Experimental set-up



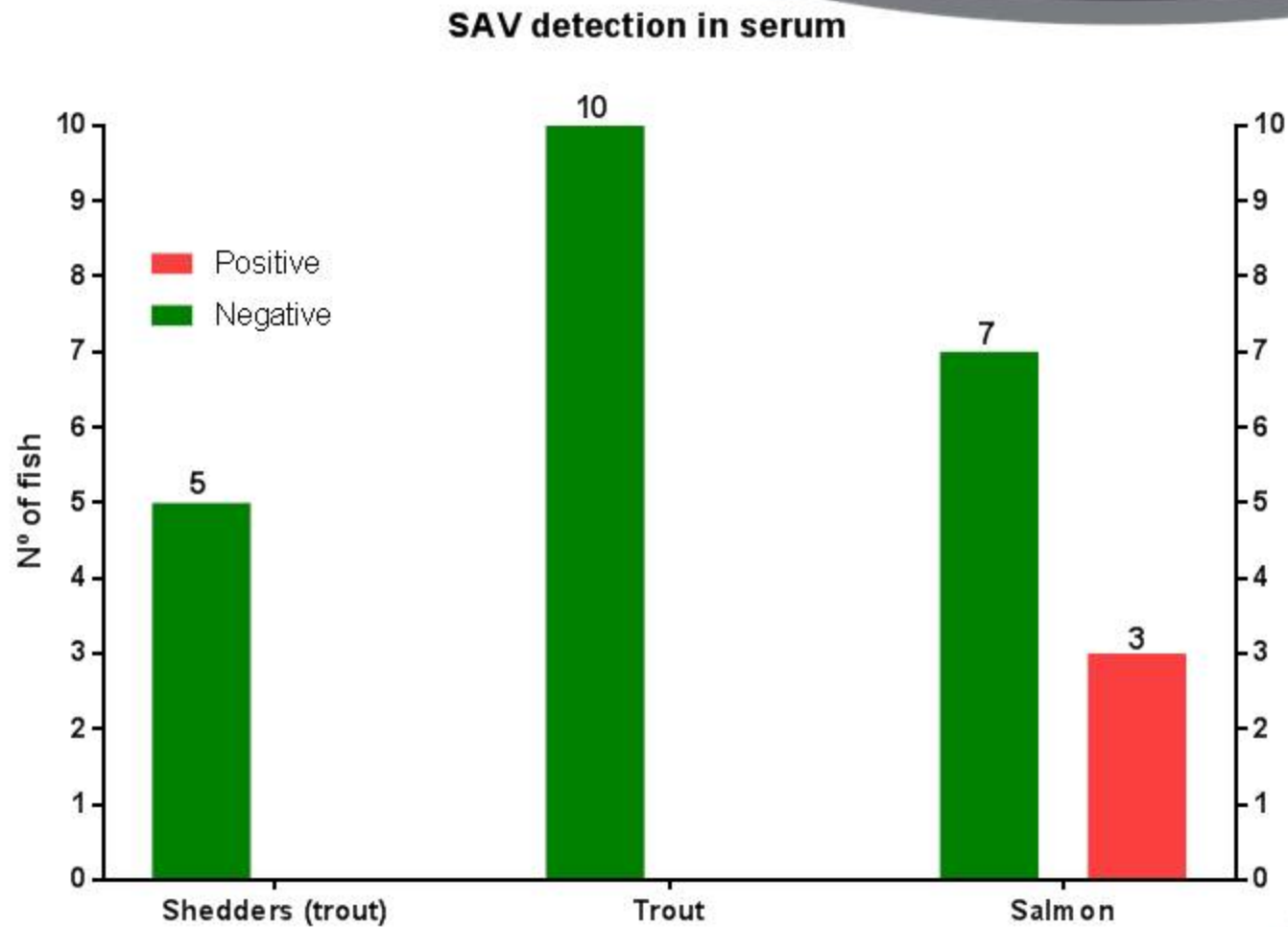
Transmission of SAV from trout?

Experimental set-up



Transmission of SAV from trout?

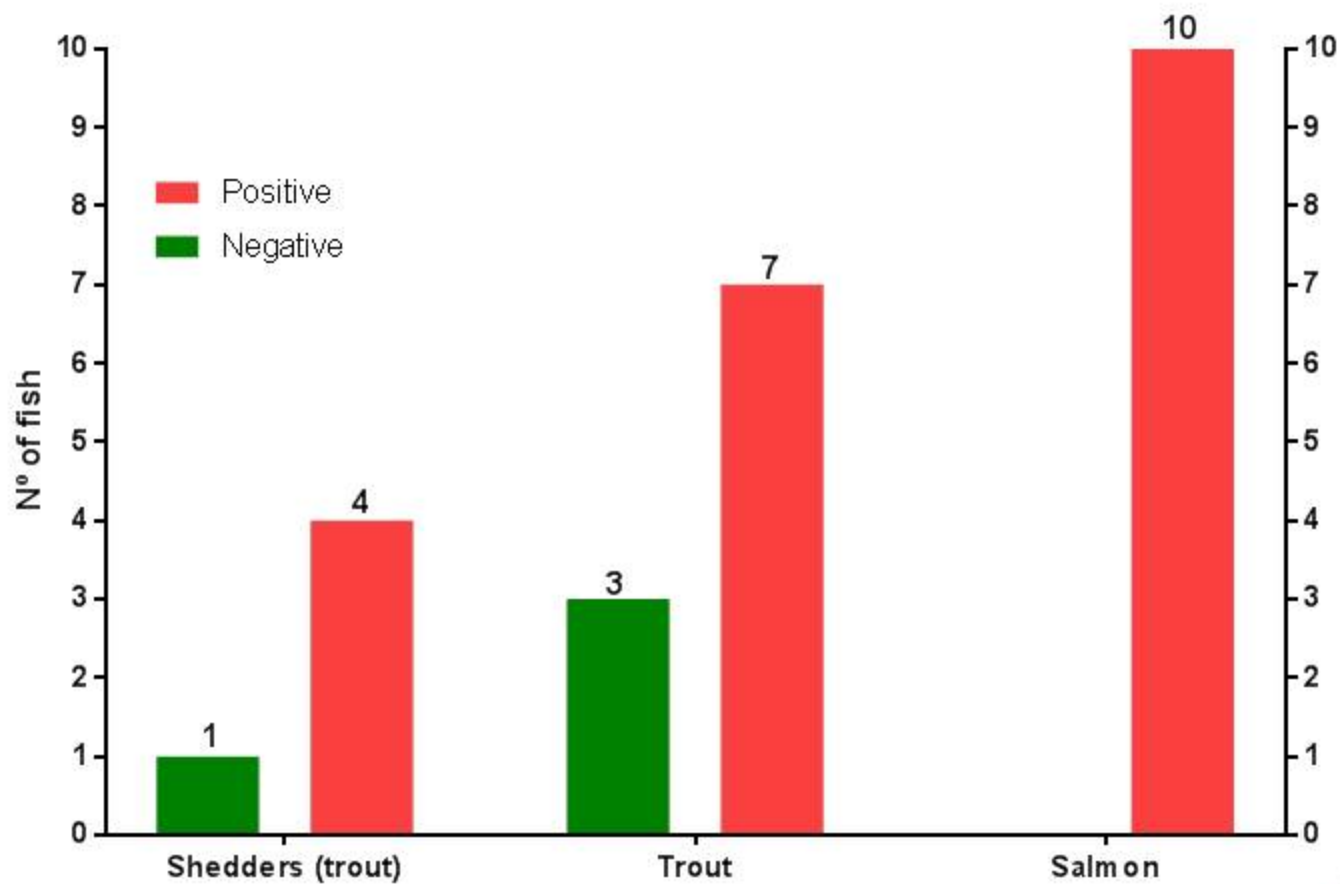
Detection of SAV in cohabitants



Transmission of SAV from trout?

Detection of SAV in cohabitants

SAV detection in heart



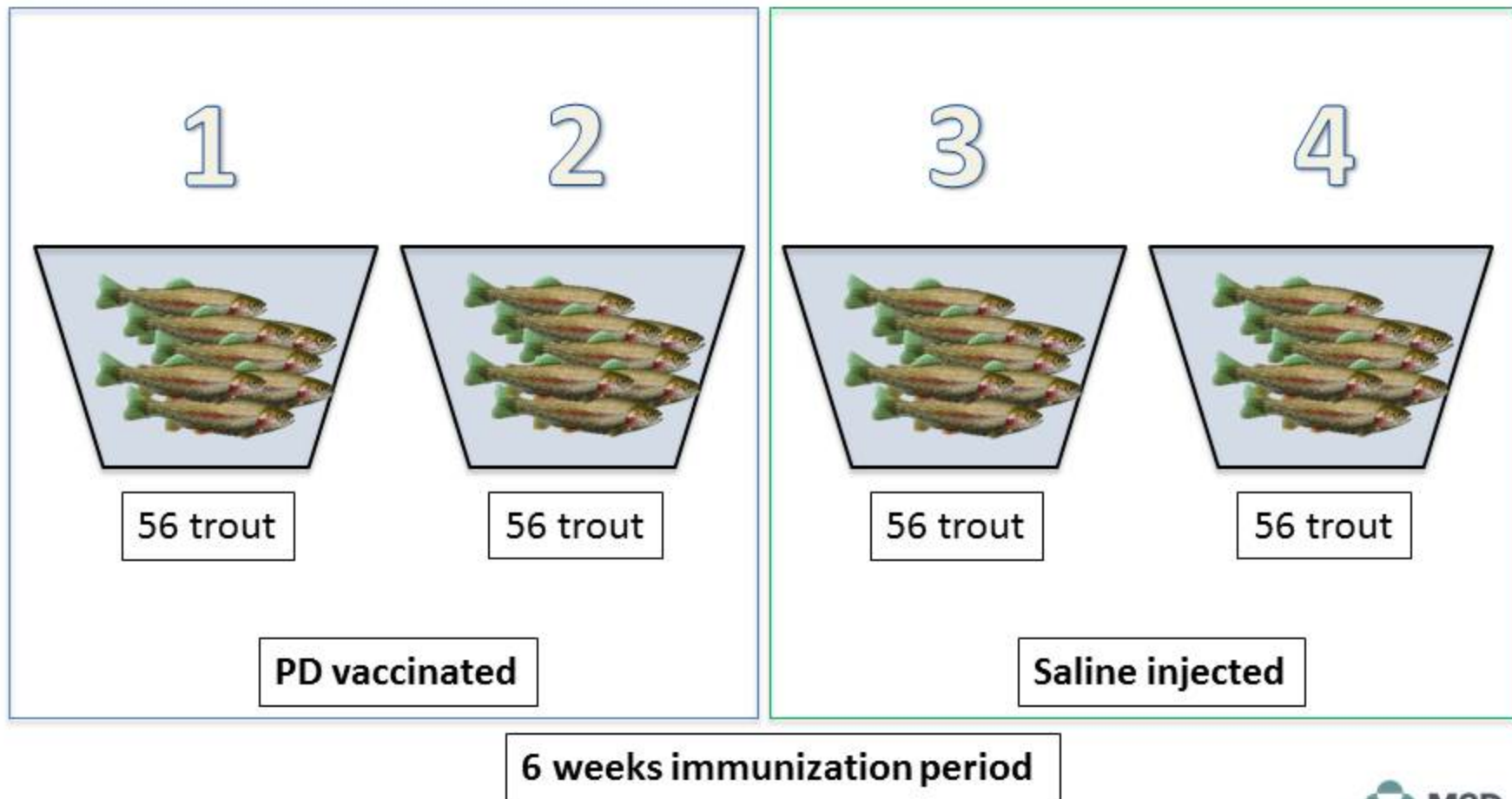
Transmission of SAV from trout?

Conclusions

- **At 4 wpc SAV is detected in the serum of salmon**
- **At 4 wpc SAV is detected in the heart of salmon and trout**
- **IP infected rainbow trout can transmit SAV to rainbow trout and to Atlantic salmon.**

PD vaccination in rainbow trout

Effect on viral shedding



PD vaccination in rainbow trout

Effect on viral shedding

Water filtration



SAV detection by
real-time RT-PCR

All fish
challenged by
IM injection of
SAV

Water sampling from each tank

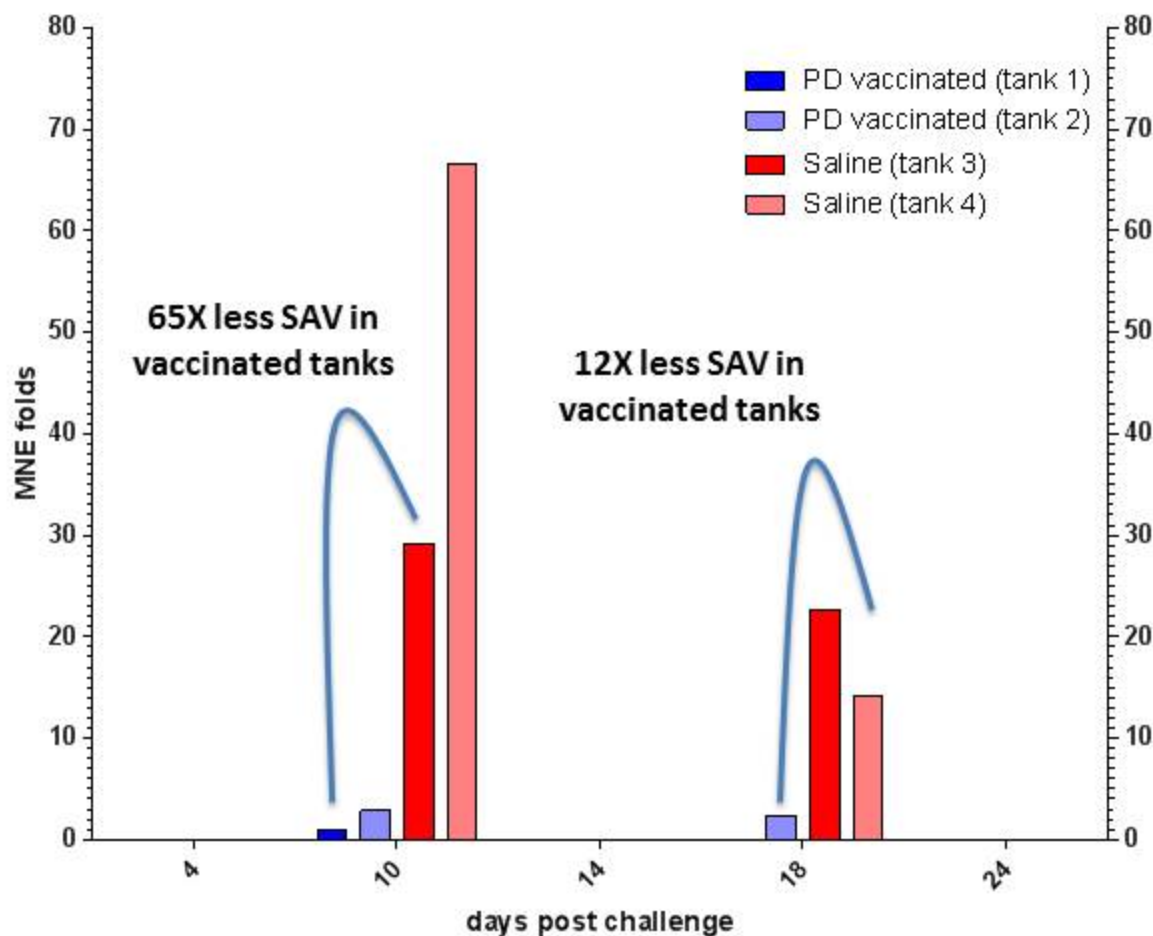
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26

Days post-challenge

PD vaccination in rainbow trout

Effect on viral shedding

SAV detection in tank water



Conclusions

- **Experimentally infected rainbow trout can transmit SAV to rainbow trout and to Atlantic salmon.**
- **PD vaccination reduces the shedding of SAV from experimentally infected rainbow trout (up to 65X reduction at 10 dpc and 12X at 18 dpc).**
- **SAV-infected rainbow trout should be considered a risk factor to neighbouring farms.**

MSD Animal Health

THERE'S
ONLY ONE
THING THAT
DRIVES US



“The Science of Healthier Animals”