CMS –What are our options for control?

Britt Bang Jensen

TriNation

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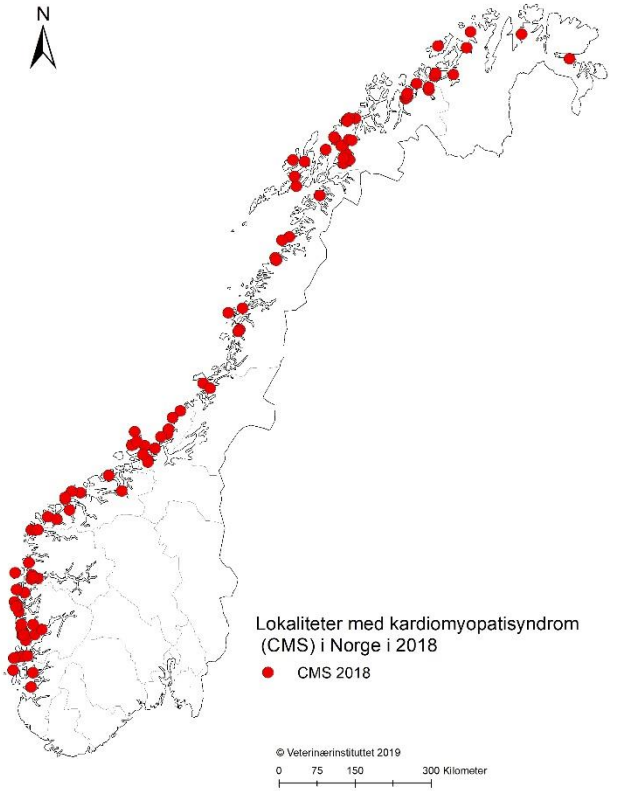
Setting the stage

- CMS = The most important infectious animal disease in Norway
- Total mortality and morbitdity unknown, but:
  - A total of 46.000.000 salmon reported dead in 2018.
  - A great part (perhaps 70%) due to disease
  - More than 100 farms effected each year



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So what to do?

- Understand transmission and infection
- Recommendations for control

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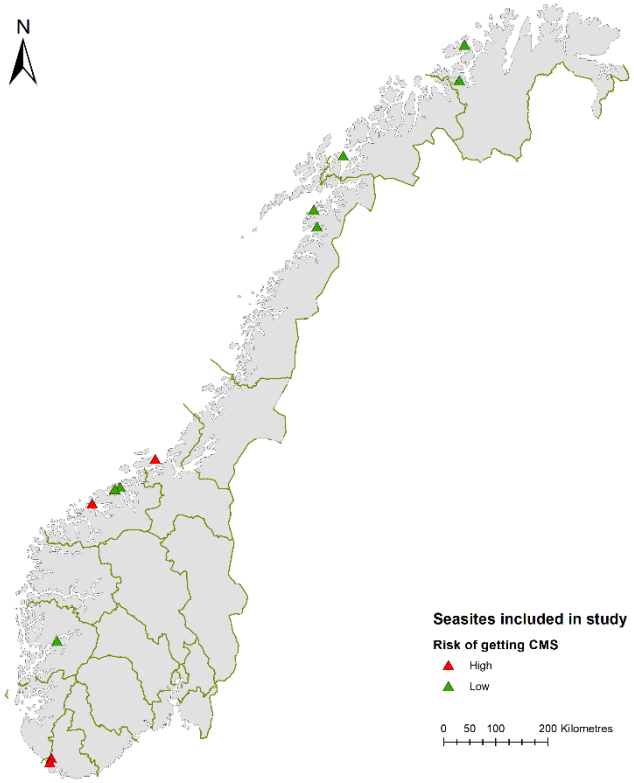
Understanding infection -In the field

- 12 seasites -25 cages
- From areas with very low to very high prevalence of CMS
- Followed every/every other month from seatransfer to slaughter
- PCR for PMCV of 30 fish +histo if suspiscion of clinical disease



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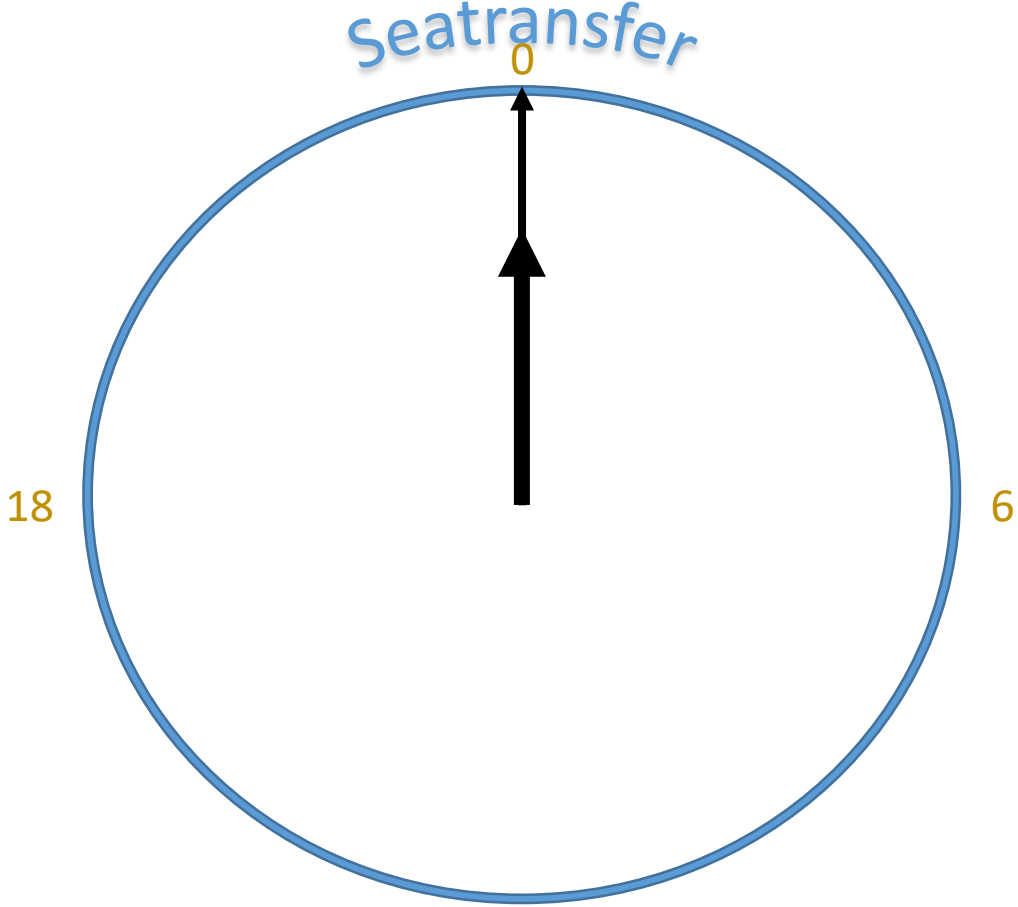

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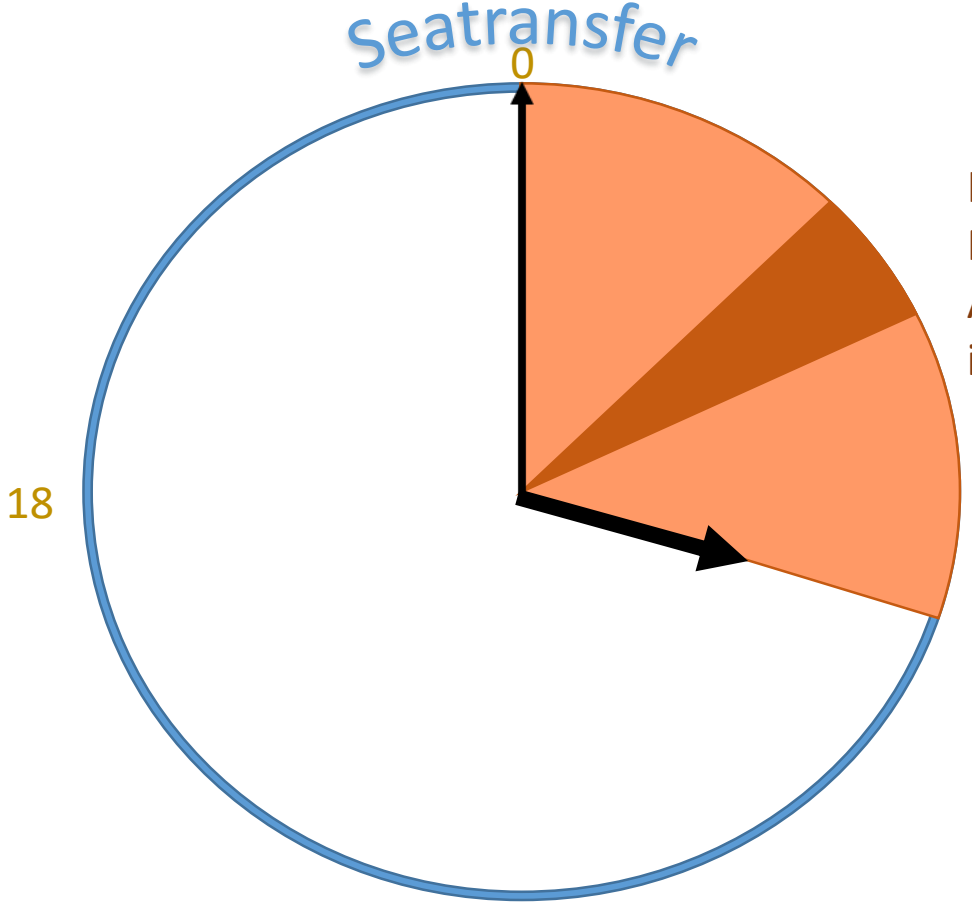

Infection with PMCV:
All seasites got infected

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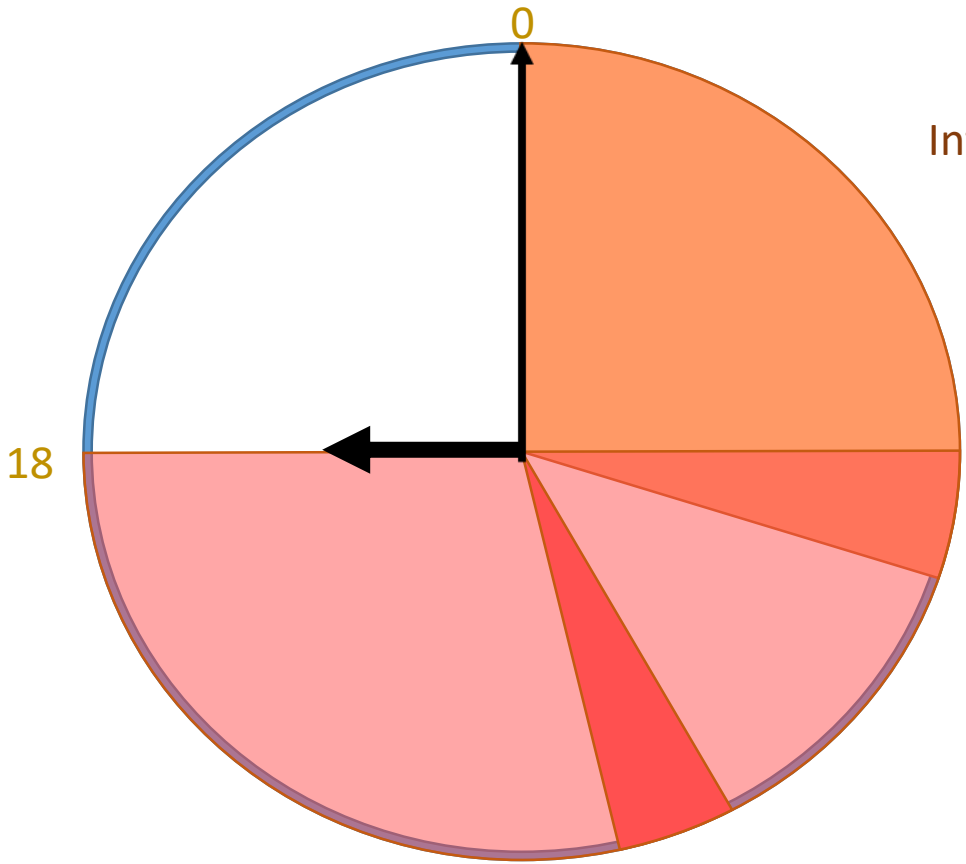

Infection with PMCV

Clinical CMS:
6/12 seasites

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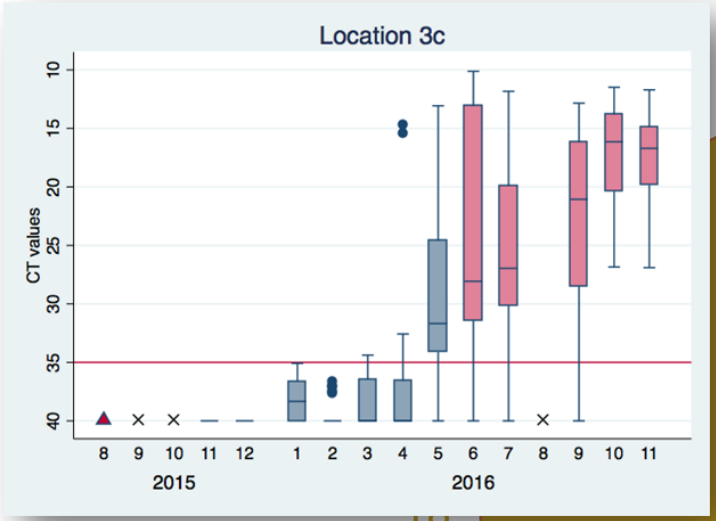
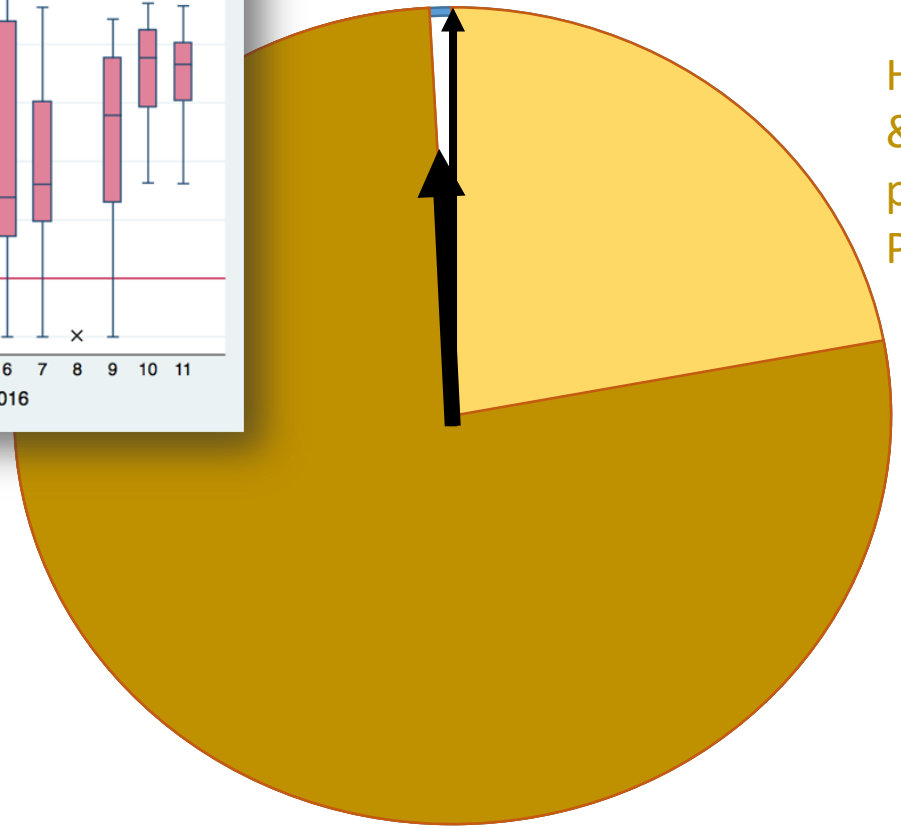


Slaughter

24



High ct-values & low prevalence of PMCV

6

Low ct-values & high prevalence of PMCV

12

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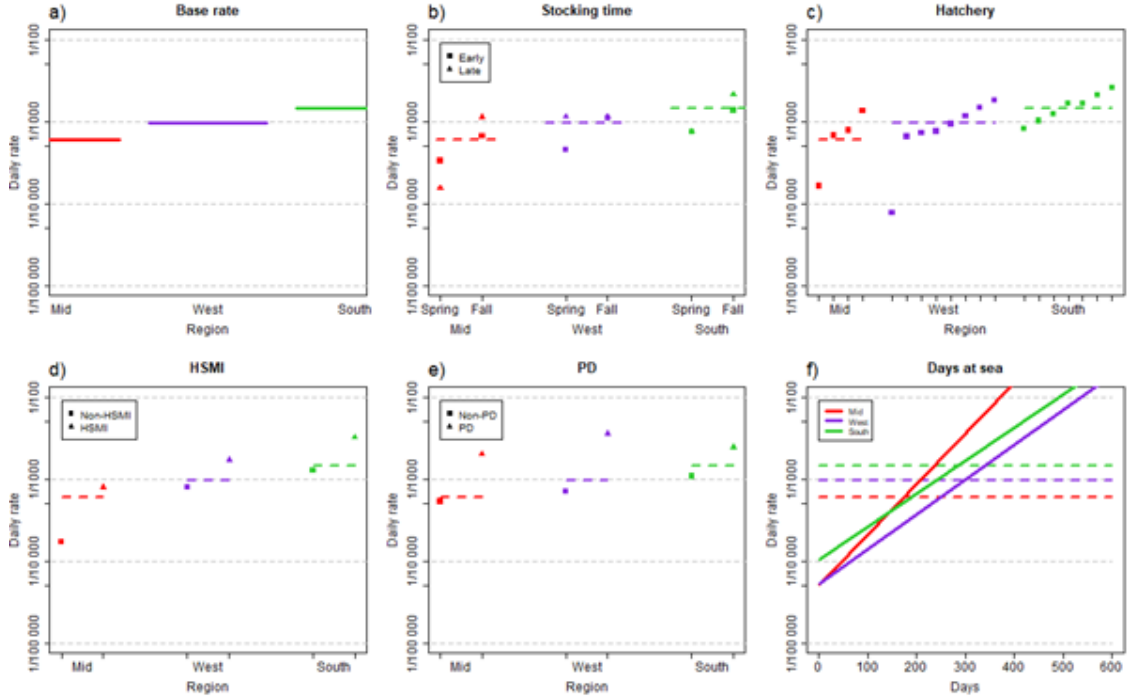
Why does only some get CMS?



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Transmission routes?

- Transmission between fish established in experiments and observed in field
- Transmission between farms also established (Bang Jensen et al. 2013)
- What about from broodstock to smolt?

The case for (or against?) vertical transmission of PMCV

Britt Bang Jensen
Norwegian Veterinary Institute

CMS-workshop, March 13-15., Bergen

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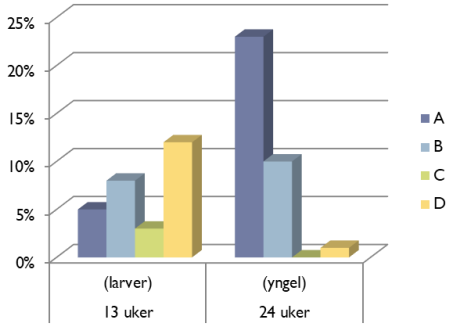

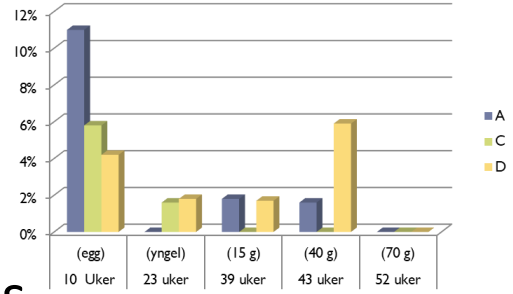

- Indications of a possible route:
  - High prevalence in broodstock
  - PMCV found in progeny at different stages
  - PMCV found in smolt immediately after seatransfer

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So –options for controlll?

KEEP
CALM
AND
STAY IN
CONTROL

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Screening -> Early detection?

- Half the seasites developed clinical CMS – The rest remained «healthy»
  - Prevalence of PMCV much higher than CMS
  - What is the true prevalence of PMCV and CMS?
- Time from infection varied from 3 to 13 months
  - Detection of PMCV does not indicate disease development

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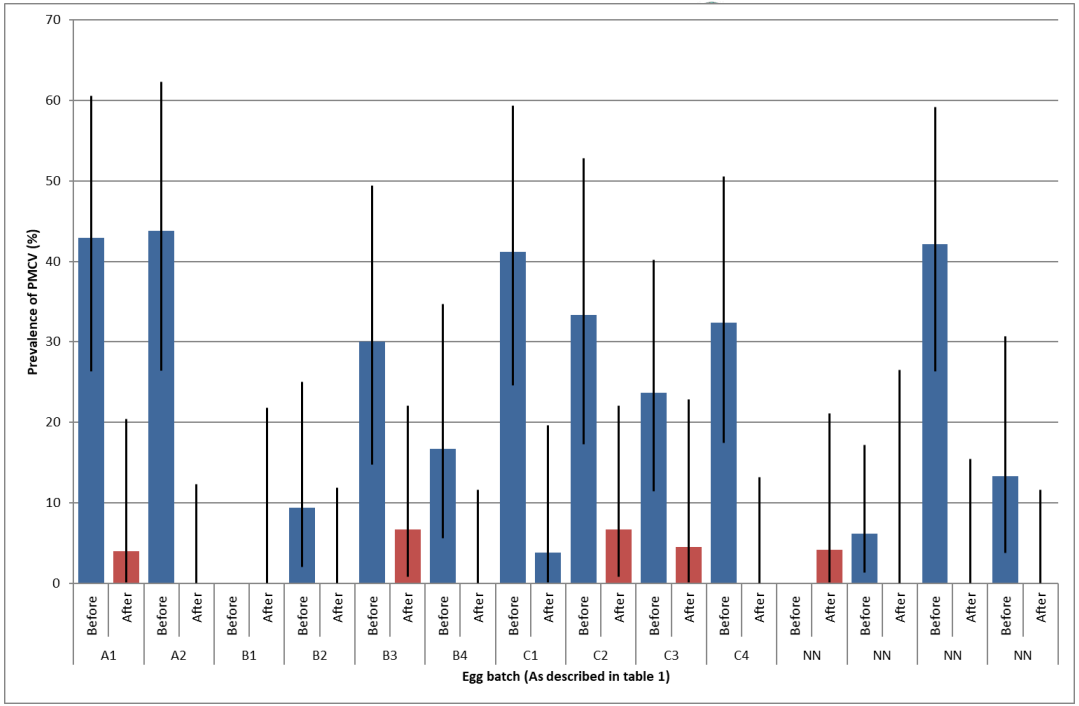
Breaking the transmission chain

- Disinfecton of eggs
  - Best practice?



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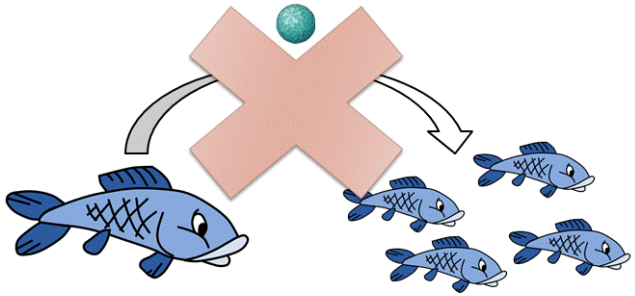
Breaking the transmission chain

- Disinfecton of eggs
  - Best practice?



- Selection of broodstock without PMCV or low prevalence
- Control with PMCV in freshwater phase

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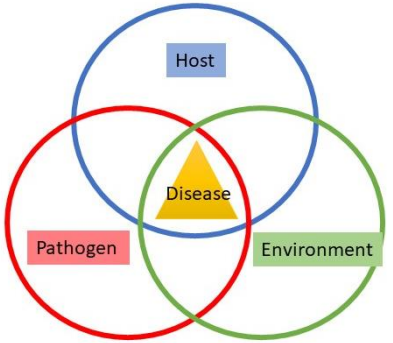
Other options for control

- PMCV was detected through to slaugther
    - Indications of persistent infection
    - To be considered with regards to transportion and slaugther
- Use of CMS-resistent fish (QTL-eggs commercially available)
- Vaccination…..?
- Understanding disease triggers



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References

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REVIEW

WILEY Journal of Fish Diseases

Cardiomyopathy syndrome in Atlantic salmon *Salmo salar* L.: A review of the current state of knowledge

Å H Garseth[1] | C Fritsvold[1] | J C Svendsen[1] | B Bang Jensen[1] | A B Mikalsen[2]

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ORIGINAL ARTICLE

WILEY Journal of Fish Diseases

Monitoring infection with *Piscine myocarditis virus* and development of cardiomyopathy syndrome in farmed Atlantic salmon (*Salmo salar* L.) in Norway

Julie Christine Svendsen[1] | Stian Nylund[2] | Anja B. Kristoffersen[1] | Harald Takle[3] | Julia Fossberg Buhaug[4] | Britt Bang Jensen[1]

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ORIGINAL ARTICLE

WILEY Journal of Fish Diseases

Indications for a vertical transmission pathway of piscine myocarditis virus in Atlantic salmon (*Salmo salar* L.)

Britt Bang Jensen[1] | Stian Nylund[2] | Julie Christine Svendsen[1] | Paul-Martin R. Ski[3] | Harald Takle[4]

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