



Veterinærinstituttet
Norwegian Veterinary Institute

A field evaluation of diagnostic tests for SAV and PD

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Field Evaluation of Diagnostic Test Sensitivity and Specificity for Salmonid Alphavirus (SAV) Infection and Pancreas Disease (PD) in Farmed Atlantic salmon (*Salmo salar* L.) in Norway Using Bayesian Latent Class Analysis

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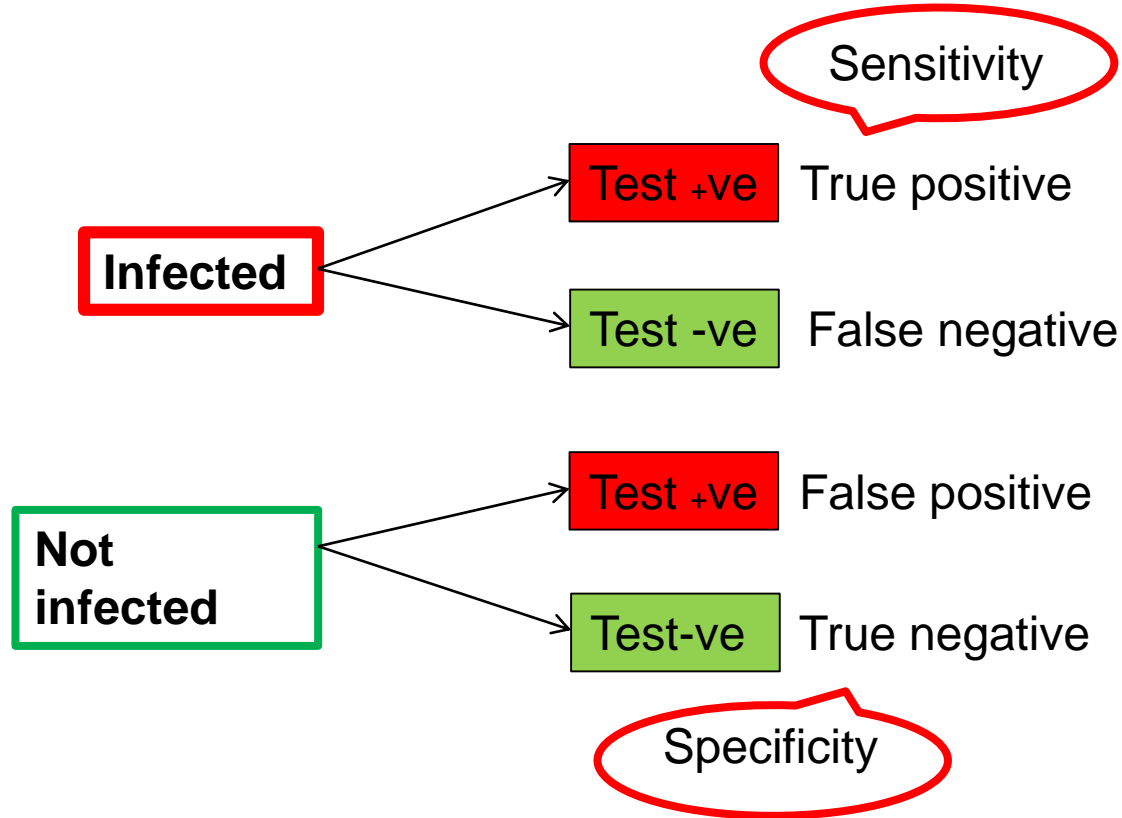
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Confidence in a test's ability
to correctly predict the
infection or disease status

OIE Reference laboratory



No diagnostic test is perfect



Diagnostic sensitivity/specificity



Image by M. Press

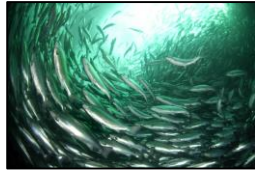
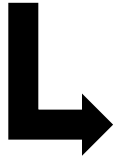


Image by E. Svendsen

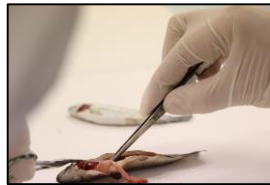
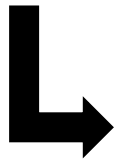
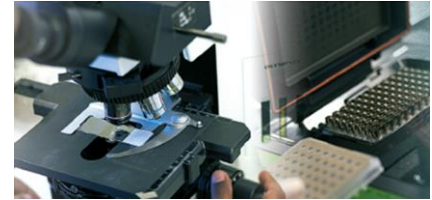


Image by H. Giske





Farm 1

Atlantic salmon

N-E Finnmark

1.5 million fish

2 kg

SAV negative



Farm 2

Atlantic salmon

Hordaland

1 million fish

1.6 kg

PD (SAV3) -
sampled same
month



Farm 3

Atlantic salmon

Møre og Romsdal

630 000 fish

1.5 kg

PD (SAV2) -
sampled after 4
months



Real-time RT-PCR

Isolation in cell culture

Virus neutralisation test

Histopathology

Immunohistochemistry

No gold standard -> Bayesian Latent Class Analyses (Open Bugs)



SAV infection status as informative priors for Site 1 and Site 2 prevalence.

Non-informative priors for Site 3 prevalence and test Se & Sp



Test type	Tissue or sample types	DSe	DSp
Real-time RT-PCR	Heart and mid-kidney	0.978	0.831
Isolation of SAV in cell culture	Heart and mid-kidney	0.950	0.993
Virus neutralisation test	Serum or plasma	0.085	0.744
Histopathology	Heart and mid-kidney	0.637	0.967
Immunohistochemistry	Heart and mid-kidney	0.051	0.996

Real-time RT-PCR

High DSe (≥ 0.977)
Moderate DSp (0.831)

In all 3-populations models



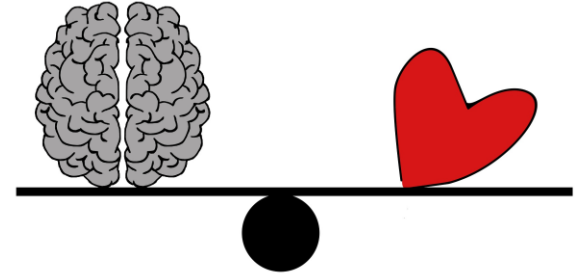
Weak positive?

Follow-up test to verify SAV presence

Cell culture - high DSe & DSp

Epidemiological information - high risk of infection

False negative => high consequence



Follow-up negative PCR results with repeated PCR
or serological monitoring



High DSe (0.929) and DSp (0.992) for Site 3. Vaccination & cross-reactivity PRV1.

Histopathology (moderate DSe, high DSp) – must not be forgotten!

Passive surveillance & differential diagnosis

Immunohistochemistry – acute pancreatic necrosis = OIE indication



Chosen test
must be
appropriate

Purpose of testing

*Faglig ambisiøs, fremtidsrettet og
samspillende - for Én helse!*



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