

The surveillance and control programme for bacterial kidney disease (BKD) in Norway

*Hanne Nilsen
Elin Bekvik Sunde*



*Editor Edgar Brun
Scientific editors Hege Hellberg and Ståle Sviland
National Veterinary Institute*



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National Veterinary Institute
PO Box 750 Sentrum
N-0106 Oslo
Norway

Fax: + 47 23 21 60 01
Tel: + 47 23 21 60 00
E-mail: vipost@vetinst.no
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Introduction

Renibacterium salmoninarum was not detected on any of the sites tested in the 2008 surveillance programme. However, in December 2008 one brood fish was found positive during stripping by the ordinary routine health inspection.

Bacterial kidney disease (BKD) is a chronic disease of salmonid fish caused by *Renibacterium salmoninarum*, first diagnosed in Norway in 1980. *R. salmoninarum* can be transmitted vertically from one generation to the next inside the eggs, so monitoring of brood fish is a key element of the surveillance programme. In addition, wild stocks can be a reservoir of infection and testing of mitigation and cultivation hatcheries is included.

Aim

The surveillance and control programme started in 2005 and is designed to provide documentation of the BKD situation in Norway in order to establish standards regarding import of live material to Norway.

Materials and methods

The sampling is done by the Food Safety Authority, for the most part in conjunction with the sampling for VHS/IHN. Freshwater sites with salmonids and seawater sites with brood fish production are selected for testing every other year (Table 1,2, Fig 1). The tissues sampled are predominantly from kidneys with the addition of other internal organs from fingerlings. Extracts of the tissues are tested individually by a commercially available (BiosChile) ELISA utilising monoclonal antibodies specific for a bacterial surface protein (p57) (1, 2, 3). ELISA positive samples are then tested for the presence of the gene coding for this protein by an in-house real-time PCR.

Results

No BKD positive salmon were detected by the programme in 2008 (Table 1). A higher number of samples from small fish have been discarded in 2007 and 2008 compared to 2005 -2006 partly because no pooling of samples has been done (Table 3).

Table 1. Results from BKD surveillance programme in Norway 2008

Farm types	No. of sites sampled	No. of samples	Samples discarded*	Negative	Positive
Hatcheries for cultivation and mitigation purposes	15	465	88	377	0
Smolt producing farms	71	2246	287	1959	0
On-growing farms	9	300	17	283	0
Brood stock farms	18	1110	2	1108	0
Research facilities	3	90	0	90	0
Total	116	4,211	394	3,817	0

* Samples unfit for testing.

Table 2. Different categories of fish at the sites included in the BKD surveillance programme in Norway in 2008

Species	Fry - smolt	On-growing	Brood fish	Total
Atlantic salmon (<i>Salmo salar</i> L.)	70	1	16	87
Rainbow trout (<i>O. mykiss</i>)	7	3	8	18
Brown trout (<i>Salmo trutta</i> L.)	9	0	1	10
Arctic char (<i>Salvelinus alpinus</i> L.)	0	6	0	6
Total	86*	10*	25*	121*

* Some sites produce more than one species or category of fish.

Table 3. Accumulated result from the BKD surveillance programme in Norway 2005-2008

Year	No. of sites sampled	No. of samples	Samples discarded*	Negative	Positive
2005-2006	54	1,994	77	1,887	0
2007	150	4,943	841	4,102	0
2008	116	4,211	394	3,817	0

* Samples unfit for testing.

Discussion

The programme did not detect any BKD positives through the 2008- sampling.

However in December 2008, BKD was diagnosed in one brood fish site by the local health service during stripping. In January the same year fingerlings from the site in question tested negative for BKD in the surveillance. The last nine months before BKD was detected, all dead brood fish at the site had been tested with negative result.

This situation illustrates limitations of the BKD- surveillance programme itself in detecting low prevalence BKD. The complementary investigations done by the healthy services are therefore very important in order to increase the sensitivity of the total national surveillance.

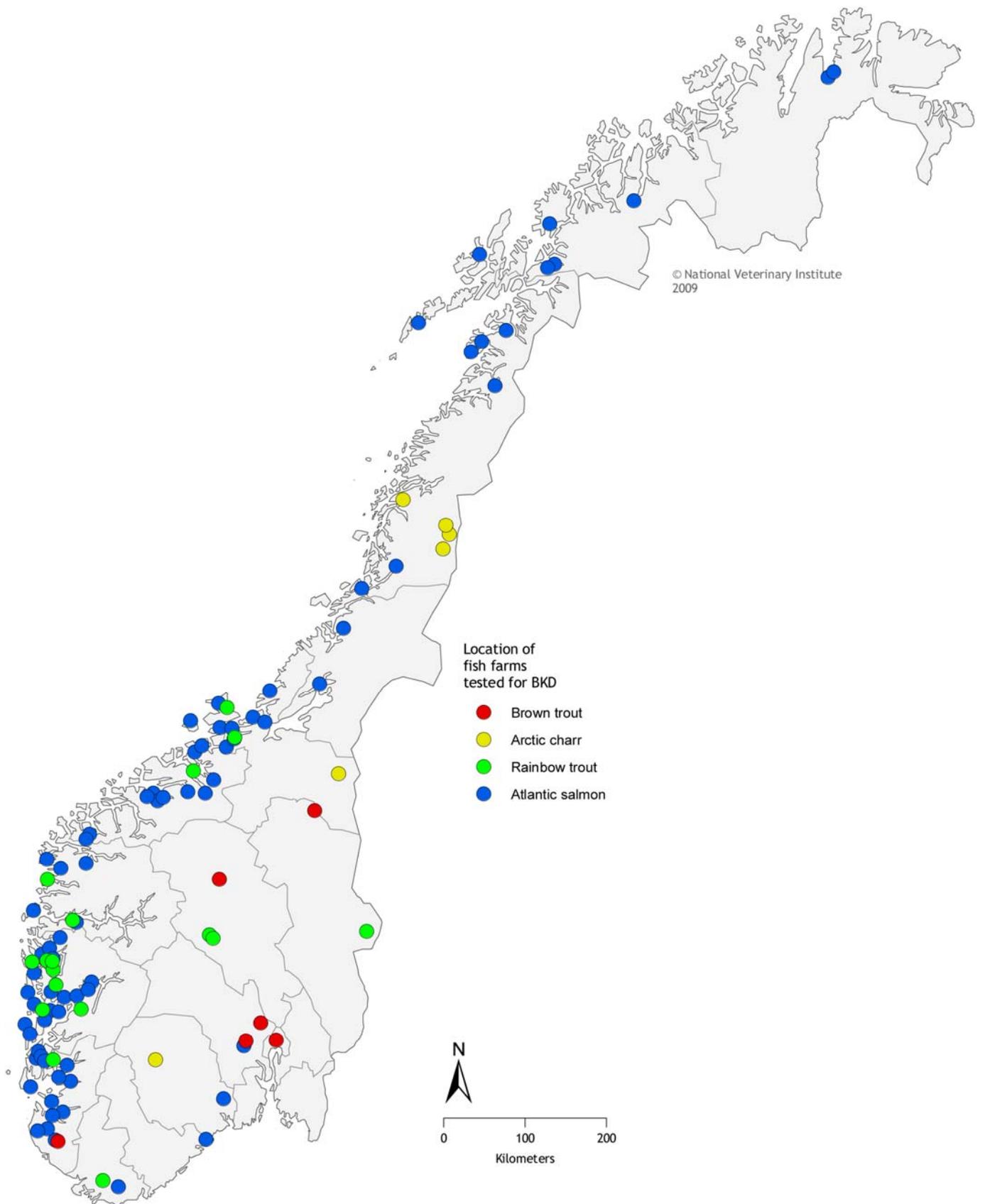


Figure 1
Geographic location of fish farms tested for BKD 2008

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