Evaluation of the effect of percolation and NaCl solutions on viral haemorrhagic septicaemia virus (VHSV) under experimental conditions

In the present Danish "Ministerial order no. 965 of 18/07/2013 regarding authorisation and operation of aquaculture farms and sale of aquatic organisms and products thereof" fish cutting plants have according to 20 the possibility to get rid of their wastewater by percolation. To examine the effect of percolation on viral haemorrhagic septicaemia virus (VHSV) a sand column experiment has been performed. VHSV was infused onto a column packed with gravel as top and bottom layer (in total 22 cm) and dug sand (76 cm). Over a period of 18 h 3.9 x 10^{10} TCID50 VHSV was pumped onto the column where after tap water was added over the rest of the experimental period. The experiment ran over 7 days. During that period samples were collected from the outlet for virological examination. The sampling was most intense in the period where there was the highest risk of VHSV escaping the column. VHSV was not isolated from any of the outlet samples. As the sensitivity of the virological examination was 13.9 TCID50/ml a reduction of >4 log was shown at the outlet. Percolation thus seems to be a usable method for sanitation of water contaminated with VHSV. Changes in temperature, pH, earth types etc. may potentially change the reduction. Some of the fish cutting plants also produce smoked trout fillets using brine in the process. It was tested whether a high NaCl solution will inactivate VHSV. After 20 h with a salinity of 20.9% no inactivation was observed. Statement of relevance Fish processing plants slaughtering VHS diseased fish may discharge wastewater containing the disease causing virus. In order to protect both farmed and wild fish it is important that this virus does not get into contact with other fish. This manuscript concerns the faith of VHSV when percolated through the ground. In Denmark this is an approved method to get rid of the wastewater. To our knowledge, for fish pathogenic viruses, this kind of investigation has never been published before and the presented knowledge is therefore new and valuable. (C) 2015 Elsevier B.V. All rights reserved.