

## **The Economics of Controlling Diseases on Fish Farms**

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### **Abstract**

Disease is a primary threat to the continued growth in salmon aquaculture due to its extensive effects on the sector. Aquaculture farms suffer the most direct and immediate economic losses through reduction in growth, low feed efficiency and market prices, increasing mortality rates, and expenditures on prevention and treatment measures. Prevention and control strategies and management practices are at the core in eliminating or minimizing the disease, while cost-effective disease control strategies at the level of the fish farm are needed to enhance productivity and profitability. This paper aims to develop a bioeconomic model to determine the optimal set of disease control strategies for sea lice at a farm level. The optimal strategies that minimize total disease costs including direct production losses and control costs and maximize overall profit depend on the integration between economics and epidemiology of disease. A production function will be first constructed to incorporate the effects on production at a farm level, followed by the development of a dynamic profit optimization model to take into account several prevention and treatment strategies. The model will be applied to case studies in Norway.