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Theme: Aquaculture

Session: ThA2 - Aquaculture: economic evaluation 1

Title: **Dynamic Models of Aquaculture of Wolffish with Multiple Outputs : Invest in growth Parameters or Invest in Bio-molecule Production?**

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Abstract: Most aquaculture rotation models deal with growing out a species to market size or to the optimum rotation age. Owners of these technologies often are also interested in investing in the growth parameters of the species, in order to shorten rotations. However, some species like the spotted and the Atlantic wolffish (*Anarhichas minor* & *A. lupus*) have potential to produce a number of by-products such as bio-molecules from mucus, blood or gastric enzymes, in addition to the production of high-quality products for human consumption (flesh & leather). We explore the implications of investing in growth parameters for meat production, versus investing in breeding programs that are more appropriate for bio-molecule markets and production of flesh. The problem is first cast as a classical Faustmann model with an investment function in growth parameters, and then as a less orthodox problem where no investment in growth parameters is made, but rather the owner invests in breeding programs that produce animals that can be used in sustainable blood extraction for antifreeze protein type III and mucus extraction for antimicrobial polypeptides, which would be sold on bio-molecule markets. The authors explore the possible effects on optimal rotations of these alternative strategies for maximizing profit for a firm. An example is presented based upon available data from the province of Quebec, Canada and Norway.