

Open-air treatment of wastewater from land-based marine fish farms in extensive and intensive systems: current technology and future perspectives



Marine land-based fish farms located in coastal wetlands (salt-pond zones, lagoon banks, etc.), whether extensive or intensive, send farm effluents directly to the sea or after short periods of stocking in retention reservoirs. The aims of our investigation have been to compare the efficiency of current and potential water treatment procedures in open-air. Wastewater retention ponds in commercial farms (Atlantic coasts of France) are efficient in removing up to 1 metric ton of particulate material (dry weight) per hectare and per day (faeces and unconsumed feed), but are inefficient in reducing dissolved wastes, both organic (urea, amino acids, protein) and inorganic (total ammonia nitrogen, phosphates). Forthcoming outdoor technology to treat these forms of waste were examined by trials at different sites: treatment by foam fractionation in extensive systems (Italian fish pond culture), treatment by microalgae production (*Skeletonema costatum*) and oyster filtration (*Crassostrea gigas*) in intensive systems (sea bass farm, *Dicentrarchus labrax*). It can be concluded that foam fractionation coupled with aeration and water circulation is a good way to treat

and recirculate wastewaters in extensive systems, but that a multiple treatment combining a retention pond, foam fractionation and microalgae-bivalve filtration, is the best solution to treat all these forms of wastes from intensive systems.

Auteurs du document : Jérôme Hussenot, Sébastien Lefebvre, Nicolas Brossard

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