



LAND-BASED SALMON FARMING

- While land-based farming is an exciting prospect, it does currently have several sustainability and financial drawbacks. Land-based farming is garnering global attention as a potential alternative to farming salmon at sea and Huon is closely watching as well as actively participating in its development and implementation.
- Our \$43.7M Whale Point nursery is Australia's first land-based salmon farming facility enabling our fish to grow larger on land before they are transferred to sea.
- Unlike other states in Australia, Tasmania does not allow the discharge of salt/saltwater into the ocean and as salmon need to spend part of their lifecycle in saltwater, this restricts how long we can farm them on land.
- The natural resources (land, electricity and water) required to house enough facilities to hypothetically cease sea-based operations is not feasible nor is it financially viable.
- Despite the challenges, growing our salmon to a larger size on land for a part of their lifecycle improves the overall efficiency of our production cycle by reducing the time the salmon spend at sea (from 14 months, to between 9-10 months).
- It is Huon's view that the experience and reliability of completely growing salmon entirely on land (in commercial volumes) is not yet proven.
- We believe that a balance of growing our salmon on land and at sea will allow us to continue to farm sustainably and employ more local people.

GLOBAL ATTENTION

In recent years, global headlines have been made around land-based salmon farming. In Huon's view, it is an exciting prospect which we are researching but it has not yet been proven to be financially viable.

Growing salmon on land before they are transferred to sea has many benefits, primarily the ability to provide a stable environment favourable for best performance, however, farming entirely on land has many drawbacks in terms of the availability of resources, sustainability and questions around eating and flesh quality attributes if taken all the way to harvest.

Despite these challenges and unanswered questions, many overseas companies are raising capital to establish land-based farms. [According to an article on IntraFish](#), most investors are from high-risk industries such as shipping and oil and they see potential in the technology to feed a growing global population. This same article cautions that these investors have 'desire to hold a token in the lottery, should it succeed'. If it fails, their investment can simply be used to grow more smolt rather than harvest-size salmon. [IntraFish cautioned](#) readers and prospective investors to do their research on land-based start-ups because they might be taking an incredibly risky bet.

In addition, due to their nature, land-based facilities can [face muddy or earthy flavour issues known as 'off-flavour'](#). This is caused by metabolites released by microbes that grow within the land-based systems.



LAND-BASED DRAWBACKS

Location:

In the event that land-based farming becomes viable, it would make sense to establish these facilities closer to market areas on the mainland. As a proud and fiercely Tasmanian company, we want to avoid moving our assets and employees to the mainland. While we have no intentions to move our operations, Whale Point allows us to continue to gain experience in this new technology which will positively shape the way we farm in the future.

We believe a balance of growing our salmon on land and at sea will allow us to continue to farm sustainably in Tasmania and employ more people locally.

Stocking Density:

A pillar of the RSPCA Approved Farming Scheme is to provide conditions where animals can be free to move and express their natural behaviours.

For on land farming to be commercially viable, the salmon would need to be held at high stocking densities. This would be up to 15 times higher than our current maximum sea pen stocking levels (which is 99 per cent water to 1 per cent fish) and could have implications for their health and wellbeing. Due to higher stocking densities, salmon would be unable to exhibit natural behaviours which is contrary to the philosophy that guides our farming.

Disposing of salt:

Theoretically, salmon can be grown on land in saltwater however, this raises an issue of how to dispose of waste collected within the facility. Current environmental legislation does not permit the disposal of saltwater waste on land, nor can the waste be recycled for fertiliser or compost due to its very high salt content. In addition, the disposal of waste produced by on land salmon farming into the ocean is not permitted in Tasmania.

Salmon have evolved to migrate from freshwater to seawater and as a result, we mimic this in our farming operations. Experience tells us that fish that are grown to harvest in seawater gives an excellent product, and it is not yet fully understood how growing salmon entirely in freshwater will impact both this, and their health and welfare at a larger size.

Electricity:

As the water within land-based facilities needs to be constantly moving to provide an optimal environment, a key resource needed for land-based farming is power and running costs are high. Putting aside all the drawbacks, if Huon were to hypothetically farm the equivalent volume of fish on land as we currently have at sea, we would require over 40 Whale Point-equivalent facilities and we aren't sure there is enough electricity produced in Tasmania to power these facilities.

Additionally, in a land-based salmon farm, any electrical outages can result in the stock loss of an entire production cycle. The peak biomass that can be held at our Whale Point nursery is the same as one 240 metre pen. There is a very big difference in capital cost of both facilities, the energy used during construction and ongoing operational costs.

We believe that future salmon production methods should be seeking to reduce environmental impacts, not increase them.

