

## Solutions to interactions between salmon farming and wild stocks

It is our medium to long-term goal that all salmon farming is carried out in closed containment systems. But what does this term mean and what are the advantages?

The great majority of salmon farming worldwide is carried out in open pen farms – with the fish contained by nets through which water flows freely. In contrast closed containment systems use tanks, either in the sea or on land. The critical advantage of tanks is that they provide a complete biological separation between the farmed fish and the wider environment.

With closed containment, there is no real possibility of escapes and thus introgression with wild populations. The spread of parasites (notably sea lice) and disease to wild fish is eliminated and mounds of fish faeces and residues of medicines do not contaminate the seabed.

The technology of closed containment is proven and there are already numerous examples of Atlantic salmon farms producing fish for a premium in a comparatively limited niche market.

Whilst there are some financial benefits to closed containment for operators (not least in the control of parasites and disease and the fact that the fish do not necessarily have to be grown in remote inaccessible locations), overall the costs can be higher compared to open pen systems. The set-up costs are greater and they depend upon recirculation and filtering systems that require energy. However, as technology moves on, costs of closed containment are reducing.

Perhaps the main brake on the development of closed containment is that the open cage farmers are not yet required properly to control the pollution they create and deal with the waste the farm fish produce, nor deal with the chemical residues of the treatments for lice, nor avoid the impacts on wild fish that their method of farming causes. Despite the very heavy environmental costs of open cage farming, the farm companies do not yet have to pay fully for the damage they cause. If they were forced to address this damage, then closed containment would become very competitive in a very short period of time. Add to this the desire of most ordinary consumers to avoid products they know to be damaging the environment and closed containment must be the future of salmon farming. It is merely a question of how long we take to get there.

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