RAS for Atlantic salmon grow-out

What are RAS?

RAS (Recirculating Aquaculture Systems) are on-land closed rearing systems used for multiple fish species, including for the grow-out phase of Atlantic salmon. RAS can be used to rear salmon in non-native areas.

How do RAS work?

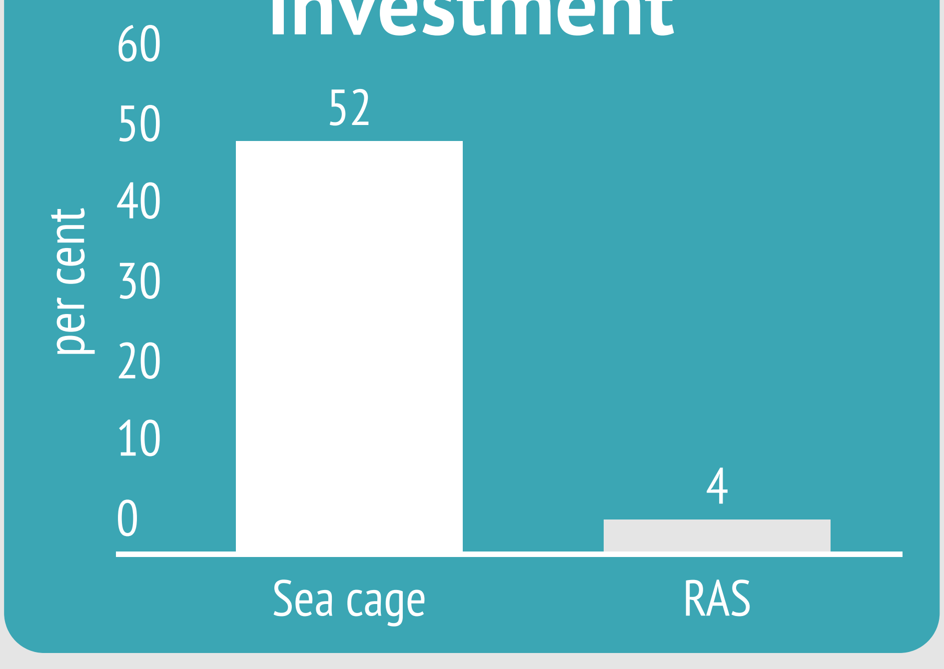
Water (fresh or salt water) is pumped into a tank containing salmon. The water is then cleaned, stripped of CO_2, disinfected, re-oxygenated and pumped back into the tank.

RAS are expensive
Building and running RAS is expensive.

RAS rely on technology
which can be badly designed and ineffective.

RAS can fail
technology failure or structural damage can cause loss of stock and prolonged closure of RAS for repairs.

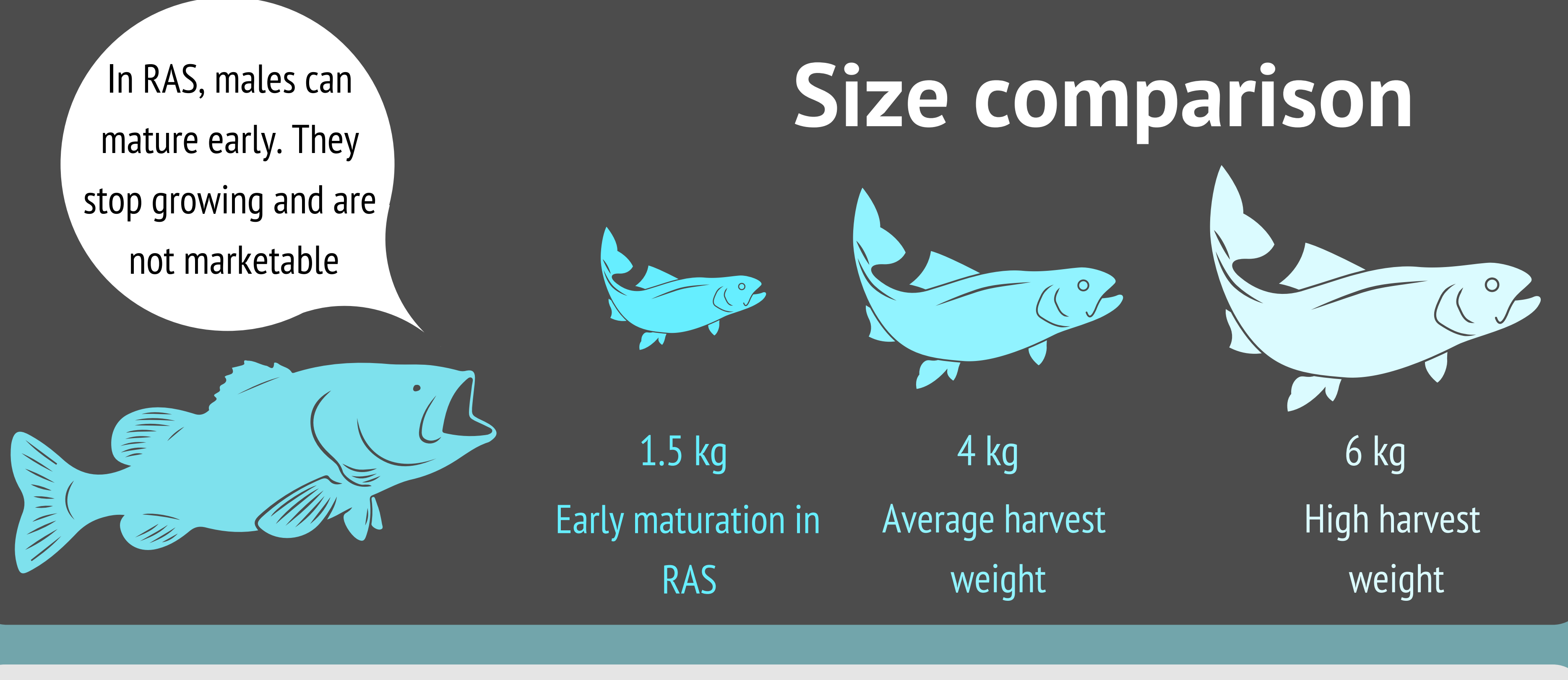
3 year return on investment



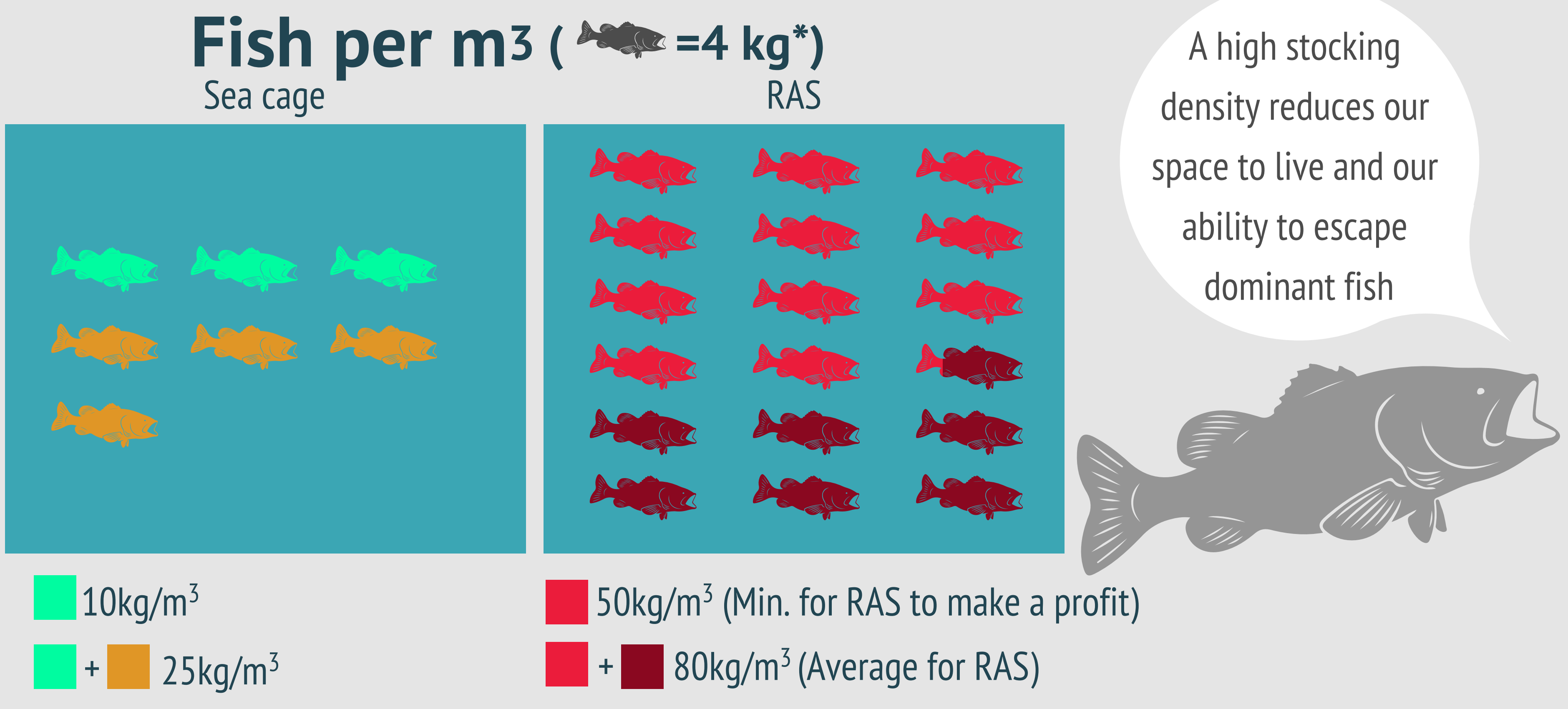
Poor welfare in RAS

There have been numerous reports of mass mortality events in RAS because of disease or poor water quality.

Size comparison



RAS rely on high stocking densities



Busting myths:

- **Viruses, bacteria, fungi and parasites do enter RAS. Removing them is almost impossible**
- **Water quality in RAS can be poor, which can cause:**
  - **calcium deposit in the kidneys due to high CO_2**
  - **poisoning due to accumulation of toxic metals**
  - **reduction in growth rate**

RAS are not sustainable

Sea cages vs RAS

	Sea cage (ideally organic)	RAS
Water currents	natural ocean currents	created with electricity
Space use	largely unused ocean space	use of limited land space
Electricity source	-	fossil fuels and renewable energy

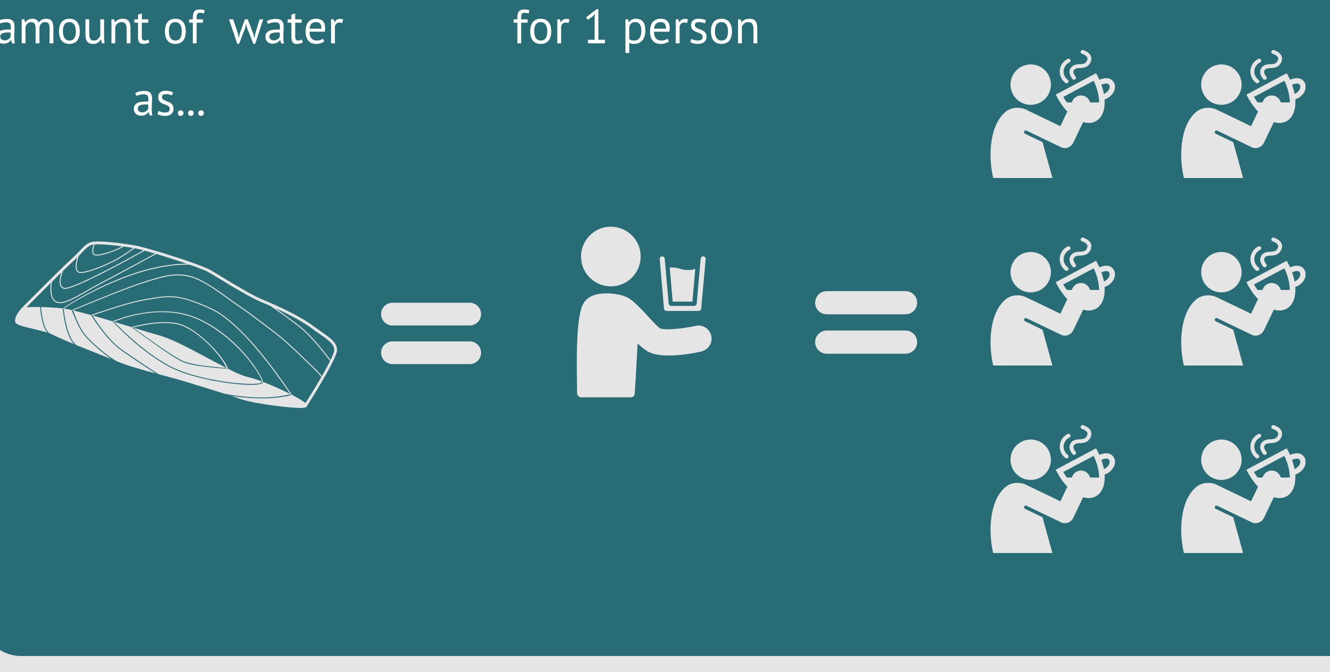
Mean greenhouse gas production

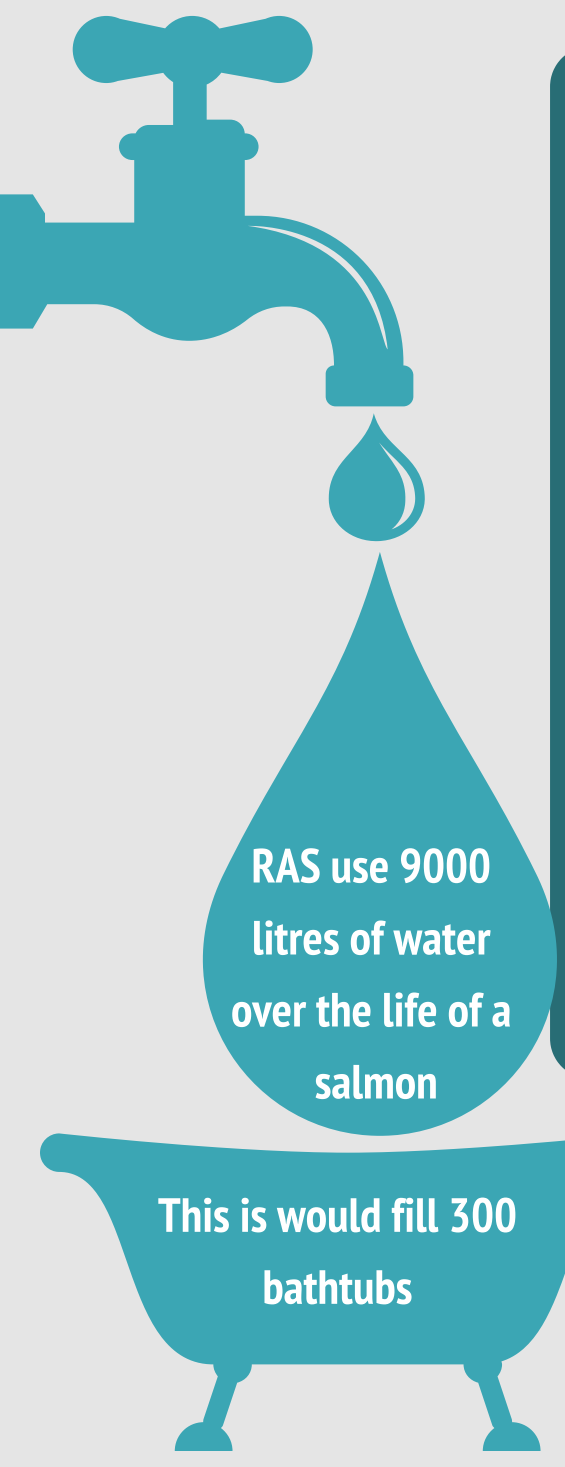
Sea-cage grow out	RAS
<3 kg CO_2	57 kg CO_2

per kg of live salmon

Water usage

1 salmon filet produced in RAS uses the same amount of water as... = 1 year worth of drinking water for 1 person = 1 year worth of coffee for 6 people





RAS use 9000 litres of water over the life of a salmon

This is would fill 300 bathtubs

COMPASSION in world farming
ciwf.org.uk

Source:
International Salmon Farmers Association (2015) The evolution of land based Atlantic salmon farms.