THE IMPACT OF CLIMATE CHANGE

- Like many farmers, we have taken steps to manage the impact that climate change has on our operations. Given we farm in the ocean and warming waters potentially pose an ongoing challenge, Huon has taken a range of steps to mitigate this risk including:
    - moving to rougher offsite farming sites where dissolved oxygen (DO) and water temperature are better for the fish;
    - selectively breeding fish that perform better in warmer waters;
    - undertaking trial with global feed companies to develop an easy-to-digest summer diet; and
    - investing in renewable energy sources to underpin our farming operations.
- We also know that concerns about climate change are influencing dietary choices. We believe increased consumption of fish can reduce global emissions and improve human health. There is untapped potential for our oceans to produce more sustainable food and salmon is a major part of the solution. Salmon farming is one of the most efficient ways of using natural resources to produce a healthy protein: it has a low carbon footprint, high energy and protein retention efficiency and low water footprint.
- Across all the different farmed animals, the Global Salmon Initiative has found that the Feed Conversion Ratio (FCR) of salmon is the lowest of all farmed animals. The FCR indicates how efficiently an animal converts feed into meat or simply, how many kilos of feed are needed to product 1kg of meat/protein. While a kg of beef meat requires between 6-10kgs of feed, a kilogram of salmon meat requires just 1.2-1.5kgs (2019 data).

FEED TRIALS – FEED FOR THE FUTURE

Warming waters are a key challenge of salmon farming globally and a joint feed trial between Huon and BioMar, a leading feed company, aims to reduce the impact on stock by creating an easy-to-digest summer diet.

The aim of the current trial is to help the fish digest and convert feed in summer temperatures that are higher than their preferred range, this will directly improve fish performance and health. Given that warming waters are a global issue for salmon farming, it is expected that the research taking place in Tasmania will have positive global implications.

The trial is being conducted at Huon's Hideaway Bay trial pens, which have hosted in-house and commercial feed trials for many years. Feed trials can be a very successful means of measuring a diet's efficiency; diets can be individually evaluated and results compared to existing commercial diets. The process involves feeding small populations of salmon different diets with the results assessed against key performance measures.

Read more on this feed trial at page 6 https://www.huonaqua.com.au/the-huon-story-edition-three/

SELECTIVE BREEDING PROGRAM

Another example of our efforts to mitigate the risk of climate change is our involvement in an industry selective breeding program. The Tasmanian salmon industry has been selectively breeding salmon for desirable traits since 2004, which has directly resulted in high performing stock that are adaptable to Tasmania's farming conditions. Selective breeding is a common practice undertaken by all sectors of agriculture whether it is breeding strains of drought-resistant wheat, to cattle that produce less methane.

Today, the program is run through the SALTAS hatcheries at Wayatinah and Florentine, and has developed high-performing broodstock being used to breed the next generation of salmon. Primary desirable traits focus on better growth and increased amoeba resistance and also incorporates selection for later sexual maturation and improved flesh quality including flesh colour and lipid levels.

Since the founder populations were recruited, there has been a steady increase in genetic gain where growth potential and amoeba resistance have improved by roughly two to three per cent a year. Initial results from the family-based program replicated those seen from earlier mass selection; ie amoeba resistance is a heritable trait and can be increased through the generations.

Approximately 200 families of salmon are bred across the program each year, and at Huon individual fish are electronically tagged, and reared in a cage at Hideaway Bay with fish performance measured in a changing "real world" environment including increasing water temperatures, amoeba challenge, algal blooms and so on. The top 10 performing families are then selected to produce the production broodstock. These are called the "Elites" and they are selected by ranking the families for a combination of their most desirable traits.

The next step in the breeding program is a move towards genotyping each salmon; this technology allows us to select the best performing fish from within the top 10 families. Huon works in conjunction with CSIRO who has developed SNP chip technology for use in livestock breeding programs and recently transferred these principles to salmon. This allows each fish's genes to be coded and the code compared to sequences with known desirable genetic strengths. This technology has already been used to assess which males were the best to use in 2019.

Read more on our SBP on page 4 https://www.huonaqua.com.au/?s=edition+four

ENERGY CONSUMPTION

While energy use varies across Huon's farming operations, the need to minimise our environmental footprint remains a focus which is why Huon has explored and continues to investigate different energy sources.

Across our freshwater operations (ie hatcheries) the biggest energy cost is hydro-electricity (from operating the RAS - recirculating aquaculture systems) while energy demands for marine operations come mainly from fuel costs for feed barges (which use diesel generators to power the distribution of feed) as well as the cost of operating a fleet of 90+ vessels. We use solar power to the operate the electronic systems on fish pens out at sea including the feed system cameras.

The challenge in Tasmania is that the main source of electricity is sourced from 100% hydropower which has lowered the price of electricity for commercial contracts while the payback on solar or other renewables versus the cost of investment has to be justified.

The company has trialled wind turbines but the exposure to wave energy raises concerns. Given the cost of generators, Huon is looking at the potential of wave and tidal for their offshore operations (feed barges) because with generators already in place there is potential for battery storage or hydrogen storage.

The company is also a partner in the Blue Economy - Cooperative Research Centre, established in 2020 by the State and Federal Governments to develop innovative and sustainable offshore industries to increase Australian seafood and marine renewable energy production through five research programs, one of which is offshore renewable energy systems.

RESEARCH PARTICIPATION

A further example of our commitment to lessening the impact of climate change on public waterways is our participation in a joint IMAS/The Climate Foundation project regarding giant kelp.

Giant Kelp has endless applications from being used in food and fertiliser, bioplastics, and high-value nutraceuticals. It also has the added benefit of being extremely fast-growing, providing habitat for numerous other species, and soaks up nutrients in the water.

There is just one problem: the warming Tasmanian waters have caused an alarming reduction in the size of the giant kelp forests in the State, in turn leaving valuable food-webs at risk.

The strengthening of the Eastern Australian Current is the primary reason for the decline in giant kelp; the current travelling down the East Coast of Australia is too warm for our cool giant kelp and isn't providing sufficient nutrients for giant kelp forests.

This is why Huon is supporting IMAS and The Climate Foundation to cultivate warm-water tolerant strains on our Storm Bay farm and assess their potential for restoration of Tasmanian kelp forests; regardless of whether the ultimate goal is restoration or cultivation, identifying these strains is the important first step.

The growth and survivorship of the out-planted giant kelp will be monitored for approximately twelve months (from late 2019) across the range of different conditions and seasons.

https://www.abc.net.au/news/rural/2019-11-11/seaweed-scientists-replanting-giant-kelp-forests/11680194