Closing the Gap: *Improving Post-Spawn Conditioning of Pacific Oysters in Nutrient-Reduced Waters*

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Research Purpose

Every year, Pacific oysters spawn in summer, lose all stored energy and become unsaleable for weeks to months. Our open coastal waters are periodically nutrient-reduced, meaning recovery is slow. In the worst years — like 2025–26, which saw a documented marine heatwave off Streaky Bay on top of spawning and low food — the "triple whammy" can cost a third or more of annual income. This scholarship investigated whether selective breeding could give SA farmers an oyster that conditions faster on less food, and what the world's best oyster industries could teach us.

Key Learnings

- *Visited 7 countries: NZ, Taiwan, Chile, Japan, Canada, USA, Tasmania*
- *Most farming regions face no conditioning gap — their nutrient-rich waters do the work*
- *SA's clean water = world-class food safety advantage; oysters eaten raw, straight from ocean — rare globally*
- *CAT trial (San Diego): clear genetic signal confirmed — h^2 = 0.82 at final May 2026 measurement*
- *Top families already in SA hatcheries and available now*

Travel



Case Studies & Evidence

- *CAT/ASI Conditioning Trial on Scholars oyster farm — Streaky Bay 2025–26 | 20 family lines | 6 measurement dates*
- *h^2 = 0.60 (Dec 2025) → 0.30 (Mar 2026) → 0.82 (May 2026) — strongest result at final measurement proving the conditioning trait in oysters is something that can be bred for.*
- *Hatchery voice — Adam Butterworth, Sea Ready Shellfish: "If growers can see fat stock at the same time they are having trouble moving oysters, they will support the continued research — there is no grey area"*

Recommendations for Industry

- *ASI Breeding Program: formally add post-spawn conditioning efficiency as a selection trait alongside survival and disease resistance into the current genomic and selective breeding programs*
- *SA Hatcheries: accelerate tetraploid-based triploid programs to restore year-round supply — significant milestones reportedly achieved already*
- *Industry: South Australia's greatest competitive asset is the pristine clean water in which our oysters grow. It is also the source of our greatest production challenge. As an industry we need to educate our consumers about the unique environment our oysters are grown in as it is rare. A future oyster that consistently achieves premium condition in these waters will be genuinely unique.*

Thank you to my sponsor

FRDC Fisheries Research and Development Corporation

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