

What Makes an Integrated Aquaculture Company Successful?

Hatchery | Pre-growing | Offshore farming | Packing station

Executive perspective

An integrated aquaculture company should be managed as **one customer-led, biologically reliable and cash-generating business**. Ownership of all four stages is an opportunity to control quality, timing and cost; it is not, by itself, proof of a competitive advantage.

The advantage must be demonstrated through healthy fish, predictable harvests, consistent customer deliveries, attractive whole-cycle margins and cash collected. Performance should therefore be assessed through to the finished product and payment, rather than stopping at harvest.

ONE CONNECTED BUSINESS

Hatchery → Pre-growing → Offshore production → Packing and cold chain → Customer delivery → Payment

What each owned asset must contribute

Stage	Required contribution
Hatchery	Healthy, consistent juveniles that perform well through to harvest.
Pre-growing	Measured improvement in whole-cycle value relative to its additional cost and time.
Offshore farm	Reliable, responsible production at a competitive cost per saleable kilogram.
Packing station	Safe, traceable, customer-ready products, with preserved quality and disciplined costs.

Scope. This paper sets out a proposed management and board-review framework, particularly relevant to Mediterranean seabream and seabass.

SUCCESS FACTORS 01-03

Customer-led production and juvenile quality

01 | Start with the customer

The first question should be “**What can be sold reliably and profitably?**”, rather than “How much can the facilities produce?” The commercial plan should specify species, size grades, product formats, delivery periods, volumes, pricing arrangements and payment terms.

MedAID research examined technical performance alongside market strategy and identified fish size, processing level and origin as relevant purchasing attributes. [1]

Planning should work backwards from customer requirements: packing and dispatch schedules determine harvest requirements; these inform offshore stocking, pre-growing and hatchery production. The resulting plan must then be tested against biological, environmental and operational constraints.

More juveniles add little value where the farm cannot accommodate them and no profitable external buyers are secured. Similarly, a larger packing station is not automatically valuable if harvests and orders leave it underused. **The objective is a balanced chain, not maximum output in every department.**

02 | Judge the hatchery on lifetime performance

The hatchery should be assessed on juvenile quality and subsequent batch results, not only the number produced. PerformFISH investigated genetics, early-stage quality, developmental abnormalities and the effects of early rearing conditions on later robustness. [2]

Management should demonstrate consistent breeding-stock management, juvenile health, size uniformity, delivery timing and traceability. Each batch should remain identifiable through pre-growing and the farm so that early-stage decisions can be compared with later results.

The economic test is **the fully allocated cost of a healthy juvenile that performs well through to saleable harvest**. A low dispatch cost is not persuasive if the batch subsequently performs poorly. Internal production should be benchmarked against credible external suppliers and justify itself through quality, reliability, economics or resilience.

03 | Make pre-growing earn its additional cost

Pre-growing should be assessed as an investment in the entire production cycle. Compare its additional feed, labor, energy, maintenance, facilities and time with the value of any demonstrated improvements in survival, growth, harvest scheduling or offshore capacity utilization.

Larger juveniles are not automatically the most profitable juveniles. Compare alternative transfer sizes and dates using comparable batches, accounting for species, season, site and health status.

Shorter time at sea is not necessarily a shorter total cycle: part of the growing period may simply move to land. Offshore survival must be considered alongside nursery survival. Released cage capacity has value only when suitable stock, demand, operating permission and funding allow it to be used profitably.

DECISION RULE

Retain or expand pre-growing where its additional whole-cycle value exceeds its additional whole-cycle cost, with an allowance for risk.

SUCCESS FACTORS 04-05

Reliable production and resilient operations

04 | Deliver predictable offshore harvests

At the offshore stage, the priority should be **reliability rather than maximum stocking**. FAO's risk guidance identifies operational disruption, mechanical failures and extreme environmental conditions as relevant threats to production. [3]

The operating review should cover seasonal water conditions, access during difficult weather, cage and mooring integrity, net maintenance, fish-health management, equipment reliability and the ability of trained staff to respond to incidents. A site should be assessed during its difficult months, not only under favourable conditions.

Feed deserves particular attention. NOAA describes the importance of nutrition suited to species and developmental stage, as well as monitoring feed consumption. [4] The commercial objective should be healthy growth and competitive feed expenditure per kilogram of saleable fish, not merely the lowest purchase price for feed.

Track consistently defined feed-conversion measures alongside feed expenditure per kilogram sold. Reconcile differences arising from stock losses, product losses and the timing of feed use and sales. Avoid comparisons between unmatched batches or production periods.

Management should be able to explain deviations from the harvest plan. When growth or survival changes, the production, customer-delivery and cash forecasts should be revised together.

OPERATING TEST

Does the farm repeatedly deliver the planned quality and quantity of saleable fish, at a competitive whole-cycle cost, without compromising welfare or environmental performance?

05 | Integrate the business without connecting every risk

Common ownership does not remove the need for biological separation and contingency planning. MedAID's biosecurity work identified live-fish movements as a relevant pathway for disease introduction and spread. [1]

The review should test whether a single upstream incident could disrupt the entire company. Management should maintain clear responsibilities for stock movements, batch traceability, fish-health oversight and incident response, supported by appropriate separation between production units.

The same discipline should apply to dependence on one customer, essential supplier, specialist employee or critical piece of equipment. Important dependencies should be identified and credible alternatives or contingencies evaluated.

Environmental performance belongs in the operating model. Feed management, suitable site selection and monitoring of seabed effects are relevant to responsible net-pen operations. [4] The company should verify that operating rights, environmental conditions and authorisations support its planned activity, rather than assuming that physical assets alone are sufficient.

Integrate information, planning and accountability; preserve the separation and redundancy needed to contain failures.

SUCCESS FACTOR 06

The packing station: quality through to the customer

06 | Turn the harvest into a customer-ready product

The packing station should be evaluated as the link between biological production and a safe, consistent, saleable product. Its value should be demonstrated across quality preservation, food safety, efficient throughput and products that customers actually value.

Quality preservation and cold-chain reliability

Rapid chilling, careful handling and uninterrupted temperature control matter because chilling slows deterioration rather than stopping it. FAO's guidance emphasises maintaining low temperatures through handling and distribution. [5]

The operating dashboard should include time from harvest to chilling, product temperatures through dispatch and delivery, handling damage, customer claims and remaining validated shelf life at receipt. **The important outcome is the condition of the fish when the customer receives it, not only when it leaves the station.**

Food safety and end-to-end traceability

The station needs a functioning food-safety system, not certificates alone. FAO's seafood-quality guidance addresses hazard analysis and preventive controls supported by hygiene, sanitation, trained personnel and verification, rather than relying only on final-product testing. [6]

For an EU operator, applicable hygiene requirements and establishment approvals must match the activities undertaken. EU food-law requirements also address traceability and the withdrawal or recall of unsafe food. Confirm detailed requirements with competent authorities and qualified advisers. [8] [9]

As a management standard, each finished-product lot should be linked to its harvest, cage and production-batch records and to its receiving customer. Traceability and recall arrangements should be tested, not simply documented.

Efficient throughput and saleable yield

Reconcile kilograms received with kilograms dispatched, product losses, rejected material and, where relevant, processing yields. Practical capacity should allow for cleaning, maintenance, product changes, labour, cold storage and dispatch schedules.

FAO's processing guidance emphasises suitable layouts, separation of potentially contaminating activities and avoiding delays in product flow. [7] Measure packing cost per kilogram at **actual utilisation**, not only at the equipment supplier's maximum rated throughput.

Commercially justified product formats

A packing station does not automatically provide the capabilities of a filleting, portioning or retail-ready processing facility. Each proposed product should have its own assessment of equipment, skills, approvals, yield, shelf life, demand and economics.

MedAID assessed customer preferences for product and packaging configurations alongside technical and economic feasibility. [1] A higher price per kilogram of fillet does not, by itself, prove greater profitability: account for the whole fish required, processing, packaging, losses and recoverable by-product value.

Ownership test. Packing ownership is attractive when it demonstrably improves the total commercial result compared with a credible outsourced alternative.

Whole-chain profitability and cash discipline

07 | Measure one honest whole-chain margin

The proposed management measure is **external sales revenue less the full cost of producing, packing and delivering those sales**. It should be reconciled to the company's reported accounts, using a consistent policy for inventory and production costs.

Measure revenue after discounts, rebates, returns and claims. Include the relevant costs of hatchery and nursery production, feed, production losses, labour, energy, maintenance, harvesting, packing, transport, overhead and depreciation. Show financing costs and taxes separately.

Count internal transfers only once in the group result. Transfer prices can help assess departments, but moving juveniles from the company's hatchery to its farm does not create an additional external sale or bring cash into the group.

Use consistent product and delivery boundaries. Do not compare the farm cost of whole fish with the selling price of delivered fillets while ignoring the costs and yields between those points. Review profitability by species, size grade, customer and product format, not only at company level.

ILLUSTRATIVE ARITHMETIC - NOT A FORECAST

At **2,500 tonnes** of annual sales, a genuine **€0.10 per kilogram** improvement in operating margin produces **€250,000** of additional annual operating profit: $2,500,000 \text{ kg} \times €0.10/\text{kg}$.

The illustration is after any additional operating costs required to achieve the improvement. Its cash benefit will also depend on investment, working-capital and tax effects. It does not assume a production volume or performance target.

08 | Fund the full biological and sales cycle

Aquaculture requires operating finance as well as construction funding. FAO's financial-risk guidance distinguishes these needs and emphasizes cash-flow management. [3] Valuable infrastructure is therefore not a substitute for a funded operating plan.

Prepare a monthly cash forecast from production through customer payment, showing the **maximum funding requirement**, not simply annual profit. The plan should identify when money is required for stock, feed, labor, maintenance, packing and distribution, and when customers are expected to pay.

Test a combined downside case: slower growth, lower realized prices, higher input costs, production disruption and delayed customer payment. The purpose is to establish whether the company can continue caring for its stock and honoring its commitments through a plausible adverse period.

Expansion should have separately identified funding for the additional operating costs it creates. Paying for new tanks, cages or packing equipment is only part of financing growth. A debt-free balance sheet is helpful, but does not replace this analysis.

The financial test: Can the company maintain safe, responsible operations and complete its production commitments under a plausible adverse scenario?

SUCCESS FACTOR 09 AND PROPOSED BOARD DASHBOARD

Accountability, information and measurable results

09 | Manage one plan with one accountable team

Organize the business around a shared production and commercial plan, with clear responsibility for each stage. Departmental incentives should not reward hatchery volume, nursery cost reduction or offshore biomass in isolation when those objectives conflict.

Instead, incentives should support healthy stock, accurate planning, dependable delivery, product quality, profitability and cash collection. PerformFISH developed linked performance measures across hatchery, pre-growing and grow-out, covering growth, health, feed efficiency, welfare and environmental sustainability. [2]

The proposed governance model requires competent production leadership, professional fish-health oversight, a quality manager with authority to stop unsuitable dispatches, and a finance function able to reconcile stock, production, sales and cash.

Technology should address a defined problem. Before purchasing equipment or software, specify who will use it, the expected improvement and how the result will be verified.

The management dashboard

These are proposed measures, not universal industry targets.

Area	Evidence to review
Hatchery	Healthy juveniles at the required size and date; fully allocated cost; later batch performance.
Pre-growing	Demonstrated whole-cycle value relative to its additional cost and time.
Offshore farm	Survival, growth, feed efficiency and harvest timing against a credible batch plan.
Packing station	Controlled temperatures, traceability, saleable yield and packing cost at actual utilisation.
Customer service	Correct specifications, on-time deliveries, claims, repeat orders and concentration.
Profitability	Fully costed margins by species, size grade, product and customer.
Cash	Funding through the cycle, timely collections and transparent overdue receivables.
Resilience and responsibility	Effective health, welfare, safety, maintenance and environmental controls.

Set targets from comparable operating history and appropriate external benchmarks. Do not impose one survival rate, feed-conversion ratio or margin across different species, sites, seasons and product formats. Define the measurement boundaries so that results are genuinely comparable.

Conclusion and source notes

CENTRAL CONCLUSION

The successful company is not simply the one that owns the complete chain. It is the one that makes the complete chain perform better than the available alternatives.

The hatchery must supply quality. Pre-growing must improve whole-cycle economics. The offshore farm must deliver reliable harvests. The packing station must preserve that quality and meet customer requirements. Management must convert these achievements into sustainable margins and collected cash.

For an established integrated operator, the proposed priority is to **prove and improve the current chain before expanding it**. Additional capacity becomes valuable when biology, customers, people and funding are ready to support it.

Sources and supporting references

Numbered references support the technical and regulatory principles cited in the text. Management tests, dashboard design and the financial illustration are the proposed analytical framework. Older FAO material is used for foundational principles, not as evidence of current market benchmarks or current legislation. Sources reviewed on 27 September 2026.

[1] **European Commission / CORDIS**. MedAID, project 727315: final periodic reporting. [Source](#)
Market preferences, product feasibility and biosecurity.

[2] **European Commission / CORDIS**. PerformFISH, project 727610: final periodic reporting. [Source](#)
Juvenile quality and linked performance measures.

[3] **FAO**. Identification of risk, chapter 2. [Source](#)
Operational and financial risks in aquaculture.

[4] **NOAA Fisheries**. Feeds for Aquaculture. [Source](#)
Nutrition, feeding management and environmental considerations.

[5] **FAO**. The Use of Ice on Small Fishing Vessels, introduction. [Source](#)
Chilling and quality preservation.

[6] **FAO**. Assurance of Seafood Quality. [Source](#)
Hazard analysis and preventive quality controls.

[7] **FAO**. Assurance of Seafood Quality, chapter 7. [Source](#)
Establishments for seafood processing.

[8] **European Commission**. Food hygiene. [Source](#)
EU hygiene framework and establishment requirements.

[9] **European Commission**. Food law general requirements. [Source](#)
Traceability, withdrawal and recall responsibilities.