



Bio-Organic Catalyst



Cleaner Water, Healthier Stock, Lower Cost

A non-toxic biocatalyst — not a microbe, not an enzyme — that accelerates the entire nitrogen cycle, breaking down waste, clearing water, and boosting dissolved oxygen across ponds, RAS and biofloc systems

25% → 0.3%

tilapia mortality, months 1–2*

- 40%

sludge volume*

>200x

safety margin, even at the top dose**

* BOC field case study, a tilapia operation in Garzón, Huila, Colombia (2016). Results vary by system. ** 96-hr LC₅₀ in marine fish vs. the highest dose we use anywhere (1 ppm, lake remediation). At the aquaculture field dose the margin is far larger — see slide 6.



Water quality is the limit on every farm

In high-density ponds, RAS and biofloc systems, the same few problems cap growth, raise costs, and put stock at risk. Each one traces back to how fast waste and nitrogen are processed.



Toxic nitrogen spikes

Ammonia and nitrite from feed and waste spike quickly — the most common cause of stock loss.



Aeration energy cost

Aeration is the #1–2 electricity cost on land-based farms, run hard to hold dissolved oxygen.



Sludge & cleaning labor

Feces and uneaten feed accumulate, demanding manual cleaning and costly disposal.



Stress, disease, antibiotics

Poor clarity and low oxygen stress stock, slowing growth and inviting antibiotic use.

ONE PRODUCT, THREE ACTIONS

BOC works with the biology you already have



BOC is a plant-based biocatalyst — not a new microbe, and not a conventional surfactant. It optimises the environment so your native bacteria work faster and more efficiently. Non-invasive, non-toxic, dosed straight into the water.

1

Catalyse

Lowers the activation energy for biological reactions, accelerating the metabolism of native microbes and the whole nitrogen cycle.

2

Solubilise

Breaks down slime, fats, oils and greases — freeing internal carbon and exposing waste to enzymatic attack.

3

Oxygenate

Patented microbubble chemistry raises dissolved-oxygen transfer, so aerators deliver more O₂ per kilowatt.

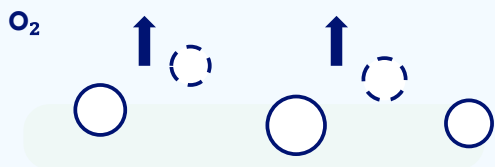
The result: faster, more reliable nitrogen removal — without adding toxic chemistry.



MECHANISM OF ACTION

How BOC does three jobs at once

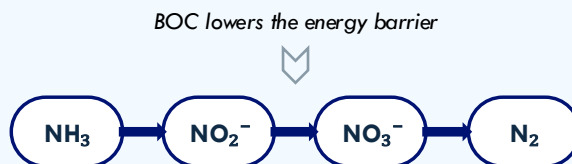
BOC is a plant- and mineral-derived biocatalyst — not a microbe, not an enzyme. Dosed straight into the water, it makes the biology you already have work faster, through three linked mechanisms.



OXYGENATION

More dissolved oxygen

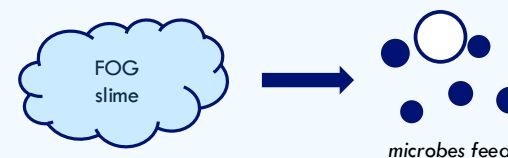
BOC forms ultra-fine micro-bubbles with loose, porous shells, so gas passes into the water column far faster than aeration alone.



CATALYSATION

A faster nitrogen cycle

As a true catalyst, BOC lowers the energy barrier at each step — and isn't used up — so native microbes drive ammonia to harmless N_2 faster.



SOLUBILISATION

Waste made bio-available

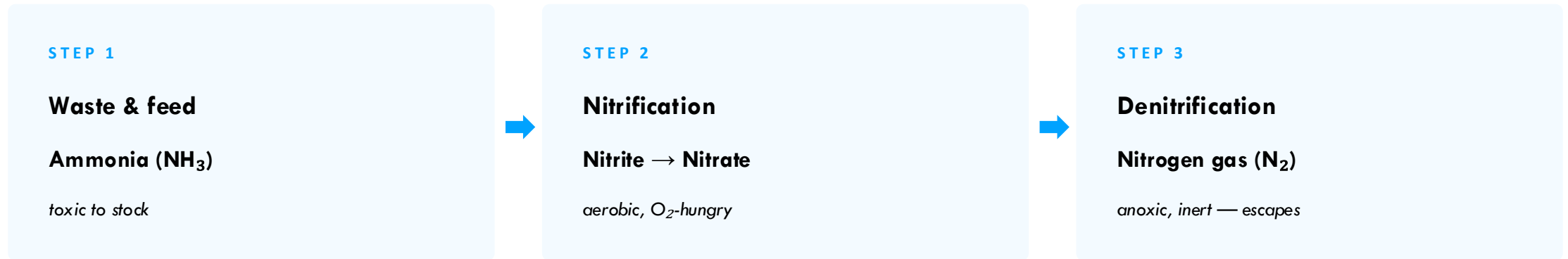
BOC's amphiphilic molecules open up slime, fats, oils and greases, turning locked-up carbon into food the microbes can eat.

Not consumed, not a microbe, not an enzyme. BOC accelerates the biology and chemistry already in your water.



BOC supports every step of the nitrogen cycle

Fish waste and uneaten feed release ammonia. Left unmanaged it turns toxic. BOC accelerates each conversion — all the way to harmless nitrogen gas that leaves the water.



BOC accelerates all three steps at once

It frees internal carbon for denitrifiers, boosts O₂ for nitrifiers, and can drive simultaneous nitrification—denitrification (SND) inside a single biofilm — even in low-carbon RAS water.



Two ways BOC cuts the aeration bill

Aeration is priced in kilowatts. BOC attacks both sides of the equation — it lowers how much oxygen the water demands, and raises how much oxygen each kilowatt delivers.

1

Less oxygen demand

BOC accelerates the breakdown of BOD and TKN in the water, so there is simply less oxygen demand to satisfy. Blowers hold the same dissolved-oxygen target at lower frequency or shorter duration.

2

More oxygen in

BOC is not a conventional surfactant. Our patented chemistry forms micro- and nano-bubbles with highly reactive shells, raising oxygen transfer into the water column — a mechanism a plain surfactant does not have.

AERATION ENERGY

up to

15-40%

reduction, measured in municipal wastewater systems

In aquaculture: ~25% less aerator energy, field-reported by a Brazilian tilapia nursery. Not an instrumented trial yet — that's what we're asking for.

Aeration and pumping run 7–15% of shrimp production cost — roughly \$0.41–0.53/kg in electricity. Source: Boyd, Global Seafood Alliance.



A 200× margin — even at the strongest dose we use

The first question any farm vet or RAS technical director asks about a new input is whether it harms the stock. Here is the answer, from our Safety Data Sheets — before you ask.

DOSE

0.03–0.1 ppm / week

aquaculture, in maintenance

0.5–1.0 ppm

lake remediation / shock

LC₅₀ — MARINE FISH

203 ppm

203× over the top dose

Menidia beryllina · 96 hr

LC₅₀ — MYSID SHRIMP

316 ppm

316× over the top dose

Mysidopsis bahia · 48 hr

Fathead minnow

100% survival at 1 ppm — 30× the aquaculture dose.

Daphnia magna

48-hr EC₅₀ — toxicity not detected.

Readily biodegradable

> 75% in 28 days, OECD 302B. Low bioaccumulation potential.

Not mutagenic

Salmonella typhimurium — not detected.

Margins shown against the strongest dose we use anywhere (1 ppm, lake remediation). At the aquaculture maintenance dose the margin exceeds 6,000×. Source: BOC Safety Data Sheets — Clear-Cat™ (rev. 1.3, Sept 2023) and PC3 Organic Water Treatment™ (May 2025).



Spend less, lose less

BOC's return comes from the cost line and the loss line — the two numbers a farm manager is actually measured on.

LOWER OPERATING COST

Aeration energy

up to 15–40% less

measured in wastewater; ~25% field-reported in tilapia

Sludge & labour

up to 40% less

less manual cleaning, less disposal

Chemicals & carbon

cut external dosing

half the lime for pH in the Huila study

LOWER LOSSES

25% → 0.3%

tilapia mortality, months 1–2

45% → 3%

mortality in a power-failure event, without BOC vs.
with BOC

Survival figures from the Garzón, Huila tilapia case study (2016). Feed-conversion and growth-rate claims have been removed pending data.



Simple to apply, easy to adopt

BOC dilutes straight into the water — no new equipment, no plant retrofit, no new microbial strains to manage.

RAS systems

Dose into the sump, biofilter intake, or a dedicated treatment zone via a small peristaltic pump — continuous or timed.

Ponds & lagoons

Mix with water and spray over the surface or into the aeration zone for full water-column and sediment contact.

Solids separation

Dose at settling / dewatering to solubilise solids, improve dewatering, and cut sludge volume and odour.

Shock vs. maintenance dosing. Dose depends on water volume, exchange rate and organic load (kg feed/day). BOC provides guidelines per goal — odour, sludge, or nitrogen removal.

THE NUMBERS



Under two cents per kilo of shrimp

Not a model — this is what our Brazilian distributors actually charge, at the doses they actually run, on commercial shrimp and tilapia farms today.

WHAT IT COSTS THE FARM

Dose, in maintenance	0.5 kg / ha / week
Shrimp — 13-week cycle	6.5 kg / ha
Tilapia — 26-week cycle	13 kg / ha
Cost per kg produced	\$0.010–0.017

WHAT IT SAVES — ENERGY ALONE

BOC per shrimp cycle	≈ \$98 / ha
Aeration electricity	\$0.41–0.53 / kg
Aeration spend per cycle	\$1,640–2,120 / ha
Return at a 25% saving	4.2–5.4×

BREAK-EVEN

≈ 5%

BOC has to cut your aeration energy by about 5% to pay for itself. In wastewater we report up to 15–40%; a Brazilian tilapia nursery reports ~25%. And that counts only the electricity — before a single kilo of avoided mortality, 40% less sludge, or half the lime.

Dosing and price per Bio-Organic's Brazilian distributors, commercial tilapia and shrimp operations (2026). The energy saving is a distributor field report, not an instrumented trial. Aeration electricity per Boyd, Global Seafood Alliance, at 4 t/ha. Yield, depth and power price vary — we rerun this with your numbers.



Mortality fell from 25% to 0.3%

Earthen-pond tilapia operations in Huila dosed BOC at maintenance rates. Dawn was the danger window — oxygen crashed and fish died. BOC changed that.

MORTALITY, MONTHS 1–2

25% → 0.3%

North farm
134 ponds
29,000 tilapia

POWER-FAILURE EVENT · 85 M³ POND

45% → 3%

mortality without BOC vs. with BOC

WATER QUALITY, BEFORE → AFTER

Ammonia

8.0 → 2.0 ppm

Nitrites

6.0 → 1.0 ppm

Dissolved O₂ (4 a.m.)

0.3–0.9 → 1.8 mg/L

Lime for pH

4.0 → 2.0 kg

Source: BOC field case study, a tilapia operation in Garzón, Huila, Colombia (2016). Dawn dissolved oxygen improved but remained below the 3 mg/L comfort target — mortality is the load-bearing number here.



Deployed at scale, across applications

BOC isn't a lab concept. Our UAE distributor remediates real lakes and lagoons with it today — the same water-quality job aquaculture needs — alongside commercial use across many other water and industrial applications worldwide.

UAE • LAKE REMEDIATION

Remediating lakes today

Our distributor Bio Catalyst Middle East runs ongoing lake- and lagoon-management programmes across the UAE — raising dissolved oxygen, controlling algae and odour, and cutting sludge in standing water. It's the same nitrogen and oxygen chemistry aquaculture depends on, proven at full scale.

ALSO IN COMMERCIAL USE WORLDWIDE

Wastewater treatment

District cooling

Anaerobic digestion

Agriculture & irrigation

Facilities management

Water parks

Pulp & paper, membranes

Aquaculture

The same product line, deployed by distributors across these channels. Source: Bio Catalyst Middle East (biocatalystme.com), BOC's UAE distributor.



Commercial today in shrimp and tilapia

Two independent Brazilian distributors are running BOC in commercial operations today — one across tilapia in the south and shrimp in the northeast, the other in a brackish-water tilapia nursery of more than 1.2 million juveniles.

DISTRIBUTOR 1 • 10+ YEAR PARTNERSHIP

BOC + bioremediation in the water

Our longest-standing Brazilian partner pairs BOC bio-stimulants with powder-based microbial bioremediators, improving the aquatic environment across both tilapia and shrimp farming.

10+ yrs

partnership

2 species

tilapia & shrimp, at scale

TWO INDEPENDENT REFERENCES

Distributor 1

Tilapia & shrimp

Distributor 2

Tilapia nursery

WHAT THE PRODUCTS TARGET

Water quality

Organic load

Nitrogen (NH₃)

The focus is the aquatic environment — water quality, organic load and nitrogen — not the control of specific diseases. A large field team adjusts protocols to each operation.

Source: field reports from two Bio-Organic distributors in Brazil (2026). Nursery: >1.2 million juveniles, 500 mL/ha every 7 days, ~1.5 m average depth; figures as reported, not an instrumented trial.



Proven mechanism. Now widening the reference base.

BOC is in commercial use worldwide, including in aquaculture. What we want now is a wider set of measured reference accounts — across species, geographies and system types.

1

Proven mechanism

Nitrogen-cycle acceleration, oxygen transfer and waste solubilisation are demonstrated across BOC's water-treatment work.

2

Commercial in aquaculture

Two independent Brazilian distributors run BOC in commercial shrimp and tilapia, and Colombian tilapia farms cut mortality at scale.

3

Deployed at scale

UAE lakes are remediated with BOC today, and a BOC-based aquarium product launched in Belgium sells strongly through a major retailer.

What's missing is an instrumented aquaculture trial — energy, nitrogen and survival measured to protocol. That's what we're asking for.



Let's run the first trials.

We're looking for aquaculture partners — RAS, biofloc and pond operators — to turn proven BOC science into measured, on-farm results and reference accounts.



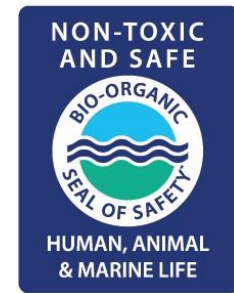
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100 patents world-wide,
21 patents pending.