Bio-Organic Catalyst

Cleaner Water, Healthier Stock, Lower Cost

A non-toxic biocatalyst that accelerates the entire nitrogen cycle — breaking down waste, clearing water, and boosting dissolved oxygen across ponds, RAS and biofloc systems.

25% → 0.3% lower tilapia mortality*

2× dawn dissolved oxygen*

½ the lime / sludge*

** Documented results from BOC field case studies on tilapia farms in Huila, Colombia (2016). Results vary by system.*

THE CHALLENGE

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 liquid — not a new microbe. It optimizes the environment so your native bacteria work faster and more efficiently. It is non-invasive, non-toxic, and dosed straight into the water.

01

Catalyze

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

02

Solubilize

Non-ionic surfactants break down slime, fats, oils and greases — freeing internal carbon and exposing waste to enzymes.

03

Oxygenate

Forms micro- and nano-bubbles that raise dissolved-oxygen transfer, so aerators deliver more O_2 per kilowatt.

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

HOW IT WORKS

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.

STEP 1

Waste & feed

Ammonia (NH_3)

toxic to stock

→

STEP 2

Nitrification

Nitrite → Nitrate

aerobic, O_2-hungry

→

STEP 3

Denitrification

Nitrogen gas (N_2)

anoxic, inert — escapes

BOC accelerates all three steps at once

It frees internal carbon for denitrifiers, boosts O_2 for nitrifiers, and can drive simultaneous nitrification-denitrification (SND) inside a single biofilm — even in low-carbon RAS water.

THE OXYGEN ADVANTAGE

More oxygen per kilowatt of aeration

BOC's biosurfactants lower water's surface tension, so the same blower makes smaller, longer-lasting bubbles — turning aeration from your biggest cost into a point of savings.

1

Smaller bubbles

Lower surface tension lets diffusers form micro- and nano-bubbles with far greater collective surface area.

2

Longer contact

Tiny bubbles rise slowly or stay suspended, dramatically increasing gas hold-up time in the water column.

3

Faster diffusion

BOC loosens the bubble's boundary film, so oxygen crosses into the water more rapidly.

AERATION ENERGY

15–40%

reported reduction in aeration energy

Same dissolved-oxygen target, blowers running at lower frequency or shorter duration.

DIALING IT IN

What denitrification needs — how BOC helps

Denitrification is finicky: it wants the right oxygen, carbon, pH and temperature. BOC widens the window on the two hardest to control.

Low oxygen (anoxic)	Denitrifiers switch to nitrate when O_2 is scarce.	**BOC enables SND — aerobic shell, anoxic core — in one biofilm.**
Organic carbon	An electron donor is needed; RAS water is often too lean.	**BOC frees internal carbon from waste, cutting external dosing.**
Neutral–alkaline pH	Denitrification itself produces alkalinity and buffers pH.	**Cleaner, faster cycling supports stable pH.**
Warm temperature	Higher temperature speeds the reaction rate.	**Faster kinetics help offset cooler-water slowdowns.**

Left: what the process requires. Right: how BOC improves it. Teal markers = where BOC has the clearest impact.

THE BUSINESS CASE

Spend less, harvest more

BOC's return comes from two directions at once — lower operating costs and higher production value.

LOWER OPERATING COST

Aeration energy

15–40% less

Sludge & labor

up to 40% less sludge

Chemicals & carbon

cut external dosing

HIGHER PRODUCTION VALUE

Feed conversion

better FCR

Time to market

faster growth cycles

Survival rate

lower mortality

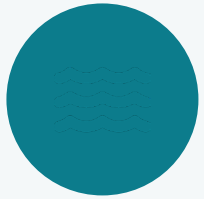
IN PRACTICE

Simple to apply, easy to adopt

BOC ships as a concentrated liquid and dilutes 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 solubilize solids, improve dewatering, and cut sludge volume and odor.

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

CASE STUDY · HUILA, COLOMBIA

Proven on tilapia farms, in the field

Earthen-pond tilapia operations in Huila dosed BOC at just 0.05–0.1 ppm. Dawn was the danger window — oxygen crashed and fish died. BOC changed both.

Mortality, months 1–2

~~25%~~ → **0.3%**

North farm · 134 ponds · 29,000 tilapia

Power-failure event

~~45%~~ → **3%**

Mortality without BOC vs. with BOC (85 m³ pond)

WATER QUALITY, BEFORE → AFTER

Dissolved O_2 (4 a.m.)

~~0.3–0.9~~ → **1.8 mg/L**

Ammonia

~~8.0~~ → **2.0 ppm**

Nitrites

~~6.0~~ → **1.0 ppm**

Lime for pH (sludge)

~~4.0~~ → **2.0 kg**

Source: BOC case study, Piscícola Garzón and farms in Huila, Colombia (2016).

WHERE WE ARE TODAY

Field-proven, ready to scale

BOC's aquaculture benefits rest on proven mechanisms and documented field results. The next step is widening the reference base across species, geographies and system types.

Proven mechanism

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

Field results

Colombian tilapia farms cut mortality and stabilized dawn oxygen at commercial scale — real ponds, real stock.

Consumer traction

A BOC-based aquarium product launched by a distributor in Belgium is reportedly selling strongly through a major retailer.

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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