IntaBiotech SL: Strategy for Animal and Ovo-Productive Biorefinery

Commercial action guide based on the technical-economic analysis of the leather crisis and the reconfiguration of the value of animal slaughter.

April 2026

COMMERCIAL ACTION

www.intabiotech.com

Executive Summary

The problem that becomes an opportunity

The value of raw bovine hide has fallen from 59 USD/hide (2014) to 5 USD/hide (2025) in Brazil. Hide is no longer the engine of valorisation of slaughter. This destruction of value forces us to redesign the slaughtered animal as a portfolio of bioindustrial flows.

For IntaBiotech, this means that suppliers of animal raw materials are actively seeking new value outlets. **We are that outlet.**

The central thesis

It is not about "saving the leather". It is about building a **multi-outlet biorefinery architecture** that assigns hides, bones, blood, fats, offal, tripes and eggshell membrane to their highest-value technical and commercial destination.

- IntaBiotech is positioned to be the technological and commercial partner for this transition in the European and Latin American markets.

INTABIOTECH

Transforming Ideas for a Better World

The Commodity Leather Crisis: Key Data

−91%

Decline in bovine hide

From 59 USD/hide (2014) to 5 USD/hide (2025) in Brazil. From ~14% to 0.5% of the animal's value.

692M$

US exports 2025

Compared with a three-year average of 844.55 M USD. Downward trend confirmed by USDA/FAS.

−2%

Global luxury sales 2025

Expected fall in global luxury sales, with a sharp stock market hit on European houses.

2026

EUDR enters into force

European due diligence regulation on deforestation. Additional traceability costs across livestock chains.

Sources: Reuters 2025, USDA AMS April 2026, USDA/FAS 2026, Access2Markets January 2026.

Structural Causes: Why This Crisis Is Permanent

Substitution in automotive

Volvo Cars announced leather-free electric models and an ambition for a fully leather-free range by 2030. Automotive upholstery was the classic outlet for large volumes of bovine hide of medium grades.

EUDR regulatory pressure

The European regulation requires traceability and due diligence. A devalued raw material must now absorb higher information and documentary proof costs. Timeline: December 2026 / June 2027.

Supply chain opacity

COTANCE admits that the low value of hide discourages investment in traceability and that traceability back to the animal's place of birth is practically non-existent on a global scale.

Physical quality degradation

Damage from branding, parasites, transport and handling destroys value for traditional tanning, but opens an industrial opportunity: mediocre hides retain high interest as a raw material for collagen and biomaterials.

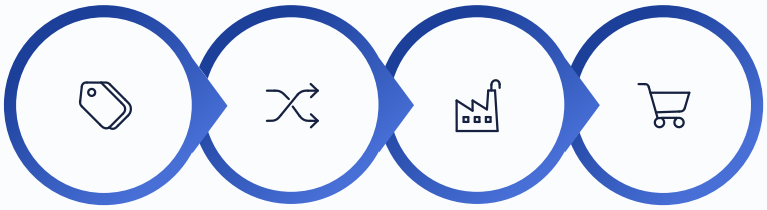
Market Segmentation of Leather: Where to Act

Not all leather declines in the same way. IntaBiotech's commercial strategy must distinguish precisely between segments.

⚠ The strategic conclusion is segmented: IntaBiotech should not compete in the ultra-premium finished leather segment, but should capture the value of commodity and mid-tier flows redirected to bioindustry.

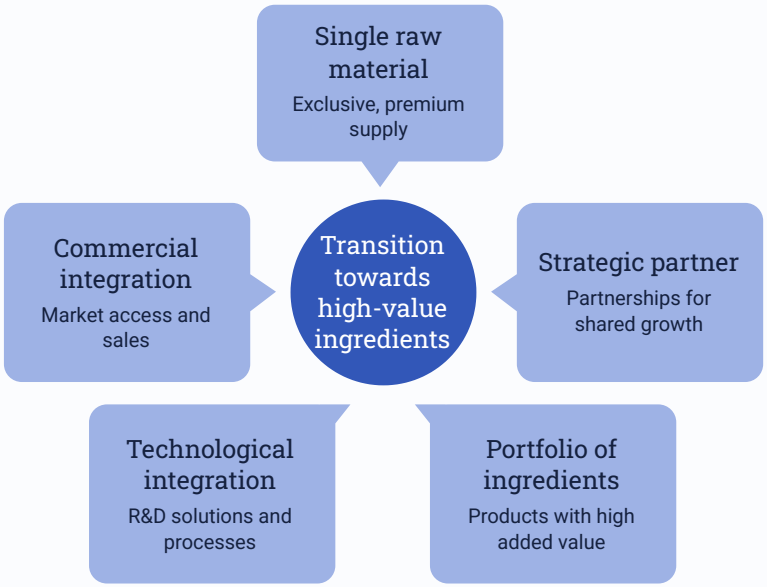
The Slaughter Biorefinery: IntaBiotech's Action Framework

The economically rational response is not to try to rescue commodity leather. It is to reorganise slaughter under a **multi-output biorefinery** logic: assigning each fraction to its highest-value technical, regulatory and commercial destination.



Classification | Allocation | Processing | Commercialisation

This model transforms the slaughterhouse from a supplier of a single raw material into a strategic partner in a portfolio of high-value ingredients. IntaBiotech acts as the technological and commercial integrator of this transition.



Valuable Flow Map: Commercial Opportunities by Fraction

Hide/Skin

Component: Type I collagen / gelatine / peptides

- Food grade and nutraceutical
- Functional cosmetics
- Medical biomaterials

Key advantage: Hides with poor aesthetic quality can exceed commodity leather in value if redirected to molecular extraction.

Bone, Cartilage and Tendon

Component: Collagen, gelatine, minerals, hydroxyapatite

- Joint supplements
- Bone biomaterials
- Bioactive peptides

Key advantage: A robust route with high availability when hide alone is not enough to sustain profitability.

Intestines and Intestinal Tissues

Component: Collagenous submucosa

- Natural casings for sausages
- Structural collagen
- Specialised biomaterials

Key advantage: Stable market and compatible with existing meat specialisation.

Blood

Component: Plasma, haemoproteins, haem iron, peptides

- Functional ingredients
- Biotech culture media
- Organic fertilisation

Key advantage: More than 30 Mt/year globally, only ~30% utilised. Enormous underutilisation margin.

Beef and Pork Collagen: The Real Market Situation

What IS true

- There is increasing **pressure on competitively available and traceable supply** for certain grades and origins.
- **Traceability requirements** are growing, as are cultural restrictions on certain origins (bovine in Hindu markets, porcine in Islamic markets).
- Demand for **supplements and biomaterials** is growing faster than traceable supply and supply that is reputationally acceptable.
- The **regulatory segmentation** between raw materials of different natures creates niches where origin matters as much as price.

What is NOT true

⚠ There is no immediate, absolute global shortage of bovine or porcine collagen. Claiming otherwise is technically inaccurate and could damage IntaBiotech's commercial credibility.

The industrial advantage of bovine and porcine collagen in terms of availability and technological maturity remains overwhelming. What is changing is **market re-segmentation**: alternative sources (marine, avian, egg-based, recombinant) are gaining relevance in premium niches, not in mass volume.

ⓘ Correct commercial message: "Growing tension around traceable qualities" — not "global shortage".

Eggshell Membrane (ESM): The Great Premium Opportunity

Fundamental precision: when the market talks about "eggshell collagen", the correct expression is **collagen or eggshell membrane peptides (ESM, Eggshell Membrane)**. The mineral shell (calcium carbonate) is a distinct fraction.

Composition of ESM

- ~1,02% of the wet weight of the egg
- ~0,24% of the dry weight
- 80–85% organic matter
- 15–20% inorganic fraction
- ~10% of the organic matter is collagen (types I, V and X)

High-value components

- Collagen types I, V and X
- Glucosamine
- Chondroitin
- Hyaluronic acid
- Other extracellular matrix proteins

Differential advantage

ESM does not offer just collagen: it offers a **complete ecosystem of extracellular matrix components**. Its value does not lie in replacing grams of bovine collagen, but in commercialising a complex, differentiated and circular ingredient.

The Theoretical Capacity of ESM: The Numbers for IntaBiotech

Global potential calculation

Worldwide egg production 2024: 100 million tonnes (FAO)

Recoverable ESM (dry basis): ~240.000 tonnes/year

Organic fraction (80–85%): ~192.000–204.000 t

Theoretical crude collagen (~10%): 19.200–20.400 tonnes/year

Before deducting losses from collection, separation, purification and hydrolysis.

Strategic interpretation for IntaBiotech

1 Enough for premium niches

The tonnage justifies specific industrial investments and differentiated ingredient strategies.

2 Insufficient for mass substitution

It cannot replace the full set of bovine and porcine streams at global scale. Do not try to.

3 Opportunity for local capture

Proximity to ovoproduct hubs in Spain and Europe is a real competitive advantage for IntaBiotech.

Competitive Advantages of ESM: The Commercial Case

Authentic Circularity

ESM comes from an ovo-product by-product. The mineral fraction (calcium carbonate) is valorised separately, while the membrane is directed to peptides or biomaterials. Combined utilisation improves the overall economics of the residue.

Sales argument: "100% circular ingredient, zero waste, ESG narrative you can verify."

Origin Differentiation

Avoids objections associated with bovine or porcine sources in many markets (halal, kosher, vegan-adjacent, Asian markets). Opens doors where traditional collagen faces cultural or religious barriers.

Sales argument: "Collagen without restrictions linked to terrestrial animal origin."

Premium Functional Density

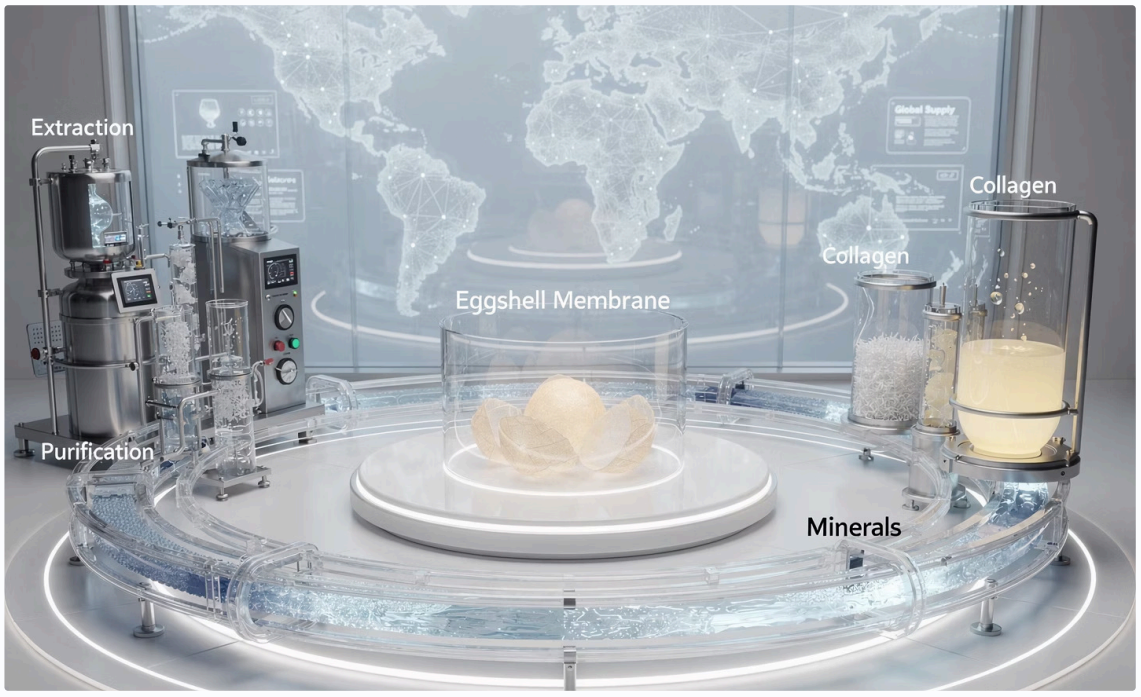
Collagen + glucosamine + chondroitin + hyaluronic acid in one matrix. Positioning that goes beyond standard "collagen powder". Especially attractive for joints, skin and wound healing.

Sales argument: "It is not collagen. It is the complete joint matrix."

Independence from the Abattoir

For IntaBiotech, ESM makes it possible to build an alternative supply route from the egg industry, without relying on large streams of bovine hides or bones.

Sales argument: "Diversified and resilient supply chain."



Limitations

1

Technological limitation: insolubility

The ESM shows marked insolubility due to its highly cross-linked structure and disulphide bonds. Recoveries of up to 98,9% in separation are possible, but the highest reported solubility is around 62%. Conversion into stable, standardised ingredients is complex and costly.

2

Economic limitation: not a commodity

ESM is only competitive with concentrated collection, proximity to ovoproduct centres, solvent separation technology and the ability to sell a premium ingredient. Competing with cheap bovine collagen in mass markets is a weak strategy.

3

Regulatory limitation: a demanding route

In the EU, EFSA approved egg membrane collagen peptides as a novel food in 2025 (450 mg/day). In the US, the FDA stopped assessing a GRAS notification due to deficiencies in characterisation and safety. The regulatory pathway requires analytical robustness superior to what the market presumes.

4

Allergen: mandatory management

ESM retains its allergenic status linked to egg. Cultural or perceived advantages do not remove the requirement for labelling and allergen management in all markets.

Strategic Comparison: Where IntaBiotech Plays

Analysis of the three collagen sources to define IntaBiotech's optimal competitive positioning.

Criterion	Bovine/Porcine	ESM (egg membrane)	Non-animal recombinant	IntaBiotech position
Current scalability	Very high	Medium-low	Still limited	ESM as a premium niche; bovine/porcine as the volume base
Cost per tonne	Generally lower	Higher	Currently high	ESM should not enter as a commodity
Circular narrative	High if a by-product	Very high	High (animal-free)	ESM leads on ESG narrative
Functional differentiation	Good but standard	Very high (complex matrix)	High by molecular design	ESM and recombinant are premium pathways
EU regulatory maturity	High	In progress (EFSA 2025)	Expanding	Documentary robustness is critical
Main risks	Traceability, origin, culture	Egg allergen, process cost	Cost and acceptance	There is no universal solution

Sources: EFSA 2024 (BSE/collagen), EFSA 2025 (ESM novel food), FDA 2025 (GRAS GRN 001194), Al Hajj et al. 2024, Han et al. 2023.

Commercial Action Plan for IntaBiotech: 5 Priorities

1. We map available streams and qualities

We identify suppliers of skins, bones, blood and eggshells within IntaBiotech's logistical radius. We classify them by quality, traceability and potential destination. It is not advisable to assume that all raw material is worth the same.

2. We segment by value destination, not by production habit

Traceable, defect-free skin → premium leather. Degraded skin → collagen/gelatine/peptides. ESM → nutraceuticals/cosmetics/biomaterials. Blood → functional ingredients. Fat → oleochemicals.

3. We ensure minimum viable traceability

EUDR and novel food requirements demand origin documentation. IntaBiotech must build, or require from its suppliers, a traceability system that can withstand regulatory and commercial audits, which is our priority.

4. Decide the target market for ESM

Nutraceuticals/cosmetics (EFSA novel food approved, 450 mg/day) or medical biomaterials (higher value, greater regulatory requirements). We work in the niches where we have the strongest competitive advantage.

5. We manage expectations with technical rigour

We do not promise mass substitution of bovine collagen. We do not claim absolute scarcity. We position ESM according to our perspective as a premium, circular, differentiated and selective ingredient. Technical credibility is IntaBiotech's most valuable asset, and that is why we do what we do.

Commercial Contact

Sue Rodríguez

Position: Customer Relations & Supply Chain Manager

Telephone: +34 604 068 683

Email: sr.ndpharma@europe.com

Álvaro Robles

Position: CCO – Chief Circulation Officer

Telephone: +34 609 825 416

Email: a.robles@intabiotech.com

José Ramón Castells

Position: Commercial Manager

Telephone: +34 674 001 716

Email: jr.ndpharma@europe.com

General contact information

📞

(Landline) (+34) 613 812 425

(Mobile) | (+34) 881 092 720

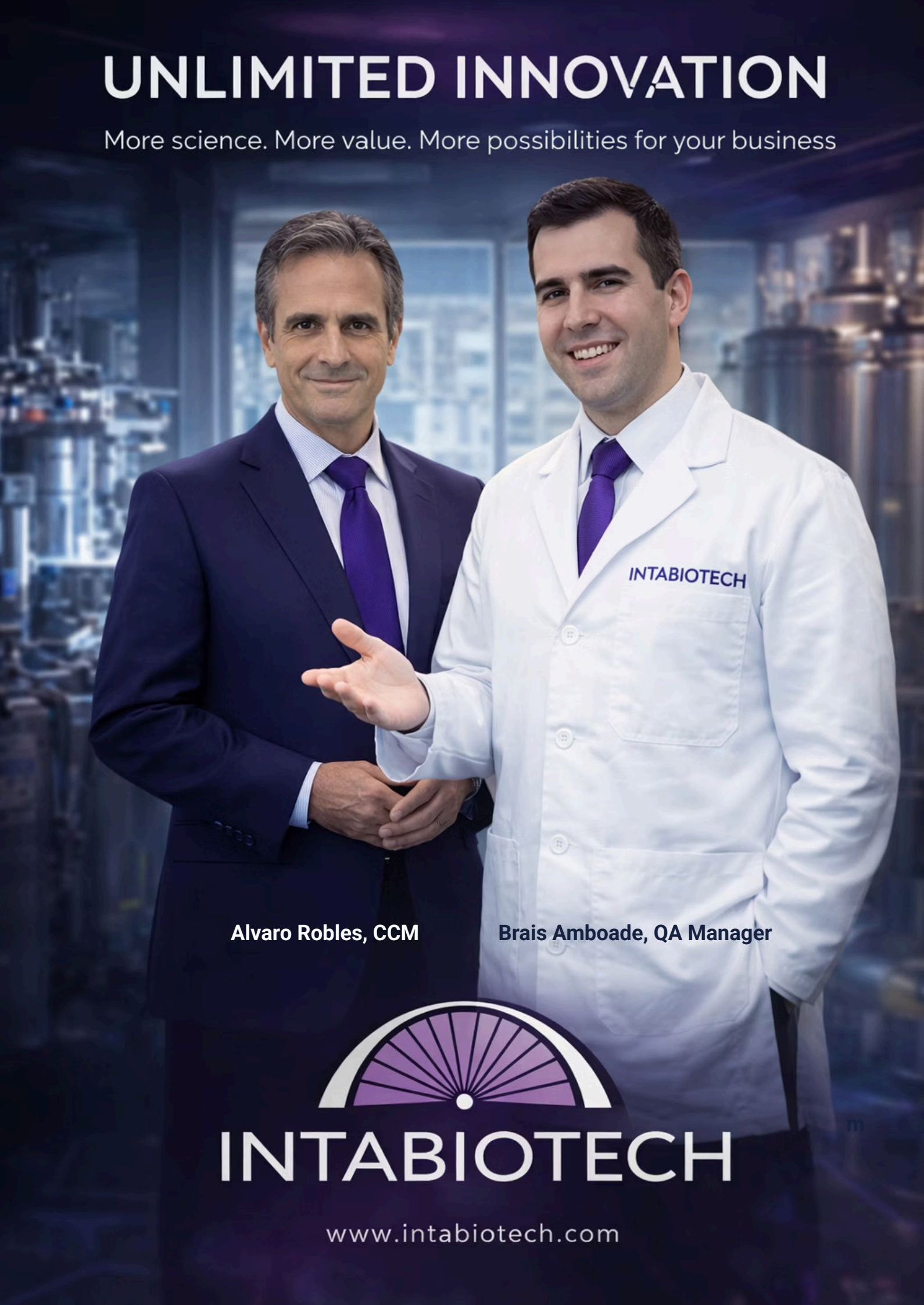
✉️

E-mail:

intabiotech@intabiotech.com

Registered Address: Botiguers, 3, 1ª Planta, Parque Empresarial Táctica, 46980, Paterna, Valencia, España

Industrial Address: Avda. Ferreiros, 143, Polígono Industrial Rio Do Pozo, 15578, Narón, A Coruña, España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