

## Singapore's TurtleTree debuts first-ever plant based lactoferrin protein

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TurtleTree (HQ: Singapore), a global leader in animal-free functional dairy proteins, has developed the world's first precision fermentation-produced lactoferrin (LF+), a high-value bioactive milk protein. TurtleTree projects to commercially launch LF+ in Q4 2023.

Lactoferrin is one of the most powerful parts of cow's milk, with great functional benefits for immunity, iron regulation, and digestive health. The highly nutritious ingredient is designed into LF+-powered food and beverages that deliver delicious, unadulterated flavor coupled with health-boosting benefits.

Lactoferrin, otherwise known as "pink gold" because of its high value and iron-rich pink hue, is naturally found in cow's milk but the low concentrations and current resource-intensive extraction processes limit access for many people. Its iron-regulating benefits can improve physical performance, aiding endurance, fatigue resistance, muscle strength, and energetic efficiency.

To put the value of lactoferrin into context with other dairy proteins like whey, which costs approximately \$1 per kilogram, lactoferrin retails at between \$700 to \$1,500 per kilogram. These prices reflect the significant resources necessary to extract the highly-prized protein, with up to 10,000 liters of milk or nearly 50 cows producing a week's worth of milk required to obtain just 1 kilogram of purified lactoferrin.

Currently, lactoferrin is already used in supplements and infant formula. Yet, there remains a supply scarcity concerns unable to meet the demand for other fertile segments like sports nutrition. Accessing lactoferrin directly through off-the-shelf whole cow's milk can be a challenge, with pasteurization removing up to 50% of the naturally occurring protein. Furthermore, for conscious consumers who make the switch to plant-based milk, where lactoferrin is not inherently present, maintaining intake

of this important nutrient can be a struggle.

"The development and debut of this highly valuable animal-free dairy protein is yet another innovative breakthrough that creates more sustainable food choices and a more sustainable food system. With more private sector and public sector support, precision fermentation is one of the brilliant alternative protein technologies that can open up a world of possibilities on this front" says Good Food Institute Co-Founder and President Bruce Friedrich.

Through the use of precision fermentation—harnessing microbes as tiny factories embedded with lactoferrin's unique recipe—TurtleTree is removing high methane-emitting cows from the lactoferrin supply chain and unlocking an abundant, sustainable, and affordable source of the highly-prized nutrient. TurtleTree is demonstrating how precision fermentation-derived proteins can help reduce the nutritional gap between conventional and plant-based products.