



# KYTOS

**A Radical Change in Microbiome Management**

Ruben Props, CEO and co-founder

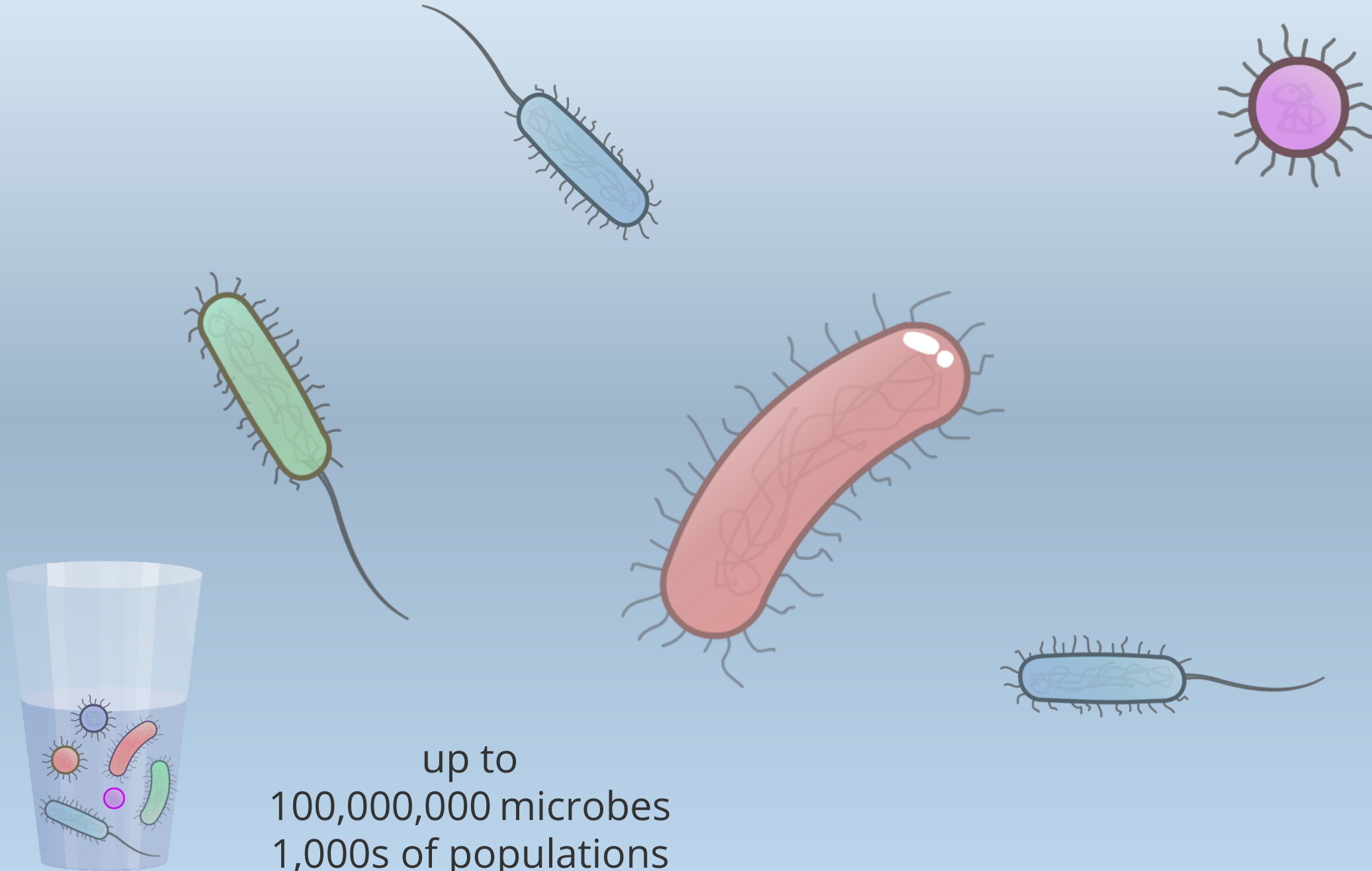
TCRS – Shrimp Summit  
Bali, June 24<sup>th</sup>, 2025

# What's Happening in the Water ?

**Today's Reality**

<50% success rate **and**

6 bln USD/year in crop losses from disease



up to  
100,000,000 microbes  
1,000s of populations



♥ Microbiome health

30,000,000 40,000,000 50,000,000

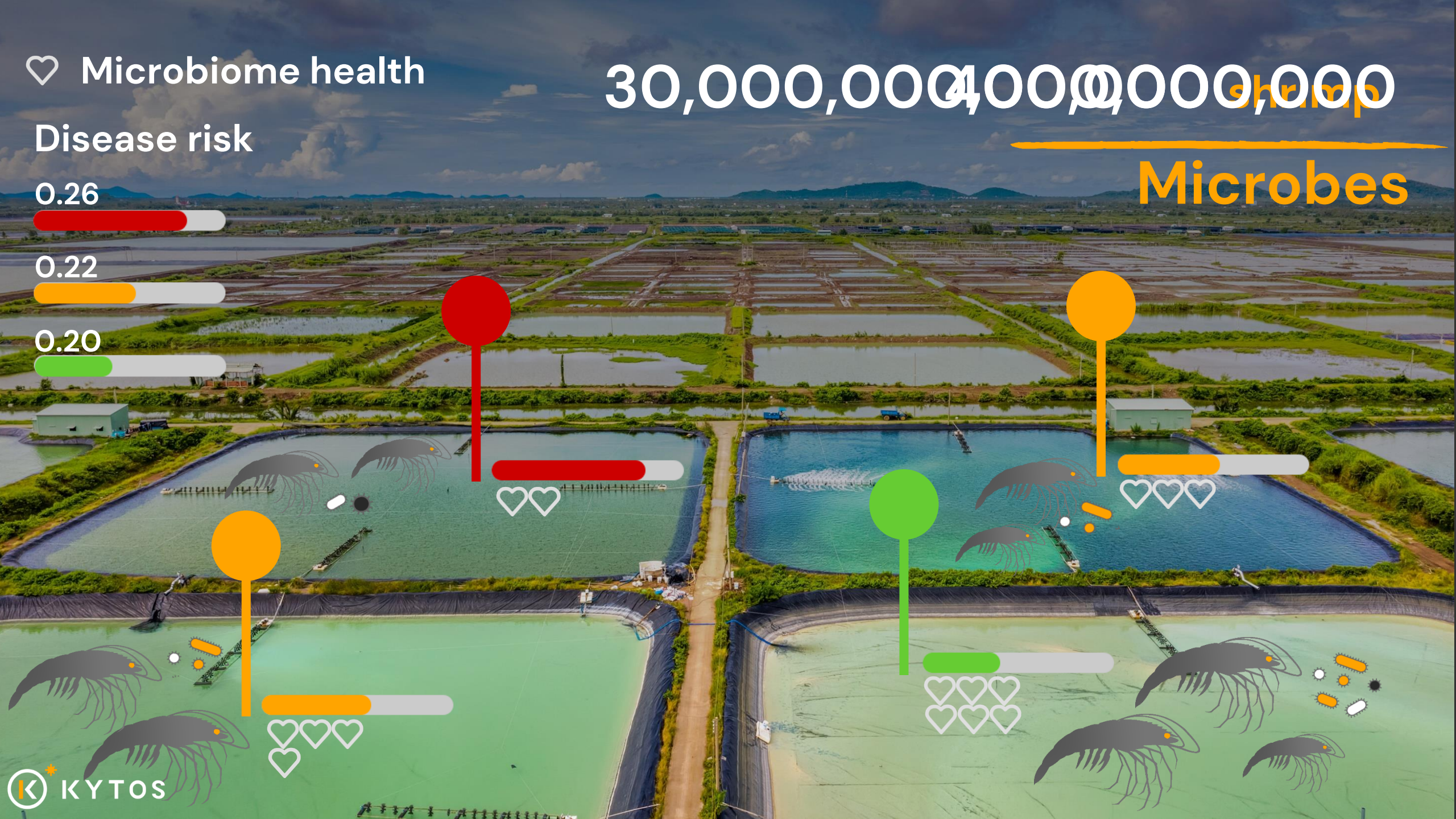
Disease risk

0.26

0.22

0.20

shrimp  
Microbes





# The Farming Industry Is **Looking for Solutions**

Managing a Microbiome Demands ....

*Business*



**Easy and Accessible Service**

**Fast and Frequent Health Data**

*Technology*



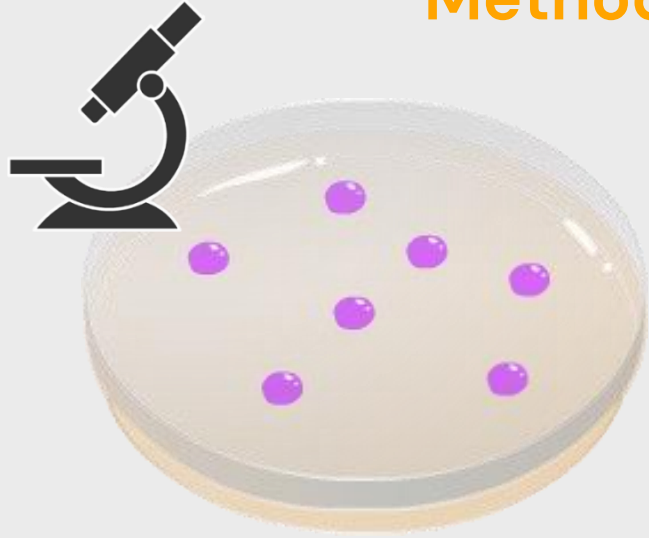
**Comprehensive Evaluation**



**Support Decision-Making**



## Culture-based Methods

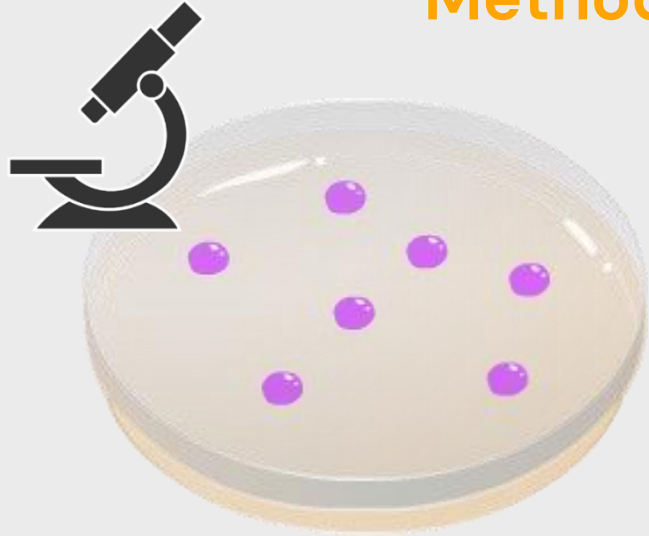


< 1 %

of cells can grow



## Culture-based Methods

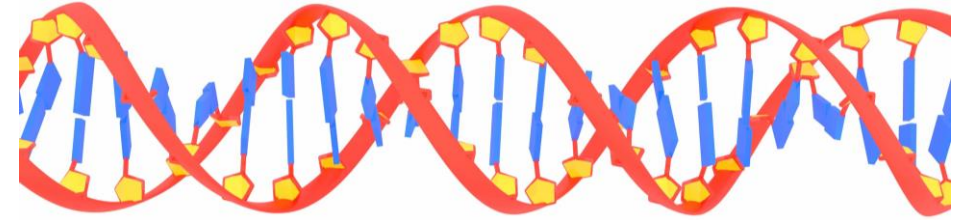


**< 1 %**

of cells can grow



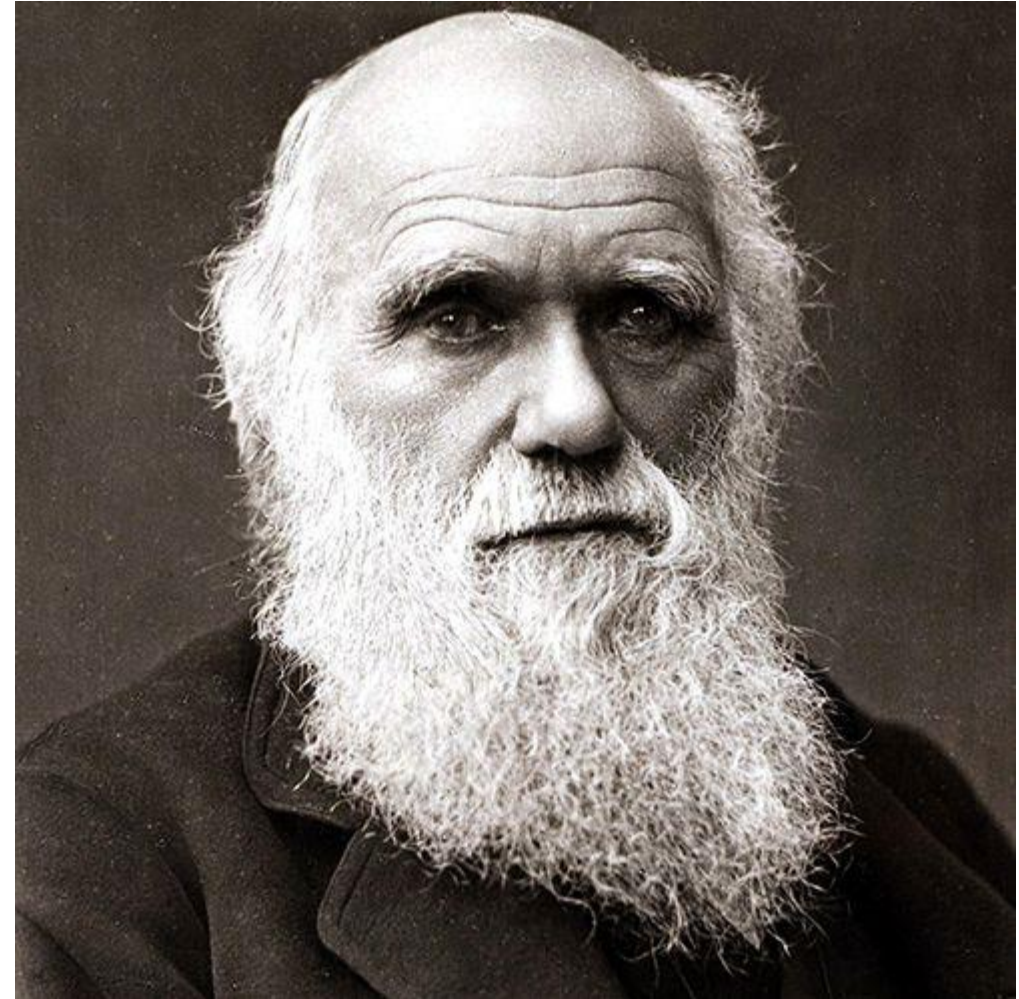
## Genetic-based Methods



Are they alive ?  
What are they doing ?



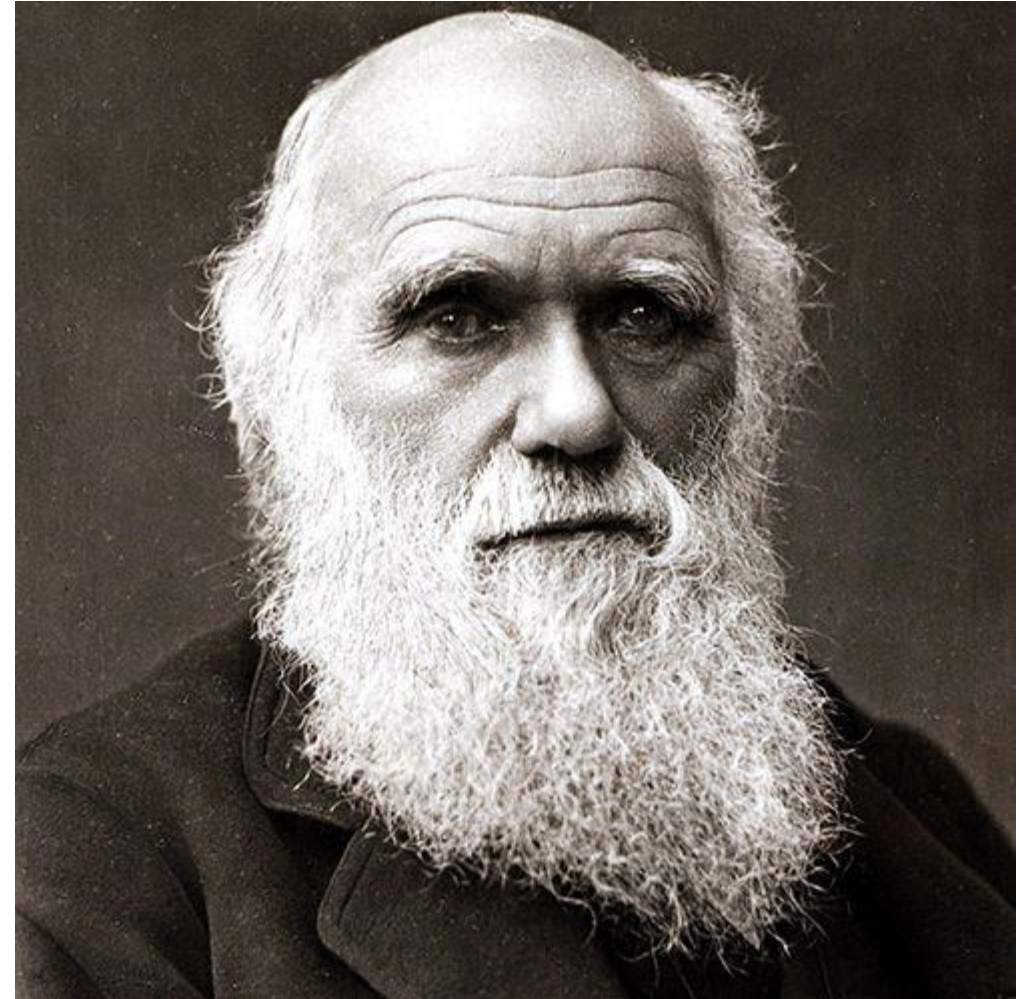
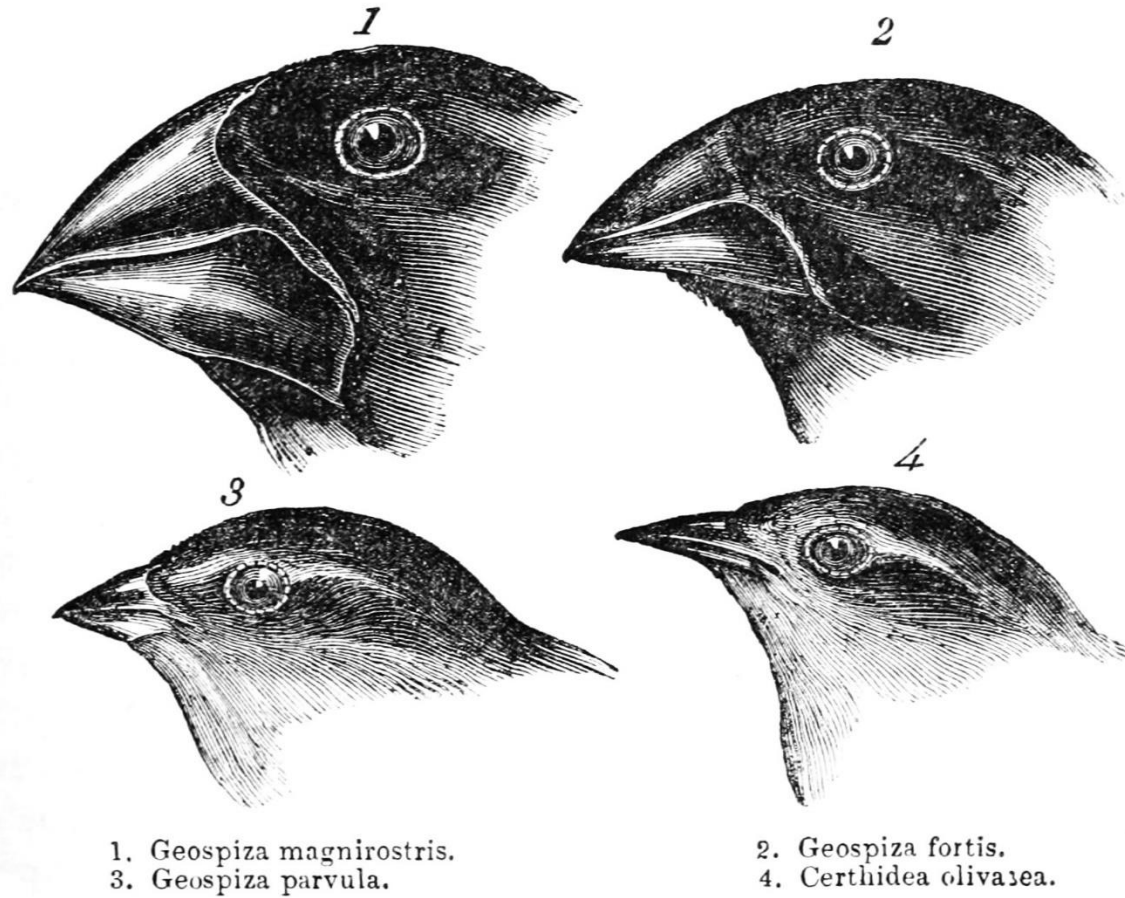
# To Go Forward – We Must First Go 200 Years Back



Charles Darwin (1809-1882)  
Bob Thomas/Popperfoto via Getty Images/Getty Images

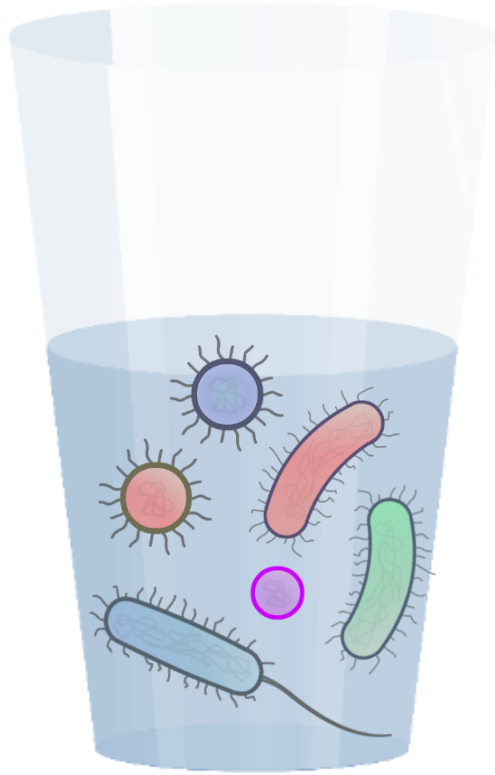


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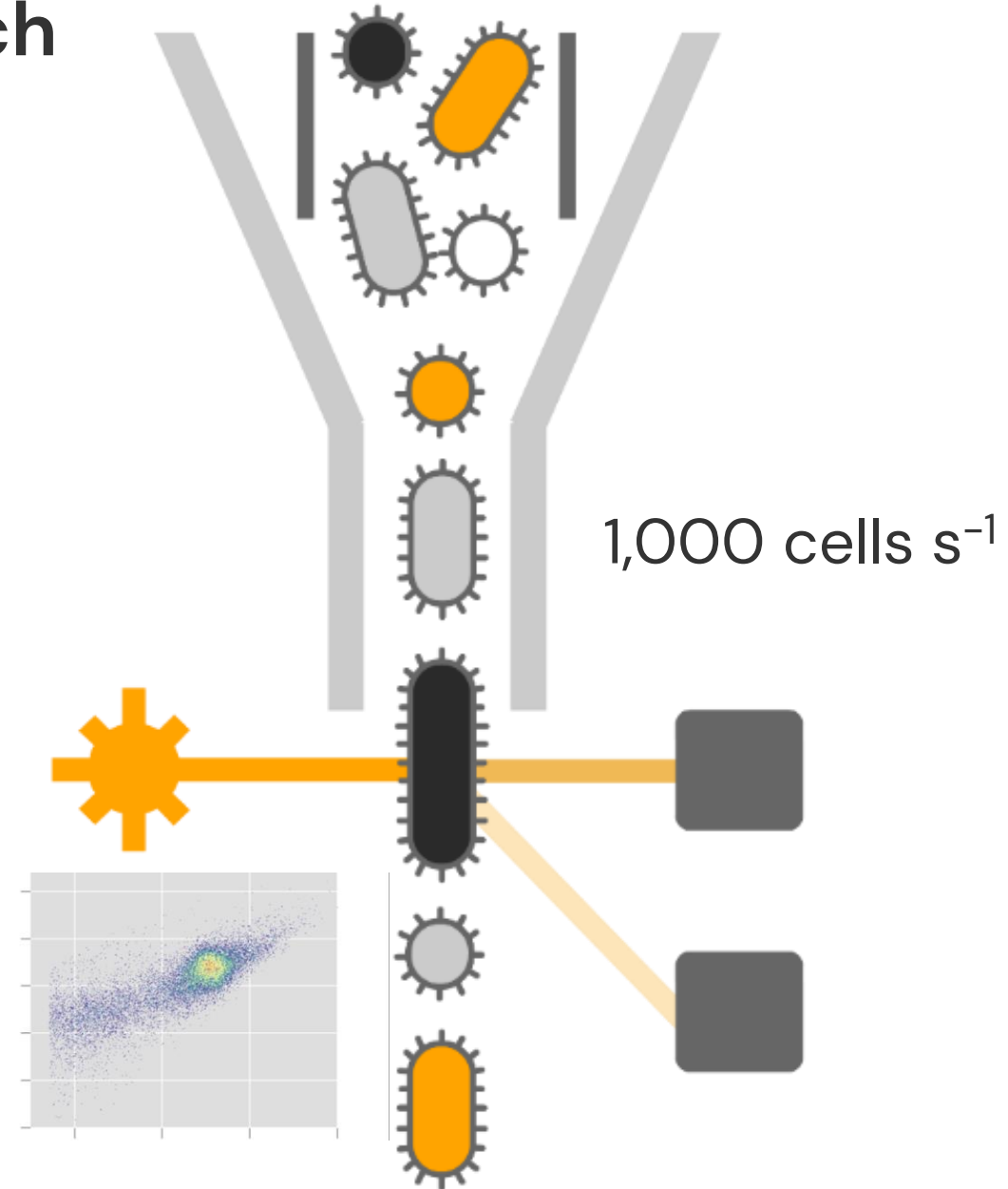


Charles Darwin (1809-1882)  
Bob Thomas/Popperfoto via Getty Images/Getty Images

# Flow Cytometry – A Darwin Approach



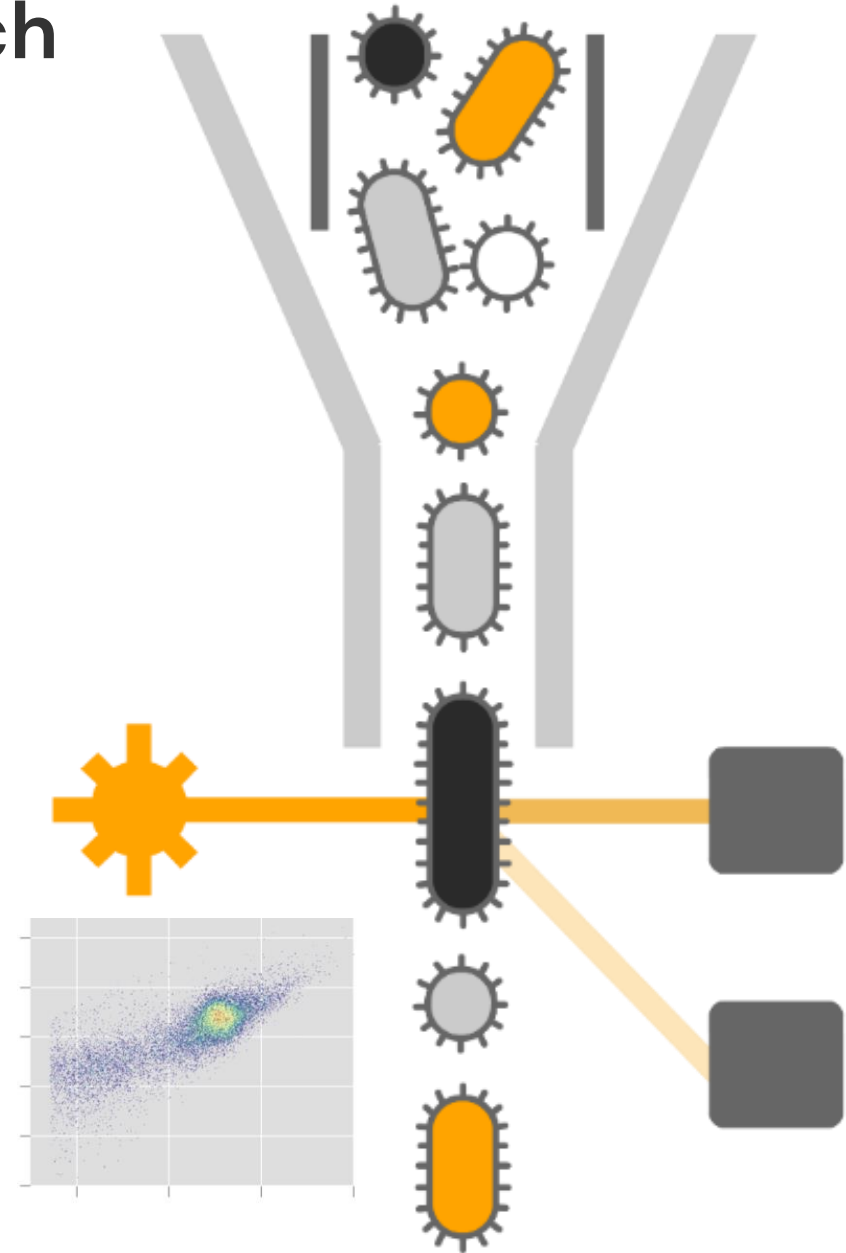
*cells are stained with fluorescent markers*



# Flow Cytometry – A Darwin Approach

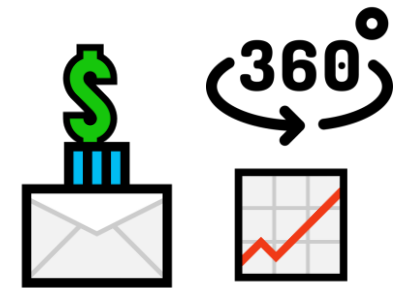


*applications expanded to gut/sediment*





# KYTOS: Fast, Accurate, Quantitative End-to-End Microbiome Management



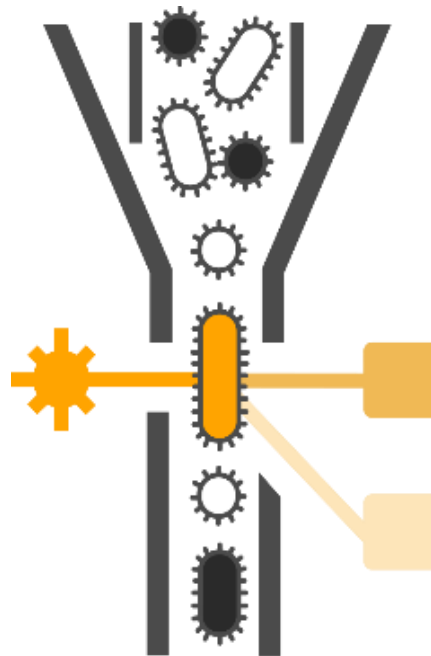
## EASY SAMPLE



< 24 h



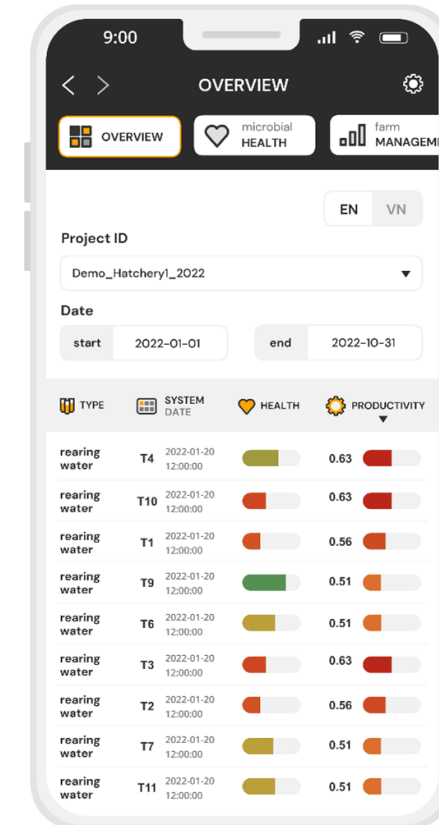
## RAPID ANALYSIS



Software +  
A.I.



## DECISION-MAKING





KYTOS

BẢNG ĐIỀU KHIỂN

Thông tin dưới đây thể hiện những thay đổi chính của hệ vi sinh vật kể từ lần cuối phân tích

Hệ thống / Tên máy	Ngày	Sức khỏe	Hoạt động	Chỉ số rủi ro	Thao tác
Nước nuôi T9	2022-01-19 12:20:00	<div><div></div></div> 0.51	<div><div></div></div> 0.38	0.00	<div><div></div></div>
Nước nuôi T4	2022-01-20 12:20:00	<div><div></div></div> 0.63	<div><div></div></div> 0.38	0.00	<div><div></div></div>
Nước nuôi T6	2022-01-19 12:03:00	<div><div></div></div> 0.51	<div><div></div></div> 0.38	0.00	<div><div></div></div>
Nước nuôi T3	2022-01-19 12:20:00	<div><div></div></div> 0.49	<div><div></div></div> 0.38	0.00	<div><div></div></div>
Nước nuôi T1	2022-01-20 12:03:00	<div><div></div></div> 0.38	<div><div></div></div> 0.38	0.00	<div><div></div></div>

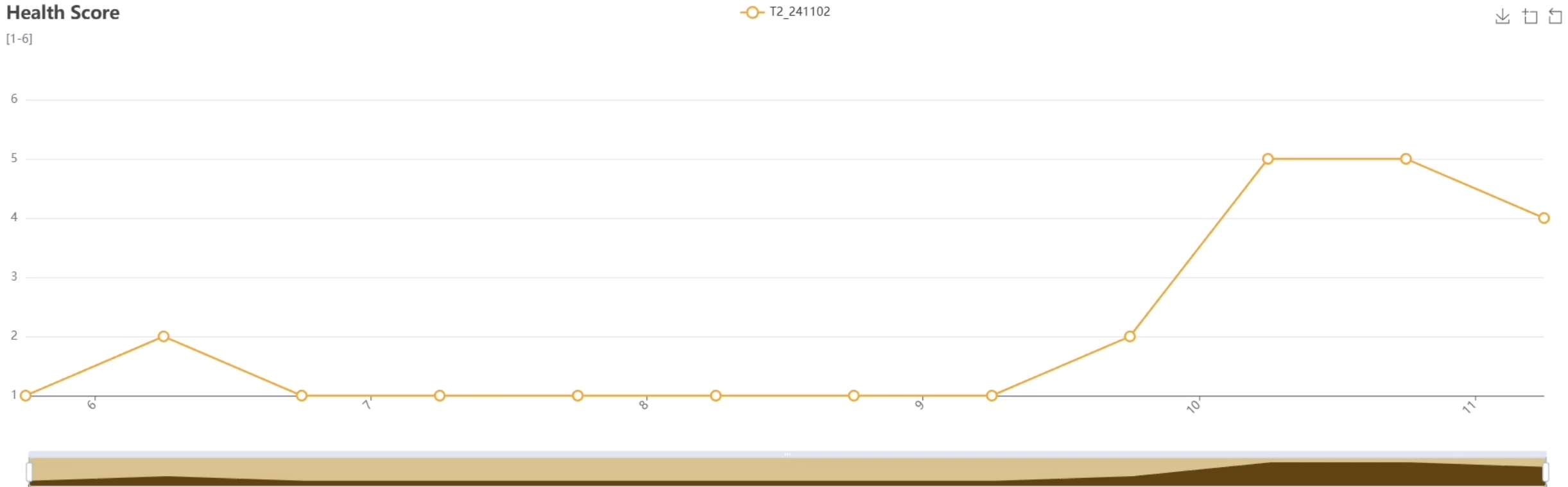
<input type="checkbox"/>	TYPE	SYSTEM / DATE	HEALTH	TREND	PRODUCTIVITY	GROWTH RISK	VIBRIO MARKER	SURVIVAL
<input checked="" type="checkbox"/>	Rearing water	T2_241102 2024-11-11 06:00:00	♥♥♥♥ ♥	▼ -10%	49 % <div></div>	0.21 <div></div>	1.6 % <div></div>	HIGH
<input type="checkbox"/>		T1_241102 2024-11-11 06:00:00	♥♥♥♥ ♥	▼ -10%	51 % <div></div>	0.20 <div></div>	1.6 % <div></div>	HIGH
<input type="checkbox"/>		T6_241104 2024-11-05 18:00:00	♥♥♥ ♥	—	93 % <div></div>	0.28 <div></div>	1.7 % <div></div>	HIGH
<input type="checkbox"/>		T4_241105 2024-11-05 18:00:00	♥♥♥ ♥	—	93 % <div></div>	0.30 <div></div>	1.5 % <div></div>	HIGH

Quick View



Health Score

[1-6]





# From Data to Data-Driven Decision Making

## A.I. Recommendation Engines

Sample sublocation	Date	Health Score	Bacterial load (cells/mL)	Biofloc levels (%)	Trophic index (a.u.)	Productivity (%)	Cell viability (%)	Diversity (a.u.)	Growth Risk index (a.u.)	Vibrio marker (cells/mL)
T1_241102	2024-11-05T18:00:00Z	2	1919200	1.62	0.99	82.18	46.02	1873	0.25	362
T2_241102	2024-11-05T18:00:00Z	1	2726667	2.12	1	84.89	41.5	1744	0.26	504
T6_241104	2024-11-05T18:00:00Z	1	2235867	1.89	1	93.33	50.03	1626	0.28	377
T4_241105	2024-11-05T18:00:00Z	1	1486933	1.56	1	93	35.85	1188	0.36	224
T1_241102	2024-11-06T06:00:00Z	4	565733	2.85	0.99	55.29	29.48	3137	0.23	89
T2_241102	2024-11-06T06:00:00Z	2	3266000	2.16	1	83.81	43.92	1890	0.26	623
T1_241102	2024-11-06T18:00:00Z	4	338000	3.87	0.97	50.31	33.73	3194	0.23	56
T2_241102	2024-11-06T18:00:00Z	1	3240133	2.35	1	84.26	51.28	1773	0.26	576
T1_241102	2024-11-07T06:00:00Z	5	338000	4.42	0.98	53.03	43.27	3496	0.25	48
T2_241102	2024-11-07T06:00:00Z	1	2548400	1.99	0.99	85.14	52.2	1587	0.23	489



Continuous Innovation  
Software updates

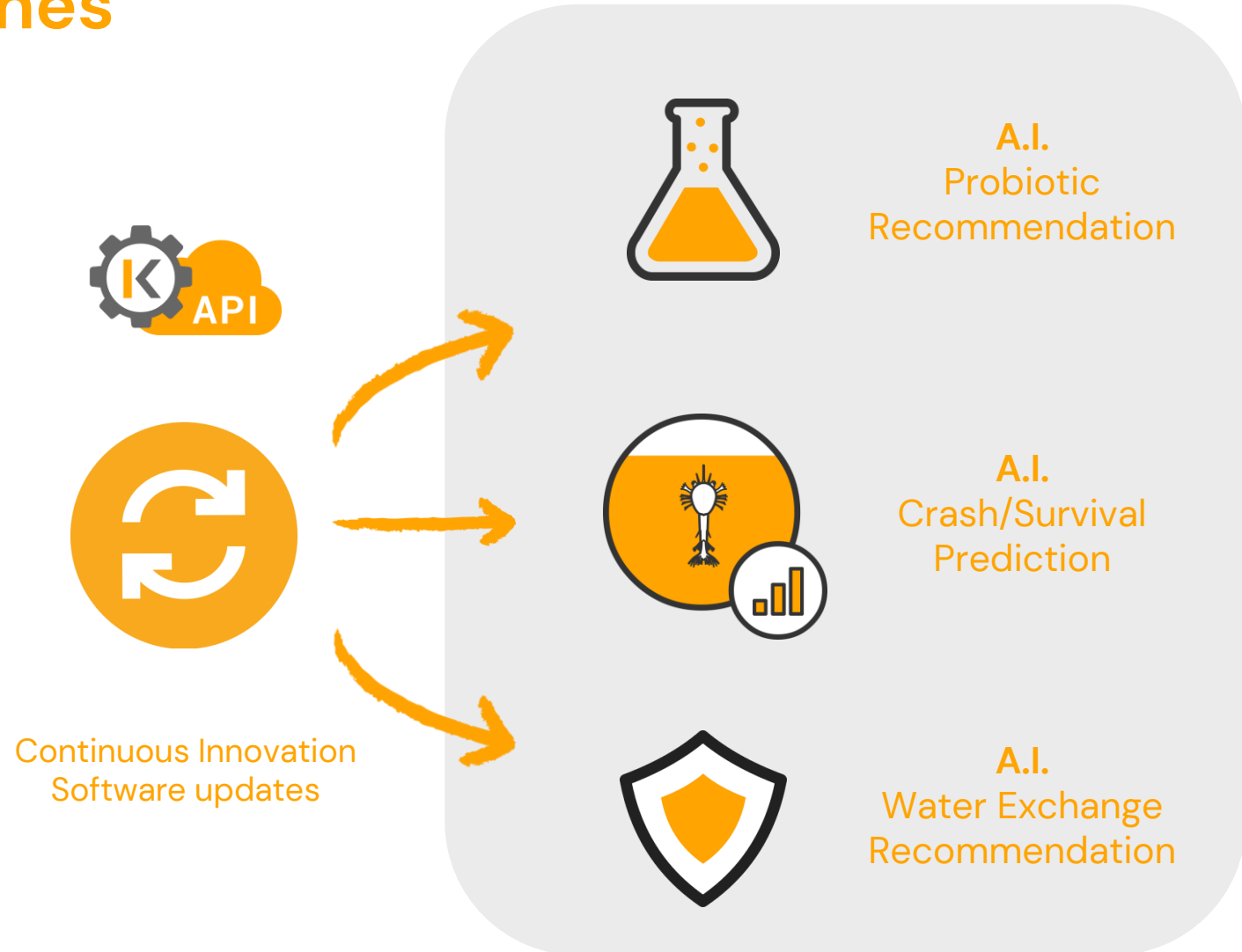
> 200,000 samples

# From Data to Data-Driven Decision Making

## A.I. Recommendation Engines

Sample sublocation	Date	Health Score	Bacterial load (cells/mL)	Biofloc levels (%)	Trophic index (a.u.)	Productivity (%)	Cell viability (%)	Diversity (a.u.)	Growth Risk index (a.u.)	Vibrio marker (cells/mL)
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> 200,000 samples



Choose your application

☒ Probiotic ☐ Sanitiser

PRODUCT RECOMMENDATION    GRAPHS

 .SYSTEM	 .TYPE	 .DOSING.NEED	 .DOSE	 .MAX.EFFECT	 .TREND
▶ T6_241104 (5)			32.5 ppm	25%	
▶ T4_241105 (5)			19.5 ppm	20%	
▶ T1_241102 (5)			10.0 ppm	35%	
▶ T2_241102 (5)			6.5 ppm	25%	



# A.I. (LLM) Innovations are coming !



What is the status of my farm?



## Farm Status Overview

Based on the most recent data from your farm, here are the key insights:

### 1. Productivity Metrics:

- All sampling sublocations are currently in the ● **Poor** zone for productivity, indicating high carbon and nutrient levels in your system. This suggests optimal conditions for bacterial growth, which may not be favorable for your objectives.

### 2. Growth Risk Index:

- The **Growth Risk Index** is also showing predominantly ● **Poor** results across most sublocations, except for a few that are rated ● **Moderate**. This indicates a higher risk associated with larger and faster-growing cells in your system.

### 3. Vibrio Marker:

- The **Vibrio Marker** levels are critically high across all sublocations, characterized by ● **Poor** readings. This poses a significant risk for Vibrio-related diseases, and close monitoring is advised.

## Summary of Notable Trends:

- The trend in bacterial diversity is generally declining, with several sampling points showing negative percentage changes. Some samples, however, show positive changes but remain in the poor zone for productivity and growth risk.

## Recommendations:

- **Immediate Action:** Given the high Vibrio loads and poor productivity metrics, it may be necessary to reassess your feeding strategies or water quality management to encourage a healthier microbiome and lower the risks associated with Vibrio.
- **Monitoring:** Regular monitoring and testing should continue to track changes in these metrics.

If you need further assistance or a human specialist to help address these issues, please let me know!

# Shrimp Post-Summit Tour



Microbial health assessment of participating farms/hatcheries

25 samples will be collected

Data shared anonymously

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**Haris Muhtadi**  
Associate Director – CJ Feed & Care Indonesia



# We've built a significant user base ...



**Mr. Ta Duc Nghia - Distributor & farm owner**

*"Kytos' services are of great benefit to farmers. Farmers typically lack knowledge about the microbiology of their ponds and rely on their own experience to use microbiology and biocides.*

*If we can combine Kytos' analysis results with product usage, we will optimize production costs more effectively."*



**Mr. Nguyen Thanh Hoa - Farm owner**

*"One of the most useful applications of KYTOS technology is that it helps me effectively regulate the use of probiotics and disinfectants.*

*Previously, I only applied probiotics and sanitizers to my pond periodically based on my personal experience, sometimes it worked but sometimes it didn't.*

*With the results from KYTOS, I know when and how to adjust thanks to more information about the state of the microbial population in the pond"*

