Predicting diseases through the power of biotechnology and AI

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THE SIZE OF THE PROBLEM

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THE SIZE OF THE PROBLEM

AVIAN INFLUENZA

$20Bn

FAO Reports economic losses
(2018-2022, Southest Asia)

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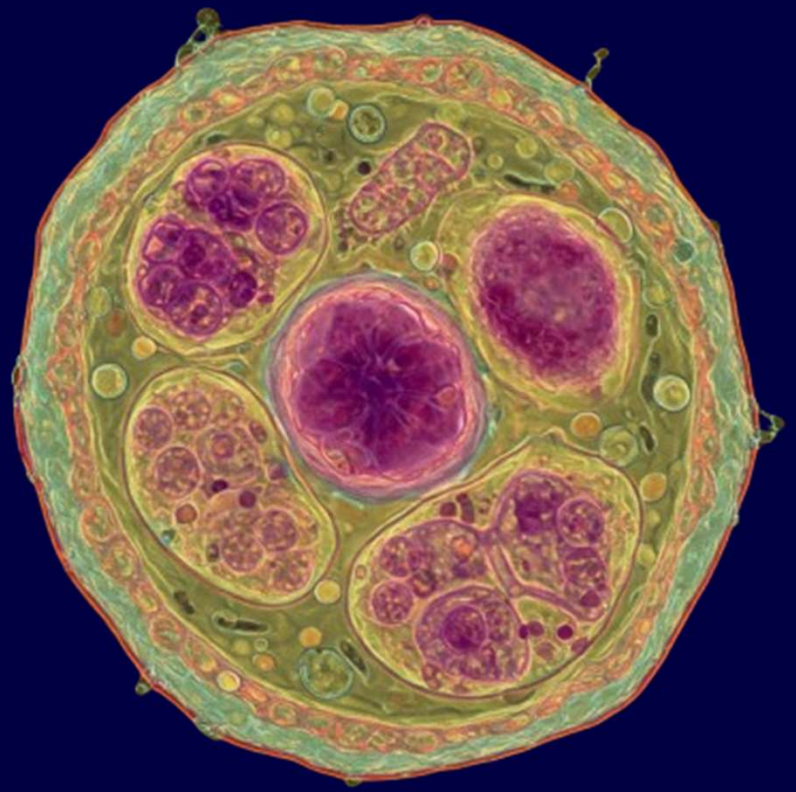
THE SIZE OF THE PROBLEM

COCCIDIOSIS

$2.4Bn/yr

Global economic losses in poultry



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NEWCASTLE DISEASE

+++ Morbidity & Mortality

Significant impact of virulent strains

THE SIZE OF THE PROBLEM

Morbidity

90% losses

Mortality

10% losses

SANOFI

MERIAL
UNA COMPAÑIA SANOFI

ARAVAN LABS

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B.Sc. in Biology, specialized in Biotechnology

Entrepreneur

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Managing Risks of Pandemics, Epidemics, and Common Diseases in
Animal Health and Their Potential Impact on Human Health
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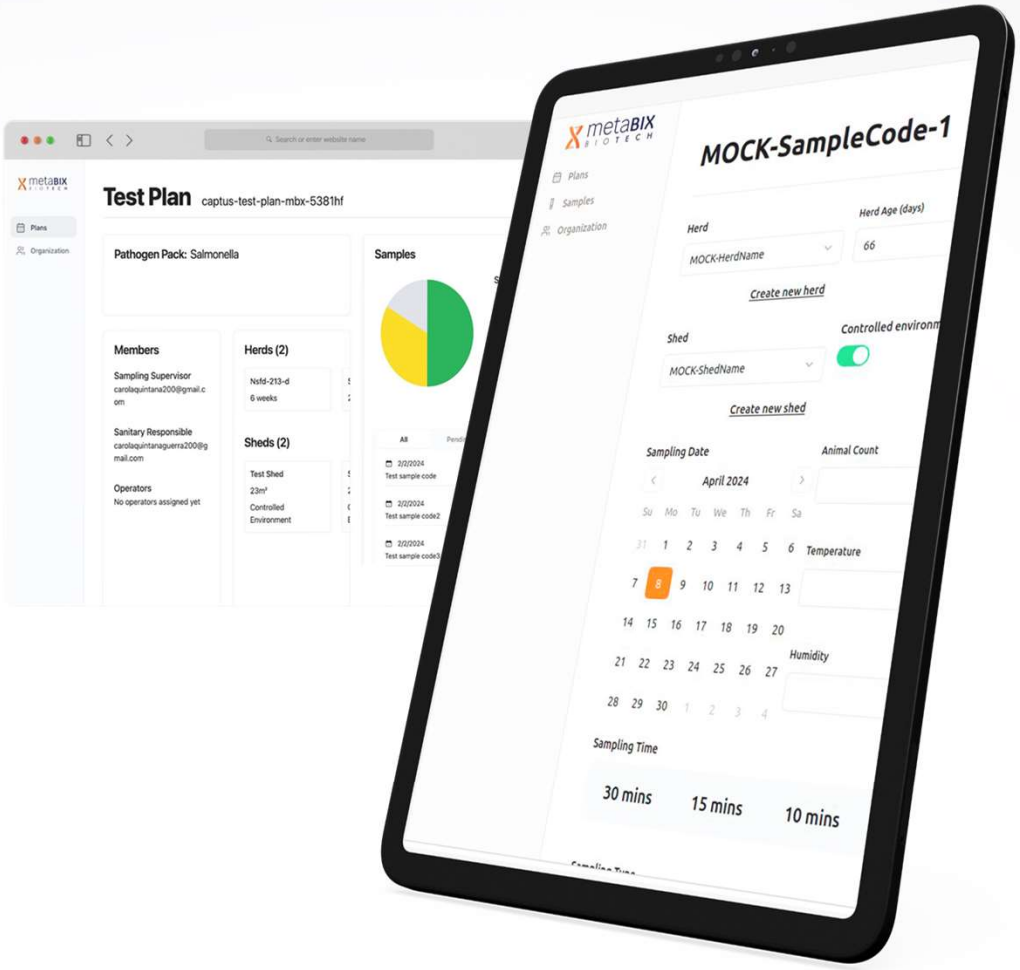

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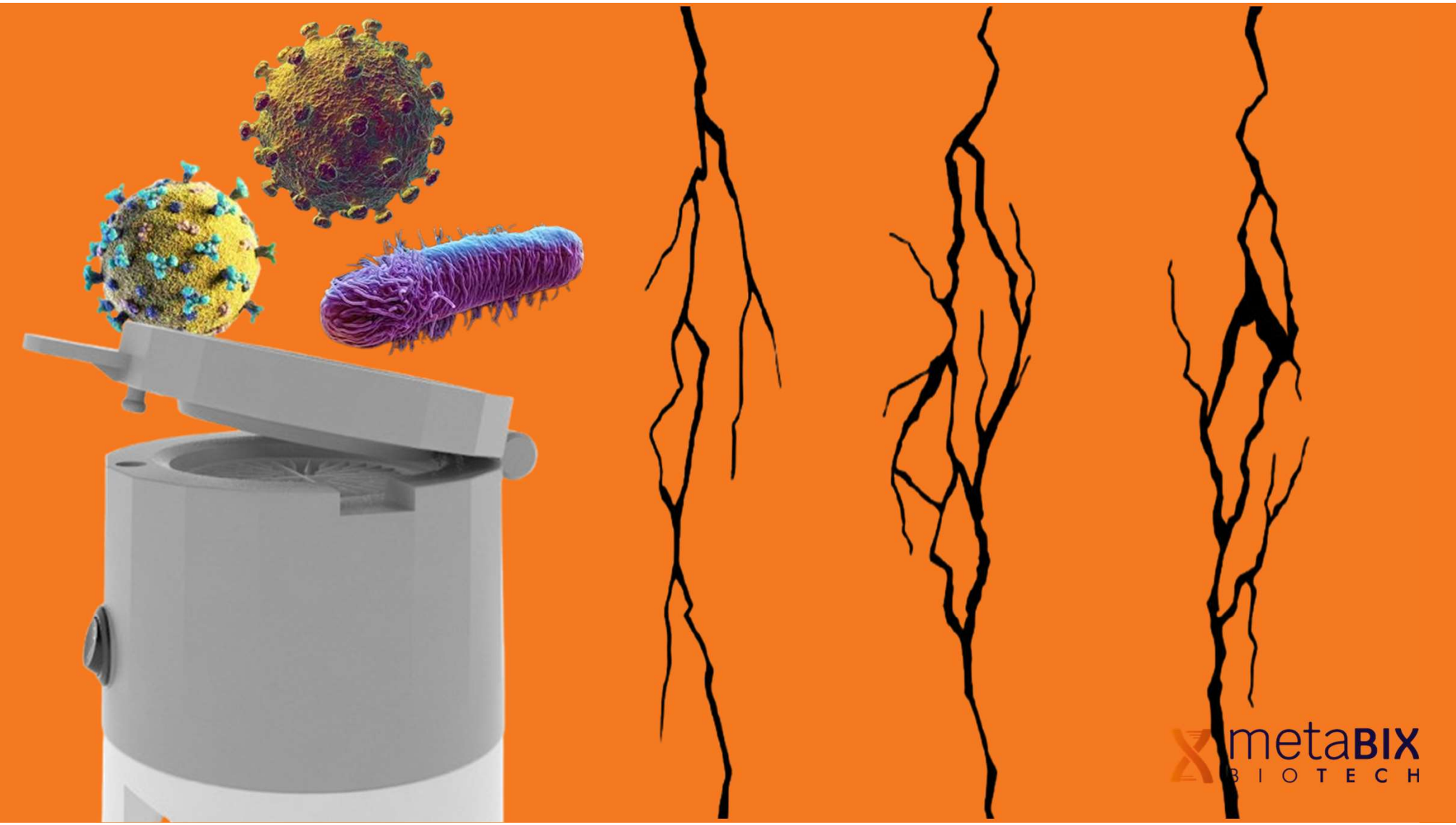
DISRUPTION + SIMPLICITY +
DISRUPTION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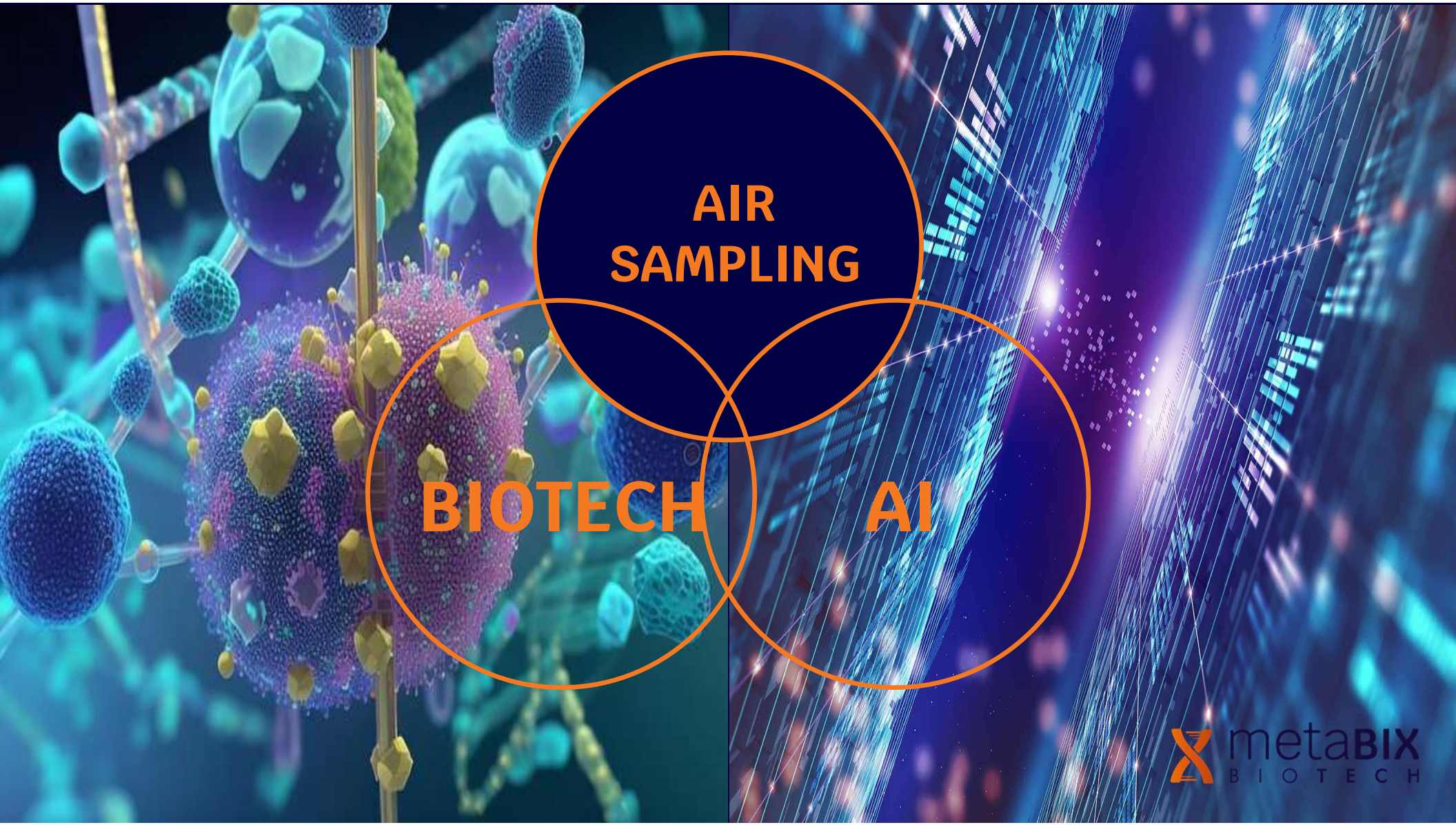
AIR
SAMPLING
BIOTECH
AI
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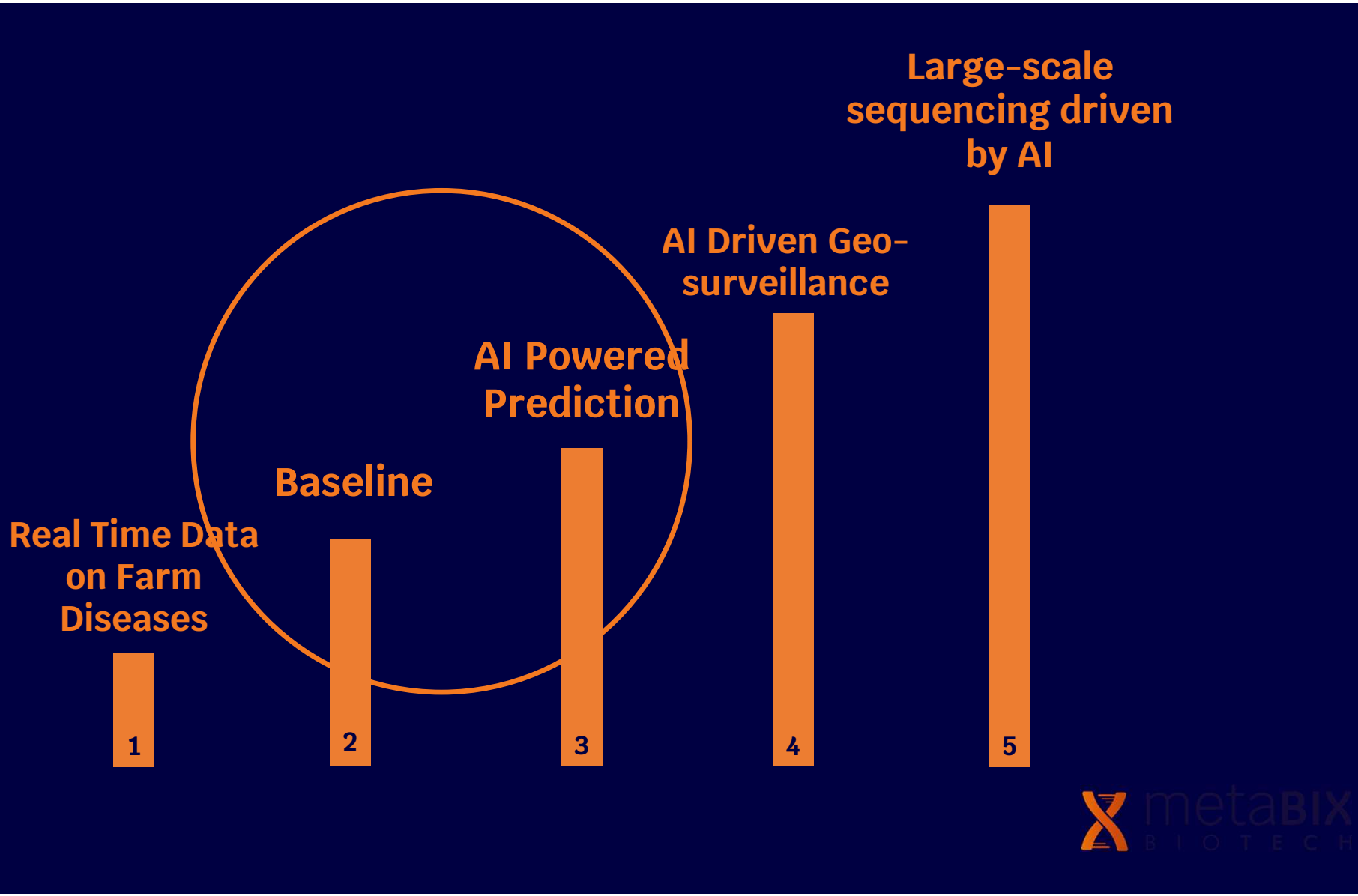
Large-scale sequencing driven by AI
AI Driven Geo-surveillance
AI Powered Prediction
Baseline
Real Time Data on Farm Diseases
1
2
3
4
5
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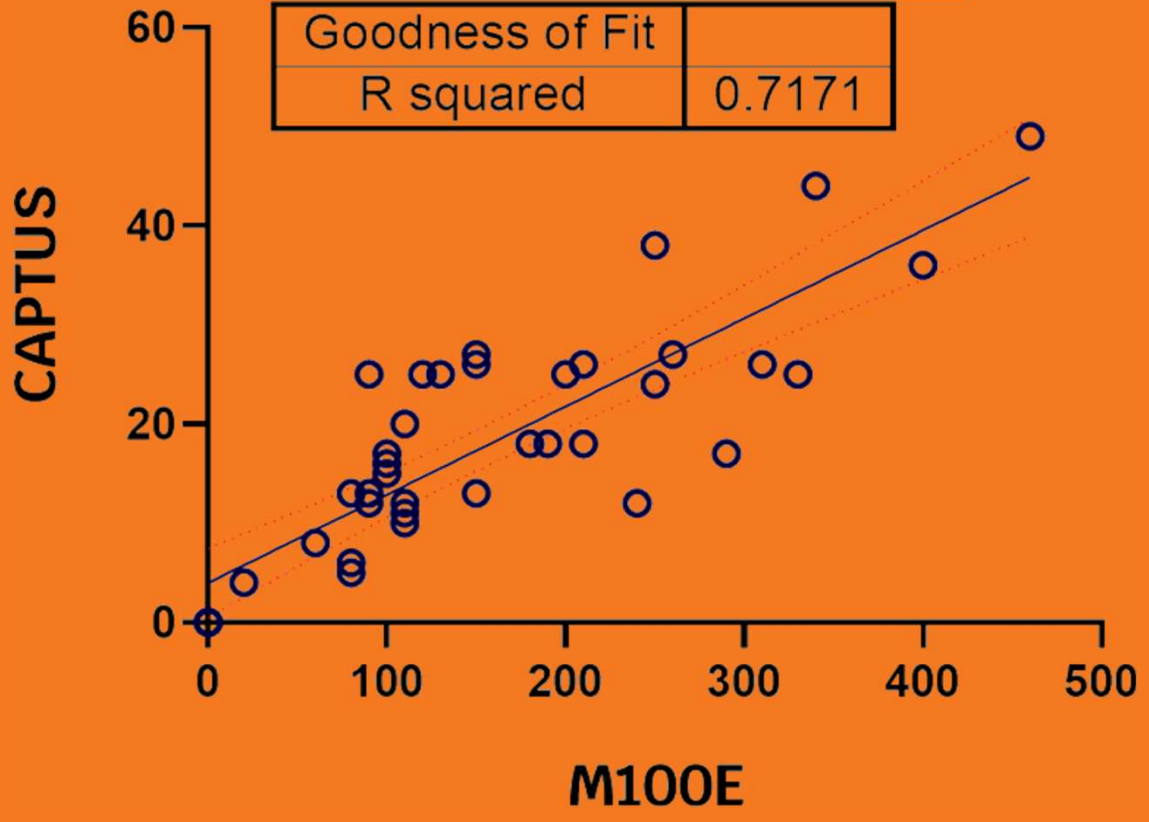
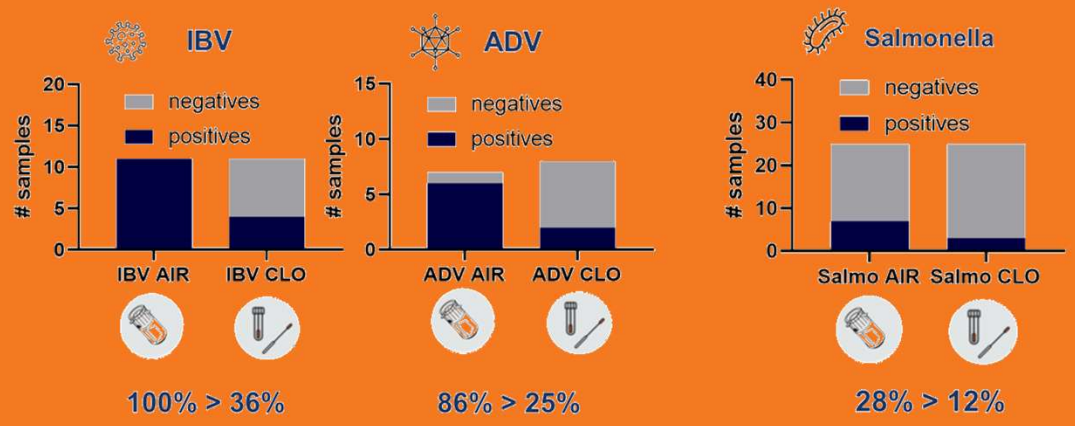
General Correlation

Equation	Y = 0.08889*X + 3.983
Goodness of Fit	
R squared	0.7171





100% > 36%

86% > 25%

28% > 12%

Avian adenovirus,
Avian infectious bronchitis (inc. G1-23, G1-11 and G1-16 variants),
Salmonella spp., S. enteritidis,
S. typhimurium,
Mycoplasma gallisepticum, Mycoplasma synoviae
Infectious Bursitis virus (Gumboro),
Avian reovirus,
Newcastle

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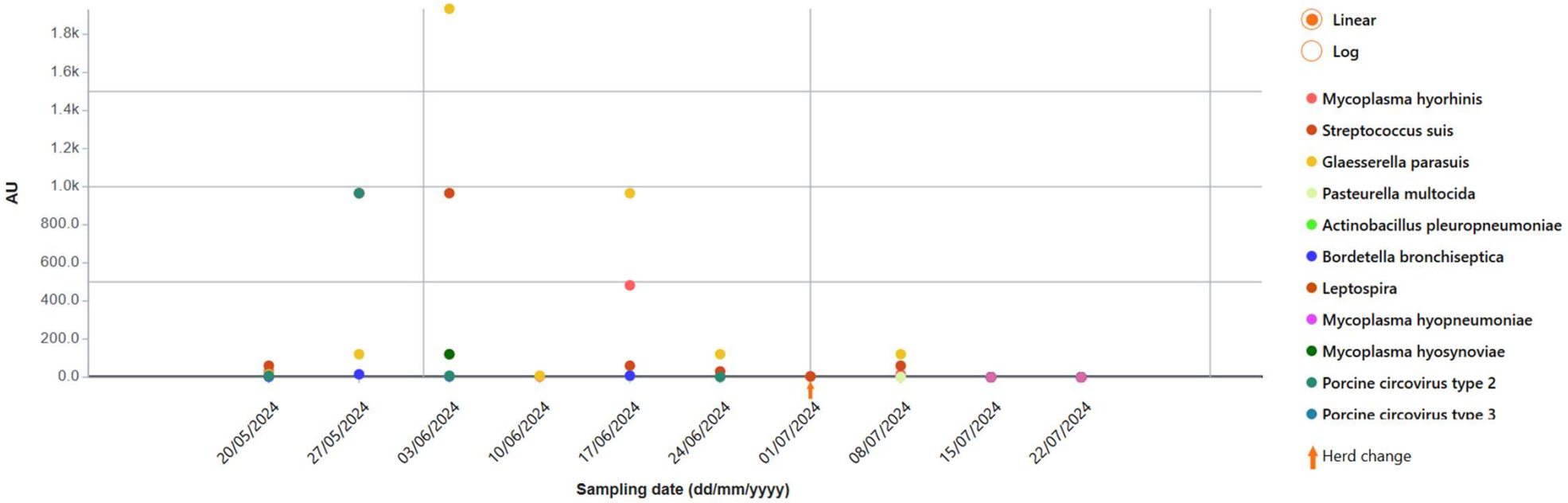
Seasonal in pathogen quantifications



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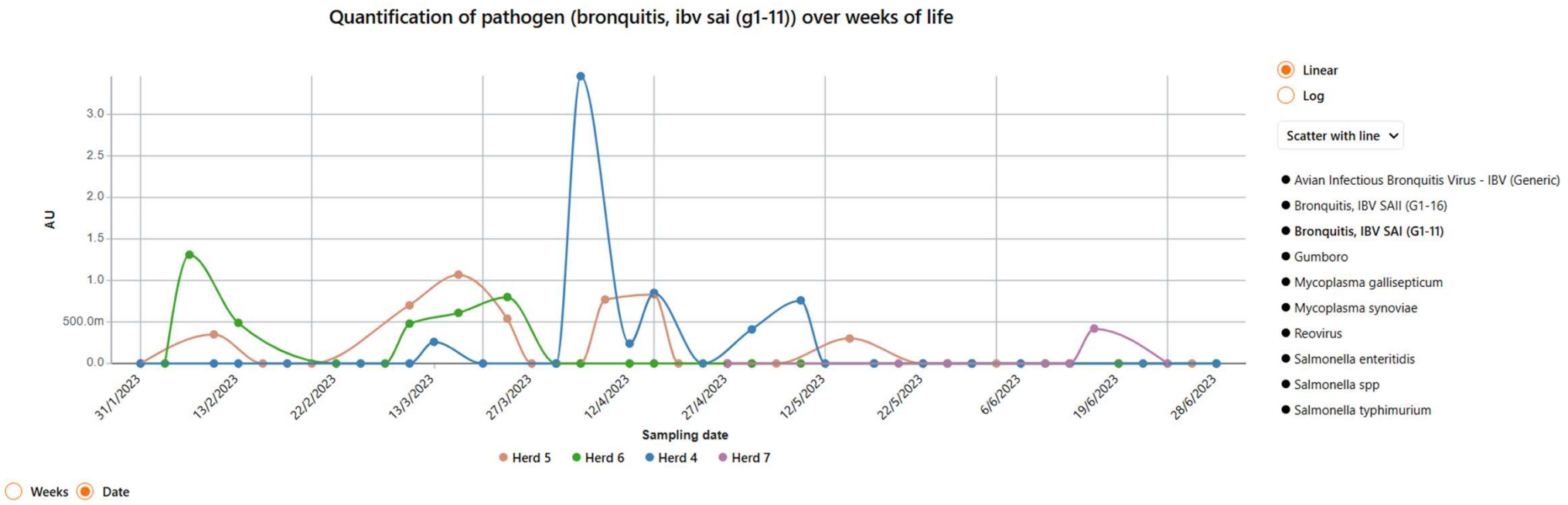
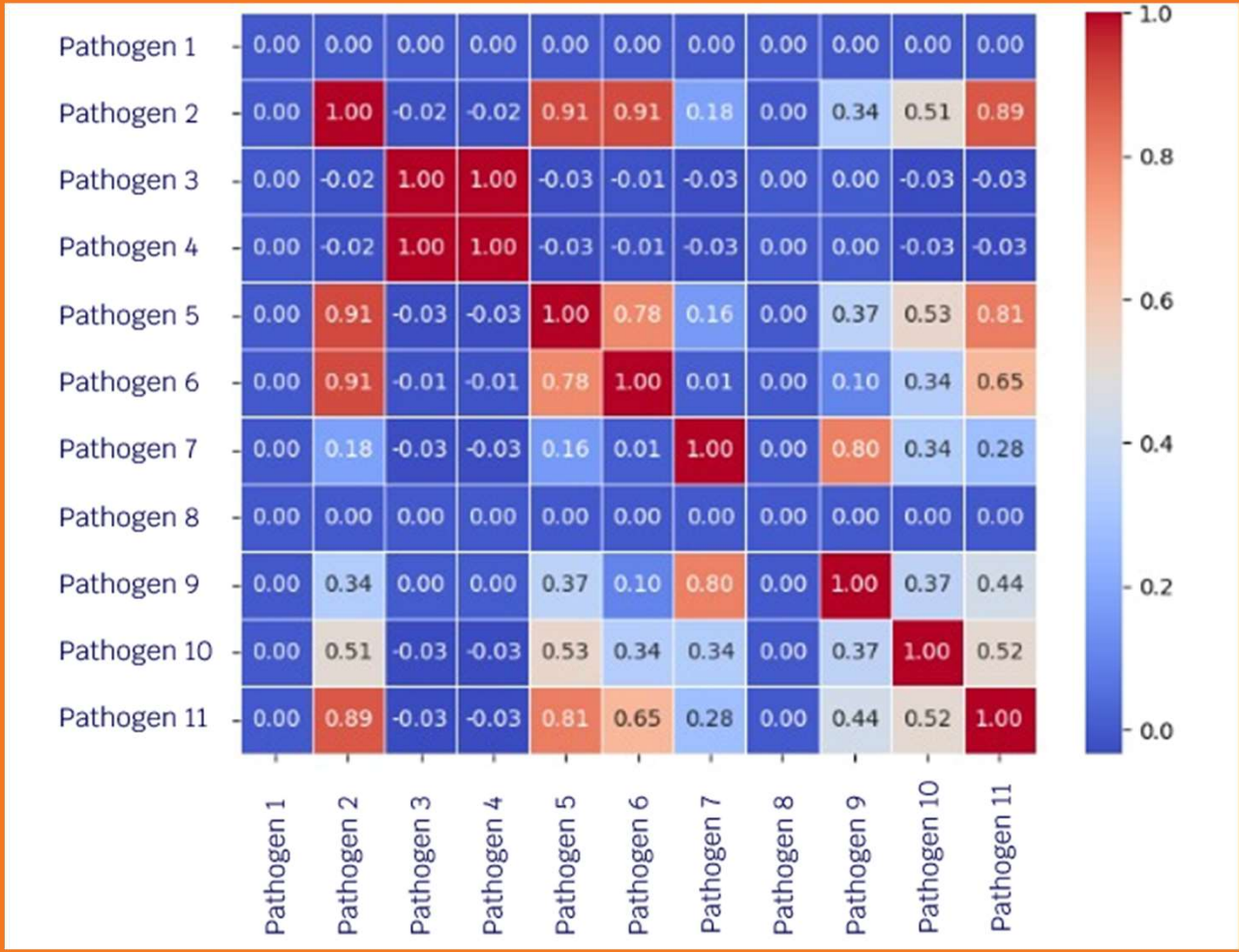

Quantification of pathogen (bronquitis, ibv sai (g1-11)) over weeks of life
AU
3.0
2.5
2.0
1.5
1.0
500.0m
0.0
31/1/2023
13/2/2023
22/2/2023
13/3/2023
27/3/2023
12/4/2023
27/4/2023
12/5/2023
22/5/2023
6/6/2023
19/6/2023
28/6/2023
Sampling date
Herd 5
Herd 6
Herd 4
Herd 7
Linear
Log
Scatter with line
Avian Infectious Bronquitis Virus - IBV (Generic)
Bronquitis, IBV SAII (G1-16)
Bronquitis, IBV SAI (G1-11)
Gumboro
Mycoplasma gallisepticum
Mycoplasma synoviae
Reovirus
Salmonella enteritidis
Salmonella spp
Salmonella typhimurium
Weeks
Date
Herds
Herd 5
Herd 6
Herd 4
Herd 7



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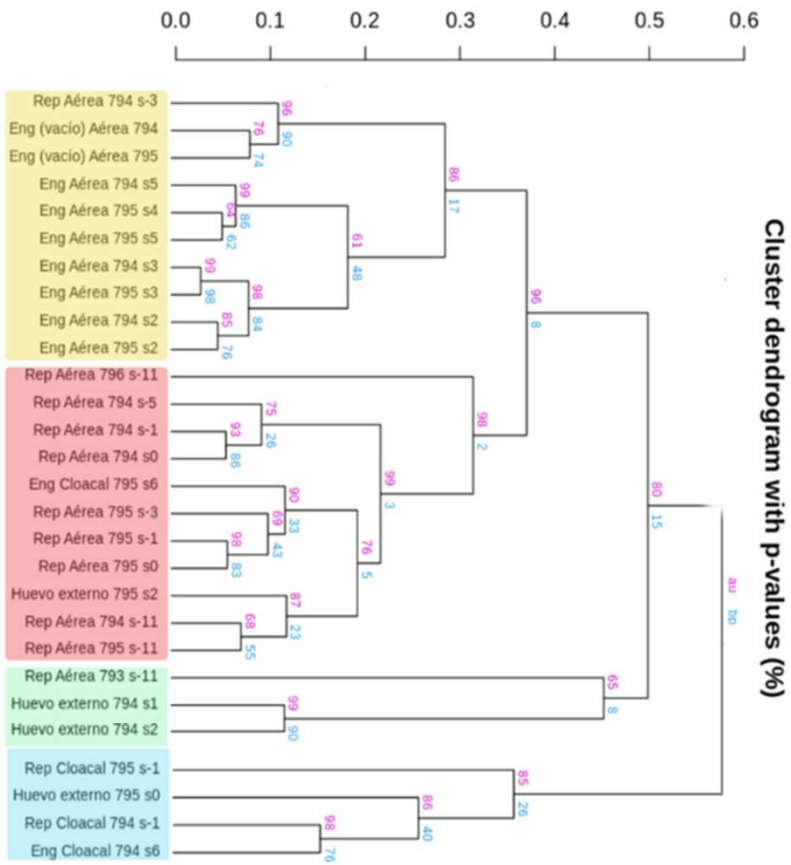


Phase, Flock, Weeks of Age, Air Patterns
Patterns are the base for other indicators

LA RESISTENCIA DEL AIRE: BÚSQUEDA DE MECANISMOS DE RESISTENCIA ANTIBIÓTICA A PARTIR DE MUESTRAS DE AIRE

Ferreira, Federica [1]; Teguer, Lea [2]; Macció, Laura [3]; Vignoli, Rafael [1]; Bado, Inés [1]

1. Departamento de Bacteriología y Virología, Instituto de Higiene, Facultad de Medicina, UDELAR. 2. Universidad ORT Uruguay. 3. Laboratorio Aravanlabs.

fferreira@higiene.edu.uy

OBJETIVO

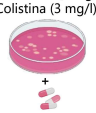
Búsqueda de mecanismos de resistencia a antibióticos en muestras provenientes de aire tomadas mediante el equipo de filtración CAPTŪS.

MATERIALES Y METODOS

Se estudiaron 2 establecimientos avícolas

Equipo **CAPTŪS** 10'

Medios suplementados con Ciprofloxacina (0,125 mg/l) Ceftriaxona (1 mg/l) Colistina (3 mg/l)



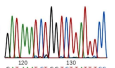
Identificación mediante **MALDI-TOF**

Antibiograma por disco-difusión siguiendo las normas CLSI 2021

Antibiograma estratégico (búsqueda de β-lactamasas)

PCR para genes *qnr*, *aac*, bla_{CTX-M} y bla_{AmpC}

Secuenciación

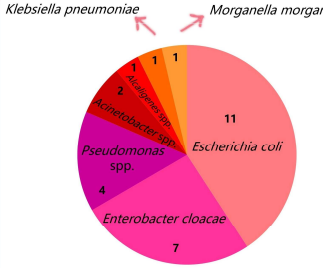


Ensayos de conjugación utilizando ceftriaxona y rifampicina

RESULTADOS

Identificación:

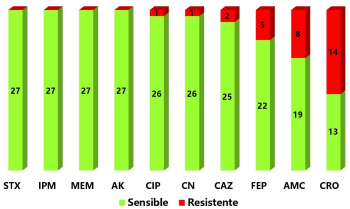
Número de microorganismos detectados a partir de muestras de aire.



Se obtuvieron 27 aislamientos de bacilos gram negativos no exigentes resistentes a ciprofloxacina y/o ciprofloxacina y/o colistin.

Estudios de susceptibilidad:

Número de microorganismos resistentes y sensibles a los antibióticos estudiados.



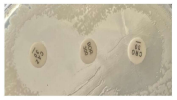
STX: Trimetoprim-Sulfametoxazol; IPM: Imipenem; MEM: Meropenem; AK: Amikacina; CIP: Ciprofloxacina; CN: Gentamicina; CAZ: Ceftazidime; FEP: Cefepime; AMC: Amoxicilina acido clavulánico; CRO: Ceftriaxona.

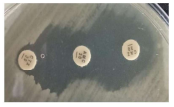
Todos los aislamientos no Enterobacterales fueron sensibles al 100% de los antibióticos.

Detección de mecanismos de Resistencia

Sinergia positiva para β–lactamasa de tipo AmpC.

2/27 aislamientos presentaron sinergia (+) AmpC.





Sinergia positiva para β-lactamasa de espectro extendido (BLEE).

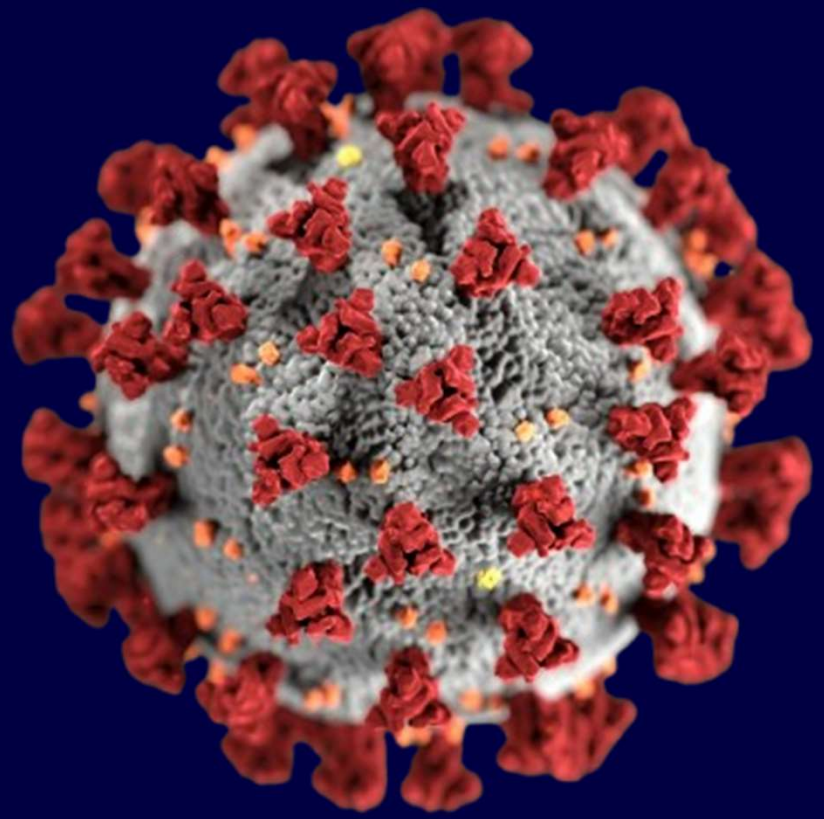
4/27 aislamientos presentaron sinergia (+) para BLEE.

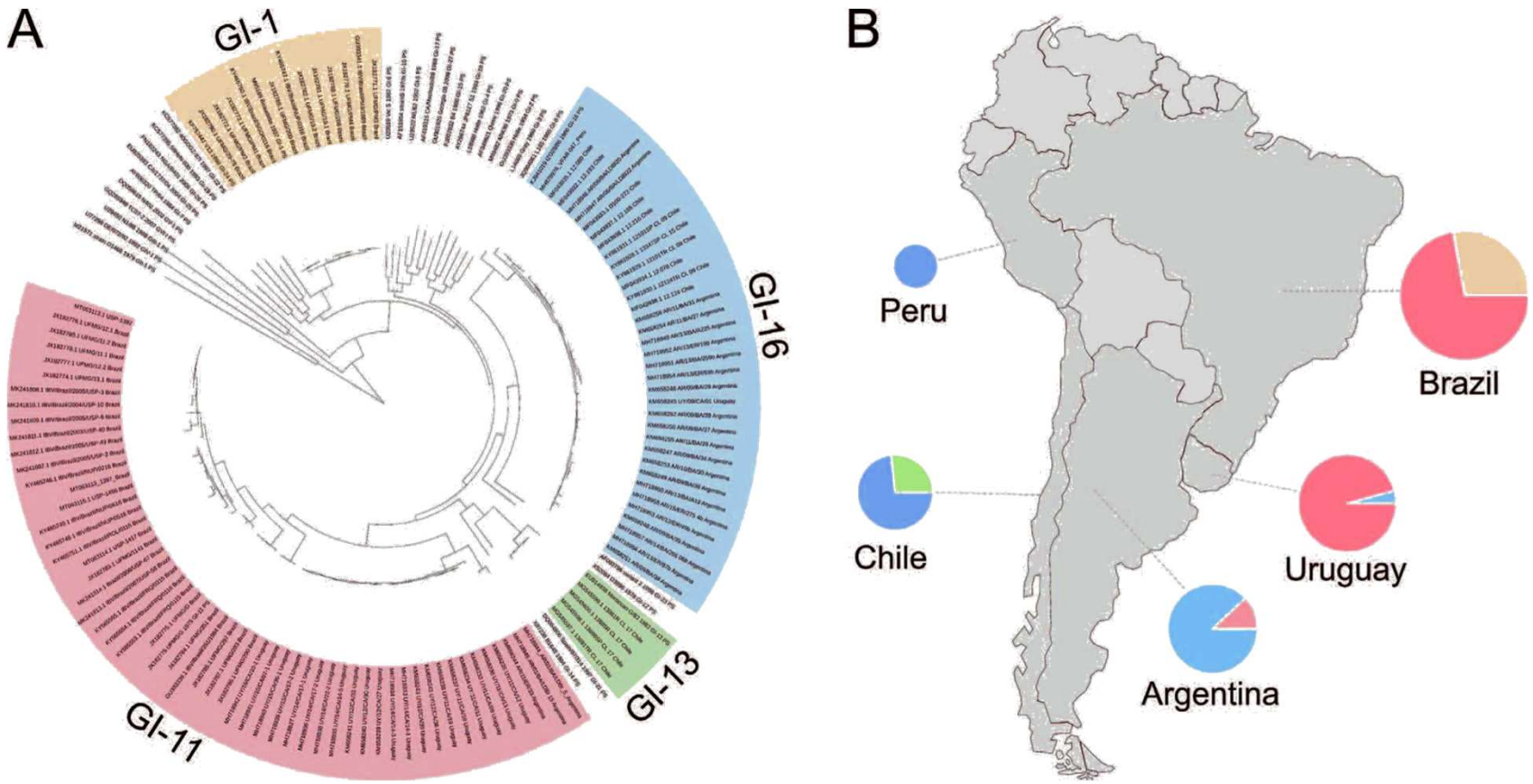
Número de mecanismos de resistencia encontrados.

4/27 presentaron CTX-M-2	2/27 presentaron CTX-M-3	2/27 presentaron CTX-M-15
2/27 presentaron AmpC	0/27 presentaron Qnr	0/27 presentaron Aac

Uno de los genes $bla_{CTX-M-2}$ y un gen $bla_{CTX-M-15}$ se encontraron en plásmidos conjugativos.

IBV’s dynamics





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G1-23

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G1-23

RAPID COMMUNICATION

Emergence and molecular characterization of the avian infectious bronchitis virus GI-23 in commercial broiler farms from South America

Nilo Ikuta, André Salvador Kazantzi Fonseca, Filipe Santos Fernando, Tobias Fernandes Filho, Nelson Rodrigo da Silva Martins, Vagner Ricardo Lunge

First published: 05 October 2022 | https://doi.org/10.1111/tbed.14724 | Citations: 1

Pathogenicity of GI-23 Avian Infectious Bronchitis Virus Strain Isolated in Brazil

by Iara Maria Trevisol [1,*], Luizinho Caron [1], Marcos Antônio Zanella Mores [1], Daiane Voss-Rech [1], Gabriel da Silva Zani [2], Alberto Back [3], Jorge Augusto Petroli Marchesi [3] and Paulo Augusto Esteves [1]

Environmental monitoring of the IBV-G1-23 Variant in Uruguayan Poultry Flocks using the CAPTUS air sampling tool

INTERNATIONAL IPPE PRODUCTION & PROCESSING EXPO

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2022: G1-11

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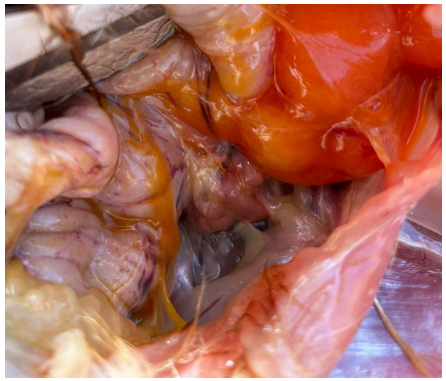
Layers

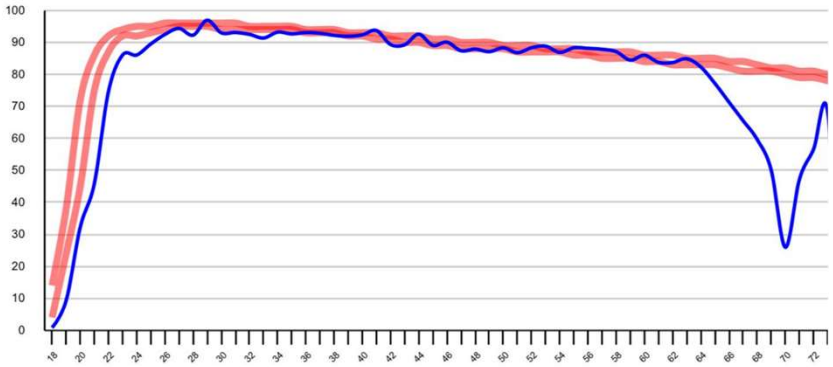


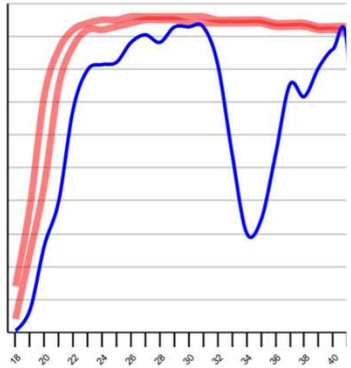
Congested Ovaries

Signs of peritonitis

Soft egg shell
& Decolouration
of eggs

Decolouration
of eggs





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Breeders

Similar peak air IBV
G1-11, G1-16 & G1-23

Long tailed after peak
(like Brazilian reports)

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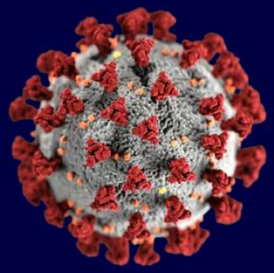
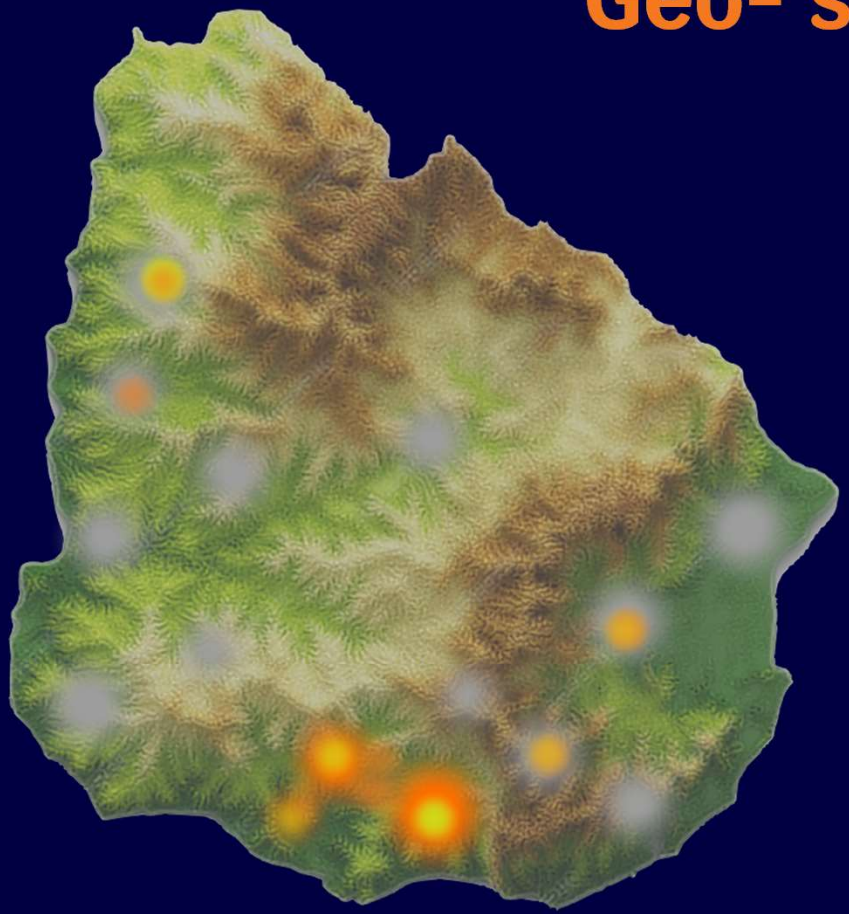
2021	2022	2023	2024
IBV G1-11	IBV G1-11	IBV G1-11	IBV G1-23
	IBV G1-16	IBV G1-16	



Geo- surveillance



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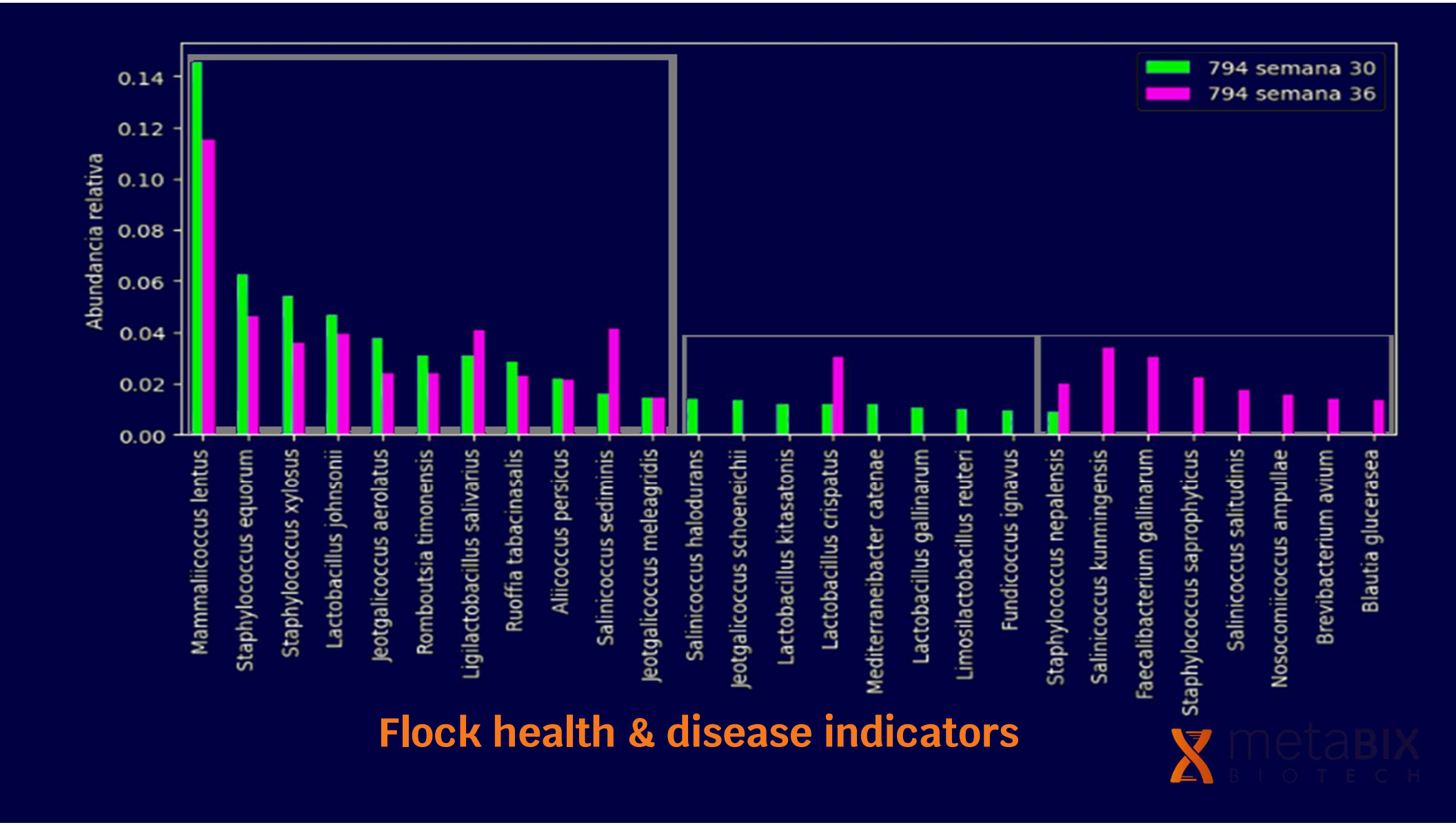

Flock health & disease indicators

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sapience
south asia
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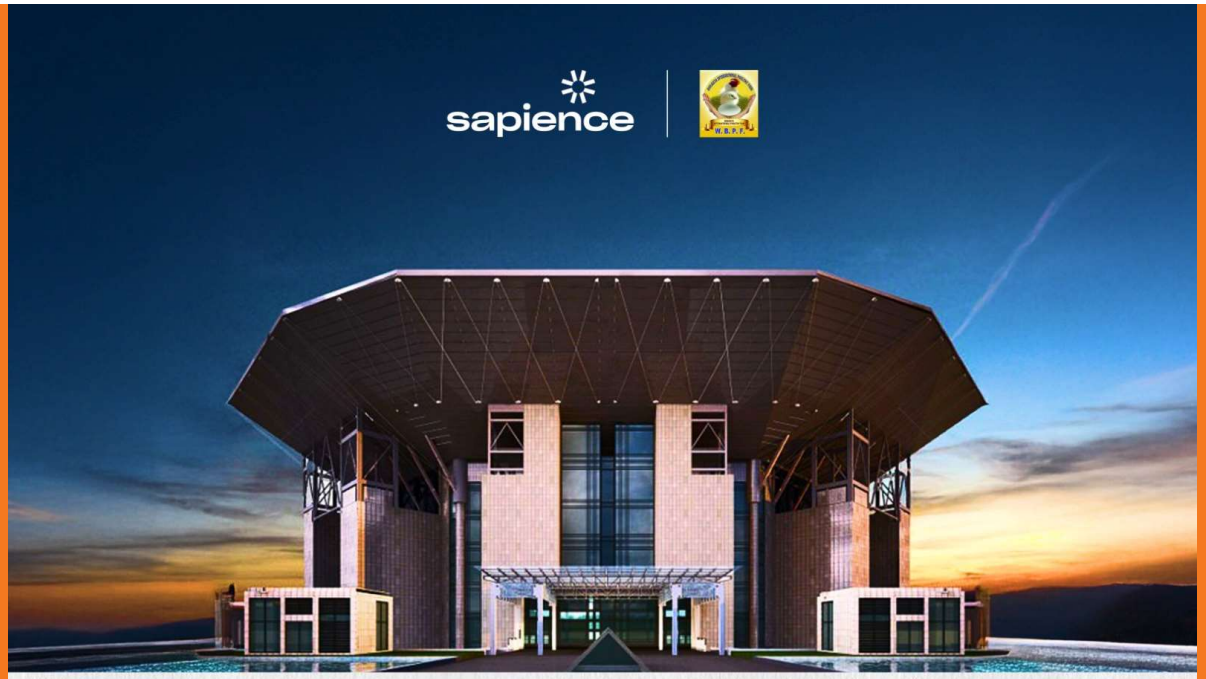

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Kolkata International Poultry Fair (KIPF) 2025

Booth B11 & B12, Hall B

10:00 AM to 06:00 PM	Biswa Bangla Exhibition Centre, Newtown, Rajarhat, Kolkata	12th-14th Feb, 2025

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