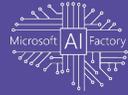


# Networking Microbiome Science



## Probiota Pioneers Panel – 8<sup>th</sup> February 2023

Dr Artem Khlebnikov, Director of Bioeconomy – Food & Nutrition



# About Eagle Genomics



## Deep Tech scale-up business in the TechBio space

- Driving the Bioeconomy through the digitization of science



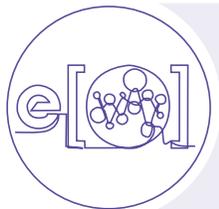
## Applying Microbiome Network Science

- Changing the face of One Health - to help solve the world's 'Grand Challenges'



## Driving sustainable systems change

- Promoting and protecting the health of humans, animals and the environment
- Working in partnership to save our planet

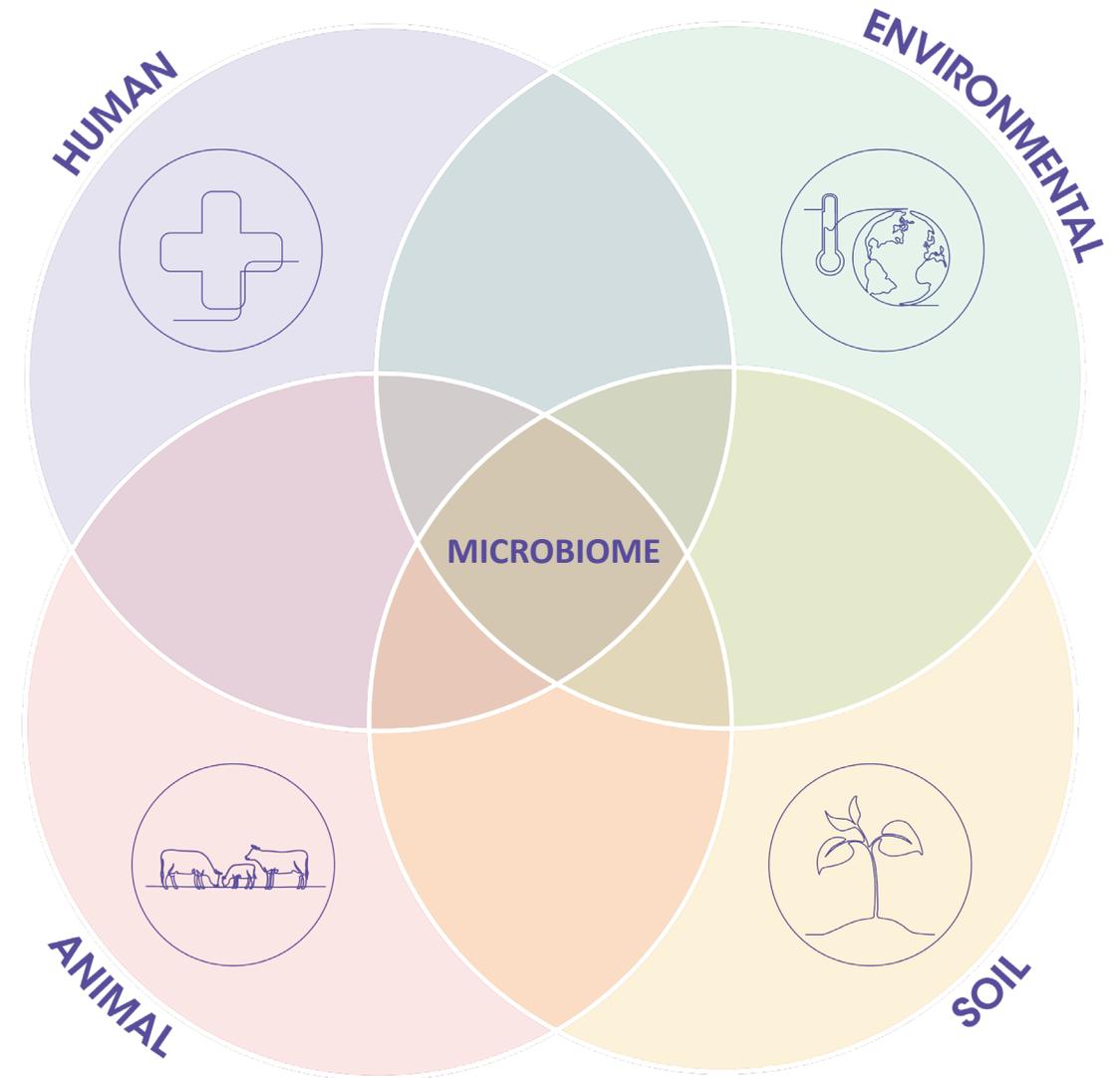


## e[datascientist]™

- Award-winning AI-augmented knowledge discovery platform
- Leverages AI and network science, surfacing scientific connections and exploring multi-causal relationships

# One Health at Eagle Genomics

- One Health is a concept that connects human, animal and environmental health
- The WHO has declared 'One Health' critical to addressing health threats at animal, human and environmental interfaces
- Intense interactions between all three systems have contributed to global threats, and highlighted the critical nature of One Health:
  - COVID-19 pandemic
  - Antimicrobial resistance (AMR)
  - Climate change
  - Lack of food security
  - Rise in zoonotic diseases



# The microbiome – driving **One Health** by harnessing nature

- Microbiome: ecosystem of microorganisms that co-exists in the body and the environment (e.g., gut and skin).
- Being able to interrogate complex data, such as that of the microbiome, is where Eagle Genomics' **e[datascientist]**<sup>™</sup> is bringing about a systems-change shift in innovation.

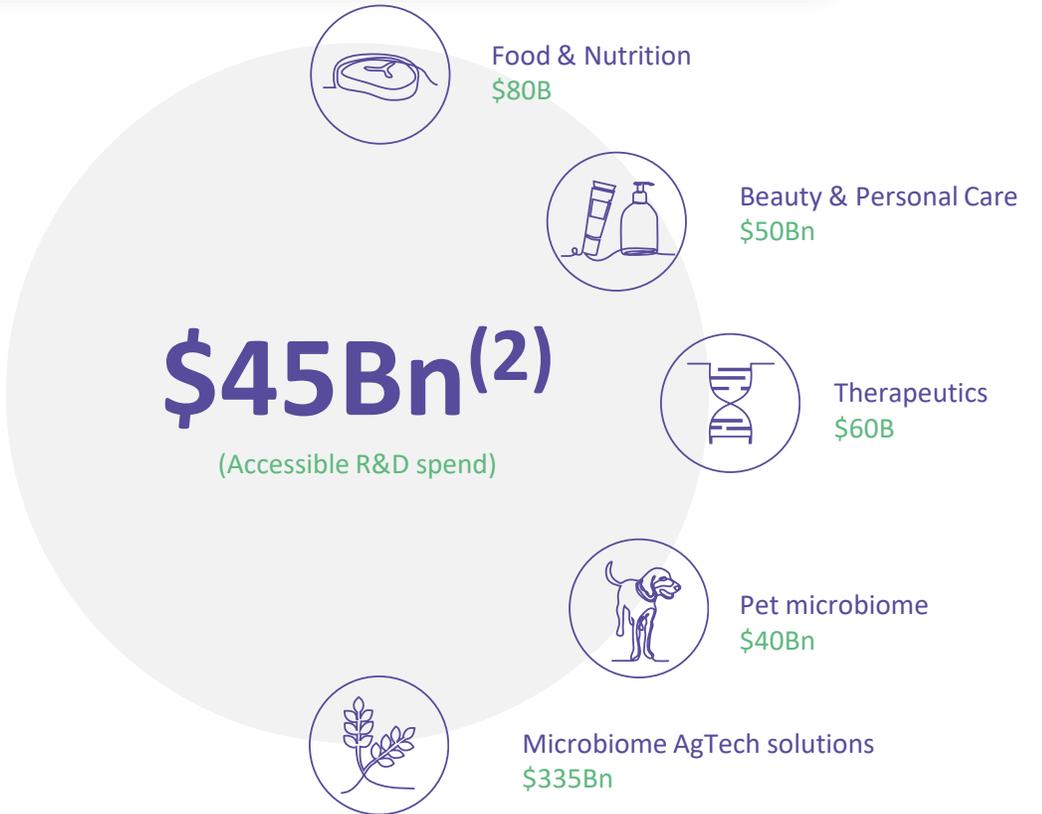
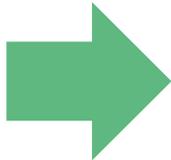
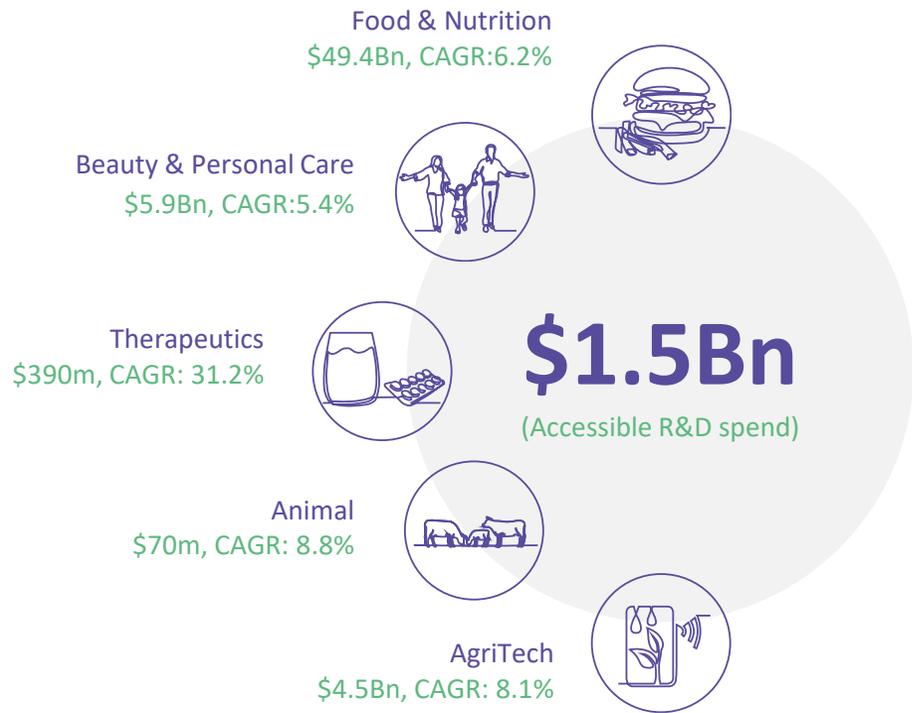


<https://blogs.scientificamerican.com/observations/how-microbiomes-could-save-the-planet/>

# One Health – unlocking opportunity through the growing Bioeconomy

We focus on uniting digital R&D across the Food, BPC, AgriTech, Animal, and Therapeutics markets

Our platform enables transformational innovation through network science



**\$100B+ Cash flow<sup>(1)</sup> in just Biopharma, not including other industries (e.g., Food, BPC)**

(1) McKinsey: [Digital in R&D: The \\$100 billion opportunity](#)

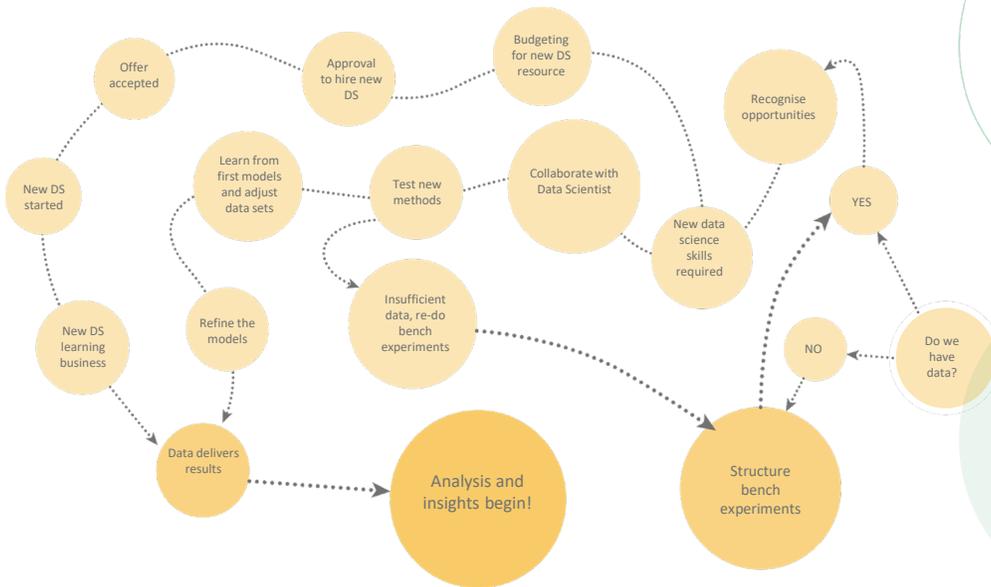
(2) McKinsey Global institute: [The Bio Revolution \(2020\)](#); BCG, Henderson Institute, HelloTomorrow: [Nature Co-Design: A Revolution in the Making](#); ReThinkX: [Future of Food](#)



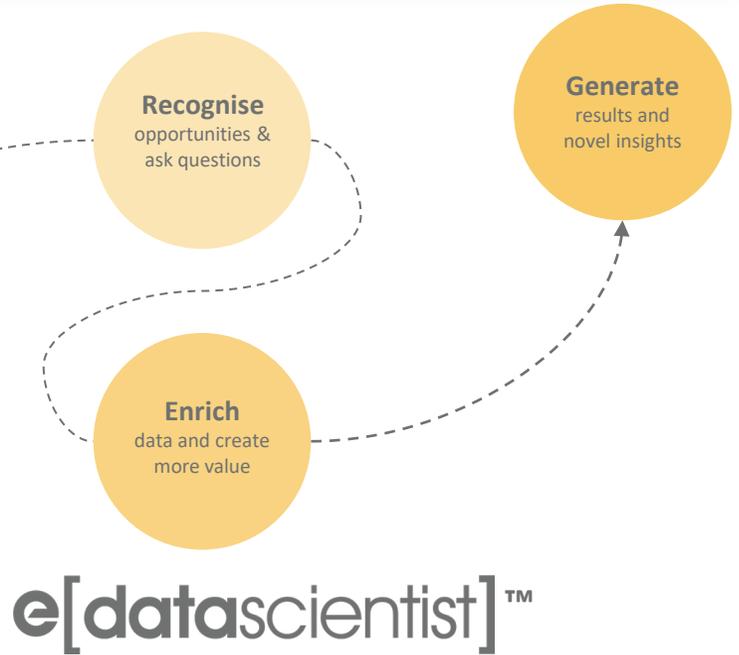
# Data as the unit of currency in the Bioeconomy

Previously, without Eagle Genomics

Tedious processes, scientists have to manage every step themselves, absorbing precious focus time that is better spent on research



e[datascientist]ñ



Starting from a hypothesis, scientists can query a semantic data fabric to accelerate R&D and innovation by generating results and novel insights



# How the e[datascientist]<sup>TM</sup> works

Intuitive, easy-to-use interface that allows:

**e[pipeline]**

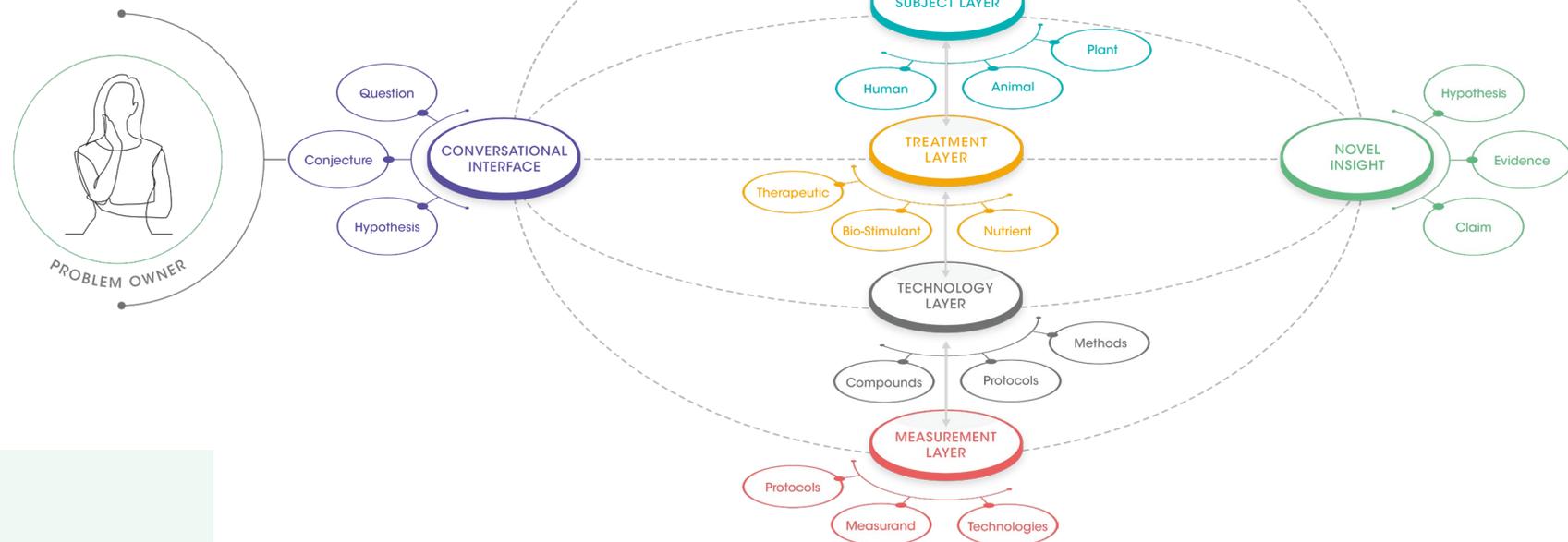
Uploading of data

**e[curate]**

Data processing & structure - integration, standardization and curation

**e[hypergraph]**

Deriving novel insights, via AI-augmented knowledge discovery

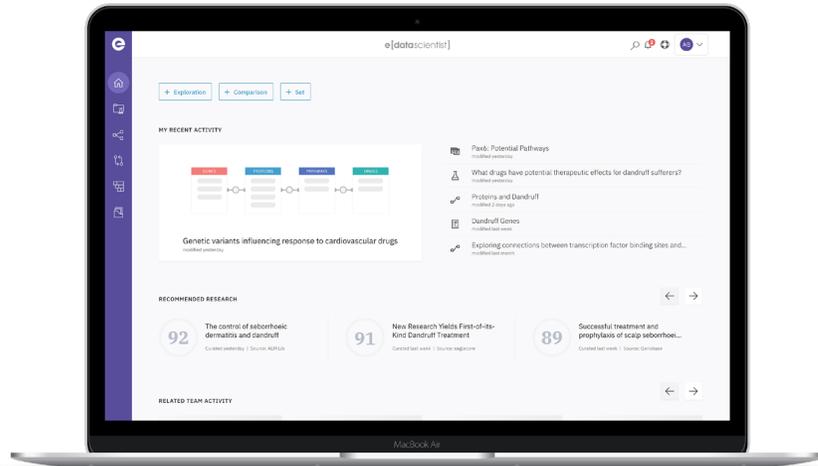


## Examples of applications

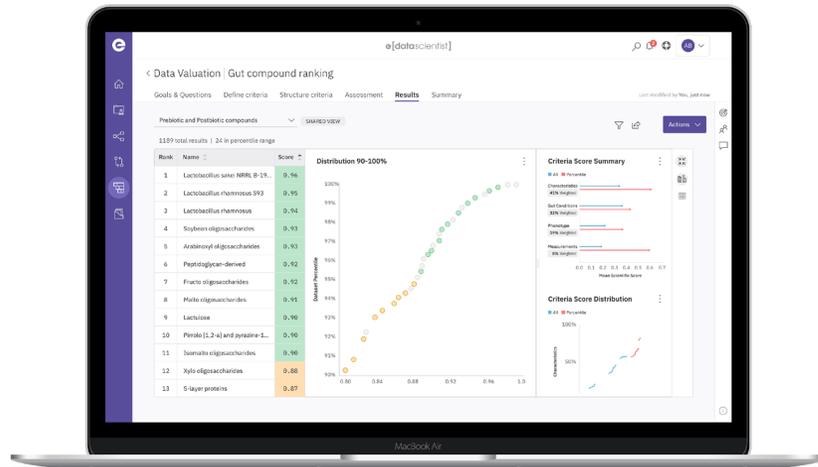
- **Food and Nutrition:** Personalized and functional nutrition; e.g., energy balance, feed efficiency, growth rate, botanicals, food as medicine, **pre/pro/postbiotics** and **synbiotics**, precision fermentation, alternative proteins and ingredient design and differentiation.
- **Beauty and Personal Care:** Personalized/stratified cosmetics; e.g., skin, oral, scalp, **pre/pro/postbiotics**, ingredient manufacturing, cosmeceuticals, and genital health/personal hygiene products.

**Result:** Market-leading competitive advantage.

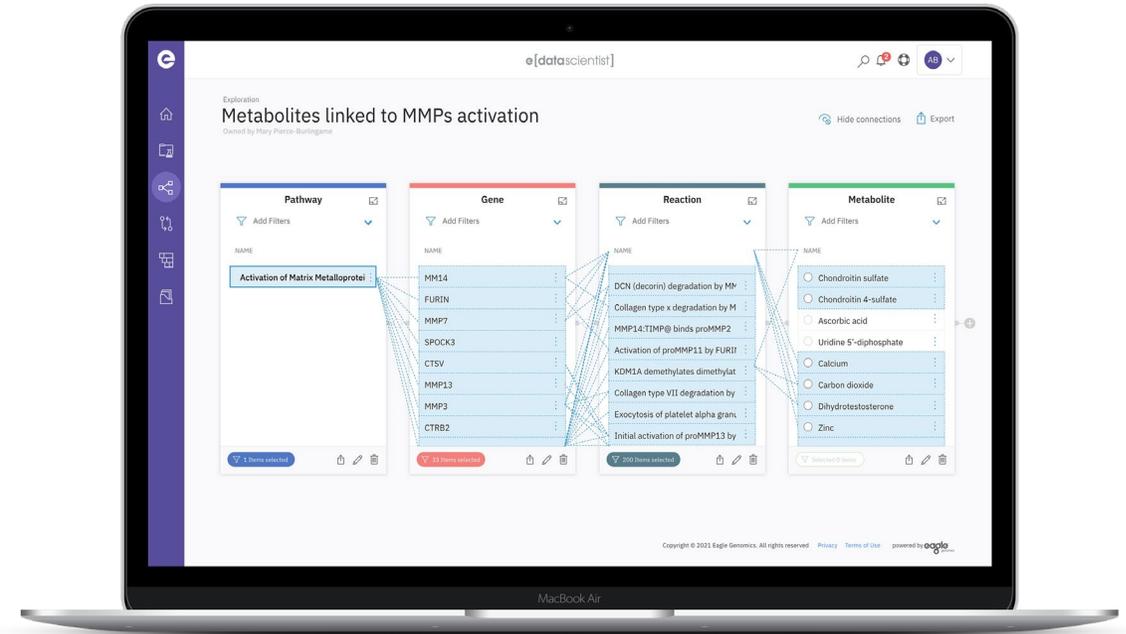




## Uploading of data



## Data integration, standardization and curation



## AI-augmented knowledge discovery



# We generate robust insights for superior **product development** and enhanced **customer experiences**

## Product claim



Unilever developed a new toothpaste product, Zendium, that is clinically proven to promote a healthy oral microbiome

## New formulation



Unilever improved its Dove body wash product to create a better skin microbiome balance

## Novel ingredients

Metabolic outputs and novel ingredients

Customer is tackling the hard problems of nutritional science – both defining metabolic outputs and exploring novel ingredients to drive beneficial conditions



## Mode of action

Feed additives

Customer is interested in new claims for feed additives; particularly, understanding their mode of action

## Re-formulation

Antimicrobials

Customer identified a list of novel antimicrobial compounds with a safer profile to replace actives used in its current disinfectant products



## Novel ingredients

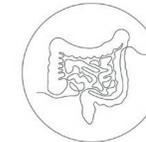
Dairy multi-omics

Customer is integrating dairy multi-omics data to understand biochemical and physiological effects of dairy products, and uncover broader consumer benefits of ingredients



## Product performance

Cargill



Cargill is conducting more efficient research to explore the connections between diet, gut and its microflora, and the immune system

## Product improvement

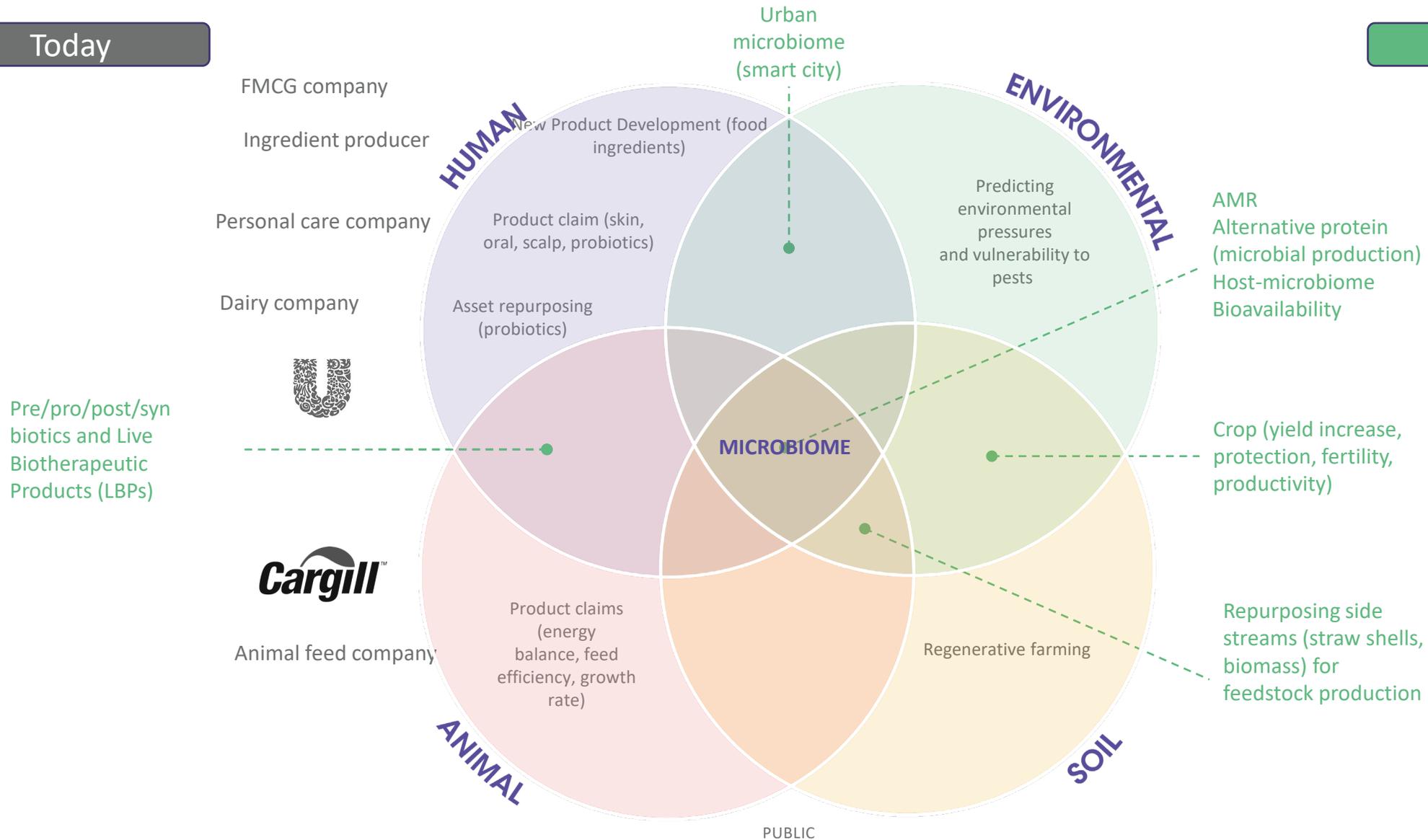
Moisture-wicking materials in diapers and sanitary pads

Customer investigated the impact of moisture-wicking materials in diapers and sanitary pads on the infant and female genital microbiome to improve health and safety of products

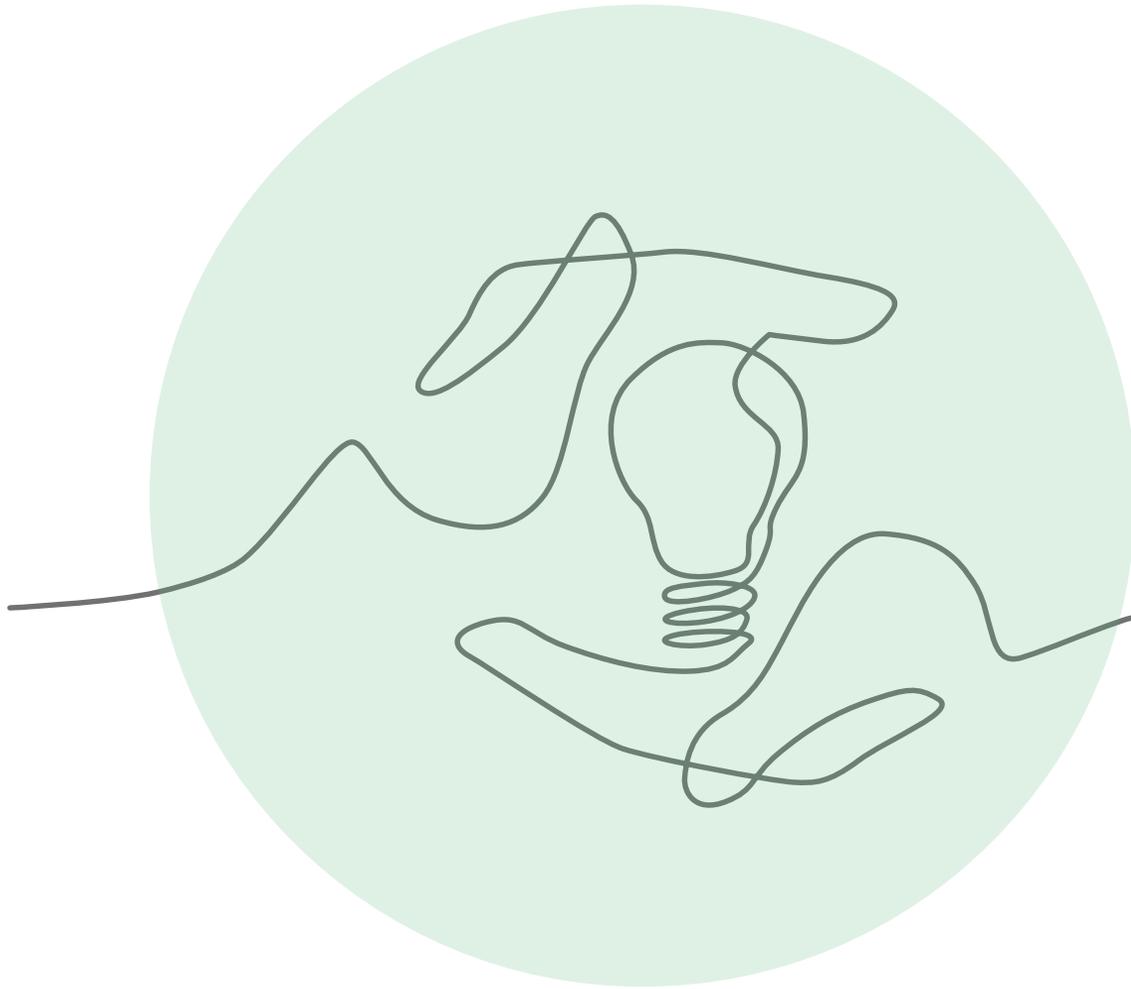
# The e[datascientist]<sup>TM</sup> tomorrow: unlocking microbiome opportunities

Today

Tomorrow



# Eagle Genomics welcomes **new partners** in life sciences innovation



Come speak with us about applying network science to your innovation journey

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