

A large group of fluffy yellow chicks are shown in a farm setting. The chicks are densely packed, with many in the foreground and others receding into the background. They have bright yellow downy feathers and small red beaks. The background is slightly blurred, showing more chicks and some greenery.

Maximising the microbiome of the chicken for
health and welfare

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Overview



- What is a microbiome?
- What is a chicken's microbiome?
- How can it be managed?
- Outcomes

A close-up photograph of a person's hands gently holding a small, fluffy yellow chick. The chick is positioned in the center of the frame, facing left. The person's hands are visible, with fingers spread to support the chick. The background is dark and out of focus. A blue and white striped fabric is visible on the right side of the frame. The text "What is a microbiome?" is overlaid in white, sans-serif font across the middle of the image.

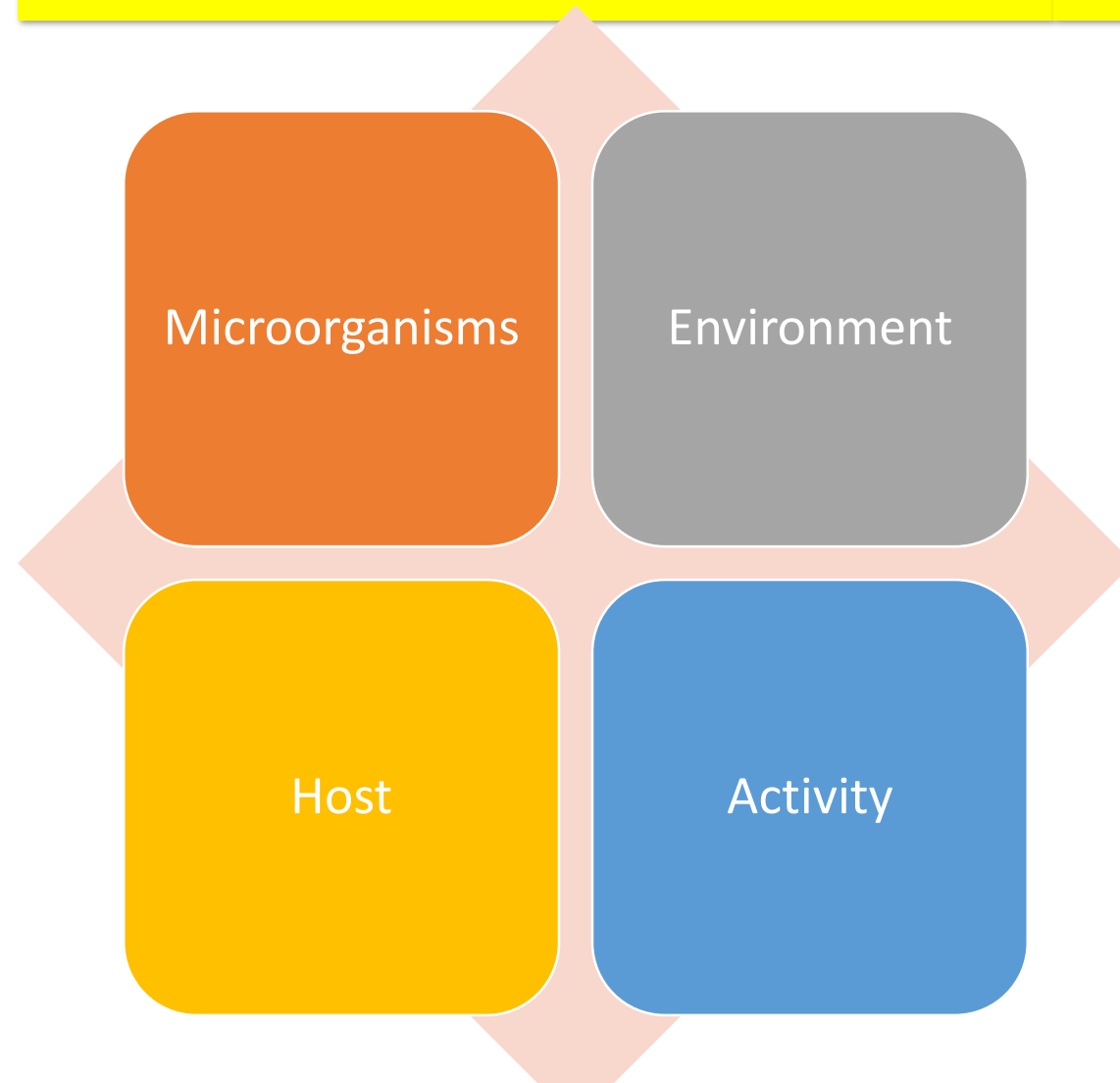
What is a microbiome?

Microbiome?

A population of microorganisms inhabiting a specific environment; a microbial community or ecosystem, now esp. that of the body. (Oxford English Dictionary, 2023)

“The microbiome is the collection of genomes, genes and gene products of the microbiota living in a given environment, such as a soil patch or the gut of a human being” (Setubal et al, 2022)

Microbiome?



Bacteria

Protozoa

Mould

Yeast

Microbiome?

Parasites

Viruses

A close-up photograph of a small, fluffy yellow chick being held gently in a person's hands. The chick is positioned in the center-left of the frame, facing left. Its feathers are soft and downy. The person's hands are visible, with fingers spread to support the chick. The background is dark and out of focus, with a hint of a blue and white patterned object on the right side. The text "What is a chicken's microbiome?" is overlaid in white, sans-serif font across the middle of the image.

What is a chicken's microbiome?





Colonisation



Sterile?



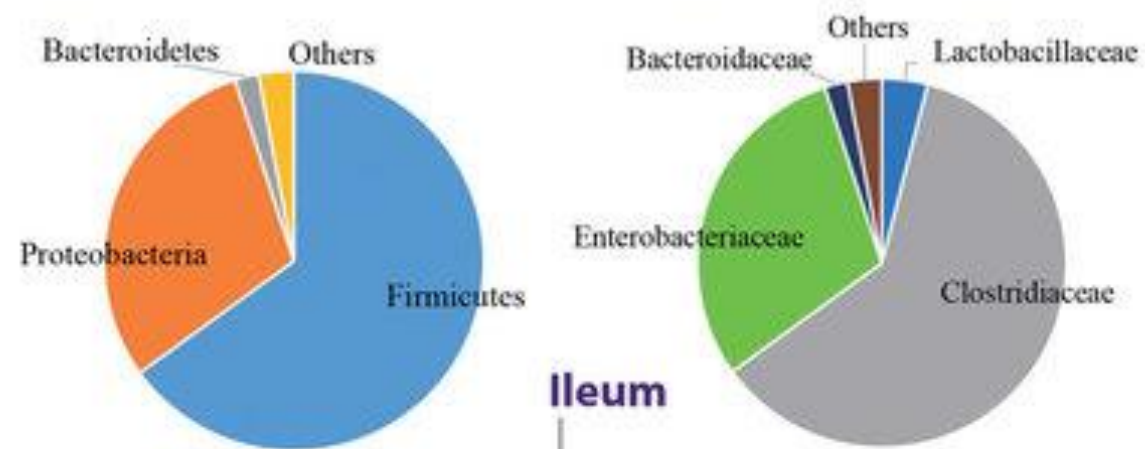
Maturation



7 days old

Phylum

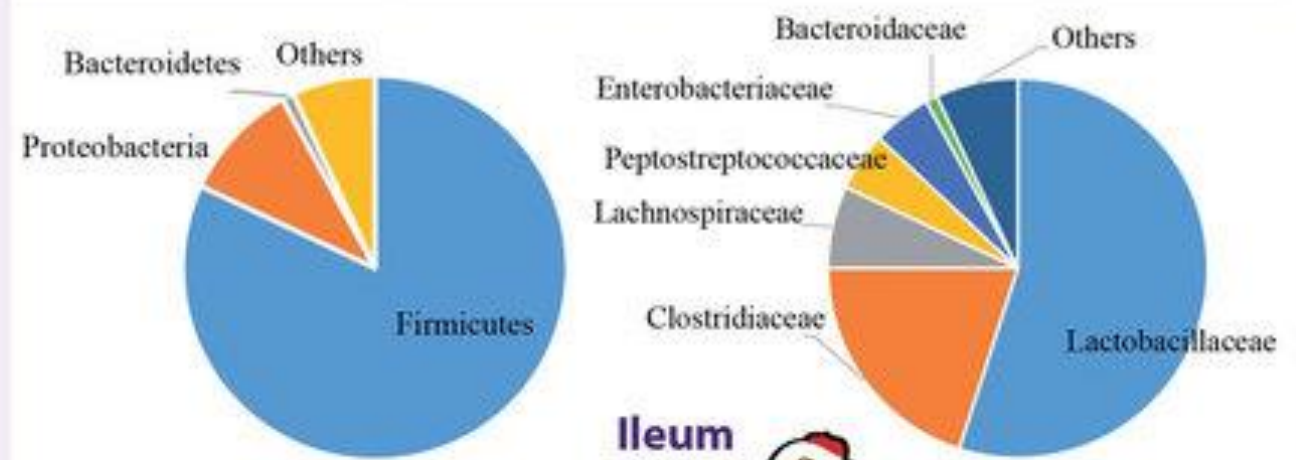
Family



35 days old

Phylum

Family



(Pourabedin et al, 2015)

Avian Pathogenic Ecoli (APEC)



A close-up photograph of a small, fluffy yellow chick being held gently in a person's hands. The chick is positioned in the center-left of the frame, facing left. Its feathers are soft and downy. The person's hands are visible, with fingers spread to support the chick. The background is dark and out of focus, with a blue and white striped pattern visible on the right side. The text "How can it be managed?" is overlaid in white, sans-serif font across the middle of the image.

How can it be managed?



Balance

Water

Feed

Microorganisms

Chicks

C & D

Environment

Stress

Biosecurity

Digestion

Mortality

Wet Litter

Immunity

INPUT = OUTPUT

Disease

Growth

Condemns

On-farm Control

C & D

Environment

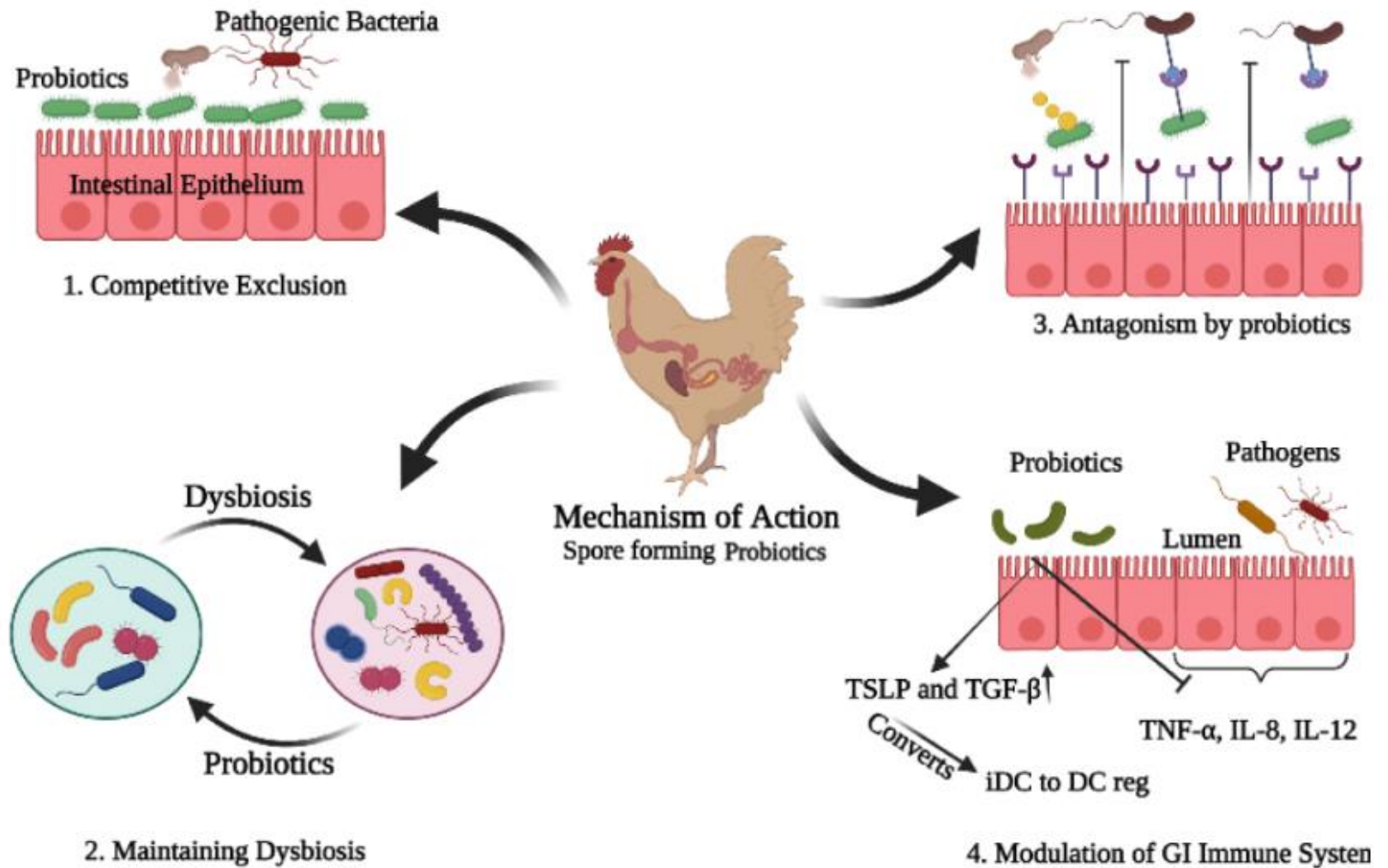
Stress

Biosecurity

Water

Additional Tools

- Nutrient manipulation
- Nutraceuticals
 - Prebiotics
 - Probiotics
 - Acidification
 - Enzymes



(Khalid et al, 2022)



Search



Modern Poultry

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Pathogenic *Enterococcus cecorum* (EC) continues to plague the broiler industry, causing mortality from pericarditis and sepsis early in the growing period and lameness and paralysis late in the growing period.

Research at [North Carolina State University](#) led by [Mitsu Suyemoto](#) tested the ability of recently generated, avirulent deletion mutants and commensal EC strains to disrupt gut colonization by pathogenic EC. <https://lnkd.in/gkMYH8td>
[#poultryhealth](#)



Home



My Network



Post



Notifications



Jobs

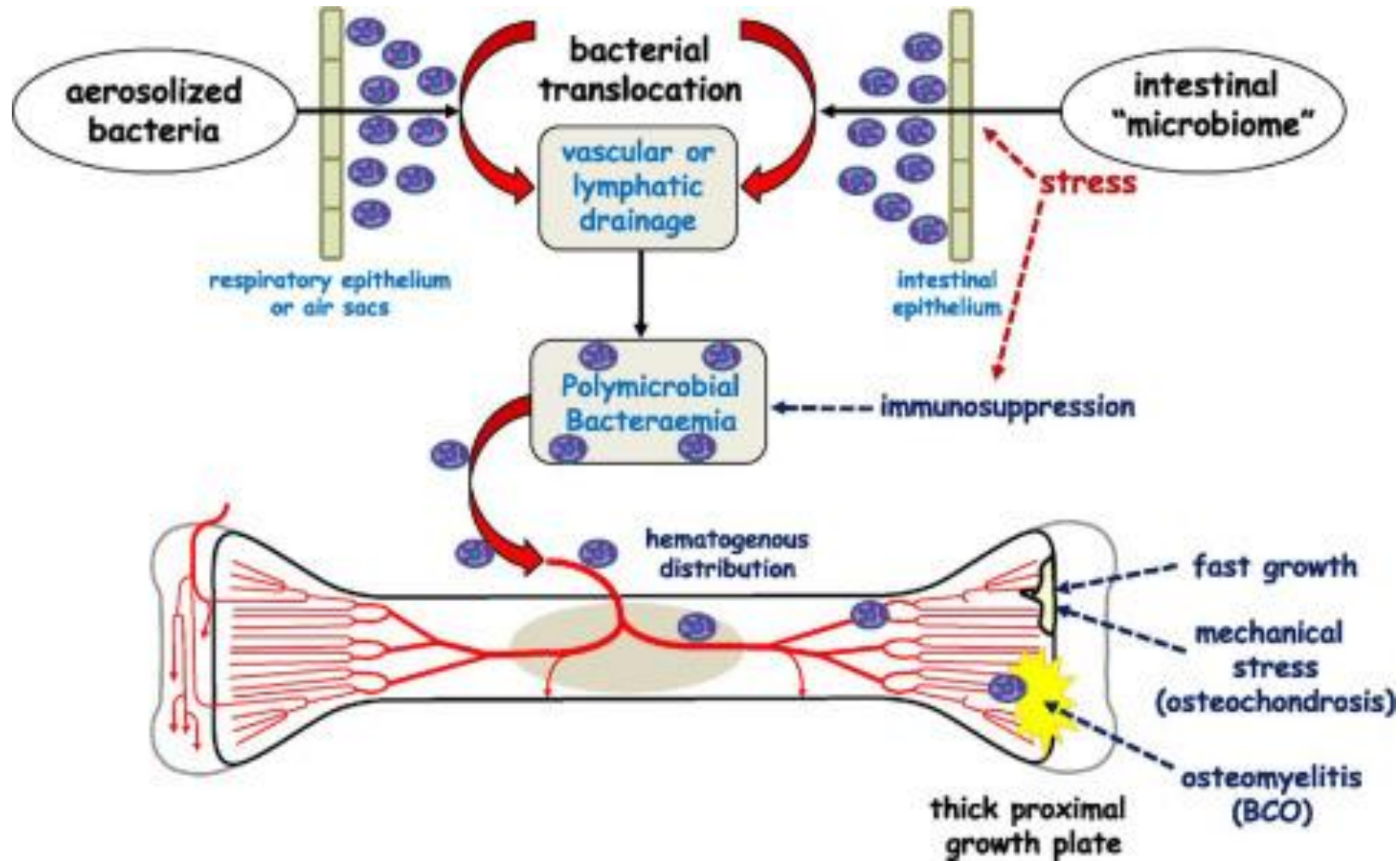


Outcomes



Scenario 1

- 21-day-old Ross 308 flock
- Sudden on-set lameness
- Postmortem
 - Femoral head necrosis
 - Pericarditis
- Bacteriology
 - Enterococcus faecalis



Bacterial chondronecrosis with osteomyelitis and lameness in broilers: a review

Robert F. Wideman, Jr. 2016 Poultry Science 95:325–344

- 5-day treatment of amoxicillin

Target

- Enterococcus faecalis



Action of Amoxicillin

- Gram positive / gram negative
- “broad spectrum”



Outcome

- Clinical recover
- Microbiome / Microbiota?





Outcome

- Clinical recovery of birds
 - Lameness resolved
- Raised mortality / culls from lameness period = reduced livability
- Indiscriminate bacterial control – reduced diversity of microbiome
- Resistant bacterial population

Conclusion



- A diverse and functioning microbiome is critical to performance, health and welfare
- The microbiome is not outside of your control
- Best practices, compliment the development of a healthy and effective microbiome