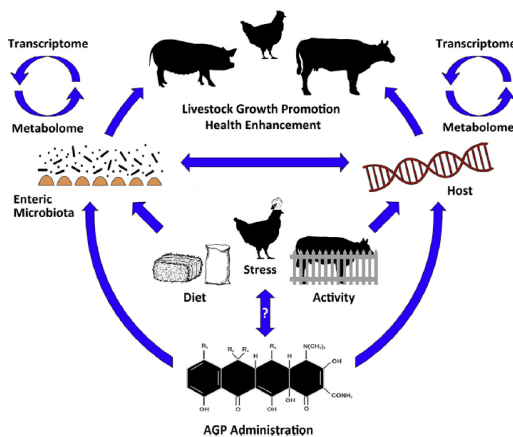


## Research Summary

### Effective mitigation of enteric inflammation in chickens

Antimicrobials are essential tools to protect the health and welfare of birds and to ensure a safe food supply. The used of antimicrobials to treat enterocolitis remains essential in the poultry industry. However, the restrictions to antibiotics for prevention has brought the necessity to find alternative mitigation strategies.



Antibiotics used at non-therapeutic concentrations, antimicrobial growth promoters (AGPs) have been applied to enhance growth and health of birds. However, the interactions of these products with the host and the microbiota are still unclear.

#### Immunomodulation hypothesis

We proposed that AGPs will dampen the immune response allowing redirect of energy to muscle development.

#### Targeting inflammation: an alternate strategy to AGPs

The induction of an inflammatory cascade is **catabolically costly** redirecting energy from muscle development to immune response. We propose to target inflammation rather than pathogens to mitigate disease.

#### Benefits of targeting inflammation

- Broad range of responses
- Target a variety of pathogens
- Avoids complications of secondary effects
- Less economically costly

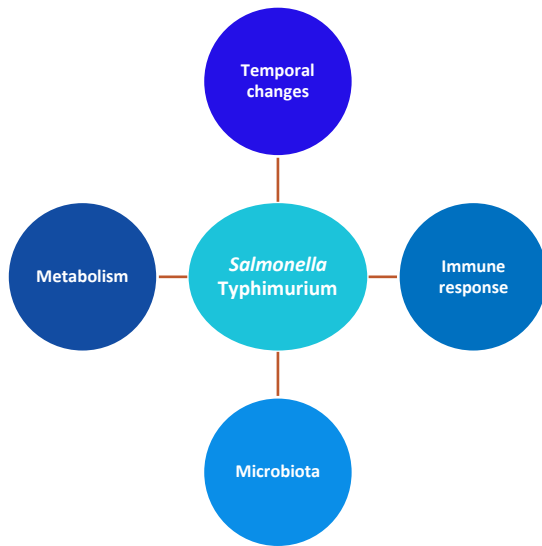
#### Targeting pathogen-incited inflammation: an alternative to antimicrobials

*Salmonella enterica* is a main cause of enterocolitis in human beings and chickens, and a significant foodborne pathogen of people.

#### Effects of *Salmonella* in chickens

- Incites a severe inflammatory response
- Alters the enteric microbiota
- Alters the skeletal muscle metabolism

## Our future experiment



The aim of this study is to characterize host responses to pathogens such as *Salmonella* Typhimurium. Evaluate the changes incited in the microbiota community, and the impact that the pathogen has on chicken metabolism.

## Identification of immunomodulatory molecules

The identification and use of immunomodulatory agents to control inflammation is the main goal of our research program. Therefore, we are aiming to identify immunosuppressant molecules produced during pathogen infection to target enterocolitis.

This research will be conducted by Danisa M. Bescucci DVM M.Sc. at Agriculture and Agri-Food Canada under the supervision of Dr. Douglas Inglis

## Local delivery: novel technologies

We are currently developing technologies to deliver anti-inflammatory molecules to sites of inflammation in livestock and people. The development of enterocolitis models in chickens, and identification of specific immunosuppressant will allow us to apply these technologies in birds.

### Benefits of local delivery

- Targeted release
- Directed to site of inflammation
- Decreased doses
- Increased efficacy
- Decreased cost

## Conclusions

- Target inflammation as a novel, **cost effective**, and **broad-spectrum strategy**
- Develop and use **models of chicken enterocolitis**
- Develop **delivery technologies** for immunomodulators and immunosuppressants

