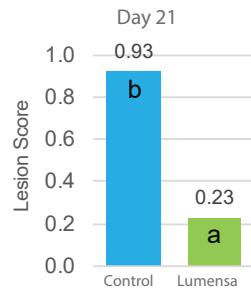


## Effect of Lumensa with Antibiotic-Free Diets on Live Performance and Gut Health of Broiler Chickens in Heat Stress Environment

Yang et al., 2018. (International Poultry Scientific Forum, Atlanta, Georgia, T134, pp 40)

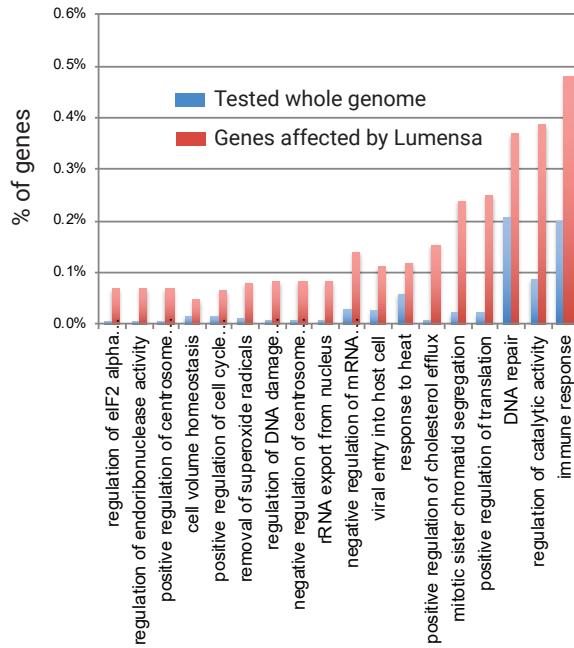
### Improved gut integrity

#### Lesion Score

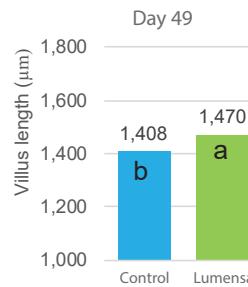
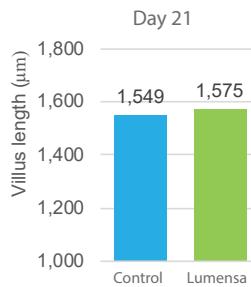


#### Gene Expression in Tissues

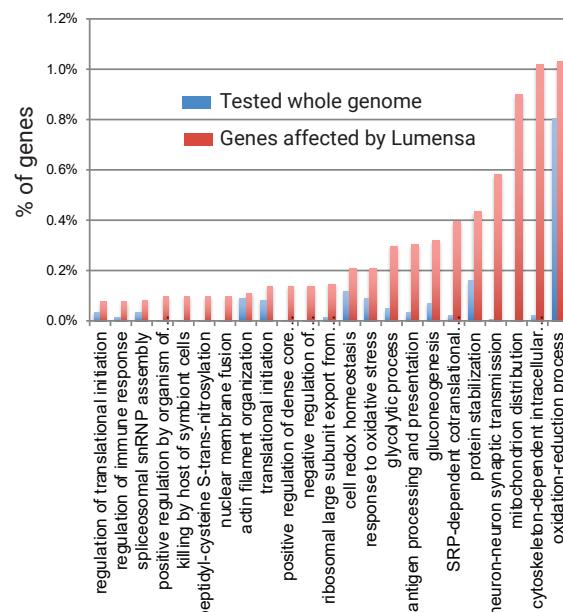
##### Thymus Gene Ontology (GO) Enrichment



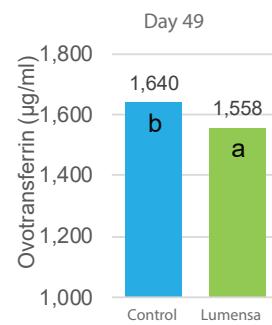
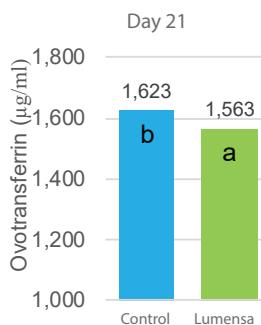
#### Villus Length



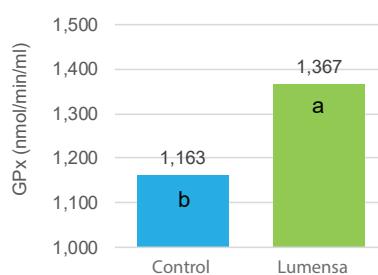
#### Ileum Gene Ontology (GO) Enrichment



#### Serum Ovotransferrin (Biomarker of Infectious and Metabolic Disorders)



#### Antioxidant Enzyme Activity (Glutathione Peroxidase)

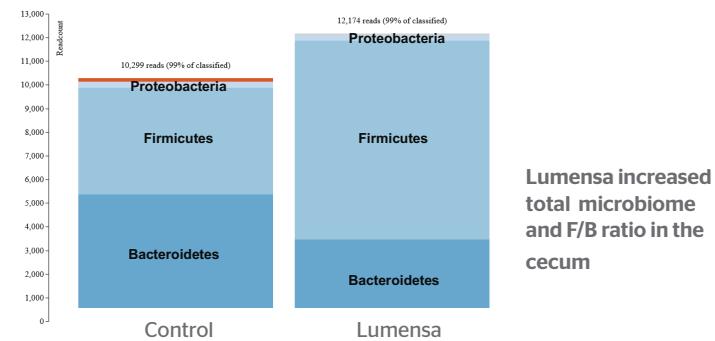


This result indicates that heat stress, a potent inducer of oxidative stress, can be ameliorated by supplementing Lumensa.

Dietary Lumensa supplementation enhances expression of genes involved in response to oxidative stress

## Modified gut microbiome

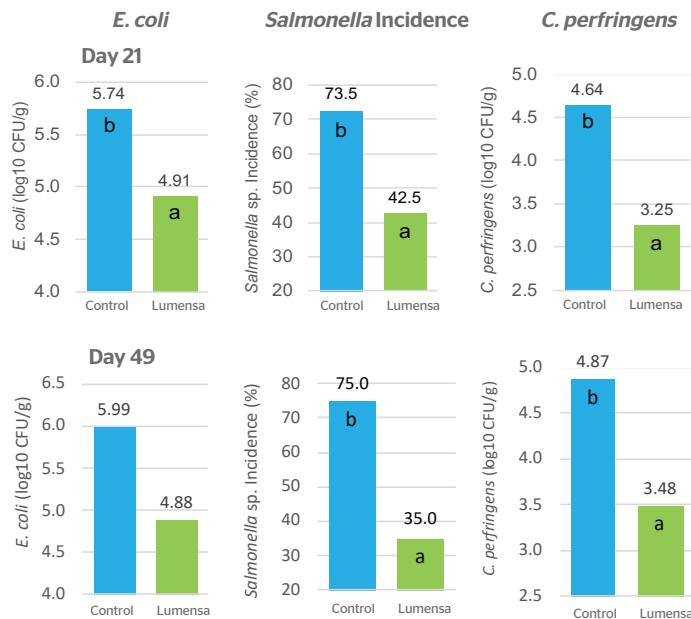
### Firmicutes/Bacteroidetes (F/B) Ratio



Great F/B ratio have been associated with bacterial profiles with high capacity of energy harvesting. Firmicutes have a positive correlation with high energy efficiency, and the F/B ratio affects the amount of energy extracted from the diet. The F/B ratio is directly related to the growth performance of broilers.

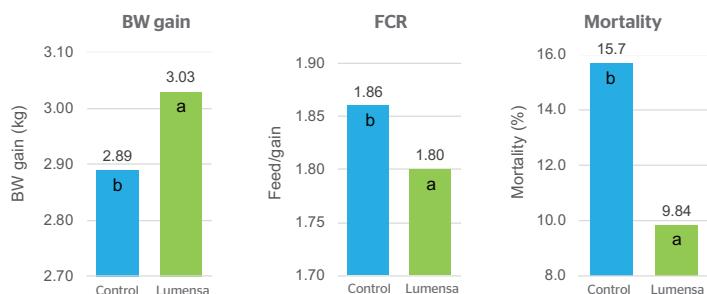
## Reduced pathogens

### Microbiota



## Lumensa™ Performance

### BW Gain, Feed Conversion Ratio and Mortality



Lumensa improved BW gain, FCR and livability at 0-49 days of age

### Body Temperature



Lumensa reduced body temperature

Improved gross performance by Lumensa supplementation may be attributed to lowered body temperature resulting in more energy diversion toward BW gain, rather than dissipating body heat load.

### Summary

- Lumensa supplementation to antibiotic-free diets improved BW gain, FCR and livability in Ross 708 broilers under high temperature conditions.
- Lumensa supplementation reduced lesion score, *E. coli* count, *Salmonella* incidence and *Clostridium perfringens* count in intestine.
- Lumensa supplementation decreased rectal temperature and serum ovotransferrin concentrations, and increased intestinal villus length and blood glutathione peroxidase activity.

- Lumensa supplementation increased the Firmicutes/Bacteroidetes ratio in cecal microbiome. The F/B ratio in cecal microbiome was positively correlated with BW gain.
- Results from the present study confirm previously reported performance benefits of Lumensa supplementation to antibiotic-free diets and suggest the mode of action of Lumensa includes increasing villus length, decreasing body temperature and inflammatory stress, and modulating gut microbiome and chicken tissues gene expression in broilers under high temperature conditions.