



Department of Poultry Science

College of Agricultural & Environmental Sciences

UNIVERSITY OF GEORGIA

UGA Poultry Nutrition Newsletter

September, 2023



Upcoming Poultry Events

2023

- 9/25-9/27 58th National Meeting on Poultry Health, Processing, and Live Production, Ocean City, MD
- 9/25 Layer Conference, Athens, GA
- 9/27 Broiler Conference, Athens, GA
- 10/4 Broiler Breeder Management Seminar, Athens GA
- 10/4 GPLN Annual Meeting, Gainesville, GA
- 10/6 Homecoming tailgate & new poultry science building grand opening, Athens, GA
- 10/17-10/19 Sunbelt Ag Expo, Moultrie, GA
- 10/29-11/1 GPF Poultry Strong, Lanier Islands, GA
- 10/29-11/1 Symposium on Gut Health in Production of Food Animals, St. Louis, MO
- 11/6-11/8 Poultry Tech Summit, Atlanta, GA

- 11/14-11/16 Cold weather workshop, Athens, GA

2023

- 1/23-1/26 International short course, Athens, GA

- 1/29-2/1 ISPF/IPPE, Atlanta, GA

- 3/3-3/7 Purchasing and Ingredient Suppliers Conference, Orlando, FL

Poultry News at a glance

- **August Business Update: What's new in the world of poultry? (Poultry World)**
 - The latest business developments and updates from around the world.
 - **US poultry groups applaud new trade agreement with India (The Poultry Site)**
 - The agreement reduces to 5% from 30% the duty on both turkey and duck imports from the US.
 - **Preparing the poultry industry for tech disruption (Poultry World)**
 - Like hospitals, the poultry industry is about to be radically transformed by robots, the Internet of Things (IoT), and artificial intelligence (AI). Agricultural employment in the US will increase by only 1%. Even before the agritech revolution, agriculture was suffering a “people problem” due to poor pay and harsh conditions.
 - **Avian influenza confirmed in more poultry in Peru (WATT Poultry)**
 - The latest outbreaks involve a laying hen operation and a fattening duck operation. WOAHA has also issued new reports for the HPAI situations in Brazil, Argentina and Uruguay. However, none of these new infections involved poultry.
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UGA Poultry Research Highlight



Dr. Woo Kyun Kim, professor, specializes in feed additives, amino acids, vitamins, and minerals on nutrient utilization, gut health, and bone health in poultry. His recent research focus is to evaluate functional roles of key amino acids including arginine and methionine in broilers and laying hens under *Eimeria* challenge and heat stress conditions. These studies were conducted by former Ph.D. students (**Drs. Po-Yun Teng and Fernanda Castro**). Currently, **Guanchen Liu, Ph.D. student**, is continuously working on these projects. His group found that Arginine supplementation improved body weight gain, lean meat production, and bone mineral density and reduced body fat percentage in broilers under a normal condition. In addition, arginine deficiency considerably increased leg issues in broilers, whereas arginine supplementation improved such conditions. Moreover, arginine supplementation significantly reduced gut permeability and minimized negative effects in broilers challenged with *Eimeria* spp. Methionine plays an important role in skeletal integrity and egg production in laying hens under heat stress. Our findings suggest that

functional roles of arginine and methionine are critical to maintain efficient production and gut and bone health in poultry under stress conditions (enteric diseases and heat stress).

[Learn more about the research](#)

Intrigued by Dr.Kim's research and lab? Reach out to the team:

[Email](#)

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2023 SEPTEMBER

In this issue, you will read research summaries from
9 Broilers studies
2 Layer studies
3 Literature review
from 14 research institutes in 12 countries

POULTRY NUTRITION RESEARCH SUMMARY

Chongxiao (Sean) Chen*, Xixi Chen #, Catherine Fudge*, Muhammad Ali*, Nicolás Mejía-
Abaunza*, and Lily Xu #

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Nutribins LLC



Fig. An example of a footpad with a score 2.

In 5-10 wk broiler breeder cockerels, **standard diets diluted with 20% oat hulls and 150 grams of roughage** did not impact uniformity or body weight gain. However, it increased foot pad dermatitis at wk10.

The Norwegian Meat and Poultry Research Centre/ [Link](#)

In broilers, **comparing two sources of methionine** (DL-Met vs. DL-HMTBA) and **three levels of total sulfur amino acids** (TSAA = 80, 100, 120%), Sources of methionine did not affect growth performance. DL-HMTBA upregulated genes related to the gut barrier and downregulated genes related to gut inflammatory response. Additionally, the DL-HMTBA group exhibited higher abundance of ileal *lactobacilli* and higher levels of short-chain fatty acids. When TSAA levels were at 100%, there was improved intestinal morphology.

China Agricultural University/ [Link](#)

In broiler breeders fed 50% **mycotoxin contaminated corn**, hatchability and embryo survivability at later stages both decreased. Progeny chicks from broiler breeders provided 100% mycotoxin-contaminated corn had significantly lower BW and BWG during brooding, and reduced antibody-mediated immunity; while supplementing a mycotoxin adsorbent partially alleviated the negative effects.

Sichuan Agricultural University/ [Link](#)

In broiler, **reducing up to 3% crude protein but maintaining amino acids requirement** from 11 to 35d did not affect performance or meat quality.

Université Laval/ [Link](#)

In broilers, increasing **balanced protein** (6.66% to 33.3%) during an *Eimeria maxima* challenge resulted in decreased gut health and litter quality, and increased foot dermatitis; Balanced protein level above 25% decreased villus: crypt ratio in non-challenged birds compared with the lower levels.

Universidade Estadual Paulista / [Link](#)

In broilers, 0.06% of **Quercetin** (a flavonoid) improved growth performance, nutrient digestibility, meat quality, and tibia ash at d 32.

Dankook University/ [Link](#)

POULTRY

LATEST NUTRITION RESEARCH AT A GLANCE

In broilers, supplementing **iron glycine chelate** (10-40 mg/kg) did not affect the chemical composition and meat quality of chicken breast meat.

University of Life Sciences Poland /[Link](#)

In broilers, supplementing **orange peel meal** (80, 160, 240 g/kg) improved growth performance, nutrient digestibility, and carcass criteria at 0-42 days. There were no interaction effects between orange peel meal and multi-enzymes.

Mendel University in Brno /[Link](#)

In broilers, including **DDGS up to 14%** did not affect CP digestibility and AME at d 21, nor growth performance, gut permeability, and cecal bacteria at d 28. Additional exogenous enzymes (multi-carbohydrase + phytase at 100 g/ton) improved FCR & intestinal microbiota. The diversity of ileal microbiota was reduced, while cecal microbiota diversity was increased with an increase in DDGS inclusion (0 to 14%).

Western Parana State University /[Link](#)

In layers, temporal patterns of the faecal microbiota were identified in 4 commercial flocks in Australia from hatch to production. The **microbiome** increased in richness and diversity in the rearing phase. However, the microbiota went under a major shift from *Proteobacteria* and *Firmicutes* being dominant to *Bacteroidota* once laying started

The University of Adelaide & RMIT University /[Link](#)

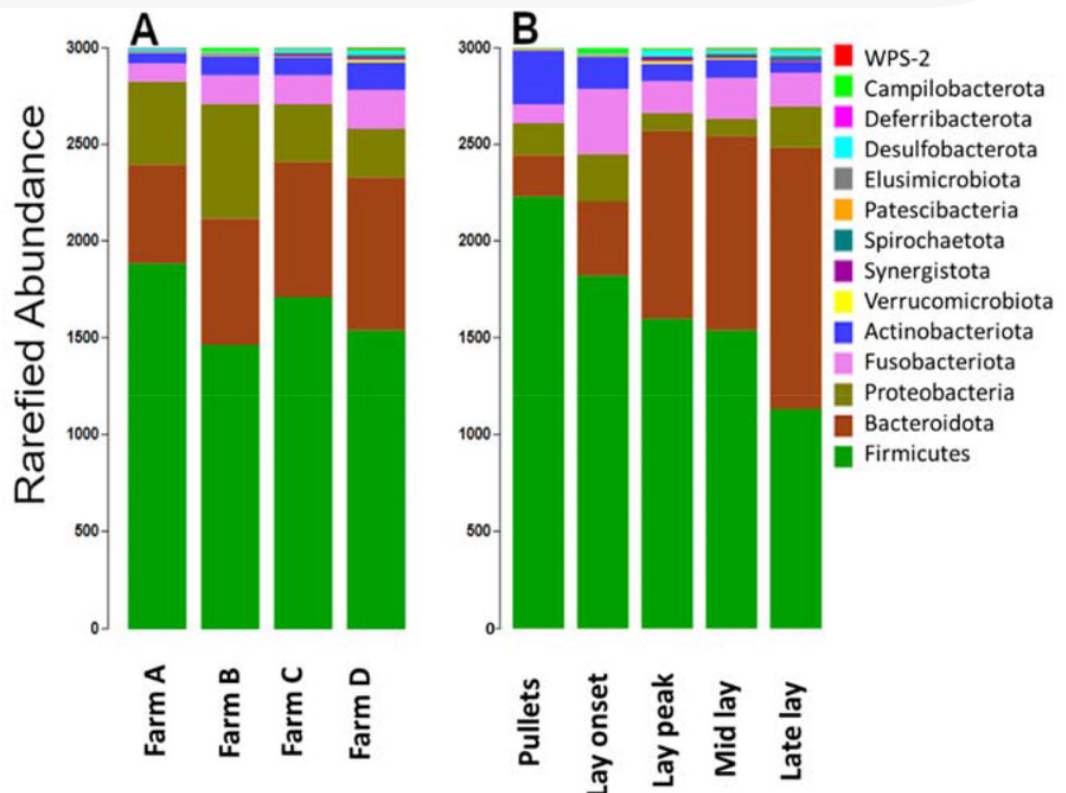


Fig. Stacked bar-charts showing phylum level microbiota compositions by the farm (A) and by stage of lay (B).

In 20-72 week laying hens, feeding 3% **black soldier fly larvae** meal increased cecal beneficial bacteria and short-chain fatty acids concentrations, and altered microbial pathways that metabolize bile acids.

Kagawa University /[Link](#)

Review #1

Insects as an alternative protein source for poultry nutrition

“Alternative protein sources, such as insects, have demonstrated favorable nutritive values, immunological response, and improved layer and broiler performance in complete or partial replacement of crop-based protein. This review summarizes the research focusing on black soldier flies, houseflies, and mealworms as an alternative protein source and their benefits in the poultry industry. Results from poultry studies suggest equivalent or enhanced growth performances and quality of end-products as compared to fish meal and soybean meal. In addition, this review also discusses the impact of insect farming and processing treatment on the nutritive value, as well as the safety of insect protein.”



Black Soldier Fly



Housefly

Hungarian University | [Link](#)

Review#2

Effect of different corn hybrids on the growth performance, survival and carcass yield of broilers

Corn is considered the most popular energy source in chicken diets globally. With agricultural biotechnology advancements, scientists have produced different hybrid corn varieties with better quality traits. This review covers the effect of different corn hybrid varieties on broiler performance, growth parameters, and carcass yield and concludes that genetically modified corn varieties exhibit no negative effects on chicken yield.

Tarbiat Modares University | [Link](#)



Grasshopper



Desert locust



The beetle



Mealworms



Silkworms



Earthworms



Crickets

Review #3

The potential of lactoferrin: A call for future research in poultry nutrition

Lactoferrin is a commonly found glycoprotein in many tissues within the body and has been shown to have effects on viruses, bacteria, fungi, and as an immune modulator. With the push for the industry to seek out non-pharmaceuticals as antibiotic replacements, lactoferrin may be a suitable option. This review defines the benefits that lactoferrin may provide as a feed additive to the poultry industry.

Chungnam National University | [Link](#)

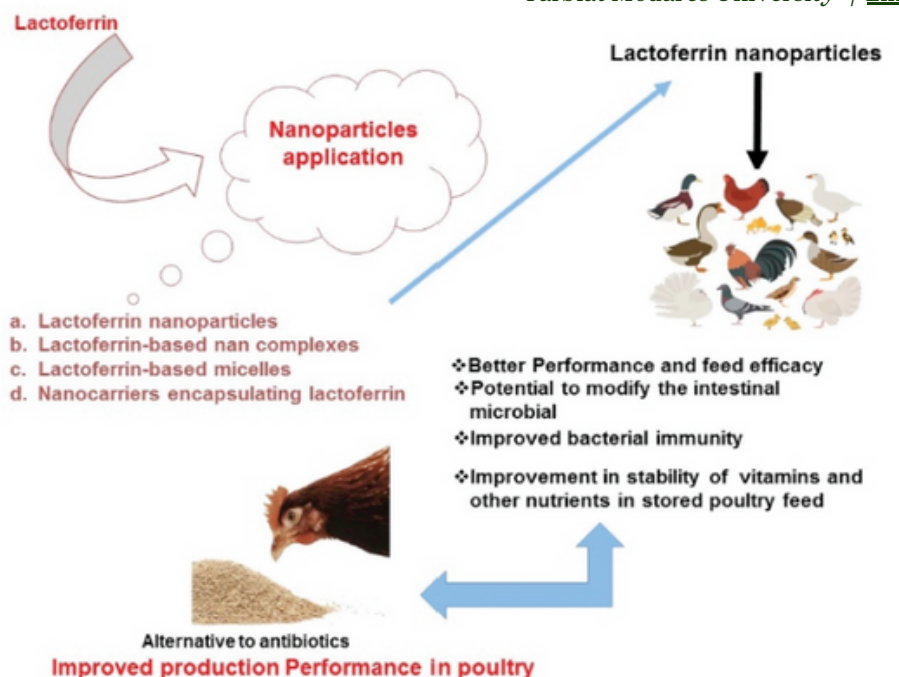


Fig. The proposed promising use of LF nanoparticles application in poultry.