Department of Poultry Science
College of Agricultural & Environmental Sciences
UNIVERSITY OF GEORGIA

UGA POULTRY NUTRITION NEWSLETTER

October 2024

Editorial

We are almost celebrating the third year of our UGA Poultry Nutrition Newsletter, and we would like to thank all our readers who have contributed ideas, suggestions, and comments that helped us to improve this experience.

Now, a new phase has started for our lab. In addition to **Catherine Fudge**, **Muhammad Ali**, and **Nicolás Mejía Abaunza**, we have recently incorporated **Allison Kawaoku** and **Federico Etcheverry**. This fantastic team is working together on our research, Journal Club, Poultry Nutrition Research Summary, and many other exciting projects.

I hope you enjoy this new edition of our **Poultry Nutrition Research Summary**. Every month, we do a deep search in the leading scientific magazines related to poultry nutrition and production, and we select the relevant publications that catch our attention and share them with you. We know it is tough to read the more than 100 articles published monthly, so we hope this summary can help you stay updated on the latest research. In this issue, you will read research summaries of **8 broilers, 4 layers, and 1 mycotoxin study, together with 3 literature reviews, from 15 research institutes in 12 countries**; these articles were carefully selected from **71 articles** published in poultry nutrition this month. Enjoy the reading! Meanwhile, we updated our poultry event calendar for your business planning. We also thoughtfully selected several poultry news from press media to keep you updated with the latest industrial news.

We are very open to any recommendation from the industry to align our work with the new nutrition and poultry production trends. Feel free to share your ideas with us.

See you soon!

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CHEN LAB

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Latest Nutrition Research Summary

Broilers

In broilers, additional **pumpkin oil** (1 – 2 ml/kg diet) improved growth performance, liver and kidney functions, plasma lipid profile, digestive enzymes, immunity, antioxidants, and Lactobacilli while reducing the caecal count of pathogenic bacteria (*E. coli*, *Salmonella*, and Coliform) at d 42.

Zagazig University (Egypt) / Link

In broilers, **xylanase** supplementation (1200/2400/4800 U/kg) in a reduced AMEn wheat-based diet (-100 Kcal/kg) improved growth performance and reduced ileal digesta viscosity compared to the non-added control. Xylanase supplementation at 2400 U/kg also increased CP digestibility.

Auburn University (USA) / Link

In broilers, **soyhulls** inclusion above 4 % decreased the growth performance, carcass yield and wings %, visceral organs weight (liver and abdominal fat), nutrient digestibility (DM%, CP and AME) and jejunum morphology at d 35.

University of Agriculture (Pakistan) / Link

In broilers fed a low Ca and P diet and challenged with coccidiosis, the interactions of **coccidiosis vaccination** and **phytase** (1,500 FTU/kg) or **25-OH-D_3** (3,000 IU/kg) were studied. Dietary treatment has no significant beneficial effect on performance. However, the coccidiosis vaccine increased performance, gut morphology, and permeability.

University of Georgia (USA) / Link

In broilers, **salidroside** supplementation (200/400/600 mg/kg of feed) dose-dependently improved femur and tibia morphology and biomechanical properties. Higher doses enhanced bone and cartilage formation while reducing femoral head necrosis.

Nanjing Agriculture University (China) / Link

In broilers, supplementation of **β-alanine** at 10 mg/kg reduced jejunal pro-inflammatory cytokines (TNFSF15, IL-1β, IL-6, and IL-8), oocyst shedding; improved gut integrity (Occludin, JAM-2), nutrient transporter expression; and maintaining body weight during *E. maxima* infection.

Agricultural Research Service-USDA (USA) / Link

In broiler breeder pullets, 20% or 30% **diluted feed** provided twice daily improved general welfare. Twice-daily feeding programs also improved uniformity, increased water intake, and reduced mortality during rearing without impacting laying performance.

Wageningen Livestock Research (Netherland) / Link

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Latest Nutrition Research Summary

Layers

In layers, partial replacement of soybean meal with 10% ***Chlorella vulgaris*** (microalga) had a limited impact on performance parameters. Still, it can positively influence egg quality and yolk color, although careful consideration of optimal levels is necessary to avoid adverse effects on other parameters.

University of Lisbon (Portugal) / Link

In white layer hens, adding **multicarbohydrase-phytase complex** (0.01%) or **xylanase-glucanase** (0.01%) along with **phytase** (0.015%) in diets with reduced AME (65 – 85 kcal/kg) and AAs (2-4%), can maintain laying performance, egg quality, and income over feed cost. However, it increased overall (43-61 wk) feed intake and FCR.

University of Liverpool (UK) / Link

In layer hens, a diet replacing soybean meal with alternative **plant-based ingredients** (peas, DDGS, and sunflower meal) with added 5% **whole dried black soldier fly larvae** from 23 to 38 weeks old did not affect the egg quality and laying performance. Instead, it improved Haugh Unit at 21 wk and reduced blood cholesterol and triglycerides at wk32.

University of Murcia (Spain) / Link

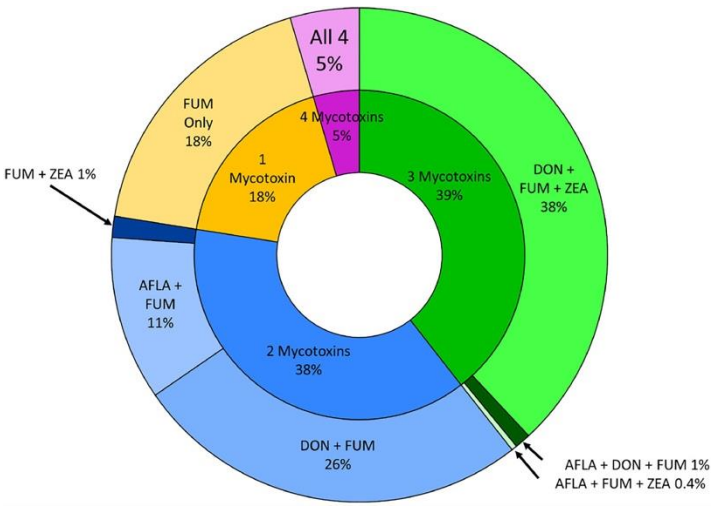
In laying hens, **glucosamine sulfate sodium** (0.2-0.6%) improved average daily feed intake, laying rate, egg weight, and egg mass. Additionally, GSS increased Haugh Unit, albumen height, calcium and phosphorous content while raising serum calcium and calcitonin levels.

China Agricultural University (China) / Link

Mycotoxins

In corn samples, over 80% contained 2 or more mycotoxins, primarily fumonisin, deoxynivalenol, and zearalenone. NIR analysis of contaminated corn indicated aflatoxin B1 negatively affected the fat content. However, deoxynivalenol and fumonisin increased corn starch and protein content, respectively.

USDA-ARS (USA)/ Link



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Latest Nutrition Research Summary

Reviews

Assessing the Influence of Cumulative *Chlorella vulgaris* Intake on Broiler Carcass Traits, Meat Quality and Oxidative Stability

Chlorella vulgaris is a microalga with a rich nutritional profile and antioxidants. It has shown benefits in broiler carcass traits, meat quality, and oxidative stability. However, high variation across studies has not identified the optimal dose response to maximize results. This review collects multiple research studies to fit statistical models and find the best dose response to boost broiler carcass traits, meat quality, and oxidative stability. The author suggested 8.73 to 401 g/bird for meat quality. Higher levels might decrease the carcass dressing percentage.

University of Lisbon (Portugal) / Link

Effects of varying cumulative intake levels of *Chlorella vulgaris* on carcass traits of broilers.

Starting Weight and Age	Microalga (%) in Feed and Trial Duration (days) [1]	Cumulative Microalga Intake (g/bird) [2]	Carcass Traits					References
			Carcass Dressing (%)	Carcass Weight (g) [3]	Thigh Yield (%)	Breast MEAT Cooking Loss (%)	Breast Meat Water Holding Capacity (%) [4]	
45.1 g, 1 d-old [5]	0.05%, 34 d	1.40	-	-	-	27.1	-	[35]
72.56 g, 4 d-old [5,6]	0.10%, 31 d	3.52	-	-	-	12.56	73.49	[34]
45.1 g, 1 d-old [5]	0.15%, 34 d	4.27	-	-	-	26.1	-	[35]
40.03 g, 1 d-old [5]	0.10%, 41 d	4.35	61.3	1533	28.9	-	-	[32]
41.8 g, 1 d-old	0.20%, 41 d	6.71	70.78	1416	-	21.00	83.26	[33]
40.03 g, 1 d-old [5]	0.20%, 41 d	8.73	63.2	1593	29.6	-	-	[32]
41.8 g, 1 d-old	0.40%, 41 d	13.0	69.79	1450	-	20.33	86.82	[33]
45.1 g, 1 d-old [5]	0.50%, 34 d	14.1	-	-	-	26.5	-	[35]
41.8 g, 1 d-old	0.60%, 41 d	20.0	71.69	1553	-	21.66	88.33	[33]
788 g, 21 d-old [5]	10%, 14 d	176	-		-	23.0	-	[18]
107 g, 5 d-old [5]	10%, 34 d	401	74.46	2099	26.82	29.18	79.21	[10]
109 g, 5 d-old [5]	15%, 34 d	561	73.11	1891	26.12	27.06	80.94	[10]
106 g, 5 d-old [5]	20%, 34 d	718	72.58	1700	25.81	24.13	83.62	[10]

1 Slaughtering day was not considered for this calculation. 2 Percentage of microalgae in the diet multiplied by the total feed ingested per animal during the experiment. If cumulative feed intake (CFI) results were not available, the following estimation was made: CFI (g/bird) [10] = CFI (g/pen)/number of birds; CFI (g/bird) [18] = CFI (g/d/pen) × number of trial days/number of birds; CFI (g/bird) [34] = CFI (g/d/bird) × number of trial days. 3 An estimation was done when the carcass weight was not available: Carcass weight (g) ([10,32,33]) = dressing (%) × final body weight (g). 4 Water holding capacity (%) [33] = (500 − (water holding capacity (cm2) × 8.4)) × 0.2. 5 Male broilers. 6 Female broilers.

Effects of varying cumulative intake levels of *Chlorella vulgaris* on meat quality traits of broilers.

Starting Weight and Age	Microalga (%) in Feed and Trial Duration (Days) [1]	Cumulative Microalga Intake (g/Bird) [2]	pH24h	Colour Traits [3]			References
			Absolute Value (pH Scale)	Absolute Value (CIELAB Scale) L*	a*	b*	
45.1 g, 1 d-old [4]	0.05%, 34 d	1.40	5.69	60.3	1.24	7.89	[35]
72.56 g, 4 d-old [4,5]	0.10%, 31 d	3.52	5.86	-	-	-	[34]
45.1 g, 1 d-old [4]	0.15%, 34 d	4.27	5.74	58.6	0.57	8.15	[35]
41.8 g, 1 d-old	0.20%, 41 d	6.71	6.480	-	-	-	[33]
41.8 g, 1 d-old	0.40%, 41 d	13.0	6.610	-	-	-	[33]
45.1 g, 1 d-old [4,5]	0.50%, 34 d	14.1	5.68	58.9	0.87	7.86	[35]
41.8 g, 1 d-old	0.60%, 41 d	20.0	6.603	-	-	-	[33]
788 g, 21 d-old [4]	10%, 14 d	176	5.77	44.1	4.45	9.96	[18]
107 g, 5 d-old [4]	10%, 34 d	401	6.08	54.63	1.4	17.46	[10]
109 g, 5 d-old [4]	15%, 34 d	561	6.06	54.87	0.83	20.14	[10]
106 g, 5 d-old [4]	20%, 34 d	718	6.15	51.02	0.97	19.39	[10]

[1] Slaughtering day was not considered for this calculation. [2] Percentage of microalgae in the diet multiplied by the total feed ingested per animal during the experiment. If cumulative feed intake (CFI) results were not available, the following estimation was made: CFI (g/bird) [10] = CFI (g/pen)/number of birds; CFI (g/bird) [18] = CFI (g/d/pen) × number of trial days/number of birds; CFI (g/bird) [34] = CFI (g/d/bird) × number of trial days. [3] Colour scale: a*—redness; b*—yellowness; L*—lightness. [4] Male broilers. [5] Female broilers.

Branched-chain amino acids supplementation in low-protein broiler diets

Branched-chain amino acids (BCAA), including isoleucine, leucine, and valine, play an important role in metabolism, protein synthesis, and immunity. This review highlighted BCAA requirements in low-protein diets and their role in nutrient utilization, meat quality, and BCAA antagonism.

Shandong Agricultural University (China) / Link

Bee pollen as natural additive in poultry nutrition

Bee pollen contains many nutrients, including lipids, proteins, carbohydrates, vitamins, and unique bioactive substances, which can improve gut health and promote growth. This review emphasizes the effects of bee pollen in poultry feed on growth, health, and the quality of meat and eggs, including the in vivo feeding. However, the safe doses and limits for using bee pollen need more research.

National Institute of Animal Production (Poland) / Link

UGA & Industry News

Meet our Graduates

Micaela Sinclair-Black

Spending time on our family's farm cemented my love for poultry and the people working in this industry. In the future, I aspire to bring scientific and agricultural communities together to generate innovative solutions. I obtained my MSc. in poultry nutrition in South Africa while completing a poultry industry-based internship. Following that, I pursued my dreams and started my **Ph.D. at the University of Georgia**, where I gained valuable experience in mentorship, communication, and critical thinking. My research focuses on calcium and phosphorus homeostasis in laying hens. These experiences have given me a unique perspective, allowing me to address challenges from nutritional and physiological approaches. I anticipate **graduating at the end of 2024** and am eager to continue my professional growth in either an academic or industry-based capacity.

Industry News

September 2024 Business Update: What's new in the world of poultry? (Poultry World)

The summary of the latest business updates from the global poultry industry

Poultry industry responds to hurricane devastation (Poultry Times)

Relief efforts continued due to the recent devastation caused by hurricanes. Multiple sources of support from the company, federal and state, are available. Check out the details in the news.

Cal-Maine announces cage-free expansion (The Poultry Site)

Cal-Maine Foods Inc. approved $40 million to expand cage-free production capabilities .The projects will add five new cage-free layer houses in Florida, Georgia, Utah, and Texas, adding approximately 1 million cage-free layer hens by late summer 2025.

BrucePac Recalls Ready-To-Eat Meat and Poultry Products Due to Possible Listeria Contamination (USDA)

BrucePac, a Durant, Oklahoma, establishment, is recalling approximately 11,765,285 pounds of ready-to-eat (RTE) meat and poultry products that may be adulterated with *Listeria monocytogenes*.

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Eggsplore Poultry Events

November

National Breeders Roundtable | Nashville TN | **5-7**
Symposium on Gut Health in Production of Food Animals | St Louis MO | **10 - 13**
Cold Weather Management Workshop | Athens GA | **12-14**
PS Open House (Pre-professional) | Athens GA | **15**

2025 – January

International Poultry Short Course | Athens GA | **21-24**
NPFDA Annual Convention and Showcase | Atlanta GA | **27-30**
International Production and Processing Expo | Atlanta GA | **28-30**
AFIA International Feed Expo | Atlanta GA | **28-30**
Feed Your ESG: How Will Help Hit Sustainability Targets | Atlanta GA | **TBD**

February

NTF Annual Convection | Scottsdale AR | **19-22**

March

NC Processing and Products Academy | Raleigh NC | **11-13**
Purchasing and Ingredient Suppliers Conference | Orlando FL | **18-20**
Feed Mill Management Seminar | Nashville TN | **20-21**
Annual Meat Conference | Orlando FL | **24-26**
Deep South Poultry Conference | Tifon GA | **26**
Alumni & Friends Reception | Tifon GA | **TBD**

April

West Poultry Disease Conference | Calgary, Canada | **7-9**
PEAK | Minneapolis MN | **8-10**
UGA Hot Weather Workshop | Athens GA | **15-17**
Workforce Success and Engagement Conference | Destin FL | **16-18**
AFGA Nutririon Seminar | Huntsville AL | **22-24**
Stakeholders Summit | Arlington VA | **30-2**
UGA Hatchery Workshop | Athens GA | **TBD**
North Central Avian Disease Conferences | **TBD** | **TBD**
GPF Annual Meeting and Legacy Golf Tournament | **TBD** | **TBD**

May

Precision Poultry Seminar | Virtual | **6**
Poultry Processor Workshop | Nashville TN | **13-14**
Poultry Health Management School | Ames IA | **19-22**
International Poultry Congress | **TBD** | **TBD**
International Avian Respiratory Disease Conference | **TBD** | **TBD**

June

Avian Academy Teacher Education Program 2.0 | Athens GA | **16-18**
Financial Management Seminar | Amelia Island FL | **16-18**
Avian Academy Teacher Education Program | Athens GA | **23-25**
24th European Symposium on Poultry Nutrition | Maastricht, The Netherlands | **23-26**
Southeast Egg Industry Regional Conference | **TBD** | **TBD**
European Poultry Conference | **TBD** | **TBD**
FSMA PCQI Training | **TBD** | **TBD**
Feed Industry Institute | **TBD** | **TBD**

July

Hatchery Breeder Clinic | Nashville TN | **8-9**
Poultry Science Association Annual Meeting | Raleigh NC | **14-17**
State 4-H Congress | Atlanta GA | **22-25**
Chicken Marketing Summit | Savannah GA | **28-30**
AAAP 68th Annual Meeting | Portland, OR | **29-31**
SC Poultry Federation Annual Conference | **TBD** | **TBD**
14th International Symposium on Makek's Disease and Avian Herpesviruses | **TBD** | **TBD**
Texas Poultry Federation Annual Convention | **TBD** | **TBD**

August

National Safety Conference for the Poultry Industry | Destin FL | **18-20**
Women's Leadership Conference | Destin FL | **21-22**
Arkansas Nutrition Conference | Rogers AR | **TBD**

September

Environmental Management Seminar | Destin FL | **18-19**
UGA Layers Conference | Virtual | **22**
UGA Broiler Conference | Athens GA | **24**
Poultry Sustainability and Welfare Summit | **TBD** | **TBD**
Liquid Feed Symposium | **TBD** | **TBD**
Shell Egg Academy | **TBD** | **TBD**
California Poultry Federation Annual Conference | **TBD** | **TBD**
NPFDA 2025 Fall Meeting | **TBD** | **TBD**
NTF Leadership Conference | **TBD** | **TBD**
59th National Meeting on Poultry Health, Processing, and Live Production | **TBD** | **TBD**
International Avian Influenza and One Health Emerging Issues Summit | **TBD** | **TBD**

October

GA National Fair | Perry GA | **3-12**
PSA Pacific Rim Scientific Conferences | Macau China | **13-16**
Sunbelt Ag Expo | Moultrie GA | **14-16**
Poultry Protein & Fat Seminar | Nashville TN | **15-16**
Georgia Poultry Strong | Peachtree Pointe @ Lanier Islands GA | **18**
Live Production, Welfare & Biosecurity Seminar | **TBD** | **TBD**
Poultry Symposium for Production & Processing | **TBD** | **TBD**
Southern Feed & Grain Convection | **TBD** | **TBD**
PSA Professional Development Conference | **TBD** | **TBD**
International Conference on Poultry Science | Lisbon Portugal | **TBD**

TBD – Upcoming

Poultry Tech Summit | Atlanta GA | **Nov 3-6(2025)**
Cold Weather Management Workshop | Athens GA | **Nov (2025)**
9th International Conference on Poultry Intestinal Health | Istanbul, Turkey | **April 22-24 (2026)**
World's Poultry Congress | Toronto Canada | **July 13-17 (2026)**
Food Animal Innovation Summit | Raleigh NC | **TBD**

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