

HESHAM EED SAAD DESOUKY, PhD

Associate Professor of Fish Physiology | Fish Physiology & Aquaculture Scientist |
Fish Nutrition Specialist

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Researcher ID: ISA-9319-2023



PROFESSIONAL PROFILE

Associate Professor of Fish Physiology and an aquaculture scientist with over 15 years of academic and research experience, including international appointments in Egypt, China, and Spain. Expertise spans fish physiology, nutritional physiology, metabolism, stress responses, growth regulation, digestive and intestinal physiology, antioxidant and immune responses, and the physiological effects of dietary strategies and functional feed additives. Research integrates whole-animal performance with biochemical, molecular, histological, hematological, and gene-expression approaches to explain how nutrition and environmental factors regulate fish health, metabolism, and production efficiency. Brings extensive experience in undergraduate and postgraduate teaching, MSc and PhD supervision, research project development and implementation, laboratory research, scientific publishing, international collaboration, and translating physiological research into practical applications for sustainable aquaculture.

ACADEMIC & RESEARCH FOCUS

Fish Physiology | Nutritional Physiology | Academic Teaching & Postgraduate Supervision | Aquaculture Research | Fish Nutrition & Metabolism | Research Projects & Grant Development | Laboratory Research | Sustainable Aquaculture | Scientific Collaboration & Knowledge Transfer

CORE COMPETENCIES

Fish Physiology | Nutritional Physiology | Energy, Lipid & Protein Metabolism | Growth Physiology | Digestive & Intestinal Physiology | Stress Physiology | Fish Health & Immunity | Antioxidant Responses | Fish Nutrition & Feed Formulation | Functional Feed Additives | Nutrient Digestibility & Utilization | Histology & Hematology | Molecular Biology | PCR & Gene Expression | Transcriptomics | Experimental Design | Laboratory Operations | SPSS, R & GraphPad | Scientific Writing | MSc & PhD Supervision | Research Project Development | International Collaboration

SELECTED IMPACT HIGHLIGHTS

- Published 21 peer-reviewed journal articles, including six first-author papers, plus four Springer book chapters, with research spanning fish physiology, nutritional physiology, metabolism, health, and aquaculture nutrition.
- Co-authored more than 12 SCI-indexed publications during postdoctoral research focused on physiological and metabolic responses to nutrition, intestinal health, immunity, and sustainable aquaculture.
- Built international research experience across Egypt, China, and Spain and collaborated with researchers and institutions across more than 10 countries.
- Developed and applied integrated physiological, biochemical, molecular, and performance-based approaches to study nutrient utilization, metabolism, gene expression, intestinal function, and fish health.
- Supervises and mentors students and early-career researchers in experimental fish physiology, aquaculture research, data analysis, scientific writing, and research dissemination.

PROFESSIONAL EXPERIENCE

Associate Professor of Fish Physiology | Faculty of Agriculture, Damanhour University

Aug 2026 - Present | Damanhour, Egypt

- Teach and coordinate undergraduate and postgraduate courses in fish physiology, nutritional physiology, aquaculture, fish nutrition, breeding, and related laboratory subjects.
- Lead research on fish physiological responses to nutrition and culture conditions, including metabolism, growth regulation, digestive and intestinal function, stress responses, antioxidant status, immunity, and health.
- Design, develop, and manage research projects integrating physiological, biochemical, histological, hematological, molecular, and gene-expression approaches in fish and other aquatic organisms.
- Supervise MSc and PhD students and mentor junior researchers in research question development, experimental design, laboratory methods, data interpretation, scientific writing, publication, and thesis preparation.
- Prepare and contribute to competitive research proposals, multidisciplinary projects, scientific reports, manuscripts, conference outputs, and national and international research collaborations.
- Contribute to curriculum development, academic committees, quality assurance, departmental research strategy, laboratory development, and knowledge transfer to aquaculture and feed-industry stakeholders.

Assistant Professor of Fish Production | Faculty of Agriculture, Damanhour University

Sep 2021 - Aug 2026 | Damanhour, Egypt

- Taught fish physiology, aquaculture, fish nutrition, breeding, and feed science, with emphasis on linking physiological principles to fish growth, health, reproduction, and production performance.
- Conducted and supervised research on nutritional physiology, metabolism, growth, feed utilization, antioxidant and immune responses, intestinal health, and physiological effects of functional feed additives.
- Applied physiological, biochemical, molecular, histological, and performance-based methods to evaluate responses of fish to dietary and production-related factors.
- Supervised student research, laboratory activities, experimental planning, data analysis, scientific reporting, and presentation of research findings.
- Contributed to research collaboration, academic activities, project development, and evidence-based applications in fish physiology and sustainable aquaculture.

Postdoctoral Fellow | Fujian Agriculture and Forestry University

Feb 2023 - Feb 2025 | Fuzhou, China

- Conducted controlled studies on nutritional physiology, nutrient digestibility, lipid and energy metabolism, growth, antioxidant responses, immunity, intestinal health, and physiological performance in finfish and crustaceans.
- Investigated physiological and molecular regulation of metabolism and intestinal function in response to functional feed additives and dietary treatments.
- Integrated biochemical assays, physiological measurements, molecular biology, gene-expression analysis, and production performance data to characterize dietary responses.
- Managed experimental design, sample collection, laboratory analysis, statistical interpretation, manuscript preparation, and multidisciplinary collaboration.
- Co-authored more than 12 SCI-indexed publications in fish physiology, nutritional physiology, aquatic animal health, nutrition, and sustainable aquaculture.

Visiting Scholar | Fujian Agriculture and Forestry University

Nov 2022 - Feb 2023 | Fuzhou, China

- Participated in collaborative research on fish nutritional physiology, metabolism, intestinal health, and aquaculture nutrition between Egyptian and Chinese research teams.
- Supported experimental planning, laboratory work, data interpretation, and scientific writing, while mentoring students and early-career researchers.

- Contributed to knowledge exchange and research outputs related to physiological and metabolic responses of aquatic animals to nutrition.

Lecturer of Fish Production | Faculty of Agriculture, Damanhour University

Nov 2015 - Sep 2021 | Damanhour, Egypt

- Delivered teaching in fish physiology, aquaculture, fish nutrition, breeding, and feed science, including lectures, practical classes, and laboratory training.
- Participated in research on fish physiological performance, nutritional responses, growth, feed utilization, metabolism, health indicators, and production systems.
- Supported student assessment, practical training, laboratory instruction, research supervision, and academic activities.

Teaching Assistant of Fish Production | Faculty of Agriculture, Damanhour University

Apr 2010 - Nov 2015 | Damanhour, Egypt

- Assisted in practical and laboratory teaching in fish physiology, aquaculture, breeding, nutrition, and feed science.
- Prepared laboratory materials and supported physiological and production-related experiments, demonstrations, and student practical training.
- Contributed to departmental research while developing expertise in fish physiology, nutrition, and aquaculture science.

EDUCATION

PhD in Animal Nutrition and Feed Science (Fish Nutrition)

Sep 2016 - Jun 2021 | Nanjing, China

Aquaculture Department, College of Animal Science and Technology, Nanjing Agricultural University

- Dissertation: Effect of glycyrrhetic acid (GA) on growth and lipid metabolism in channel catfish fed high-fat diets.

Master of Science in Animal Nutrition (Fish Nutrition)

Sep 2013 - Jul 2015 | Zaragoza, Spain

Mediterranean Agronomic Institute of Zaragoza (IAMZ) and University of Zaragoza

- Thesis: Replacement of fish meal by a mixture of vegetable proteins, with and without prebiotics, in gilthead sea bream (*Sparus aurata*) diets.

Bachelor of Science in Agricultural Sciences

Sep 2005 - Jun 2009 | Damanhour, Egypt

Department of Animal and Poultry Production, Faculty of Agriculture, Alexandria University - Damanhour Branch

- Graduated with an overall grade of Excellent with Honors.

RESEARCH AND TECHNICAL EXPERTISE

- Feed formulation, proximate analysis, alternative ingredient evaluation, nutrient requirement assessment, and feed-efficiency improvement.
- Digestibility assays, nutrient utilization studies, growth trials, phenotyping, and production performance assessment.
- Biochemical and molecular analyses of fish tissues, including PCR, gene-expression analysis, transcriptomics, and nutritional physiology assessments.
- Histological, hematological, antioxidant, immune, and intestinal health assays.
- Experimental design, data management, statistical analysis, visualization, and interpretation using SPSS, R, and GraphPad.
- Scientific literature review, manuscript preparation, peer-reviewed publication, technical reporting, teaching, mentoring, and research communication.

RESEARCH LEADERSHIP AND COLLABORATION

- Integrated nutritional, physiological, and molecular approaches to investigate nutrient utilization, metabolism, and health.
- Developed research strategies for sustainable feed ingredients, functional additives, improved feed efficiency, and reduced environmental impact.
- Established and applied protocols for assessing diet-related gene expression, genotype-nutrient interactions, and production responses.
- Maintained productive international collaborations, supported multinational research initiatives, and facilitated knowledge transfer between universities, laboratories, and industry stakeholders.

TEACHING, MENTORING, AND ACADEMIC CONTRIBUTION

- Course delivery: aquaculture, fish nutrition, fish physiology, breeding, feed science, and practical laboratory training.
- Student and early-career researcher supervision in experimental planning, laboratory methods, data analysis, scientific writing, and presentation.
- Contribution to multidisciplinary research, departmental academic activities, scientific collaboration, and applied aquaculture development.

WORKSHOPS AND PROFESSIONAL TRAINING

- 12th Symposium of the World's Chinese Scientists on Nutrition and Feeding of Finfish and Shellfish (SWCSNFFS), Zhengzhou, China, 14-18 Oct 2019.
- 11th Symposium of the World's Chinese Scientists on Nutrition and Feeding of Finfish and Shellfish (SWCSNFFS), Huzhou, China, 14-18 Oct 2017.
- Master's thesis research placement, Department of Animal Science, Polytechnic University of Valencia (UPV), Spain, Sep 2014 - Jun 2015.
- Practical training in aquaculture laboratory methods, Aquaculture Laboratory, Polytechnic University of Valencia (UPV), Spain, Apr-May 2014.
- Workshop in Fisheries Management, National Institute of Oceanography and Fisheries (NIOF), Alexandria, Egypt, 2011.
- Training course, Sakha Research Center for Animal Production, Kafr El-Sheikh, Egypt, 2011.
- Training course, Fish Research Center, Abbassa, Zagazig, Egypt, 2010.
- Workshop in Animal Production and Farm Management, Faculty of Agriculture, Alexandria University, Egypt, 2010.

LANGUAGES AND ADDITIONAL INFORMATION

Arabic: Native | English: Fluent | Spanish: Fluent | Nationality: Egyptian | Skype: eettch | WeChat: desouky2016

PUBLICATION RECORD

Total listed output: 21 peer-reviewed journal articles and 4 book chapters.

Peer-Reviewed Journal Articles

- Desouky, H. E., Jiang, G., Abasubong, K. P., Sayed, N. M., Umehai, M. C., Adjoumani, J.-J. Y., & Liu, W. (2026). Nutritional intervention with glycyrrhetic acid (GA) enhances growth and metabolic balance in channel catfish (*Ictalurus punctatus*) fed a high-fat diet. *Fish Physiology and Biochemistry*, 52, 56. <https://doi.org/10.1007/s10695-026-01673-5>
- Desouky, H. E., Sayed, N. M., Abasubong, K. P., Salem, A. M., & Zhang, Z. (2026). The impact of betaine regulation on ovarian development and protein synthesis promotion in the Chinese mitten crab, *Eriocheir sinensis*. *Journal of Crustacean Biology*, 46(1), ruag011. <https://doi.org/10.1093/jcbiol/ruag011>

- Desouky, H. E., Sayed, N. M., Abasubong, K. P., & Zhang, Z. (2025). Nutritional and physiological effects of high-fat diets in finfish: Effects on growth, immunity, lipid metabolism, and intestinal health - A review. *Journal of Comparative Physiology B*, 1-23. <https://doi.org/10.1007/s00360-025-01626-z>
- Sayed, N. M., Desouky, H. E., Abasubong, K. P., Seddik, H. E., & Zhang, Z. (2025). Dietary functional feed additives and their influence on the physiological development of crab species: Current status, prospects, and future trends. *Animal Advances*, 3(1). <https://doi.org/10.48130/animadv-0025-0050>
- Abasubong, K. P., Amin, A. B., Uwem, G. U., & Desouky, H. E. (2025). A review of fish waste and byproducts in poultry production: Effects on growth, egg quality, carcass traits, and broader knowledge beyond physiological response. *Animal Advances*, 2(1). <https://doi.org/10.48130/animadv-0025-0027>
- Sayed, N. M., Desouky, H. E., Abasubong, K. P., Seddik, H. E., & Zhang, Z. (2025). Effect of dietary betaine on growth, physiological response, and immune-related genes in Chinese mitten crab (*Eriocheir sinensis*). *Aquaculture International*, 33(5), 1-17. <https://doi.org/10.1007/s10499-025-02039-z>
- Abasubong, K. P., Jiang, G., Cao, X. F., Liu, W., Li, X. F., & Desouky, H. E. (2025). A significant role of dietary xylooligosaccharides prebiotics in aquatic species: Progressive advances beyond growth - A review. *Animal Advances*, 2(1). <https://doi.org/10.48130/animadv-0025-0006>
- Desouky, H. E., Sayed, N. M., Abasubong, K. P., & Zhang, Z. (2024). A review on protein utilization and its interactions with carbohydrate and lipid from a molecular perspective in aquaculture: An implication beyond growth. *Journal of Animal Physiology and Animal Nutrition*. <https://doi.org/10.1111/jpn.14008>
- Abasubong, K. P., Adjoumani, J. J. Y., Jiang, G. Z., Liu, W. B., Li, X. F., Cao, X. F., & Desouky, H. E. (2024). Licorice (*Glycyrrhiza glabra*) and its derivatives (glycyrrhizic and glycyrrhetic acid) in finfish aquaculture: A review. *Aquaculture Reports*, 39, 102509. <https://doi.org/10.1016/j.aqrep.2024.102509>
- Adjoumani, J. J. Y., Abasubong, K. P., Zhang, L., Liu, W. B., Liu, X. F., & Desouky, H. E. (2024). Metformin attenuates high-carbohydrate diet-induced redox imbalance, inflammation and mitochondrial dysfunction in *Megalobrama amblycephala*. *Fish Physiology and Biochemistry*. <https://doi.org/10.1007/s10695-024-01386-7>
- Desouky, H. E., Jiang, G. Z., Abasubong, K. P., Dai, Y., Yuan, X., Adjoumani, J. J. Y., & Liu, W. B. (2023). Plant-based additives improved growth performance, immune response and mitigated inflammatory signals in channel catfish fed a high-fat diet. *Aquaculture Research*, 3525041. <https://doi.org/10.1155/2023/352504>
- Abasubong, K. P., Jiang, G.-Z., Guo, H.-X., Wang, X., Huang, Y.-Y., Li, X.-F., Yan-Zou, D., Liu, W.-B., & Desouky, H. E. (2023). Effects of a high-fat and high-carbohydrate diet on appetite regulation and central AMPK in the hypothalamus of blunt snout bream (*Megalobrama amblycephala*). *Journal of Animal Physiology and Animal Nutrition*, 1-13. <https://doi.org/10.1111/jpn.13908>
- Abasubong, K. P., Jiang, G. Z., Guo, H. X., Wang, X., Li, X. F., Yan-Zou, D., et al., & Desouky, H. E. (2023). High-fat diet alters intestinal microbiota and induces endoplasmic reticulum stress via the activation of apoptosis and inflammation in blunt snout bream. *Fish Physiology and Biochemistry*, 1-17. <https://doi.org/10.1007/s10695-023-01240-2>
- Abasubong, K. P., Jiang, G.-Z., Adjoumani, J.-J. Y., Guo, H., Wang, X., Huang, Y., Dai, Y.-J., Li, X.-F., Dong, Y., Liu, W., & Desouky, H. E. (2023). Oral bovine serum albumin administration benefits plasma amino acid profile in blunt snout bream fed a high-fat and high-energy diet through the TOR signaling pathway. *Journal of the World Aquaculture Society*, 1-19. <https://doi.org/10.1111/jwas.13022>
- Wang, L., Yao, Y., Zhao, Z., Li, L., Gan, H., Desouky, H., Wang, X., & Zhang, Z. (2022). Effect of dietary protein, vitamin E, and vitamin C levels on the growth and gonad development of hybrid male abalone (*Haliotis fulgens* x *H. discus hannai*) by orthogonal array design. *Aquaculture International*, 1-23. <https://doi.org/10.1007/s10499-023-01100-z>
- Abasubong, K. P., Li, X. F., Adjoumani, J. J. Y., Jiang, G. Z., Desouky, H. E., & Liu, W. B. (2022). Effects of dietary xylooligosaccharide prebiotic supplementation on growth, antioxidant and intestinal immune-related gene expression in common carp (*Cyprinus carpio*) fed a high-fat diet. *Journal of Animal Physiology and Animal Nutrition*, 106(2), 403-418. <https://doi.org/10.1111/jpn.13669>

- Yuan, X., Liu, W., Jiang, G., Dai, Y., & Desouky, H. E. (2021). Effect of replacing fish meal by yeast hydrolysate on growth and intestinal function of juvenile Jian carp (*Cyprinus carpio* var. Jian). *Indian Journal of Fisheries*, 68(2). <https://doi.org/10.21077/ijf.2021.68.2.107609-12>
- Wang, C. L., Wang, Z. Y., Song, C. W., Luo, S., Yuan, X. Y., Huang, Y. Y., & Desouky, H. E. (2021). A comparative study on growth, muscle cellularity, and flesh quality of farmed and imitative ecological farming loach (*Misgurnus anguillicaudatus*). *Aquaculture*, 543, 736933. <https://doi.org/10.1016/j.aquaculture.2021.736933>
- Desouky, H. E., Jiang, G. Z., Zhang, D. D., Abasubong, K. P., Yuan, X., Li, X. F., & Liu, W. B. (2020). Influences of glycyrrhetic acid (GA) dietary supplementation on growth, feed utilization, and expression of lipid metabolism genes in channel catfish (*Ictalurus punctatus*) fed a high-fat diet. *Fish Physiology and Biochemistry*, 46(2), 653-663. <https://doi.org/10.1007/s10695-019-00740-4>
- Rahimnejad, S., Yuan, X. Y., Liu, W. B., Jiang, G. Z., Cao, X. F., Dai, Y. J., et al., & Desouky, H. E. (2020). Evaluation of antioxidant capacity and immunomodulatory effects of yeast hydrolysates for hepatocytes of blunt snout bream (*Megalobrama amblycephala*). *Fish & Shellfish Immunology*, 106, 142-148. <https://doi.org/10.1016/j.fsi.2020.06.019>
- Yuan, X., Wang, C., Huang, Y., Dai, Y., & Desouky, H. E. (2020). A comparative study on intestinal morphology and function of normal and injured intestines of Jian carp (*Cyprinus carpio* var. Jian). *Aquaculture*, 528, 735496. <https://doi.org/10.1016/j.aquaculture.2020.735496>

Book Chapters

- Abasubong, K. P., Gabriel, N. N., Adjoumani, J. J. Y., Okon, A. O., & Desouky, H. E. (2024). Effect of root and tuber peels as a carbohydrate source in African aquaculture production. In *Sustainable Feed Ingredients and Additives for Aquaculture Farming: Perspectives from Africa and Asia* (pp. 271-289). Springer Nature Singapore. https://doi.org/10.1007/978-981-97-4279-0_12
- Abasubong, K. P., Adjoumani, J. J. Y., Gabriel, N. N., Okon, A. O., & Desouky, H. E. (2024). Promising future of banana peel on fish performance and health status: A review. In *Sustainable Feed Ingredients and Additives for Aquaculture Farming: Perspectives from Africa and Asia* (pp. 381-403). Springer Nature Singapore. https://doi.org/10.1007/978-981-97-4279-0_17
- Abasubong, K. P., Adjoumani, J. J. Y., Gabriel, N. N., & Desouky, H. E. (2024). Sustainable application of olive by-products in aquafeeds: Effects on growth, physiological response, and disease resistance in fish species. In *Sustainable Feed Ingredients and Additives for Aquaculture Farming: Perspectives from Africa and Asia* (pp. 433-457). Springer Nature Singapore. https://doi.org/10.1007/978-981-97-4279-0_19
- Abasubong, K. P., Gabriel, N. N., Adjoumani, J. J. Y., Okon, A. O., Udo, M. T., Etim, A. A., & Desouky, H. E. (2023). A dynamic study of the influence of *Jatropha curcas* on growth and haematological indices in finfish. In *Emerging Sustainable Aquaculture Innovations in Africa* (pp. 301-323). Springer Nature Singapore. https://doi.org/10.1007/978-981-19-7451-9_12. ISBN 978-981-19-7450-2

PROFESSIONAL REFERENCES

Available upon request.