

# Serhat Turkmen

1402 Lane Parke Ct. 35223, Mountain Brook, AL, USA

[turkmen@uab.edu](mailto:turkmen@uab.edu)

+1 (205) 212 01 04

[www.serhatturkmen.com](http://www.serhatturkmen.com)



## EDUCATION

**University of Las Palmas de Gran Canaria**, Las Palmas, Spain.

**PhD**, Institute of Sustainable Aquaculture and Marine Ecosystems (ECOQUA Institute), Nutrition in Aquaculture, *cum laude*, June 2019

Thesis title: "Nutritional programming of gilthead sea bream for better utilisation of high vegetable meal and oil diets"

Supervisor: Prof. Marisol Izquierdo and Maria Jesus Zamorano

**University of Las Palmas de Gran Canaria**, Las Palmas, Spain

**MSc (2)**, Institute of Sustainable Aquaculture and Marine Ecosystems (ECOQUA Institute), Nutrition in Aquaculture, *cum laude*, ECOQUA Institute, July 2014

Thesis title: "Nutritional programming of gilthead seabream (*Sparus aurata*) during weaning for better utilisation of low fish meal and fish oil diets along on-growing"

Supervisor: Prof. Marisol Izquierdo and Maria Jesus Zamorano

**University of Cukurova**, Adana, Turkey.

**University of Gothenburg**, Gothenburg, Sweden (2010, 4 months).

**MSc (1)**, Institute of Applied Sciences, Department of Aquaculture, June 2011.

Thesis title: "Determination of growth performance, some chronic stress and histological changes of juvenile European sea bass (*Dicentrarchus labrax*) reared in different salinities and temperatures".

Supervisors: Metin Kumlu and M. Tufan Eroldogan

**University of Cukurova**, Adana, Turkey.

**University of Algarve**, Faro, Portugal (2006 – 2007)

**BSc, honours**, Faculty of Fisheries Engineering, February 2009.

## RESEARCH INTEREST AND BACKGROUND

Finfish and shrimp nutrition  
Sustainability in aquaculture

Early programming  
Alternative feed ingredients

Fish physiology  
Epigenetics

Research experience with a variety of fish and shrimp species.  
Involved in 40 research studies, involved in planning and conducted 23 of those.  
Worked in 6 different laboratories across different countries in Europe and USA.

## LANGUAGES

English (7.5 out of 9.0 from IELTS), Spanish (Advanced), Turkish (Mother language)

## PUBLICATIONS

Peer-reviewed Journal Articles (Citations: 434, h-index: 12 by 29 November 2021, data from Google Scholar)

1. Ferosekhan S., **Turkmen S.**, Afonso J.M., Zamorano M.J., Izquierdo M. (2021)  
Influence of genetic selection for growth and broodstock diet n-3 LC-PUFA levels on reproductive performance of gilthead seabream, *Sparus aurata*  
*Animals*, 11(2):519
2. Xu H., Ferosekhan S., **Turkmen S.**, Afonso J.M., Zamorano M.J., Izquierdo M. (2021)  
High broodstock *fads2* expression combined with nutritional programming through broodstock diet improves the use of low fishmeal and low fish oil diets in gilthead seabream (*Sparus aurata*) progeny  
*Aquaculture*, 2021 736321
3. **Turkmen S.**, Zamorano M.J., Xu H., Fernández-Palacios H., Robaina L., Izquierdo M. (2020)  
Parental LC-PUFA biosynthesis capacity and nutritional intervention with ALA affect performance of *Sparus aurata* progeny  
*Journal of Experimental Biology* 223: jeb214999
4. Xu H., Ferosekhan S., **Turkmen S.**, Afonso J.M., Zamorano M.J., Izquierdo M. (2020)  
Influence of parental fatty acid desaturase 2 (*fads2*) expression and diet on gilthead seabream (*Sparus aurata*) offspring *fads2* expression during ontogenesis  
*Animals*, 10 (11), 2191
5. Ferosekhan S., Xu H., **Turkmen S.**, Gomez A., Afonso J.M., Fontanillas R., Roselund G., Kaushik S., Izquierdo M. (2020)  
Reproductive performance of gilthead seabream (*Sparus aurata*) broodstock showing different expression of fatty acyl desaturase 2 and fed two dietary fatty acid profiles  
*Scientific Reports* 10 15547
6. Ferosekhan S., **Turkmen S.**, Xu H., Afonso J.M., Zamorano M.J., Kaushik S., Izquierdo M. (2020)  
The relationship between the expression of fatty acyl desaturase 2 (*fads2*) gene in peripheral blood cells (pbc) and liver in gilthead seabream, *Sparus aurata* broodstock fed a low n-3 LC-PUFA diet  
*Life* 10 (7), 117
7. Perrera E., **Turkmen S.**, Zamorano M.J., Simo-Miramet P., Xu H., Izquierdo M. Perez-Sanchez J., (2020)  
Stearoyl-CoA desaturase (*scd1a*) is epigenetically regulated by broodstock nutrition in gilthead sea bream (*Sparus aurata*)  
*Epigenetics* 15 (5), 536-553
8. **Turkmen S.**, Perrera E., Zamorano M.J., Simo-Miramet P., Xu H., Perez-Sanchez J., Izquierdo M. (2020)  
Effects of dietary lipid composition and fatty acid desaturase 2 expression in broodstock gilthead sea bream on lipid metabolism-related genes and methylation of the *fads2* gene promoter in their offspring  
*International Journal of Molecular Sciences* 20 (24), 6250
9. Yilmaz A., **Turkmen S.**, Kumlu M., Erolodogan O.T., Perker N. (2020)  
Alteration of growth and temperature tolerance of European sea bass (*Dicentrarchus labrax*, Linnaeus 1758) in different temperature and salinity combinations  
*Turkish Journal of Fisheries and Aquatic Sciences* 20 (5), 331-340

10. Xu H., **Turkmen S.**, Rimoldi S., Terova G., Zamorano M.J., Afonso J.M., Sarih S., Fernández-Palacios H., Izquierdo M. (2019)  
Nutritional intervention through dietary vegetable proteins and lipids to gilthead sea bream (*Sparus aurata*) broodstock affects the offspring utilization of a low fishmeal/fish oil diet  
*Aquaculture*, 513, Article: 734402
11. **Turkmen S.**, Hernández-Cruz C.M., Zamorano M.J., Fernández-Palacios H., Montero D., Afonso J.M., Izquierdo M. (2019)  
LC-PUFA profiles in parental diets induced long-term effects on growth, fatty acid profiles and expression of selected PUFA metabolism and immune system related genes in gilthead seabream offspring  
*British Journal of Nutrition*, 122:1, 25-38
12. Saleh R., Burri L., Benitez-Santana T., **Turkmen S.**, Castro P., Izquierdo M. (2018)  
Dietary krill meal inclusion contributes to better growth performance of gilthead seabream juveniles  
*Aquaculture research*, 49 (10), 3289-3295
13. **Turkmen S.**, Zamorano M.J., Fernández-Palacios H., Hernández-Cruz C.M., Montero D., Robaina L., Izquierdo M. (2017)  
Parental nutritional programming and a reminder during juvenile stage affect growth, lipid metabolism and utilisation in later developmental stages of a marine teleost, the gilthead sea bream (*Sparus aurata*).  
*British Journal of Nutrition*, 118, 500-512
14. **Turkmen S.**, Castro P.L., Caballero M.J., Hernández-Cruz C.M., Saleh R., Zamorano M.J., Regidor J., Izquierdo M. (2017)  
Nutritional stimuli of gilthead seabream (*Sparus aurata*) larvae by dietary fatty acids: effects on larval performance, gene expression and neurogenesis.  
*Aquaculture Research*, 48, 202-213
15. Izquierdo M., **Turkmen S.**, Montero D., Zamorano M.J., Afonso J.M., Karalazos V., Fernández-Palacios H. (2015)  
Nutritional programming through broodstock diets to improve utilization of very low fishmeal and fish oil diets in gilthead sea bream.  
*Aquaculture*, 449, 18-26
16. Dulger N., Kumlu M., **Turkmen S.**, Olculu A., Eroldogan O. T., Yilmaz H. A. (2012)  
Thermal tolerance of European Sea Bass (*Dicentrarchus labrax*) juveniles acclimated to three temperature levels.  
*Journal of Thermal Biology*, 37, 79-82
17. **Turkmen S.**, Eroldogan O. T., Yilmaz H. A., Olculu A., Inan G. A., Tekelioglu N. (2011)  
Compensatory growth response of European sea bass (*Dicentrarchus labrax* L.) under cycled starvation and restricted feeding rate.  
*Aquaculture Research*, 43(11), 1643–1650
18. Kumlu M., **Turkmen S.**, Kumlu M., Eroldogan O. T. (2011)  
Off-season maturation and spawning of the Pacific white shrimp *Litopenaeus vannamei* in sub-tropical conditions.  
*Turkish Journal of Fisheries and Aquatic Sciences*, 11, 15-23
19. Kumlu M., **Turkmen S.**, Kumlu M. (2010)  
Thermal tolerance of *Litopenaeus vannamei* (Crustacea: Penaeidae) acclimated to four temperatures.

20. Kumlu M., Kumlu M., **Turkmen S.** (2010)  
Combined effects of temperature and salinity on critical thermal minima of pacific white shrimp *Litopenaeus vannamei* (Crustacea: Penaeidae).  
*Journal of Thermal Biology*, 30, 306-308

**Oral and Poster Presentations at International Congresses**

1. Perera E., **Turkmen S.**, Simo-Mirabet P., Zamorano M.J., Xu H. Izquierdo M., Perez-Sanchez J. (2019)  
Stearoyl-CoA desaturase (*scd1a*) is epigenetically regulated by broodstock nutrition in gilthead sea bream (*Sparus aurata*)  
*Oral presentation, Aquaculture Europe*, Berlin, Germany.
2. Xu H., Ferosekhan S., **Turkmen S.**, Montero D., Afonso J.M., Izquierdo M. (2019)  
Improved use of low FM and FO diets in gilthead sea bream (*Sparus aurata*) juveniles obtained by combined broodstock selection and nutritional programming  
*Oral presentation, Aquaculture Europe*, Berlin, Germany.
3. **Turkmen S.**, Xu H., Izquierdo M. (2019)  
Nutritional programming of lipid metabolism in gilthead sea bream: Transgenerational effects of broodstock selection and feeding  
*Oral presentation, Aquaculture Europe*, Berlin, Germany.
4. Ferosekhan S., Perez-Garcia C., **Turkmen S.**, Xu H., Afonso J.M., Fontanillas R., Kaushik S., Izquierdo M. (2019)  
Influence of genetic selection for growth and dietary n-3 LC-PUFA levels on reproductive performance in gilthead sea bream *Sparus aurata*  
*Oral presentation, Aquaculture Europe*, Berlin, Germany
5. **Turkmen S.**, Xu H., Ferosekhan S., Zamorano M.J., Izquierdo M. (2019)  
Potential of role of epigenetics to improve utilisation of low n-3 LC-PUFA feeds in aquaculture: Studies in a marine vertebrate gilthead sea bream (*Sparus aurata*)  
*Oral presentation, 70<sup>th</sup> Annual EAAP Meeting of the European Federation of Animal Science*, Ghent, Belgium.
6. **Turkmen S.**, Xu H., Fernández-Palacios H., Zamorano M.J., Izquierdo M. (2018)  
Nutritional programming of gilthead sea bream: Improvements towards better utilization of low n-3 HUFA diets.  
*Oral presentation, International Symposium on Fish Nutrition and Feeding*, Las Palmas, Spain.
7. Ferosekhan S., Xu H., **Turkmen S.**, Fernández-Palacios H., Afonso J.M., Gomez A., Kaushik S., Izquierdo M. (2018)  
Influence of dietary fatty acid profile on reproductive performance in gilthead seabream, *Sparus aurata* broodstock selected for high or low *fads2* expression  
*Poster presentation, International Symposium on Fish Nutrition and Feeding*, Las Palmas, Spain.
8. Xu H., **Turkmen S.**, Ferosekhan S., Fernández-Palacios H., Afonso J.M., Izquierdo M. (2018)  
Effect of low fish meal and fish oil diet on growth performance, hepatic fatty acid composition and *fads2* expression of juvenile gilthead sea bream (*Sparus aurata*) from nutritional programmed broodstock  
*Oral presentation, International Symposium on Fish Nutrition and Feeding*, Las Palmas, Spain.
9. Saleh R., Burri L., Benitez-Santana T., **Turkmen S.**, Castro P., Izquierdo M. (2018)  
Dietary Krill Meal Inclusion Contributes to Better Growth Performance of Gilthead Seabream Juveniles  
*Poster presentation, Dia Mundial de Acuicultura*, Las Palmas, Spain.

10. **Turkmen S.**, (2017)  
Programación nutricional y epigenética en peces.  
*Oral presentation, Dia Mundial de Acuicultura*, Las Palmas, Spain.
11. **Turkmen S.**, (2017)  
Nutritional programming in Fish: “*Sparus aurata* as a model for nutritional programming of marine fish”.  
*Oral presentation, ECOAQUA Institute Epigenetic Meeting*, Las Palmas, Spain.
12. **Turkmen S.**, Xu H., Saleh R., Hernández-Cruz C.M., Zamorano M.J., Izquierdo M. (2017)  
Nutritional programming through broodstock nutrition: effect of low fish meal and/or fish oil diets on offspring larval performance: growth, biochemical composition and gene expression.  
*Oral presentation, Aquaculture Europe*, Dubrovnik, Croatia.
13. **Turkmen S.** (2017)  
Can we prepare the fish for their future environment? - Nutritional programming.  
*Oral presentation, Aquaculture Europe*, Dubrovnik, Croatia.
14. Xu H., **Turkmen S.**, Sarih S., Fernández-Palacios H., Zamorano M.J., Afonso J.M., Izquierdo M. (2017)  
Nutritional programming through broodstock nutrition: effect of low fishmeal and/or fish oil diets on spawning quality of broodstock with high *fads2* expression.  
*Poster presentation, Aquaculture Europe*, Dubrovnik, Croatia.
15. Saleh R., Betancor M., **Turkmen S.**, Izquierdo M. (2017)  
Dietary phospholipid type and level in microdiets for gilthead sea-bream larvae: effects on histological changes in intestine and liver.  
*Poster presentation, larvi 2017*, Ghent, Belgium.
16. **Turkmen S.**, Hernández-Cruz C.M., Zamorano M.J., Sarih S., Xu H., Izquierdo M. (2017)  
Nutritional programming through broodstock diets in gilthead sea bream; effects on spawning quality, larval growth and long-term effects on the offspring  
*Oral presentation, larvi 2017*, Ghent, Belgium.
17. Eroldogan O. T., Ocal N. N., Yilmaz H. A., **Turkmen S.**, Olculu A. (2016)  
The effects of short starvation and refeeding on lipid metabolism in European sea bass *Dicentrarchus labrax* at different temperatures.  
*Poster presentation, Aquaculture Europe*, Edinburgh, Scotland.
18. **Turkmen S.**, Fernández-Palacios H., Hernández-Cruz C.M., Zamorano M.J., Izquierdo M. (2016)  
Effects of selection of broodstock by a genetic biomarker (delta-6-desaturase) and nutritional programming by vegetable oil inclusion in the broodstock diets: effects on reproduction quality and larval growth of gilthead sea bream *Sparus aurata*.  
*Poster presentation, Aquaculture Europe*, Edinburgh, Scotland.
19. **Turkmen S.**, Fernández-Palacios H., Hernández-Cruz C.M., Zamorano M.J., Izquierdo M. (2016)  
Testing long-term effects of parental nutritional programming with vegetable oils and a “reminder” diet during juvenile stage on growth and lipid metabolism related genes in gilthead sea bream (*Sparus aurata*).  
*Oral presentation, International Symposium on Fish Nutrition and Feeding*, Sun Valley, Idaho, USA.
20. **Turkmen S.**, Izquierdo M. (2015)  
Testing long-term effects of parental nutritional programming and a “remainder” juvenile programming on lipid metabolism and growth in *Sparus aurata*.  
*Poster presentation, Epigenetics and Preconception Environment*, Dubrovnik, Croatia.
21. **Turkmen S.**, Izquierdo M. (2014)

*Sparus aurata* as a model for nutritional reprogramming of marine fish: Effectiveness of different developmental windows.

*Oral presentation, Epigenetics and Preconception Environment*, Las Palmas, Spain.

22. Eroldogan O. T., Yilmaz H. A., Arslan M., Sirkecioglu A. N., **Turkmen S.**, Cicek İ. C., Dedeler H., (2011) Apparent digestion of nutrient and fatty Acid in European sea bass (*Dicentrarchus labrax*) fed rapeseed or cottonseed oil-based diets.  
*Oral presentation, Aquaculture Europe*, Porto, Portugal.
23. Yilmaz H. A., Eroldogan O. T., Engin K., Olculu A., Tasbozan O., **Turkmen S.** (2010) Partial and total replacement of fish oil either canola or cotton seed oils in diets 2010 for European sea bass (*Dicentrarchus labrax*): effects on flesh and whole body fatty acid composition.  
*Poster presentation, International Symposium on Fish Nutrition and Feeding*, Quingdao, China.
24. Eroldogan O. T., Cicek C.I., Yilmaz H. A., Dedeler H., **Turkmen S.** (2010) Gastrointestinal evacuation time in European sea bass (*Dicentrarchus labrax*) fed diets containing mixture of vegetable oils at high temperature.  
*Poster presentation, International Symposium on Fish Nutrition and Feeding*, Quingdao, China.

## EDITORIAL DUTIES

1. Editorial board member of **Reviews in Aquaculture** (IF: 10.592, The journal ranks 1/53 Fisheries (Q1))
2. Guest editor of '**Nutrition, Nutrigenomics and Epigenetics in Fish**' in *Animals* journal (IF: 2.752, The journal ranks 14/142 (Q1) 'Veterinary Sciences' and 10/63 (Q1) in 'Agriculture, Dairy & Animal Science')
3. Guest associate editor of Aquatic Physiology in **Frontiers in Physiology** (IF: 4.556)

## PROFESSIONAL EXPERIENCE

### Internships

- Aktuna sea products offshore tuna farm, Antalya, Turkey (June – July 2005).
- Ozpekler rainbow trout farm - Denizli – Turkey (June – July 2006).
- Cukurova University aquaculture research center - Adana – Turkey (June – August 2007).
- Sarus shrimp and fish Farm – Adana – Turkey (June – August 2008).

### Work experience

**Post-doctoral research fellow**, University of Alabama at Birmingham, Birmingham, Alabama, USA (November 2019 – ongoing).

- Conducted and planned scientific experiments and samplings,
- Mentored the graduate students,
- Involved in preparing of projects scientific articles from obtained results.
- Involved in the preparation of two research proposals

**Researcher**, University of Las Palmas de Gran Canaria, Spain (March 2017 – October 2019).  
Financed through PerformFISH EU-project.

- Conducted and planned scientific experiments and samplings,
- Analysed samples obtained from the experiments,
- Involved in preparing of project reports and wrote scientific articles from obtained results.
- Conducted 2 experiments, at broodstock, larvae, juvenile and adult stages.

- Involved in production of 3 peer-reviewed article and 6 abstracts in international meetings

**PhD fellow**, University of Las Palmas de Gran Canaria, Spain (September 2014 – February 2017).  
Financed through ARRINA EU-project.

- Conducted and planned scientific experiments and samplings,
- Analysed samples obtained from the experiments,
- Involved in preparing of project reports and wrote scientific articles from obtained results.
- Conducted 6 experiments, at broodstock, larvae, juvenile and adult stages.
- Involved in production of 3 peer-reviewed articles and 7 abstracts in international meetings

**Research Assistant**, Cukurova University, Turkey (February 2010 – August 2016).

- Conducted and planned scientific experiments,
- Analysed samples obtained from the experiments, wrote project reports and prepared scientific articles from the obtained results,
- Assisted educational activities at the faculty of fisheries engineering,
- Maintained and designed the aquaculture systems for research proposes.
- Kept inventory and ordered lab. equipment and chemicals.
- Involved in production of 5 peer-reviewed articles and 3 abstracts in international meetings

## PARTICIPATED SCIENTIFIC PROJECTS

1. Fish oil replacement by canola and cottonseed oils in diets for the European sea bass (*Dicentrarchus labrax*) under different water temperatures (2006-2010).
2. Effect of different starvation and re-feeding protocols on fatty acid composition in muscle of commercial sized European sea bass (*Dicentrarchus labrax*) (2010).
3. Changes in EPA and DHA composition of Gilthead seabream (*Sparus aurata*) with different starvation and re-feeding protocols (2008-2010).
4. Effects of water temperature on off-season reproduction of Pacific white shrimp (*Litopenaeus vannamei*) (2009).
5. Determination of critical thermal minima (CTmin) and critical thermal maxima (CTmax) values of Pacific white shrimp (*Litopenaeus vannamei*) (2010).
6. European commission funded FP7 project “Advanced Research Initiatives for Nutrition & Aquaculture (ARRINA)” under WP 6.1 Genetic programming of Gilthead sea bream larvae to better utilization of vegetable lipid sources in juveniles and WP 6.4 Early programming of embryos and lecithotrophic larvae through broodstock feeding (2012-2016).
7. European commission funded Horizon 2020 project “Integrating Innovative Approaches for Competitive and Sustainable Performance across the Mediterranean Aquaculture Value Chain (PerformFISH)” under WP4 Efficient feeds to improve the current KPIs in production systems (2017-2019).

## AWARDS and SCHOLARSHIPS

- 2 times student exchange program grant from Cukurova University, Turkey (2007–2008) & (2010-2011).
- Scholarship from research council of Turkey for scientific research (2009).
- Full grant III. University Master’s in Marine Aquaculture in Las Palmas, granted by CIHEAM, Spain.

- 2 times, Epiconcept COST action, grant to attend congresses and workshops financed by European Union.
- Larvi17 symposium, grant to make oral presentation organized by Ghent University.
- Grant to make oral presentation at Aquaculture Europe 2017 granted by European Aquaculture Society's student group.
- Best students' oral presentation at International Symposium on Fish Nutrition and Feeding, Las Palmas, Spain.
- Fully-financed by CIHEAM to make an oral presentation at student and young Researchers forum at Bari, Italy.
- Scholarship to attend 70<sup>th</sup> Annual Meeting of the European Federation of Animal Science, Ghent Belgium, 26 - 30 August 2019

## LABORATORY EXPERIENCE

<b>Biochemistry</b>	Proximate composition analysis from tissues including larvae, FAMES and gas chromatography for fatty acid profile identification.
<b>Molecular Biology</b>	DNA and RNA extraction from different tissues, gene expression analysis with RT and ddPCR, DNA methylation analysis using MSAP and ddPCR. RNASeq and RRBS data analysis
<b>Experience with aquatic specie</b>	Fish - experience on whole life cycle of gilthead seabream, larval rearing and on-growing and broodstock. Tuna on-growing in cages. Experience with European sea bass culture in different salinities. Experience with ongrowing of freshwater fishes such as tilapia and rainbow trout. Shrimp - all life cycle, including capturing wild shrimp acclimation to the facilities and production of seeds and reproducers. Species include <i>Litopenaeus vannamei</i> , <i>Penaeus kerathurus</i> , <i>Penaeus semisulcatus</i> . Model specie such as Zebrafish.
<b>Experiment Design</b>	Planning samplings, formulation of experimental feed, fish experimental system designs and maintenance.
<b>Computer programs</b>	Microsoft office programs including Word, Excel, and PowerPoint. Adobe Photoshop, Endnote, SPSS, Master Flex, Sigma Plot and R.
<b>Research assistant</b>	Analysis of samples from on-going projects, maintaining and designing the aquaculture systems for research proposes. Statistical analysis of the results. Inventory and order the lab. equipment and chemicals.

## REFERENCES

<b>Prof. Sadisivam (Sachi) Kaushik</b>	<b>Prof. Marisol Izquierdo</b>	<b>Associate Prof. Peggy Biga</b>
Founder and director of the Fish Nutrition Joint research units of the Hydrobiology Station at St Pee sur Nivelle, France. +33 673 991 039 <a href="mailto:sachi.kaushik@ulpgc.es">sachi.kaushik@ulpgc.es</a>	Director of Marine Ecosystems and Sustainable Aquaculture Institute, University of Las Palmas, Spain. +34 690 149 902 <a href="mailto:mizquierdo@dbio.ulpgc.es">mizquierdo@dbio.ulpgc.es</a>	University of Alabama at Birmingham, Alabama, United States of America +1 701 446 6021 <a href="mailto:pegbiga@uab.edu">pegbiga@uab.edu</a>