

# World Aquaculture 2017

Sustainable Aquaculture  
New Frontiers for Economic Growth  
Spotlight on Africa

June 26-30, 2017

Cape Town International Convention Centre  
Cape Town, South Africa

The Annual International Conference & Exposition of  
World Aquaculture Society

Hosted by

Aquaculture Association of Southern Africa

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# WELCOME

Welcome to World Aquaculture 2017 - the first international conference and exposition of the World Aquaculture Society (WAS) to be held on the African continent. This year's annual meeting is co-organized with the Aquaculture Association of Southern Africa (AASA) and the South African Department of Agriculture, Forestry and Fisheries (DAFF). World Aquaculture 2017 has attracted wide sponsorship and support from African development institutions including the South African Department of Agriculture, Forestry and Fisheries, the African Union and NEPAD, and the WorldFish Centre. On behalf of the World Aquaculture Society, its chapters and our co-hosts, it is our pleasure to welcome you to Cape Town, South Africa. We hope you enjoy and benefit from the conference, the trade show, and spend time enjoying the culture, history and incredible natural beauty that Cape Town has to offer.

The conference theme, "Sustainable Aquaculture – New Frontiers for Economic Growth – Spotlight on Africa" highlights the potential of aquaculture production to support economic development and investment opportunities in Africa - the world's second fastest growing regional economy. We are pleased to present a five-day program entitled "Spotlight on Africa" that includes an opening ceremony plenary address by Guinean President Alpha Condé, Chairman of the African Union and African Union special ambassador for aquaculture. On the first full-day of the conference, two plenary addresses will be given: Dr. Rohanna Subasinghe, former chief of Aquaculture for FAO, will speak on "Feeding the Nine Billion: the Role of Aquaculture" followed by Dr. Sloans Chimatiro, Acting Country Director with WorldFish Zambia, speaking on "African Perspectives on Aquaculture". In recognition of the early developmental stage of African Aquaculture, special sessions on Developing African Aquaculture Value Chains, Financing African Aquaculture and African Aquaculture Policy will be organized by the African Union, NEPAD, World Bank and WorldFish. Our trade show will feature over 90 exhibitors and the WAS Scientific Program at the conference features 70 sessions that will be conducted over four days, covering a diverse array of aquaculture-related topics and speakers, as well as a dedicated poster session.

Representing the coming of age of African aquaculture and a significant milestone for the global aquaculture community, WAS will host a meeting to launch the formation of a WAS Africa Chapter on Tuesday afternoon following the Spotlight on Africa program. Be sure to join us for this important organizational to form the African Chapter of WAS.

For students, we will host a special tour of the DAFF Marine Research Aquarium, the Student Spotlight Presentations and awards, special seminars, and the student reception and a social event. Of course there will be many social events (Welcome reception, Student reception, President's reception, and Happy hours) that are important occasions to network with new and old friends from around the world. Be sure to participate in the Farm tours, which will highlight South Africa's Aquaculture Industry. On behalf of the World Aquaculture Society, we want to thank and recognize the Steering and Program Committee members for the many years of work that went into organizing this event. Best wishes for a productive and enjoyable conference.

Kevan L. Main, Roger Krohn & Siphokazi Ndudane – WA17 Steering Committee Co-Chairs  
Maria Haws, Peter Britz & Michael Schwarz – WA17 Program Committee Co-Chairs

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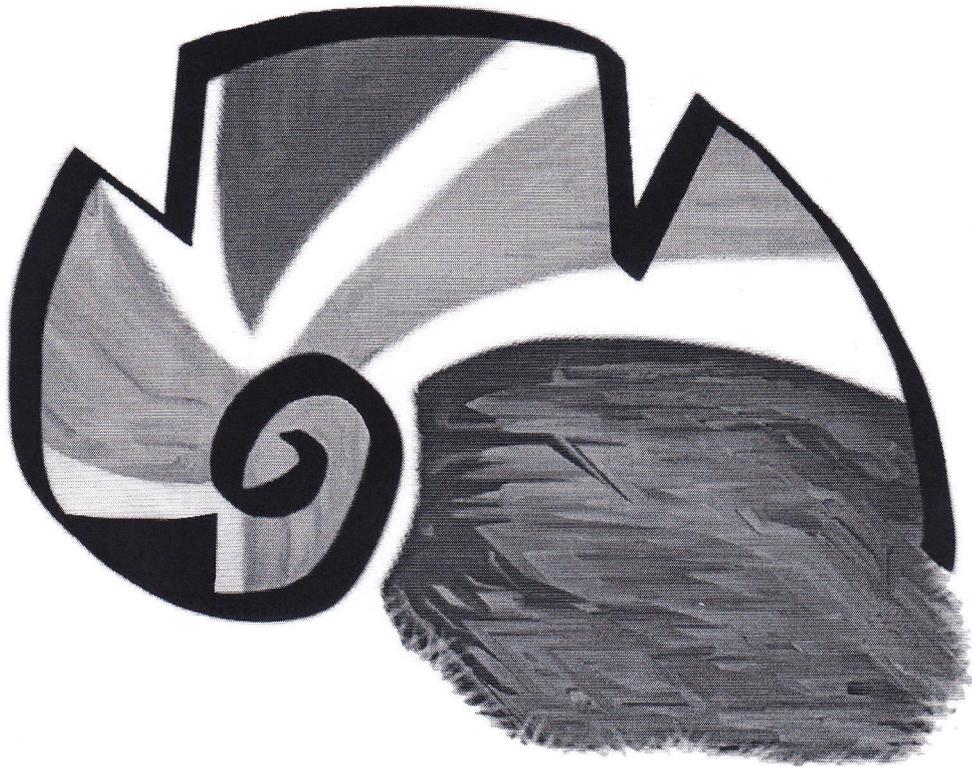
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**World Aquaculture  
2017**

**ABSTRACTS**

## THE EFFECTS OF DIETARY FISH OIL REPLACEMENT BY PLANT OILS ON THE GROWTH, WHOLE BODY AND TISSUE FATTY ACID AND NUTRIENT COMPOSITION AND DIGESTIVE ENZYME ACTIVITIES IN NILE TILAPIA (*Oreochromis niloticus* L.)

Kenan Engin\*, Hatice A. Yılmaz, Orhan T. Eroldoğan, Arzu Ö. Hunt, Ferbal Ö. Yılmaz, Mehmet Berköz, İlgin Özşahinoğlu, Mumoğullarında, Almıla Uysal, Serap Yalın, and Mustafa Yıldız

Department of Aquaculture, Faculty of Fisheries  
Mersin University 33169 Mersin/Turkey  
kengin@mersin.edu.tr

This study aimed at demonstrating the effects of dietary fish oil replacement by plant oils on the growth, whole body and tissue fatty acid and nutrient composition and digestive enzyme activities in Nile tilapia (*Oreochromis niloticus* L.). Five iso-nitrogenous and iso-lipidic diets (34 % CP and 10 % CL on a dry matter basis) were formulated to replace dietary Fish Oil (FO) by sunflower seed oil (SF), Canola Oil (CO), Linseed Oil (LO) and equal combination (BLD;1:1 w:w) of these vegetable oils. A total of 375 fish (32.5±0.5 g) were randomly assigned to 15 190 l rectangular fiberglass tanks and fed 3 % BW/d two times in equal amounts both for morning and afternoon feeding.

Fish tripled its initial weight and no significant difference was observed among growth rates of fish in different dietary treatments. Fish fed the diets containing vegetable oils had lower Hepato Somatic Index compared to that of fish fed FO diet and the difference was statistically significant ( $p<0.05$ ) between fish fed SF and FO diets. Fatty acid compositions analysis of whole body and tissues of muscle, liver and gill showed that the intermediates of n-3 LC HUFA biosynthesis pathway from  $\alpha$ -linolenic acid were more favourably expressed in fish fed SF diet compared to that of fish fed other dietary treatments. It was also evident that EPA was readily oxidized regardless of the dietary treatments whereas DHA was proportionally retained in significantly higher ( $p<0.01$ ) rates in fish fed diets containing vegetable oils compared to that of fish fed FO diet. Dietary treatments did not affect the trypsin activities in fish significantly but slight increases were recorded with fish oil inclusion in diets.  $\alpha$ -amylase activity of fish fed CO diet was found to be significantly higher ( $p<0.05$ ) than that of fish fed other dietary treatments. Furthermore, lipase activities in fish fed SF and CO diets were also measured significantly higher ( $p<0.01$ ) than that of fish fed other diets indicating lipolytic activity in Nile tilapia was stimulated by medium chain fatty acids specifically linoleic and oleic acids.

This study demonstrated that up to 80 % of total fish oil in Nile tilapia diets could be replaced by either solely or in equal combinations of sun flower, canola and linseed oils without compromising growth rates, whole body and tissue fatty acid compositions and nutrient absorbent efficiencies. Further research targeting total fish oil replacement by these vegetable oils with special consideration to fatty acid metabolism, organ histology and immune response would be highly useful in this species