



Forging New Frontiers

AQUACULTURE AMERICA 2017

FEBRUARY 19 - 22, 2017

SAN ANTONIO MARRIOTT RIVERCENTER
SAN ANTONIO, TEXAS

SPONSORED BY:

NATIONAL
Aquaculture
ASSOCIATION



Associate Sponsors

American Tilapia Association · American Veterinary Medical Association
Aquacultural Engineering Society · Aquaculture Association of Canada
Asian Fisheries Society · Catfish Farmers of America
Global Aquaculture Alliance
International Association of Aquaculture Economics and Management
Latin American Chapter WAS · Striped Bass Growers Association
US Marine Shrimp Farming Association · US Trout Farmers Association



In Cooperation with: Texas Aquaculture Association

AQUACULTURE AMERICA 2017 RETURNS TO SAN ANTONIO

AQUACULTURE AMERICA 2017 returns to one of the favorite tourist spots in the world for the only major national aquaculture conference and exposition held in the U.S. The U.S. Aquaculture Society (formerly U.S. Chapter of WAS) joins with National Aquaculture Association and the Aquaculture Suppliers Association to produce the annual Aquaculture America meetings. These sponsors are joined by the annual meetings of Aquacultural Engineering Society, American Tilapia Association, Striped Bass Growers Association, US Trout Farmers Association, US Shrimp Farming Association and many more associations to make Aquaculture America 2017 the one meeting in the U.S. that you don't want to miss!

A CRITICAL TRADE SHOW FOR AQUACULTURISTS!

AQUACULTURE AMERICA 2017 will have the largest aquaculture trade show in the Western Hemisphere and one of the largest anywhere in the world with nearly 200 booths! This is your opportunity to inspect the latest in products and services for the aquaculture industry. It is the place to visit current suppliers and make new contacts. To keep ahead and to keep profits building, you need to keep pace with the technological advancements in the industry - and AQUACULTURE AMERICA 2017 is the place to do it!

Stay in touch with the program developments for AQUACULTURE 2017 through our Web Page at:

www.was.org

SAN ANTONIO— RIVERWALK, ENTERTAINMENT, EATING AND HISTORY!

AQUACULTURE AMERICA 2017 is the place to learn about the latest in aquaculture, see the newest technology in the trade show and have a great time in the many fantastic restaurants, bars and entertainment sites in San Antonio.

EXPANDED PRODUCER PROGRAM

Aquaculture America is known for the high quality of its Producer Program organized by NAA. AQUACULTURE AMERICA 2017 will continue to expand the size and scope of the producer program to address all of the issues facing producers in the U.S. as well as around the world. Topics Include:

Aquatic Animal Health
Aquatic invasive species
Certification Programs
Commercial Aquaculture Health Program
Standards
Communications and Media
Environmental Issues
Endangered Species Act

Federal Agency Town Hall Meeting
Nutrition and Food Safety
Lacey Act
Marketing
Offshore Aquaculture
Outreach and Education
Regulatory Issues
Science/Public Policy
Start-up Aquaculture



TECHNICAL PROGRAM COVERS THE LATEST RESEARCH

The U.S. Aquaculture Society will put together an extensive technical program featuring special sessions, contributed papers and workshops on all of the species and issues facing aquaculturists around the country and throughout the world. Sample topics:

Biotechnology/Biogenetics

Crustacean genetics/selection/genomics
Finfish genetics/selection/genomics
Genetically modified organisms
Shellfish genetics/selection/genomics

Conservation/Management/ Stock Enhancement

Conservation/restoration aquaculture
Stock enhancement

Crustaceans

Species

Crawfish
L. vannamei
Macrobrachium sp.
Shrimp husbandry/production

Economics/Marketing

Aquaculture economics
Certification
Consumer perceptions of farm-raised seafood
Marketing
Organic aquaculture
Risk management

Engineering

Aquaponics
Bioflocs
Biofouling
Biofuels
Effluent waste management
Recirculating aquaculture system technology
System modelling

Finfish

Species

Baitfish
Catfish/catfish hybrids
Flatfish
Gar/paddlefish/bowfin
Largemouth bass
Marine fish
Mullet
Percids
Salmonids
Striped bass/striped bass hybrids
Sturgeon
Tilapia
Tuna
Zebrafish
Finfish husbandry/production

Food Safety

Seafood/health-related
Shellfish safety

Health/Disease

Aquaculture drugs
Aquatic animal veterinary medicine
Biofilms
Biosecurity
Crustacean bacterial diseases
Crustacean fungal diseases
Crustacean parasitic diseases
Finfish bacterial diseases
Finfish fungal diseases
Finfish parasitic diseases
Immunology/stress
Mucosal health
Physiology
Preventative medicine strategies
Shellfish bacterial diseases
Shellfish fungal diseases
Shellfish parasitic diseases
Vaccines
Viral diseases
Welfare

Nutrition

Alternative feeds
Crustacean nutrition
Feed ingredients
Finfish nutrition
Fish oil
Live feeds
Pond fertilization
Prebiotics/probiotics
Shellfish nutrition

Other Sessions

Aquaculture education
Aquaculture without Frontiers
Disaster relief
Ecology/environment
Endangered species
Extension/technology transfer
History of aquaculture
Invasive species
Ocean acidification
Outreach
Wireless/automated technologies in aquaculture

Other Species

Algae
Alligator
Amphibians
Eels
Ornamentals
Sea Urchins

Regulations/Policies/Permitting

Reproduction

Broodstock propagation/management
Crustacean reproduction
Finfish reproduction
Hatchery technology
Larval culture
Shellfish reproduction

Shellfish

Species

Abalone
Freshwater mussels
Mussels/clams/geoducks
Oysters
Pearl oysters
Scallops
Tridacna
Shellfish husbandry/production

Systems

Cage culture
In-pond raceways/split-ponds
Integrated multi trophic aquaculture
Non-traditional aquaculture
Offshore aquaculture
Pond culture
Raceway culture
Recirculating aquaculture
Recreational/ornamental pond management
Small scale aquaculture
Urban aquaculture

Water Quality/Chemistry

Algal blooms
Instrumentation
Management
Methodology
Nitrogen waste management
Toxins/contaminants

CALL FOR PAPERS – DEADLINE: August 25, 2016

AQUACULTURE AMERICA 2017 encourages the submission of high quality oral and poster presentations. We strongly encourage authors to consider poster presentations because poster sessions will be an integral part of the program. Papers submitted for “oral presentation only” may not be accepted as oral presentations due to the limited number of available time slots.

All abstracts must be in English – the official language of the conference.

Each oral presenter shall be entitled to no more than 12 minutes for a presentation, plus 3 minutes for questions. Authors of studies involving proprietary products or formulations should present this information in workshops or the trade show. Oral presentations should use Power Point. Slides, overhead projectors and video players will not be available or allowed.

All presenters are required to pay their own registration accommodation and travel expenses.

AQUACULTURE AMERICA 2017 cannot subsidize registration fees, travel or hotel costs.

No Abstract Book will be printed – an Abstract Book will be available online.

INSTRUCTIONS FOR PREPARATION OF ABSTRACTS

Expanded Abstract Format - Please refer to the sample.

- 1. TITLE OF PAPER:** The abstract title is printed in CAPITAL LETTERS, with the exception of scientific names which should be Upper/lower case and *italicized* (see example). Scientific names should not be preceded or followed by commas or parentheses or other markings.
- 2. AUTHOR(S):** The first name should be the presenting author. Use * after the presenting author. Type in upper/lower case.
- 3. ADDRESS AND EMAIL:** Type only the presenting author's institution, address and email. Type in upper/lower case.
- 4. MAXIMUM LENGTH:** One Page
- 5. PAGE SIZE:** Standard 8.5 x 11 inch paper (portrait)
- 6. MARGINS:** 1-inch margin throughout (left/right/top/bottom)
- 7. SPACING:** Single spaced
- 8. PARAGRAPHS:** Paragraphs should be separated by a blank line and should not be indented.
- 9. FONTS:** Character fonts should be 12 point type.
- 10. FIGURES & TABLES:** Figures and tables are highly recommended. They should be reduced to the appropriate size for a one page abstract and should be clearly readable at the reduced size in black print only. The reduced figures and tables should be included in the abstract in camera-ready form.

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EVALUATION OF JUVENILE AUSTRALIAN RED CLAW CRAYFISH *Cherax quadricarinatus* FED PRACTICAL DIETS WITH AND WITHOUT SUPPLEMENTAL LECITHIN AND/OR CHOLESTEROL

Laura A. Muzinic*, Kenneth R. Thompson, Tracey Christian, Carl D. Webster, Lukas Manomaitis, and David B. Rouse

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Kentucky State University
Frankfort, KY 40601
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Red claw crayfish (*Cherax quadricarinatus*) are one of more than a hundred species of Australian freshwater crayfish. However, because of its rapid growth rate, ease of spawning, wide tolerance, and dissolved oxygen tolerance, and lack of a larval stage, red claw may be the best candidate for aquaculture in the United States. Red claw are only being investigated as an aquaculture species in this country and information exists on their nutritional requirements and practical diet formulations. Many crustaceans require lecithin and cholesterol to be added to their diet, these two nutrients are usually not found in commercial feeds; however, lecithin and cholesterol are very expensive. Since diet costs can be as much as 70% of the total cost of production for an aquaculture enterprise, it is imperative that the least expensive diet be determined that meets the nutrient requirements of the species. The present study was conducted to determine if cholesterol or lecithin needs to be added to a practical diet for red claw crayfish.

An 8-week feeding trial was conducted in a recirculating system with newly-hatched juvenile (mean initial weight of 0.2 g) red claw, each stocked in a 100 L plastic mesh culture units. Individual units were housed within fiberglass tanks, each containing a water line. Water was recirculated through physical and mechanical filters. Water temperature was maintained at 27-29°C and lighting was provided by overhead fluorescent ceiling lights on a 12-hour light:dark cycle. Ammonia, nitrite, nitrate, pH, oxygen, temperature, alkalinity, chloride, and dissolved oxygen were measured three times per week. The goal of this study was to examine the effects of growth performance of newly-hatched juvenile red claw when fed four practical diets with or without cholesterol and lecithin. Other practical diets included menhaden fish meal, soybean meal, shrimp meal, wheat flour, vitamin and mineral mix, pellet binder, cod liver oil, and corn oil (Table 1).

After 8 weeks, red claw crayfish fed a practical diet without cholesterol (Diet 3) had significantly ($P < 0.05$) lower final weight, percentage weight gain, and specific growth rate (SGR) compared to crayfish fed all other diets (Table 2). These results indicate that a practical diet containing 2% cod liver oil and 1% corn oil and having no lecithin appears to be sufficient and that lecithin may not be necessary for juvenile red claw diets.

1 inch margin

11 inches long

1 inch margin

8.5 inches wide

TABLE 1. Formulation of experimental diets fed to red claw crayfish.

	Diet			
	1	2	3	4
Menhaden FM	25.0	25.0	25.0	25.0
Soybean Meal	35.0	35.0	35.0	44.5
Lecithin 0.5	0.0	0.5	0.0	
Cholesterol	1.0	1.0	0.0	0.0
Other	38.5	39.0	39.5	30.5

TABLE 2. Final weight, percentage weight gain, specific growth rate (SGR), and percentage survival of red claw crayfish fed four practical diets. Means in a column with different letters were significantly different ($P < 0.05$)

	Diet			
	1	2	3	4
Final weight (g)	6.97a	6.00a	3.64b	5.11a
Weight gain (%)	3384a	2897a	1717b	2454a
SGR (%/day)	5.74a	5.66a	4.68b	5.41a
Survival (%)	76.0	64.0	56.0	80.0

PLEASE SUBMIT YOUR ABSTRACT ONLINE

**Submit your abstract via the internet at the meeting website.
Follow the complete instructions on the website for online submission.**

www.was.org

**If you are unable to submit your abstract online, contact the Conference Manager
for alternative methods at:**

worldaqua@aol.com or Fax: +1-760-432-4275



ATTENDEE REGISTRATION FORM

AQUACULTURE AMERICA 2017

February 19-22, 2017 – San Antonio, Texas

Return address for payments in USD:
AQUACULTURE AMERICA 2017
 Conference Manager
 P.O. Box 2302
 Valley Center, CA 92082 USA
 Tel: +1 760 751 5005
 Fax: +1 760 751 5003
 Email: worldaqua@aol.com

Online registration is preferred at www.was.org OR fax or mail both sides with payment. Use one form per person.

PLEASE PRINT CLEARLY OR TYPE ALL REQUESTED INFORMATION		
BADGE INFORMATION: (As you want your name badge to read – No titles, please)		
First Name _____	SURNAME (FAMILY NAME) _____	
Company or Institution _____ (Limited to 40 Letters & Spaces)		
City _____	State/Prov _____	Country _____

MAILING INFORMATION: Email _____
 (please include email address)

Postal Address _____

City _____ State / Prov _____ Postal Code _____ Country _____

Phone _____ Fax _____ Title: (circle one) Dr. Mr. Ms. Mrs.
 (Include country and city code) (Include country and city code)

REGISTRATION FEES: In order to receive the discount rates as listed below, this form and payment must be received by the date listed. See brochure for what is included in registration fees.

TYPE OF REGISTRATION FULL CONFERENCE & TRADE SHOW <small>In order to receive the Pre-Registration discount rate, this form and payment must be received by the date above</small>	Register by January 20, 2017	Register by February 8, 2017	Register after February 8, 2017	*To qualify for Member Rate you <u>must</u> complete the Association Memberships section on the reverse side. • • • • • Trade Show is <u>included</u> in the Full Conference Registration Rate. TOTAL REGISTRATION FEE US\$ _____
MEMBER RATE*	<input type="checkbox"/> US\$ 435	<input type="checkbox"/> US\$ 535	<input type="checkbox"/> US\$ 635	
STUDENT MEMBER RATE* <small>Include copy of Student I.D.</small>	<input type="checkbox"/> US\$ 225	<input type="checkbox"/> US\$ 225	<input type="checkbox"/> US\$ 290	
Non-Member Rate Student Non-Member Rate <small>Include copy of Student I.D. You can join WAS on the reverse side and use the Member Rate.</small>	<input type="checkbox"/> US\$ 540 <input type="checkbox"/> US\$ 295	<input type="checkbox"/> US\$ 640 <input type="checkbox"/> US\$ 295	<input type="checkbox"/> US\$ 740 <input type="checkbox"/> US\$ 365	
<input type="checkbox"/> Spouse Rate – must accompany a full registration Name _____	<input type="checkbox"/> US\$ 335	<input type="checkbox"/> US\$ 395	<input type="checkbox"/> US\$ 495	

TRADE SHOW PASS (Trade show pass is included with the Full Conference Registration)
 Good for 3 days admission to exhibits only – February 20, 21, 22 ☐ US\$ 50 **TOTAL TRADE SHOW PASS** US\$ _____

INDUSTRY TOURS – Info To Come **TOTAL INDUSTRY TOURS** US\$ _____

MEMBERSHIP DUES – Enter amount from Membership Application on other side if applicable. **TOTAL MEMBERSHIP DUES** US\$ _____

Do not mail registration after Feb. 10, 2017 or fax after Feb. 15.
 After Feb 15, bring this form with you to register at the show.

➔ **TOTAL AMOUNT US\$ _____**

Registration Confirmation and Receipt will be emailed after processing.

CANCELLATION POLICY: Cancellation of registration must be received - in writing - no later than January 27, 2017. Refunds for registration fees will be subject to a 20% handling fee. Refunds are processed after the conference. No refund will be made for cancellations received after January 27, 2017 or for "no shows". After January 27, 2017, no refunds will be made for professional or personal emergencies, flight cancellations, denied visa, weather related cancellation or other travel emergencies. Fees for memberships are non-refundable.

PAYMENT METHOD: All fees must be paid to the order of **AQUACULTURE AMERICA 2017**.

For bank transfer details, contact us.

☐ Check # _____ ☐ Visa ☐ Mastercard ☐ American Express ☐ Discover ☐ Diners Club

Card # _____ Expiration Date _____

Name on Card _____ Date _____ Signature _____

Credit Card Billing Address _____

REGISTRATION FORM - SIDE 2

Name _____

ASSOCIATION MEMBERSHIPS: Please check all boxes for associations for which you are a current member. Membership in any of those associations qualifies you for the Member Rate* on the Registration Fees. You can join an association at any time before registering to qualify for the Member Rate.

MEMBERSHIPS: ☐ WAS ☐ USAS ☐ APC ☐ Korean ☐ LACC

- | | |
|--|--|
| <input type="checkbox"/> Americas Tilapia Alliance | <input type="checkbox"/> Indonesian Aquaculture Society |
| <input type="checkbox"/> American Veterinary Medical Association | <input type="checkbox"/> Korean Aquaculture Society |
| <input type="checkbox"/> Aquacultural Engineering Society | <input type="checkbox"/> Korean Society of Fisheries and Sciences (KOSFAS) |
| <input type="checkbox"/> Aquaculture Association of Canada | <input type="checkbox"/> Malaysian Fisheries Society |
| <input type="checkbox"/> Aquaculture Association of South Africa | <input type="checkbox"/> National Aquaculture Association |
| <input type="checkbox"/> Aquaculture Feed Industry Association | <input type="checkbox"/> National Shellfisheries Association |
| <input type="checkbox"/> Aquaculture Without Frontiers | <input type="checkbox"/> Sociedad Brasileira de Acuicultura |
| <input type="checkbox"/> Asian Fisheries Society | <input type="checkbox"/> Society of Aquaculture Professionals (India) |
| <input type="checkbox"/> China Society of Fisheries | <input type="checkbox"/> South African Aquaculture Society |
| <input type="checkbox"/> Egyptian Aquaculture Society | <input type="checkbox"/> Spanish Aquaculture Association (SEA) |
| <input type="checkbox"/> European Aquaculture Society | <input type="checkbox"/> Striped Bass Growers Association |
| <input type="checkbox"/> Fish Culture Section - AFS | <input type="checkbox"/> US Trout Farmers Association |
| <input type="checkbox"/> Global Aquaculture Alliance | <input type="checkbox"/> World Aquatic Veterinary Medical Association |
| <input type="checkbox"/> IAFI The International Association of Seafood Professionals | <input type="checkbox"/> Zebrafish Husbandry Association |

MEMBERSHIP APPLICATIONS ☐ NEW APPLICATION ☐ RENEWAL

NATIONAL AQUACULTURE ASSOCIATION (NAA)

For details on the different types of memberships and options, please contact the NAA home office at:

Tel: +1-304-728-2167 Fax: +1-304-728-2196 Email: naa@frontiernet.net

Individual Memberships: Individuals, growers, partnerships and corporations who engage in the practice of and who derive a portion of their income from aquaculture. Individual members nominate and elect four board members for three-year terms.

_____ Individual: \$250

_____ Silver: \$1,000 to \$2,499

_____ Gold: \$2,500 to \$4,999

_____ Platinum: \$5,000 and above

For membership information on State Associations and Species Associations, call for details.

Web: www.nationalaquaculture.org

Total Amount for NAA Membership USD _____

Fees for memberships are non-refundable.

Please enter this amount under "Membership Dues" section on opposite side of this form.

WORLD AQUACULTURE SOCIETY (WAS) APPLICATION www.was.org

For details on the different types of memberships and options, please contact the WAS home office at

Tel: +1-225-578-3137 Fax: +1-225-578-3493 Email: judya@was.org

MEMBERSHIP CATEGORY: (Indicate only one)

- ☐ **Individual** (Electronic JWAS) (USD 65/yr) Applies to an individual only
- ☐ **Individual** (Printed JWAS) (USD 85/yr) Applies to an individual only
- ☐ **Student** (Electronic JWAS) (USD 45/yr) (Copy of Student ID or Signature of Professor required)
- ☐ **Student** (Printed JWAS) (USD 65/yr) (Copy of Student ID or Signature of Professor required)
- ☐ **Sustaining** (Electronic JWAS) (USD 105/yr) Applies to any one individual from a company
- ☐ **Sustaining** (Printed JWAS) (USD 125/yr) Applies to any one individual from a company
- ☐ **Corporate** (Electronic JWAS) (USD 255/yr) Allows all employees of one company to attend meeting at Member Rate
- ☐ **Corporate** (Printed JWAS) (USD 275/yr) Allows all employees of one company to attend meeting at Member Rate
- ☐ **Lifetime** (Electronic JWAS only) (USD 1005/yr) Applies to an individual only

CHAPTER OPTIONS:

One chapter included in membership. Mark the chapter you choose.

- ☐ **Asian Pacific**
- ☐ **Korea**
- ☐ **Latin American/Caribbean**
- ☐ **United States (USAS)**
- ☐ **None** (deduct USD 5)

You can add extra Chapters for USD 5

Total Amount for WAS Membership USD _____

Fees for memberships are non-refundable.

Please enter this amount under "Membership Dues" section on opposite side of this form.

**For membership in other associations, please contact them directly.
If you need a phone number, contact the Conference Manager (+1-760-751-5005).**

MANY OPPORTUNITIES FOR FARM TOURS

Some very special tours will be set up by the Texas Aquaculture Association. Details to be provided later.

TRAVEL

Special car rental fares also have been arranged with AVIS. You can make reservations at 800-331-1600 or +1-918-624-4338 and mention the special discount code# J770126.



HOTELS

We have arranged a block of rooms with very special rates at San Antonio Marriott Riverwalk.

San Antonio Marriott Riverwalk

Tel: 1-800-233-1234/+1-210-227-1234

Fax: +1-210-227-4928



YOUR FULL CONFERENCE REGISTRATION INCLUDES:

- ❖ Only pre-registered attendees are guaranteed materials
- ❖ Admission to all sessions, seminars and the trade show.
- ❖ Admission to the President's Reception.
- ❖ Conference Bag and Show Directory.
- ❖ Refreshment Breaks and Cash Bar Happy Hour.
- ❖ Students receive the full registration package plus the Student Reception. To qualify for the student rate, a copy of your student I.D. is required.

FOR MORE INFORMATION:

AQUACULTURE 2017

Conference Manager

P.O. Box 2302 • Valley Center, CA 92082 USA

Tel: +1-760-751-5005 • Fax: +1-760-751-5003

TENTATIVE SCHEDULE

Sunday, February 19

Registration Open	11:00am - 5:30pm
Exhibitor Move-in	11:00am - 6:00pm
Poster Set-up	1:00pm - 5:30pm

Monday, February 20

Registration Open	7:30am - 5:00pm
Plenary Session	8:30am - 10:00am
Exhibitor Move-in	8:00am - 10:00am
Poster Set-up	8:00am - 10:00am
Refreshment Break	10:00am - 11:00am
Trade Show & Posters Open	10:00am - 6:00pm
Sessions	11:00am - 12:30pm
Lunch (On your own)	12:30pm - 1:30pm
Sessions	1:30pm - 4:30pm
Poster & Happy Hour	4:30pm - 5:30pm
President's Reception	6:00pm - 9:00pm

Tuesday, February 21

Registration Open	8:00am - 5:00pm
Sessions	8:30am - 10:00pm
Refreshment Break	10:00am - 10:30am
Sessions	10:30pm - 12:30pm
Trade Show & Posters Open	10:00am - 6:00pm
Lunch (On your own)	12:30pm - 1:30pm
Sessions	1:30pm - 5:00pm
Poster & Happy Hour	5:00pm - 6:00pm
NAA Auction	6:00pm - 8:00pm
Student Reception	7:30pm - 9:30pm

Wednesday, February 22

Registration Open	8:00am - 3:00pm
Sessions	8:30am - 10:00am
Trade Show & Posters Open	10:00am - 3:30pm
Refreshment Break	10:00am - 11:00am
Sessions	11:00am - 12:30am
Lunch (On your own)	12:30pm - 1:30pm
Sessions	1:30pm - 3:00pm
Refreshment Break	3:00pm - 3:30pm
Exhibitor Move-out	3:30pm - 7:00pm
Sessions	3:30pm - 5:00pm
Closing Happy Hour	5:00pm - 6:00pm

