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**AUGUST 15-18, 2022**

**ST. JOHN'S, NEWFOUNDLAND  
AND LABRADOR, CANADA**



**ST. JOHN'S CONVENTION CENTRE**

# **AQUACULTURE CANADA AND WAS NORTH AMERICA 2022**



Details coming soon to the following websites: [aquacultureassociation.ca](http://aquacultureassociation.ca) | [was.org](http://was.org) | [naia.ca](http://naia.ca)



Aquaculture Canada  
WAS North America

**August 15-18, 2022**

St. John's, Newfoundland  
and Labrador, Canada



The **World Aquaculture Society (WAS)**, **Aquaculture Association of Canada (AAC)** and **Newfoundland Aquaculture Industry Association (NAIA)** are **excited** to co-host this **world class**, international event; surely to be the **largest aquaculture conference and trade show in Canadian history**.

The conference will feature hundreds of **world-class speakers and delegates** from around the globe on the science, technology, business and social aspects of aquaculture. St. John's is located on the **most eastern edge of North America**, is Canada's **oldest European settlement**, and the region is home to some of the **most ecologically interesting areas in the World**. Nearby **UNESCO heritage sites** and **wildlife and nature conservancies** make for exciting daily excursions. **Historic** and archival locations (one of the **4 corners of the Earth, Viking Settlements**, etc.) are within 2 day excursions. This city, **famous** for its **hospitality, music and culinary experiences** is a quick trip across the Atlantic from Europe, and easily accessible from all other parts of North America, and the globe, by air. St. John's is also home to **internationally recognized centres in aquaculture and fisheries science**, with Memorial University's Fisheries and Marine Institute and Faculty of Science leading the way.

Aquaculture Canada and WAS North America 2021 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 and entertainment sites that St. John's and Newfoundland and Labrador have to offer.

We look forward to showcasing St. John's and the surrounding area to delegates.

## A CRITICAL TRADE SHOW FOR AQUACULTURISTS!

With 100 booths, Aquaculture Canada and WAS North America 2021 will have the largest aquaculture trade show in Canada! This is your opportunity to see the latest in products and services for the aquaculture industry. It is the place to visit current suppliers and make new contacts. To grow your business and keep pace with the technological advancements in the industry – this is the time and place to do it!

George Street Photo: Michel Rathwell, Flickr



## SOCIAL EVENTS

The program will include engaging and exciting *social and networking events* to enhance your experience and business opportunities. Meet old friends and new acquaintances, relax and enjoy yourself in the best of hospitality and entertainment that Newfoundland and Labrador, and St. John's have to offer. Events being planned include the Welcome Reception to open the conference, the AAC annual Dr. Joe Brown BBQ in support of aquaculture students, a Newfoundland Kitchen Party, and finally a evening Gala dinner. **Details and costs of these events to be confirmed soon.**







## TECHNICAL PROGRAM COVERS THE LATEST RESEARCH

The Aquaculture Canada and WAS North America 2022 program committee is building an extensive technical program featuring special sessions, and various symposia and workshops on all of the species and issues facing aquaculturists around the world. Sample topics will include:

### Special Topics

Cleaner Fish  
Fish Welfare  
Aquaculture Monitoring Technologies  
Aquaculture Biotechnology  
Fish and Shellfish Physiology  
Recirculating Aquaculture Systems  
Mussel and Oyster Culture  
Sea Lice: Control and Mitigation  
Public Perception and Trust  
Indigenous Partnerships / Engagement  
Law, Regulations and Policy  
Human Resource Challenges  
Marine Safety / Regulatory Requirements  
Communications and Advocacy  
Municipal Leader Forum  
Governmental Town Hall  
CEO's Workshop  
Culinary Session  
Women in Aquaculture  
Innovation Norway: Global Growth and the 'Blue Planet'  
Biorefining / Bioprocessing / Valuation  
Material Management, Processing and Utilization  
Aquaculture Services - 'Show and Tell'  
Product Traceability and Food Safety  
Aquaculture in an Era of Climate Change  
eDNA  
Wild-Culture: Ecological Interactions  
Wild Culture: Genetic Interactions  
Harmful Algal Blooms

The Integration of Offshore Ocean Aquaculture with Renewable and Non-Renewable Resources  
Environmental Impact Monitoring  
Modelling in Support of Aquaculture Ecosystem Management  
Aquatic Invasive Species

### Crustaceans

Shrimp Culture  
Shrimp Nutrition  
Shrimp Health & Disease  
Macrobrachium  
Other Crustaceans

### Finfish

Salmonids  
Tuna  
Flatfish  
Freshwater Finfish (e.g. tilapia, catfish, bass, percids etc.)  
Marine Finfish  
Larval Fish Culture  
Zebrafish  
Other Species

### Shellfish

Scallops  
Oysters  
Clams  
Mussels  
Other Shellfish

### Other Species

Algae / Seaweeds  
Sea Urchins  
Sea Cucumbers  
Ornamentals  
Endangered Species

### Nutrition

Finfish Nutrition  
Shellfish Nutrition  
Feeds and Feedstuffs  
Live Feed (incl. copepod culture)  
Nutraceuticals, Probiotics and Clinical Diets  
Incorporating Plant-Based Ingredients  
Alternative Feed Ingredients  
Feed Management and Safety

### Aquatic Animal Health and Disease

Parasites  
Bacterial Diseases  
Viral Diseases  
Biosecurity  
Epidemiology  
Vaccines  
Therapeutics and Other Treatments

### Production Systems

Open Ocean (Offshore) Aquaculture  
IMTA / Integrated Aquaculture  
Freshwater Pond Aquaculture  
Small Scale Aquaculture and Aquaponics  
Urban Aquaculture  
Hatchery Technology  
Larval Culture / Production

### Aquaculture Engineering

Water Quality & Effluents  
Recreational and Ornamental Pond Management  
Biofloc Technologies and Applications  
Fish Transport  
Cage Design and Mooring Systems  
Land-Based Aquaculture

### Genetics and Reproduction

Fish Reproduction  
Broodstock Culture, Selection and Management  
Shrimp, Finfish and Shellfish Breeding: Genetics  
Genetic Engineering

### Economics and Marketing

Market Driven Aquaculture: Developing and Sustaining an Industry  
Aquaculture Economics  
Organic Aquaculture: Future Opportunities  
Certification  
Risk Management

### Global Aquaculture

Latin American and Caribbean Aquaculture  
Aquaculture in Asia / Pacific  
Aquaculture in India  
Aquaculture in Africa

**Note:** topics may be split or combined based on interest / submitted abstracts.



# TENTATIVE SCHEDULE

## Monday, August 15

Registration Open.....	11:00 - 17:30
Exhibitor Move-in.....	13:00 - 18:00
Poster Set-up.....	13:00 - 17:30
Opening Reception.....	18:30 - 21:00

## Tuesday, August 16

Registration Open.....	7:30 - 17:00
Exhibitor Move-in.....	8:00 - 10:00
Poster Set-up.....	8:00 - 10:00
Conference Welcome.....	8:30 - 9:10
Plenary Session.....	9:10 - 10:10
Refreshment Break.....	10:10 - 10:50
Trade Show & Posters Open .....	10:00 - 18:00
Sessions.....	10:50 - 12:50
Lunch (On your own).....	12:50 - 14:00
Sessions.....	14:00 - 17:00
Happy Hour & Posters.....	17:00 - 18:00
Joe Brown BBQ/Live Auction.....	18:30 - 23:00

## Wednesday, August 17

Registration Open.....	8:00 - 17:00
Plenary Session.....	8:30 - 9:30
Trade Show .....	9:30 - 18:00
Refreshment Break.....	9:30 - 10:10
Sessions.....	10:10 - 12:30
Lunch (On your own).....	12:30 - 13:40
Sessions.....	13:40 - 17:00
Happy Hour & Posters.....	17:00 - 18:00
NL Kitchen Party 2020.....	19:00 - 22:00

## Thursday, August 18

Registration Open.....	8:00 - 15:00
Plenary Session.....	8:30 - 9:30
Trade Show .....	9:30 - 12:30
Refreshment Break.....	9:30 - 10:10
Sessions.....	10:10 - 12:30
Lunch (On your own).....	12:30 - 13:30
Exhibitor Move-out.....	12:30 - 16:00
Sessions.....	13:30 - 14:50
Refreshment Break.....	14:50 - 15:20
Sessions.....	15:20 - 17:00
Gala Reception.....	19:00 - 19:30
Gala Dinner .....	19:30 - 22:30



The Battery neighbourhood with Signal Hill in the background.

Photo: Michel Rathwell, Flickr

## CALL FOR PAPERS - DEADLINE: March 15, 2022

Aquaculture Canada and WAS North America 2022 encourage the submission of both high quality oral and poster presentations. All abstracts must be in English - the official language of the conference.

Oral presentations will be 20 minutes. Authors of studies involving proprietary products or formulations should present this information in workshops or the trade show. Oral presentations will be restricted to the use of 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 Canada and WAS North America 2022 cannot subsidize registration fees, travel or hotel costs.

No Abstract Book will be printed - The Abstract Book will be available online.



Colourful downtown St. John's. Photo: Michel Rathwell, Flickr

# ATTENDEE REGISTRATION FORM

## Aquaculture Canada and WAS North America 2022

August 15-18, 2022 – St. John's, Newfoundland, Canada

Address for payments in CND:  
ACWNA 2021  
PO Box 1031, Torbay, NL A1K 1A0  
Tel: +1 760 751 5005  
Fax: +1 760 751 5003  
Email: worldaqua@was.org

Online registration is preferred at <https://www.was.org/meeting/code/WANA2020> or Fax or mail both sides with payment.  
Please 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 - Limited to 40 Letters & Spaces)

First Name \_\_\_\_\_ Surname (Family Name) \_\_\_\_\_

Company or Institution \_\_\_\_\_

**CONTACT INFORMATION:** Email \_\_\_\_\_

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.

<b>TYPE OF REGISTRATION</b> <b>FULL CONFERENCE &amp; TRADE SHOW</b>	Register by June 30, 2022	Register after June 30, 2022	Trade Show is included in the Full Conference Registration Rate
In order to receive the Pre-Registration discount rate, this form and payment must be received by the date above			
<b>MEMBER RATE*</b> <b>STUDENT MEMBER RATE*</b> Include Student I.D.	<input type="checkbox"/> CND \$500 <input type="checkbox"/> CND \$250	<input type="checkbox"/> CND \$600 <input type="checkbox"/> CND \$300	To qualify for Member Rate, you must complete the Association Memberships section on the reverse side.
<b>Non-Member Rate</b> <b>Student Non-Member Rate</b> Include Student I.D.	<input type="checkbox"/> CND \$600 <input type="checkbox"/> CND \$300	<input type="checkbox"/> CND \$700 <input type="checkbox"/> CND \$350	
<b>Spousal Rate</b> (must accompany full reg.) Name _____	<input type="checkbox"/> CND \$250	<input type="checkbox"/> CND \$300	<b>TOTAL REGISTRATION FEE</b> CND\$ _____
<b>TRADE SHOW PASS</b> (if not a full conference registrant) Good for 3 days admission to exhibits only - Aug. 16, 17, 18 CND\$50 TOTAL TRADE SHOW PASS CND\$ _____			
<b>DR. JOE BROWN BBQ</b> (in aid of AAC Student Endowment Fund) Aug. 16 (Ltd. # Tickets Avail) CND\$40 TOTAL BBQ CND\$ _____			
Registration fees include tickets to the <b>Kitchen Party</b> (Aug. 17) and <b>Gala Dinner</b> (Aug. 18). Please indicate by checking if you plan on attending.			<input type="checkbox"/> Kitchen Party <input type="checkbox"/> Gala Dinner
<b>MEMBERSHIP DUES:</b> Enter amount from Membership Application on other side if applicable.			<b>TOTAL MEMBERSHIP DUES</b> CND\$ _____
<b>Please do not mail registration after July 15, 2022, or Fax after Aug. 1, 2022.</b> <b>After these dates bring this form with you to register at the conference.</b>			<b>TOTAL AMOUNT</b> CND\$ _____
<b>Registration Confirmation and Receipt will be e-mailed after processing.</b>			

**CANCELLATION POLICY:** Cancellation of registration must be received - in writing - no later than July 24, 2022. 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 July 24, 2022 or for "no shows". After July 24, 2022, 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 ACWAS 2022.

☐ Cheq ☐ Visa ☐ Mastercard ☐ American Express ☐ Discover ☐ Diner's Club

Card \_\_\_\_\_ Expiration Date \_\_\_\_\_ Sec. Code \_\_\_\_\_  
Name on Card \_\_\_\_\_ Date \_\_\_\_\_ Signature \_\_\_\_\_  
For bank transfer details, contact us.



# REGISTRATION FORM

(Continued)

Contact: \_\_\_\_\_

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

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

## MEMBERSHIP APPLICATIONS ☐ NEW APPLICATION ☐ RENEWAL

### AQUACULTURE ASSOCIATION OF CANADA Web: <http://aquacultureassociation.ca/join-us/>

MEMBERSHIP CATEGORY: (Indicate only one)

- ☐ Organizational (CND \$300/yr) ☐ Student (CND \$50/yr)  
☐ Individual (CND \$100/yr)  
☐ Retired (CND \$50/yr) *Signature of Professor or copy of Student ID required*

**Total Amount for AAC Membership**

**CND \$ \_\_\_\_\_**

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

### NEWFOUNDLAND AQUACULTURE INDUSTRY ASSOCIATION Web: [www.naia.ca](http://www.naia.ca) | Email: [Roberta@naia.ca](mailto:Roberta@naia.ca)

- ☐ REGULAR MEMBER: Voting membership is open to individuals representing an aquaculture enterprise that holds a valid aquaculture license in NL, (Price TBD).  
☐ ASSOCIATE MEMBER: Non-voting individual membership for suppliers, industry supporters and enterprises (CND\$500/YR)

**Total Amount for NAIA Membership**

**CND \$ \_\_\_\_\_**

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

### WORLD AQUACULTURE SOCIETY

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](mailto:judya@was.org) | Web: [www.was.org](http://www.was.org)

MEMBERSHIP CATEGORY: (Indicate only one)

- ☐ Individual (Electronic JWAS) CND \$84.5/yr Applies to an individual only  
☐ Individual (E Access) (CND \$58.5/yr) Applies to an individual only  
☐ Student (Electronic JWAS) (CND \$58.5/yr) (Copy of Student ID or Signature of Professor required)  
☐ Sustaining (Electronic JWAS) (CND \$136.5/yr) Applies to any one individual from a company  
☐ Corporate (Electronic JWAS) (CND \$331.5/yr) Allows all employees of one company to attend meeting at Member Rate  
☐ Lifetime (Electronic JWAS only) (CND \$1300 with no chapter) Applies to an individual only

#### CHAPTER OPTIONS:

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

- ☐ Africa  
☐ Asian Pacific  
☐ Korea  
☐ Latin American/Caribbean  
☐ United States (USAS)  
☐ None (CND \$6.5)

You can add extra Chapters for CND \$8.45

**Total Amount for WAS Membership CND\$ \_\_\_\_\_** Please enter this amount under "Membership Dues" section on opposite side of this form. Fees for memberships are non-refundable.

# HOTELS

We have arranged for fantastic rates at various hotels in the downtown St. John's area, including the host hotel Delta St. John's. Please visit the conference website for details.

## LOCAL AQUACULTURE FACILITY TOURS:

Please note that we will not be arranging tours. If you wish to tour one of the local facilities please contact the appropriate person below.

### **Ocean Sciences Centre:**

Danielle Nichols,  
Research Marketing Manager/Program Coordinator,  
Department of Ocean Sciences, Memorial University.  
Email: [dnichols@mun.ca](mailto:dnichols@mun.ca)

### **Marine Institute:**

Heather Burke  
Director, Centre for Aquaculture and Seafood,  
Email: [heather.burke@mi.mun.ca](mailto:heather.burke@mi.mun.ca)

## FULL CONFERENCE REGISTRATION INCLUDES:

Admission to all conference sessions  
and the trade show

Admission to the Opening Reception

Admission to Kitchen Party

Admission to Gala Dinner

Conference Bag and Show Directory

Refreshment Breaks and Happy Hour

Students receive the full registration package. To qualify for the student rate, a copy of your student I.D. is required.

Only pre-registered attendees are guaranteed materials.

## FOR MORE INFORMATION

Aquaculture Canada and WAS North America 2022

Conference Management

PO Box 1031, Torbay, NL, Canada A1K 1A0

Tel: +1-760-751-5005

Fax: +1-760-751-5003

Email: [jmburphy@nl.rogers.com](mailto:jmburphy@nl.rogers.com) OR [worldaqua@was.org](mailto:worldaqua@was.org)

REGISTER EARLY AND \$AVE!



Ocean Sciences Centre

# INSTRUCTIONS FOR PREPARATION OF ABSTRACTS

## Abstract Submission Deadline March 15, 2022

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. The reduced figures and tables should be included in the abstract in camera-ready form.

8.5 inches wide (21.6 cm)

1 inch margin (2.54 cm)

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

Aquaculture Research Center Kentucky State University Frank-  
fort, KY 40601 lmuzinic@dcrc.net

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 temperature 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 very little information exists on their nutritional requirements and practical diet formulations. Since many crustaceans require lecithin and cholesterol to be added to their diet, these two nutrients are usually added; however, lecithin and cholesterol are very expensive. Since diet costs can be as much as 70% of the operating expenses for an aquaculture enterprise, it is imperative that the least expensive diet be formulated that meets the nutrient requirements of the species. The present study was conducted to determine if cholesterol and/or lecithin needs to be added to a practical diet for red claw crayfish.

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

	1	2	3	4
Menhaden 1M	25.0	25.0	25.0	25.0
Soybean Meal	55.8	55.8	55.9	64.5
Lecithin 0.5	0.0	0.5	0.0	0.0
Cholesterol	1.0	1.0	0.0	0.0
Other	18.5	18.0	18.5	10.5

An 8-week feeding trial was conducted in a recirculating system with newly-hatched juvenile (mean individual weight of 0.2 g) red claw, each stocked in individual plastic mesh culture units. Individual units were contained within fiberglass tanks, each containing an individual water line. Water was recirculated through biological and mechanical filters. Water temperature was maintained at 27-29°C and lighting was provided by overhead fluorescent ceiling lights on a 14:10 hour light:dark cycle. Ammonia, nitrite, dissolved oxygen, temperature, alkalinity, chlorides, and pH 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).

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 ( $P < 0.05$ ).

	1	2	3	4
Final weight (g)	6.97a	6.00a	3.40b	5.11a
Weight gain (%)	3384a	2897a	1717b	2404a
SGR (%/day)	5.74a	5.66a	4.88b	5.82a
Survival (%)	70.0	64.0	36.0	80.0

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 (2.54 cm)

11 inches long (27.94 cm)

## 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.

<https://www.was.org/meeting/code/WANA2020>

If you are unable to submit your abstract online, contact the Conference Manager for alternative methods at:  
worldaqua@was.org or Fax: +1-760-751-5003

