



# PERDC

**PROCESS ENGINEERING RESEARCH  
& DEVELOPMENT CENTER**

TEXAS A&M ENGINEERING EXPERIMENT STATION

Formerly "Food Protein Research & Development Center"

## 24<sup>th</sup> Annual Practical Short Course

Organized by the

Process Engineering Research and Development Center  
Extrusion Technologies Program  
The Texas A&M University System  
College Station, Texas 77843-2476 U.S.A.

In cooperation with

Department of Wildlife and Fisheries Sciences  
Texas A&M AgriLife Research  
College Station, Texas 77843-2258 U.S.A.

## Aquaculture Feed Extrusion, Nutrition, & Feed Management August 20-25, 2017

### SCHEDULE

#### Sunday, August 20, 2017

- 6:00 PM Registration, hotel
- 6:30 PM Welcome, Introduction, & Announcements - Mian N. Riaz
- 7:00 PM Dinner with Cash Bar, hotel (optional)

#### Monday, August 21, 2017

- 7:40 AM Bus leaves hotel to Rudder Tower, Texas A&M University
- 8:00 AM "Introduction to Extrusion" - Mian N. Riaz
- 9:15 AM "The Global Aquatic Market and the Various Species of Fish, Shrimp, etc. and Where They are Produced in the World" - Delbert Gatlin
- 9:45 AM Break
- 10:00 AM "Principles of Dry Extrusion and Its Application in Aquatic Feed and Pet Food" - Dave Albin
- 10:45 AM "Solutions to Common Grinding Problems" - Mark Heimann
- 11:30 AM **Group Photo** and Lunch
- 12:45 PM "Dry Extrusion of Full Fat Soy and Partially Defatted Soybean Meal" - Dave Albin
- 1:30 PM "Bulk Material Handling in Extrusion Processes" - Mark Zschoche
- 2:30 PM Break
- 2:45 PM "Other Commercial Applications of Dry Extrusion" - Dave Albin
- 3:30 PM "Plant Dust Collection and Weighing / Feeding" - Mark Zschoche
- 4:15 PM Bus leaves for PERDC for Multiple Demonstrations:
  - **Full Fat Soy Using Whole Soybeans with a Dry Extruder**
  - **Full Fat Soy Using Dehulled Soybeans with a Dry Extruder**
  - **Fisheries By-Products Recycling with a Dry Extruder**

#### Tuesday, August 22, 2017

- 7:40 AM Bus leaves hotel for Rudder Tower, Texas A&M University
- 8:00 AM "Principles of Aquaculture Nutrition: Part 1" - Delbert Gatlin
- 9:15 AM "Optimizing Aqua Feed Quality: Oxidation Control, Microbial Growth Control, and Palatability" - Lynn Deffenbaugh
- 10:30 AM Break
- 10:45 AM "Continuous Spray and Coating Systems" - Dave Mattice
- 11:30 AM Lunch
- 12:45 PM "Ultra Fine Grinding for Aquatic Feed" - Phil Erickson
- 1:15 PM "Commercial Vitamin Product Forms, Vitamin Premixes, and Their Performance in Aquatic Feed" - Jon Bergstrom
- 2:15 PM Break
- 2:30 PM "Characteristics and Applications of Interrupted Flight Expanders" & "Processing of Full Fat Soy Products, Pet Foods, and Aquaculture Feeds" - Amanda Cresanto
- 3:30 PM Bus leaves for PERDC for Multiple Demonstrations:
  - **Full Fat Soy Using Interrupted Flight Expander**
  - **Aquatic Feed Using Interrupted Flight Expander**
  - **Surface Coating Systems for Aquatic Feed**
  - **Pulverizing of Ingredients**

#### Wednesday, August 23, 2017

- 7:40 AM Bus leaves hotel for Rudder Tower, Texas A&M University
- 8:00 AM "Ingredients and Recipe Considerations" - Galen Rokey
- 9:15 AM "Preconditioning Technology" - Gerry Hertzal
- 10:00 AM Break
- 10:15 AM "Single and Twin Screw Extruders and Their Applications in Aquatic Feed" - Joe Kearns
- 11:30 AM Lunch
- 12:45 PM "High Fat Extrusion and Product Densification" - Galen Rokey
- 1:30 PM "Product Analysis & Laboratory Techniques" - Galen Rokey
- 2:45 PM Break
- 3:00 PM "NIR Analyzer on Ingredients and Aqua Feed" - Josh Hudson
- 3:30 PM "Drying and Cooling Systems for Aquaculture Feed" - Tom Barber
- 4:30 PM Bus leaves for PERDC for Multiple Demonstrations:
  - **Salmon Feed for Vacuum Infusion Using a Single Screw Extruder**
  - **Ultra-Fine Fish Feed Using Twin Screw Extruder**
  - **NIR Analyzer on Ingredients and Aqua Feed**

#### Thursday, August 24, 2017

- 7:40 AM Bus leaves hotel for Rudder Tower, Texas A&M University
- 8:00 AM "Automated Control of Extrusion Systems" - Michael Bachelor
- 9:00 AM "Principles of Aquaculture Nutrition: Part 2" - Delbert Gatlin
- 10:00 AM Break
- 10:15 AM "Extrusion Die Technology" - Gerry Hertzal
- 11:00 AM "Vacuum Infusion Coating Principles for Aquatic Feed" - Wayne Busilla
- 11:45 PM **Graduation Lunch**
- 1:15 PM "Extrusion Processing Technologies" - Galen Rokey
- 2:15 PM "Micro-Aquatic Feeds" - Joe Kearns
- 2:45 PM Break
- 3:00 PM "Troubleshooting: Ensuring a Smooth Running Extrusion Operation" - Galen Rokey
- 4:00 PM Bus leaves for PERDC for Multiple Demonstrations:
  - **Floating Catfish Feed Using Single Screw Extruder**
  - **High Fat Yellow Tail Feed Using a Twin Screw Extruder**
  - **Vacuum Infusion for Aquatic Feed**

#### Friday, August 25, 2017

- 7:40 AM Bus leaves hotel for Rudder Tower, Texas A&M University
- 8:00 AM "Odor Control in an Aquafeed Plant" - Larry Fex
- 8:45 AM "Shrimp Feed Management and Feed Physical Characteristics" - Addison Lawrence
- 10:15 AM Break
- 10:30 AM "Least Cost Feed Formulation" - Chris Bailey
- 11:30 AM "Wrap-Up" - Mian N. Riaz and Delbert Gatlin
- 11:45 PM Bus leaves for hotel
- 1:30 PM Optional Tour of Texas A&M University's Aquaculture Facilities - Delbert Gatlin (leave from hotel)
- 3:00 PM Bus returns to hotel

You can register online at <https://perdc.tamu.edu/extrusion/>

## OBJECTIVES OF SHORT COURSE

- Train production personnel in principles and characteristics of extruders and support systems for effective selection and operation.
- Review current practices for preparation of aquaculture feeds.
- Demonstrate equipment in operation and familiarize attendees with practical aspects of feeds extrusion.
- Review aquaculture nutrition and feed management practices.

## ACCOMMODATIONS

Reservations for lodging should be made directly by attendee. A block of rooms has been reserved at the Hilton College Station for short course participants at the special rate of **\$119/night** plus tax for single or double occupancy. Ask for the rate specifically and mention the **Group Code "AQUA17."** **Hotel reservations must be received before July 28, 2017** in order to get special rate; the special rate DOES NOT APPLY before August 19 or after August 25. You can make your reservation by telephone, fax, or internet.

College Station Hilton & Conference Center  
801 University Drive East  
College Station, Texas 77840, USA  
Tel: 979.693.7500; FAX: 979.846.7361 & 979.260.1931  
www.hiltoncs.com

When faxing or emailing hotel reservations, please include a credit card number to confirm your reservation, and also include your departure and arrival dates.

## TRANSPORTATION

Easterwood Airport at College Station is easily reached by about eight flights daily. From Dallas/Ft. Worth International Airport connect via American Airlines. From Houston Intercontinental Airport connect via United Airlines. The airport code for Easterwood Airport is CLL. To get to the hotel in College Station, participants can call the Hilton hotel (979.693.7500) upon arrival at Easterwood Airport for courtesy van service or schedule a pickup with GroundShuttle.com (855.303.4415) from George Bush Intercontinental airport (IAH) or Houston Hobby airport (HOB).

## REGISTRATION

The registration fee for the course and pilot plant demonstrations includes daily lunch, refreshments at breaks, local transportation, a short course eBook manual, and certificates of completion.

**Registration fee is \$1650 if paid in full by July 28, 2017. After this date, registration fee is \$1750.** Continuing Education Units (CEUs) are available for an additional fee upon request. An **OPTIONAL** black&white paper manual/binder is available for an additional \$200 fee. There is a 10% registration discount if three or more individuals from the same organization register for the short course. Academic discounts may be applicable if space is available. **Registration fees are not refundable.** but substitute personnel may be sent by the same firm. Space is limited; therefore, applications will be accepted on a first-come, first-served basis.

You can register online at  
**<https://perdc.tamu.edu/extrusion/>**

You can pay by credit card (American Express, Visa, or Master Card) online or by telephone. If paying by check, make payable to **TEES (Texas A&M Engineering Experiment Station) and mail to TEES Fiscal Office, 3124 TAMU, College Station, TX 77843-3124.** Mail the registration form and a photocopy of your check to Cyndi Casanova, Short Course Coordinator (address below).

### For registration inquiries, contact:

**Cyndi Casanova**  
Short Course Coordinator  
Process Engineering R&D Center  
2476 TAMU  
College Station, Texas 77843-2476 U.S.A.  
Tel: 979.845.2741  
Fax: 979.845.2744  
Email: [shortcourse@tamu.edu](mailto:shortcourse@tamu.edu)

## LOCATION AND FACILITIES

All lectures will be held at Rudder Tower, Texas A&M University Campus. College Station temperatures in August are from 73-96°F (23-36°C). Participants will be taken by bus to the Process Engineering R&D Center (Texas A&M RELLIS Campus) for afternoon demonstrations. Manuals and lectures will be in English. Translation equipment is available by prior arrangement for organized groups willing to provide their own translators.

## SHORT COURSE CONDUCT

All short course sessions will be informal. Insurance policies do not allow non-university personnel, other than original manufacturers, to operate equipment. Questions are encouraged during the lectures, breaks, and social periods. Laptops are allowed in the classroom to follow the presentations in the short course eBook manual. If you require WiFi access during the conference, please inform the Short Course Coordinator when you register (the hotel has its own WiFi access and is separate from the conference). Rights to cancel this course with refund, to deny service, to substitute speakers, and to change schedules, as necessary to expedite the course, are reserved. Texas A&M University System policy does not allow inclusion of alcoholic beverages in registration fees.

## INSTRUCTORS

**Dr. Dave Albin**, Director, Nutrition & Extrusion Technologies, Insta-Pro International  
**Michael Bachelor**, Vice President, Bachelor Controls, Inc.  
**Dr. Christopher Bailey**, Professor, Poultry Science Department, Texas A&M University  
**Tom Barber**, Vice President - Process Engineering, Buhler Aeroglide  
**Dr. Jon Bergstrom**, Senior Technical Support Manager, Swine, DSM Nutritional Products North America  
**Wayne Busilla**, Purchasing & Logistics Manager, UAS Canada Inc.  
**Amanda Cresanto**, Pet Food Product Line Manager, Anderson International Corporation  
**Dr. Lynn Deffenbaugh**, Technical Services Manager, Kemin Nutrisurance, Inc.  
**Phil Erickson**, International Application Engineer, Reynolds Engineering & Equipment, Inc.  
**Larry Fex**, Technical Sales / Plant Commissioning, UAS Canada Inc.  
**Dr. Delbert Gatlin**, Professor, Department of Wildlife and Fisheries Sciences, Texas A&M University  
**Mark Heimann**, Applications Manager, CPM Roskamp Champion  
**Gerry Hertz**, Research Coordinator & Technical Service, Wenger Manufacturing Company  
**Dr. Josh Hudson**, Southwest Regional Manager, Perten Instruments, Inc. NA  
**Joe Kearns**, Vice President Aquafeed Division, Wenger Manufacturing Company  
**Dr. Addison Lawrence**, President, Lawrence Mariculture Consulting, Inc.  
**Chris Mack**, Senior Research Associate, Extrusion Technology Program, Process Engineering R&D Center  
**Dave Mattice**, VP Sales Manager, Automated Process Equipment Corp. (APEC)  
**Stephen D. Prince**, Research Assistant, Extrusion Technology Program, Process Engineering R&D Center  
**Dr. Mian N. Riaz**, Head, Extrusion Technology Program, Process Engineering R&D Center  
**Galen Rokey**, Director Process Technology, Companion Animal Division, Wenger Manufacturing Company  
**Kerry Thomas Sr.**, Technical Assistant, Extrusion Technology Program, Process Engineering R&D Center  
**Mark Zschoche**, Industry Manager, Sales, Schenck Process LLC

## UPCOMING PRACTICAL SHORT COURSES

For details, visit <https://perdc.tamu.edu/short-courses/>  
**Feeds & Pet Food Extrusion**, January 21-26, 2018  
**Extruded Pet Foods and Treats**, July 09-12, 2018

### For additional technical information, contact:

**Dr. Mian N. Riaz**  
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Texas A&M University System  
Tel: 979.845.2774  
Email: [mnriaz@tamu.edu](mailto:mnriaz@tamu.edu)