



Virtual online event for the aquafeed extrusion industry

## 10-11th March, 2021 CST HOURS











FAMSUN







### www.aqfeed.info/e/1029

## Aquafeed Extrusion E-CONFERENCE

#### Virtual online event for the aquafeed extrusion industry











6.00 AM Welcome 6.00 AM Welcome



#### **Roger Gilbert**

For 22 years, Mr Roger Gilbert was the Secretary General of the International Feed Industry Federation, which he co-founded in in 1987. In that time, he saw the federation rise from humble beginnings, to represent more than 85% of all compound feeds produced globally. He initiated the industry's NGO representation with Codex Alimentarius and set up one of the first Memorandum of Understandings between an industry and the United Nation's Food and Agriculture Organisation.

He also established the annual Feed Regulators Meeting, drawing together government food and feed regulators with industry representatives around the world. He coined the phrase, 'The need to feed 9.5 billion people by 2050.'

Today, Mr Gilbert is the publisher of International Aquafeed and Milling & Grain magazine: two international magazines translated into several languages to promote aqua and terrestrial protein production.

> Perendale <sup>4</sup> Publishers Ltd



#### **Roel Schoenmaker**

Roel Schoenmaker works at VNU Exhibitions as Business Development Manager for VIV Worldwide: the business network linking professionals from Feed to Food. Within VIV Roel is responsible for the growth and promotion of the aquaculture program at the tradeshows. Academically, Roel holds a MSc in Technology Management and Marketing from the University of Groningen.



For more information and to register visit the link below or use the QR code on your smart device



### www.aqfeed.info/e/1029

As part of the road-map towards VIV Asia 2021

VIV ASIA

	Day	(March 10th)
WIV ASIA AQUA FEED	6.00 AM	Welcome - Roel Schoenmaker and Roger Gilbert VIV worldwide and International Aqua Feed Magazine, UK
TEXAS A&M	6.15 AM	<b>How to Select an Extruder?</b> Dr. Mian Riaz, Texas A&M University, USA
	6.50 AM	<b>Guide to Modern Aquatic Plant Design</b> Mr. Jonathan Iman, Corporate Project Services, USA
Reported to	7.25 AM	<b>Pulverizing of Raw Material</b> Mr. Phil Erikson, Reynold Engineering, USA
	8.00 AM	Break
	8.15 AM	Making floating and sinking feed with twin-screw extrusion technology Hadrien Delemazure Clextral, France
	8.50 AM	<b>Optimization of Aqua Feed Quality</b> Nicola Tallarico, Kemin Europe
	9.25 AM	Q&A Session



## Day 1

6.15 AM How to Select an Extruder?



Dr. Mian Riaz, Texas A&M University, USA

Dr. Mian N. Riaz is Holder of the Professorship in Food Diversity Food Science and Technology Dept. at Texas A&M University, USA. He joined Texas A&M University 27 years ago after completing his Ph.D in Food Science from the University of Maine at Orono, Maine. His first academic appointment was in 1992 at Texas A&M University, Food Protein R&D Center, where he was put in charge of the Food and Feed Extrusion Program and went on to become the head of the Extrusion Program and a member of the Graduate Faculty in the Food Science and Technology Program. He served as Director of the Process Engineering R&D Center (formally Food Protein R&D Centre) from 2005 to March 31, 2020. He organizes 5 courses every year in the area of extrusion. Three of these courses are in the area of feed and two of them are in the area of food extrusion. Currently, he is offering these courses through Professional & Continuing Education program, Texas A&M Engineering Experiment Station (TEES), Extrusion Technology Program. He has published seven books (three of them are in the area of extrusion technology) 25 chapters and more than 143 papers on extrusion and other related topics.

#### Abstract

In today's market, several companies offer all kind of extruders for making aqua feed, which can make the process of selecting an appropriate extruder very confusing for the consumer. There are too many choices in the market for buying an extruder. For examples, Single screw extruder; twin screw extruder; wet extruder; dry extruder; interrupted flight extruders; segmented types extruder; non-segmented extruder; high sheer extruder; low or medium shear extruder; extruder with vented barrel; conical screw extruder; thermal extruder; intermeshed co-rotating or counter rotating twin screw extruder; extruder with constant speed motor drive vs variable speed drive; extruder with back pressure valve; extruder with external density control system; extruder with manual, semi-automatic and fully automated control system; extruder with capabilities for online analysis; extruder with volumetric or gravimetric feeding system; extruder with different compression ratio; expanders without preconditioner and with preconditioner. Additionally, there are even several options available for preconditioner, for example; single shaft preconditioner; double shaft preconditioner; differential diameter preconditioner (DDC); two stage preconditioner; high intensity preconditioner (HIP) and high shear conditioner (HSC), etc. Deciding on an appropriate selection depends on what kind of aqua feed need to be made. Questions such as is it floating, sinking, slow sinking, high fat or low fat, semi moist or dry, the size of the pellet need to be considered first. An extruder can make feed from 0.6 mm to 60 mm, thus selection of an extruder will depends upon the size of the pellet. All these factors will dictate what type of extruder you should select for making aqua feed.

6.50 AM Guide to Modern Aquatic Plant Design



Mr. Jonathan Iman, Corporate Project Services, USA

Jonathan Iman is an International Project Manager for Corporate Project Services (CPS). He partners with clients worldwide to provide support in engineering, food safety, design, and process improvement in aquatic, pet, and human food extrusion-based projects. Previously, Jonathan worked with Cargill, and SALT International, a nonprofit organization that built and operated soybean extrusion facilities in East Asia, Central Asia, and the Middle East. Jonathan currently lives with his family in the United Arab Emirates where is provides global customer service.

#### Abstract

Extrusion projects are not an easy task to undertake. Whether you are building a new factory or expanding your operation, proper planning is key to the success of a completed project. CPS will present a guide on important steps to consider during the conceptual stages of your project that will guide you to the overall success of your next project. Examples of the topics to be covered include financial feasibility of your project, layout influences, process flow, equipment selection, food safety and sanitation considerations, designing for prevention of contamination, and sustainability.





7.25 AM Pulverizing of Raw Material

#### 8.15 AM Making floating and sinking feed with twin-screw extrusion technology



#### Mr. Phil Erikson, Reynold Engineering, USA

Mr. Phil Ericksonis currently the International Application Engineer for Reynolds Engineering & Equipment, INC. Phil received his bachelor's degree from the University of Minnesota in Analytical Chemistry. Employedat Honeywell'ssensor and signal processing research and developmentcenterafter graduation. He has workedin the Bulk Dry Powder Processing industry for the last 30someyears focusing on ultra fine size reduction and classification of inorganic and organic materials.During hisyear in the industry he has been involved in production of shrimp and larval aqua feeds throughout the world. Working withmost major aqua feed facilities in the production of specialty feeds which require ultra fine input materials. In addition, he is well versed in the evolving developments and requirements associated with natural and organic production of foods and feeds.

#### Abstract

Size reduction requirements for most feed and food industries vary upon application, which in aqua feed is between macro and micro particles. The size of particles bound together in a pellet, whether pelleted or extruded, influence feed production in the plant and performance in an aquaenclosure. This discussion will reviewsize reduction equipment currently usedin agriculture and aquaculture applications. The discussion will also include the physical properties of particles, which are of interest in feedand food production, focusing on currentand upcomingissues associated with size reduction in aquaculture.





#### Hadrien Delemazure Clextral, France

Hadrien DELEMAZURE hold a Master degree of Food Engineering from AgroParisTech Massy. Over the last 10 years, he has worked for Clextral as a Process engineer on various application. Recently he has been promoted as market manager for pet food and fish feed processing to maintain and expand company growth and technology offer into that area.

#### Abstract

Making floating and sinking feed with twin-screw extrusion technology

Twin-screw extrusion has been extensively used to manufacture quality aqua pellets for the last 40 years.

While recipes are getting increasingly more complex and diversified, fish meal and fish oil are being replaced by cheaper alternative raw materials, which sources may vary according to international prices fluctuation. Furthermore, in order to produce both optimal floating and sinking feed, a precise control of the pellet expansion and density is necessary.

Aquafeed production lines are today expected to offer ever more process flexibility, reliability and durability that can be preferably achieved through twin-screw extrusion technology.



8.50 AM Optimization of Aqua Feed Quality



#### Nicola Tallarico, Kemin Europe

Nicola Tallarico graduated as an agriculture engineer at the University of Bologna in 1995 and completed the Ph.D in zootechnical science at University of Milan in 2001. In 2003, he joined Eurhema, an Italian company specialized in encapsulation technologies, as technical-sales manager. In 2010 Eurhema (nowadays named Kemin Cavriago) was included in the Kemin family and Nicola moved to Belgium as Technical Service Manager driving the allocation of the different encapsulated products to the relative Kemin's platform. After that, Nicola acts as Technical Service Manager and later as Product Manager, and his new tasks were to support Kemin SAFE platform, a Kemin program designed to guarantee the safety of feed controlling the microorganisms, mycotoxins and oxidation challenges. Nowadays Nicola is the Regional Director for the EMENA region of newly formed Kemin AquaScience Business Unit. In this new position, one main task of Nicola is to transfer Kemin knowledges to control previous mentioned challenges also to the aqua feed sector.

#### Abstract

With feed quality we identify a quite significant number of factors that impact mainly the physical properties of feed, their safety and nutritional properties. At the same time, feed quality is also linked with several external factors, some of which are the availability and quality of certain raw materials, implementation of Good Manufacturing Procedures at production facility, etc. Between this wide territory, in this talk we are going to focus specifically on how we can improve agua feed quality via the inclusion of specific feed additives, and more in detail we will focus our attention of fat matrix and moisture level. The first one because directly linked with the risk of oxidation, and the second one because linked with optimization of feed process and mould risk and microbial challenges. Final aqua feed and majority of raw materials used for their production, due to their substantial level of total fat and high ration of polyunsaturated fatty acids are very sensitive to oxidation process. Oxidation of feeds can negatively impact economy of feed producers, since primarily will impact feed quality with consequent possible increase of customers complain and/or feed re-call. Moreover, oxidation can have a direct effect on fish performances and state of health. Thus, a good knowledge of oxidation process and way to prevent/control via the application of a specific antioxidant program, remain a must for producing high feed quality. Moisture and related water activity control will be also presented, to define how this can be enhanced to optimize feed quality and production process, without compromising the biological challenges.



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TEXAS A&M. AQUA FEED





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Day	2 (March 11)
6.00 AM	<b>First Day Wrap up and announcement</b> Roger Gilbert, International Aqua Feed Magazine, UK and Dr. Mian Riaz, Texas A&M University, USA
6.15 AM	<b>Twin Screw Extrusion</b> Andritz, Peter Sønderskov Denmark
6.50 AM	<b>Evolution of Extrusion Technology</b> Spencer Lawson, Wenger Manufacturing, USA
7.25 AM	Common Aquafeed Drying Challenges and Practical Solutions for Improved Efficiencies James Laxton, Famsun, China
8.00 AM	Break
8.15 AM	Development of Sustainable and Nutritious Fish Feed Pellets using a Twin Screw Extruder Maria Gräfenhahn, Brabender, Germany
8.50 AM	What, When, Where, Why and How: A Proposition for Enzymes in Extruded Feed Dr Kabir Chowdhury, Jefo Nutrition Inc, Canada
9 25 AM	Q&A Session End of the session



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## Floating or sinking?

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## Day 2

6.15 AM Twin Screw Extrusion



#### Peter Sønderskov, Andritz, Denmark

Peter Sønderskov is the Industry Manager for Extrusion at Andritz Feed and Biofuel

He has worked in the extruded fish feed & Pet Food industry 12 years, mainly in salmon feed before joining Andritz in October 2018.

#### Abstract

As the recent changes in raw material demand and availability, the extrusion of "new" raw materials for dry fish feed and pet food products has challenged the traditonal way of producing quality products from premium raw materials.

To accommodate this challenge the development and use of twin screw technology has become more intense and in some region market like in Asia, startng to become the most preferred technology in especially fish feed extrusion.

Andritz is proud to launch our new twin screw family that meet the marked demands and will also ensure future production of quality aqua feeds.

In this seminar we will focus on features of twin screw extruder and in comparison with the single screw technology, challenge the development of the market and cover the latest inventions within extrusion.





#### 6.50 AM Evolution of Extrusion Technology



#### Spencer Lawson, Wenger Manufacturing, USA

Spencer has been with Wenger Mfg. for ten years. Spencer began his career with Wenger as a Service Technician where he would travel and perform new equipment commissioning or maintenance and repair of existing equipment. During this time, Spencer would also attend university short courses, large industry trade shows and other events giving technical lectures regarding extrusion and how it is valuable in pet, aquatic, human or livestock industries. Today Spencer is the RAS Process Director where he strives to further learn the role of extrusion in delivering a high-quality feed for aquatic species in RAS.

#### Abstract

Extrusion processing has been used for many years for products that countless people use daily. Family pets, livestock, humans and aquaculture, are all examples of who/what extrusion proves to be a valuable and flexible processing aid. From producing the most basic of feeds to complex, high quality formulations, aquatic feeds have evolved through the years, therefore it is necessary to expect the same for extrusion technology. Focusing on aquaculture, this presentation will go through some of the advancements extrusion has made since its beginning over a half century ago.



#### 7.25 AM

Common Aquafeed Drying Challenges and Practical Solutions for Improved Efficiencies



#### James Laxton, Famsun, China

Bachelor of Science Degree in Mechanical Engineering 16 years dedicated to Design of Industrial Dryers Experienced in Product Design, Field Commissioning and Drying Applications

#### Abstract

Every Aquafeed manufacturer faces operational challenges from time to time when producing high quality feed at maximum throughput and energy efficiency. Understanding the underlying cause of the problems faced during operation is a critical step in defining practical solutions to ensure reliable, high quality, efficient aquafeed production. These common variables will be discussed to help optimize your Drying performance and elevate your productivity.



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#### 8.15 AM

Development of Sustainable and Nutritious Fish Feed Pellets using a Twin Screw Extruder



#### Maria Gräfenhahn, Brabender, Germany

Maria Gräfenhahn received her diploma in chemical engineering (similar to M.Sc.) from the Karlsruhe Institute of Technology (KIT) in 2015. Afterwards she worked at the KIT for over 4 years as a research scientist in the field of extrusion of bio-polymeric materials. During this time, she worked on her Ph.D. thesis topic of functionalization of proteins via extrusion processing. Her defense has not yet taken place due to restrictions regarding the covid19 pandemic. In November 2020, Maria joined Brabender as the Head of Application Laboratory for food and feed. In her role as laboratory manager, she oversees all the application laboratory operations including rheological characterization of different food materials and extrusion processing of food and feed products, and supports R&D and sales department in all matters related to food & feed applications.

#### Abstract

Over the last decades, farmed fish has gained importance since conventional fishing can no longer meet the global demand for fish. Therefore, this market has grown exponentially, and with it, the demand of fish feed. Extrusion processing is often used for the production of fish feed pellets. The material mixture is mixed, heated, and sheared along the extruder due to the heated barrel and rotating screws. The combined thermal and mechanical stresses applied to the material, lead to its plasticization and cooking. Due to the temperature and pressure gradients between the melt and room conditions, the material can expand after it leaves the die and be pelletized with a rotating knife. Since protein-containing raw materials play an important role in achieving the most efficient growth possible, fish meal as a source of protein is a frequently used in the formulation for the production of fish feed. However, this has led to an additional demand for fish resulting in a significant increase on the price of fishmeal. Therefore, the usage of fishmeal in fish feed formulations is costly and not sustainable. Consequently, efforts are being made to find alternative sources of protein to replace fishmeal, at least partially. A promising and more sustainable approach is the usage of insects as an alternative to fishmeal, since they can also be rich in protein and already serve as food for many fish in nature. However, up to now, research on how substitution of fishmeal with e.g., protein powder obtained from an insect source influences the extrusion process and feed pellets properties, has been sparse.

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8.50 AM What, When, Where, Why and How: A Proposition for Enzymes in Extruded Feed



Dr Kabir Chowdhury, Jefo Nutrition Inc, Canada With broad knowledge in aquaculture production management and nutrition, Kabir's academic and research excellence are reflected in numerous scientific communications published in various outlets. He has been acting as external reviewer for several leading aquaculture journals and co-authored a book on environmental assessment guidelines for coastal aquaculture. He received his PhD in Animal Nutrition from the UG/OMNR Fish Nutrition Research Laboratory (FNRL) of the University of Guelph, Ontario, Canada. His MSc. was in Aquaculture and Aquatic Resource Management from the Asian Institute of Technology, Bangkok, Thailand. Among his works, one of the notables is a bioenergetics based feed requirement and waste output model for commercially farmed tilapia.

His expertise covers evaluation of novel plant proteins and the effects of anti-nutrients and fibers on nutrient utilization by fish. He has also developed protocols for the assessment of pellet quality, and actively participated in the Ingredient Characterization Working Group (ICWG) at the FNRL.

As Director Sales - South Asia of Jefo Nutrition Inc., a global leader in non-medicated feed additive solutions, he manages Jefo's South Asian business. At the same time, he also provides technical support to Australasian (China, ME, South Asia, SEA and Australia) aquaculture partners.

#### Abstract

The volatility in supply, price and quality of common protein sources used in aquafeed has prompted the use of dietary enzymes including protease by nutritionists and formulators worldwide. However, poor-stability of any enzymes during the harsh manufacturing process of extruded aquafeed may have hindered their use and prompted several solutions such as coated enzymes or liquid enzymes for post-pelleting application. Here, we shall discuss the advantages and disadvantages of various such solutions proposed for dietary protease by reviewing peerreviewed published literatures available in the scientific domains.





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