These courses, run annually since 2018, are presented by Australian company FoodStream in conjunction with the University of Applied Sciences & Arts Western Switzerland Valais (HES-SO Valais). Foodstream has been presenting extrusion training in countries including Australia, Thailand, Norway, Chile & New Zealand for over twenty years.

**› Due to ongoing Covid-19 travel restrictions, these courses will be presented online only in Central European Time Zone (CET). Please also note, courses will be presented in English.**

# Food Extrusion Technology

28 - 30 JUNE, 2021 (ONLINE)

## Overview

Being independent of all extruder suppliers, we offer unbiased training based on the science and engineering of extrusion. This 3-day course covers the principles of extrusion, the design of extrusion processes for human foods, as well as how the formulation interacts with the extrusion process. Principles learned will be demonstrated via streamed videos using the extruder in the Hes-So Valais pilot plant.

The program provides a good background in general extrusion technology, but is specifically directed at extrusion of human foods. The course is relevant to both single and twin screw extrusion technology, and all types of extruded foods - breakfast cereals, snacks, texturised proteins, pasta, etc.

The course will cover topics from the basics of extruders and their configuration, through what is happening chemically and physically inside the extruder barrel, to an understanding of extruder dies and extruder instability.

## Course Content

**Topics covered include -**

› Principles of extruder configurations (single and twin screw)

› Role of rheology in extrusion

› Die types and effects - die design

› Extrusion chemistry - recipe design

› Preconditioning for extrusion

› Product density control

› Causes and effects of extruder instability

› Screw, barrel, and die-plate wear

› Extrusion troubleshooting

Examples in product formulation and the design of extrusion processes will be included to demonstrate application of the theory. Principles learned will be applied during the practical demonstration on Day 2 (via streamed video). Important aspects of peripheral systems (eg raw materials pre-processing, preconditioning) are also covered.

## Course Sponsors

Day 1 Sponsored by CLEXTRAL

Day 2 Sponsored by CFAM

# Extrusion Scale-up & Process Transfer

1 - 2 JULY, 2021 (ONLINE)

## Overview

This course in Extrusion Scale-Up and Process Transfer builds on information presented in our 3 day extrusion courses. It covers techniques to scale-up an extrusion process - eg from pilot scale to production scale - or to transfer a process from one type of extruder to another. The extruders may be either the same or different makes of extruder.

Following a brief review of extrusion theory, the program discusses methods to quantify both material rheology and the extrusion process. This is then used as a basis for a planned approach to scale-up and/or process transfer. Analysis and scale-up of extrusion dies are covered as separate topics. Worked examples - taken from actual industrial scale-up experience - are used to demonstrate the methods.

The aim is to provide participants with a science-based approach to scale-up and process transfer, but which applies to real industrial processes. The limitations inherent in scaling the process is also discussed, along with how small-scale trials should be planned so that processes are more scalable.

***Note** - This is an advanced program, and considerable prior knowledge of participants is assumed - we recommend that participants should have previously attended one of our three-day extrusion courses as essential background to this more advanced program. Participants should also expect significant mathematics in the methods presented for scale-up and process transfer.*

# HMEC (Extrusion of Plant-Based Meats)

5 - 6 JULY, 2021 (ONLINE)

## Overview

High Moisture Extrusion Cooking (HMEC) is used to process functional protein ingredients into meat-like textures - that is, used to make “Meat Analogues”. It is a specialised application of extrusion technology. While not, in itself, a “new” process, it is only recently that it has started to become more widely used commercially, at a time when the vegetarian and vegan markets are expanding rapidly, and there is increasing concern over the environmental sustainability of continued widespread consumption of animal products.

The program starts by introducing extrusion technology in general, but moves quickly to consideration of the ingredients used for HMEC. Explanation of the protein reactions required to cause texturisation alternates with presentation of the conditions required in the extruder and how to achieve those conditions.

In HMEC, the design of the die is critical in firstly achieving texturisation, and secondly in controlling the type of texture produced. What is happening in the die, and the design of long cooled texturisation dies, is discussed.

To demonstrate the theory, two practical demonstrations are planned via streamed videos - a demonstration of basic HMEC technology, and one showing how variations in the ingredients and processing can be used to modify and control the texture.

## Course Sponsors

Day 1 Sponsored by CLEXTRAL

Day 2 Sponsored by CFAM

# Switzerland Course Details

JUNE/ JULY 2021 (ONLINE)

## Course Venue

Streamed online in Central European Time Zone (CET).

Due to continuing Covid-19 travel restrictions these courses, usually held at the Institute of Life Technologies, are being presented online only. A link to join the presentations will be provided shortly before course commencement.

Programs scheduled to run 08:15 - 16:45 (CET).

## Registration Fees

**Food Extrusion Technology**
**€1320 per person** (approx. CHF1470, GBP1140, USD1580)

**Extrusion Scale-up & Process Transfer**
**€930 per person** (approx. CHF1035, GBP800, USD1110)

**HMEC (Extrusion of Plant-Based Meats)**
**€930 per person** (approx. CHF1035, GBP800, USD1110)

Registration fees are set in Euro and will vary when converted to other currencies according to fluctuations in exchange rates.

A **10% discount** applies for registrations received by **7 May 2021**.

An **additional 10% discount** applies for those attending multiple courses.

An **additional 5% discount** applies for 3 or more course registrations received together from the same company.

**Discounted fees apply for PhD students and non-profit research organisations - see course webpages for details.**

Registration fee includes handout notes directly related to the presentations.

**REGISTRATIONS CLOSE 21 JUNE 2021**

Register online via course webpages, or send participant details (name, company, address, email, ph) to training@fie.com.au

## Course Enquiries

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**FoodStream Pty Ltd** is a private R&D company offering a complete range of technical consulting services to the processing industry, including a range of specialist training courses. Due to its unique business structure, FoodStream is able to deliver innovative, flexible solutions to the needs of processors.

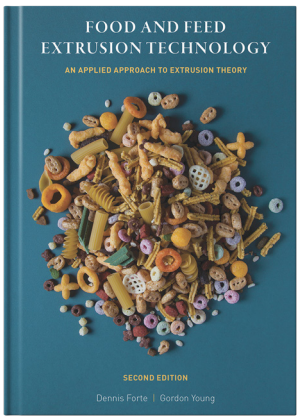
Details of services offered by FoodStream are available through our website at foodstream.com.au

**The Institute of Life Technologies at the University of Applied Sciences and Arts Western Switzerland Valais (HES-SO Valais)** offers applied research & development. Projects are carried out by research groups of principal investigators and senior research associates. The combination of complementary scientific skills and industry experience generates unique synergies and new possibilities. HES-SO Valais has extensive pilot plant facilities including a twin-screw extruder.

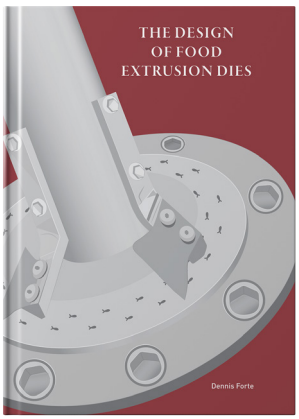
## Course Presenters

The main presenter is Mr Dennis Forte, a chemical engineer with extensive experience in extrusion processing and die design, including breakfast cereals, extruded snacks, pasta, and confectionery. Dennis has worked with a wide variety of companies using extrusion technology.

Mr Gordon Young is a food process engineer who has worked in extrusion technology in both University research and with private companies. He is also experienced in a wide range of other food processing technologies, including specific expertise in drying technology and thermal processing.








## Books Published by the Course Presenters

Available to course participants at 20% discount to list price.

Or order online from **fie.com.au/books** or major booksellers.

Access course webpages via fie.com.au/events