

Food Extrusion Technology

DIRECTED BY

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ACCREDITED
COURSE

Course Topics Include:

- Single and Twin Extruders Design and Operation Analysis
- Food Ingredients, Selection, Preparation and Conditioning

about the course

Food extrusion has become a very important processing operation. Today, the food extruder is used to produce pasta and other cold formed products, ready-to-eat cereals, snacks, pet food, aquatic feeds, confectionery products, modified starches for soup, infant food, and instant foods, beverage bases, and texturized vegetable proteins. This course is designed to provide a thorough background in extrusion principles and practice. Details of both single and twin screw extrusion of foods will be covered. Emphasis will be placed on describing the basic scientific and process engineering principles of extrusion operation in a simple, clear, and concise approach that enables good understanding of the extrusion process.

This fundamental approach will lead directly to the discussion of the control and operation of extruders to optimize production and product quality.

The chemical nature and modifications of food components making up the ingredients commonly used in extrusion operations will be described. Combined with a better understanding of extrusion principles, the course should lead to better understood, controlled, and optimized extrusion operations.

who should attend

This course is designed to explain the fundamentals of food extrusion and illustrate the application to food processing operations. The program will be of particular value to:

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- Food scientists, technologists, technicians and engineers working in R&D and operations involved with food extruders
 - Individuals employed by cereal, snack, pet food, confectionery, modified starches and proteins manufacturers
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The course will also appeal to professionals working in allied industries, equipment manufacturers and ingredient suppliers involved with food extrusion.

learning objectives

Upon completion of this course, you will be able to:

- Describe the overall process operation of screw extruders used in the food industry
- Compare the design principles of single and twin screw extruders
- Explain the parameters and variables affecting extruder performance and product properties, preconditioning of raw materials, process control and troubleshooting, scale-up and food and feed product applications using screw extruders

course outline

Review of Learning Objectives

Single Screw Extruders:

- Introduction to Extrusion and Single Screw extruders including Screw design, operating characteristics and parameters; High shear cooking and low shear forming extruders

Twin Screw Extruders:

- Design criteria for co-rotating twin screw extruders; Barrel and screw design; screw configurations, comparisons between manufacturers

Raw materials for Extrusion:

- Review of the characteristics, interactions and impact of raw materials utilized in food and feed extrusion and their components including starch, proteins, fats and other minor ingredients

Preconditioning:

- Design and operation of effective preconditioning of raw materials prior to extrusion and impact on the extrusion process

Extruder Dies and Cutters:

- Design and selection of extruder dies and cutters to accomplish product shaping and process control

Operation and Control Principles of Food Extruders:

- Influence of material properties; Extruder design and operating conditions on the extruder performance and product properties

Development of Product Functional Properties:

- Influence of extruder design and operating conditions on product expansion, texture, and other functional properties

Petfood and Feed Applications Review:

- Extrusion processing of pet foods, aquatic feeds, and other animal feed related applications.

Food and Industrial Applications Review:

- Extrusion processing of breakfast cereals, snacks, breads, infant foods, and other food and industrial related applications

Post Extrusion Processing:

- Drying, and coating and down-stream processing of extruded products.

Scale-Up of Food Extruders:

- Determination of process limitations; Scale-up methods and alternative adjustments for large scale operation

Assessment Opportunity

**course
instructor**

Dr. Brad Strahm is a Principal with The XIM Group, LLC, a firm providing consulting services in the area of product development, process engineering, equipment engineering, and project management located in Sabetha, KS. Dr. Strahm holds degrees in Agricultural Engineering from Kansas State University and Business Administration from Kennedy-Western University.

Dr. Strahm had 12 years of experience participating in extrusion, drying, and laboratory research and sales support with Wenger Manufacturing before founding The XIM Group in 2005. His unique blend of experience and expertise in food chemistry, process engineering, and equipment engineering lends itself to a robust understanding and ability to communicate about all aspects of extrusion. He has written and contributed to numerous technical papers, magazine articles, and book chapters related to extrusion, food polymer science and other areas of food and feed processing and is an accomplished lecturer at a number of extrusion-related short courses for the food and feed processing industries.

Accreditations**International Accreditors for Continuing Education and Training (IACET)**

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