

## Registration Information

- \$1,400 Early-bird Registration Fee (U.S.) by June 14, 2024
- \$1,500 Regular Registration Fee (U.S.)

For course registration, please go to the IGP website ([www.grains.ksu.edu/igp](http://www.grains.ksu.edu/igp)) and under "Upcoming Courses" click on the "IGP-KSU Extrusion Processing" link.

Hotel rooms and meals other than those mentioned in the course outline are not included in the registration fee.



## Hotel Information

### Holiday Inn at the Campus

1641 Anderson Avenue, Manhattan, KS  
Phone: 785-539-7531

Single/Double Room: \$99.95 + tax  
Breakfast included

A block of rooms has been reserved at the Holiday Inn at the Campus at a special rate until July 12, 2024.

Reserve room directly with the hotel. It is important to mention group code EXT and the IGP Extrusion Course to obtain the special rate. [www.holidayinn.com/universityks](http://www.holidayinn.com/universityks)

## Discounts and For-Credit Enrollment

If two or more people from the same organization enroll, each is entitled to a 10% discount. College students will receive a 20% discount on providing written endorsement of student status from a professor in their department. Students have the option of receiving two KSU Global Campus credits. Tuition and Global Campus charges will apply in that case, in addition to the course fee. For more details on registration for Global Campus credits, contact Dr. Sajid Alavi [salavi@ksu.edu](mailto:salavi@ksu.edu).

## Questions or Special Needs

Please contact one of the following if you have a special dietary need or are physically limited:

IGP, [igp@ksu.edu](mailto:igp@ksu.edu)

Phone: 785-532-4070/Fax: 785-532-6080

or

Sajid Alavi, Course Instructor, [salavi@ksu.edu](mailto:salavi@ksu.edu)

Dept. of Grain Science and Industry

Phone: 785-410-9051

[www.grains.ksu.edu/extrusion](http://www.grains.ksu.edu/extrusion)

## Who Should Attend

Technical and managerial personnel in the food, pet food, and feed industries and ingredient companies desiring training in fundamentals and operations; entrepreneurs who want to set up an extrusion-based business and would like to develop a business plan; and researchers interested in learning the latest trends in extrusion processing. The course is tailored for U.S. and international participants, and presents an excellent opportunity to develop contacts with experts and industry professionals from all over the world.

## Comments from Past Participants

*"Every aspect was informative and some sections gave in-depth knowledge on application/processing... I have several suggestions/recommendations to take back to my company."*

*"This short course was really wonderful. Please tell me every time whenever these type of courses (are) held. I'll be grateful to join them."*

*"Awesome! Real world case studies (in the business planning session) are great. This separates this extrusion course from any other I have attended. Perfect!"*

*"I had fun and learned a lot (at the hands-on sessions). I was able to adjust fat, BPV (back pressure valve), and RPM (screw speed)."*

*"Good hands-on experience with the extruders."*

*"An excellent course. I would love to recommend (this to) anyone... for an enrichment of fundamentals (of extrusion)."*

*"Very good high level overview (of ingredient functionality)."*

*"Good examples and practical problems (covered under troubleshooting)."*



**IGP Institute**

## Extrusion Processing: Technology and Commercialization

Special 1-Day  
focus on Plant-  
based Meat



**August 13-16, 2024**

IGP Institute Conference Center  
Dept. of Grain Science and Industry  
Kansas State University  
Manhattan, Kansas USA

**Optional Supplement:  
Pet Food Workshop**

August 12, 2024

**KANSAS STATE  
UNIVERSITY**



## Course Description

This course will cover topics including:

- principles of extrusion processing
- raw material selection
- equipment and control systems
- post-processing operations
- extruded products (including breakfast cereal, snacks, textured soy protein, pet food, and feed for poultry, animal and aquatic species)
- business planning and commercialization
- lab sessions and hands-on experience with pilot-scale extrusion equipment

This is the 15th year this course is being offered. More than 300 industry participants from 30 countries representing 6 continents have attended the KSU extrusion processing course. For more information and pictures from past courses please visit the course registration site and click on the link 'Previous Course Information'. The course is jointly organized by the departments of grain science and agricultural economics at KSU, with active support by industry partners. The Kansas State Extrusion Lab has a strong emphasis on service, research and teaching and is primarily housed in the Bioprocessing and Industrial Value-Added Program building. It has a variety of facilities including lab-scale and pilot-scale twin and single screw extruders, and a pilot-scale gas-fired dryer.

## Learn the Basics of Extrusion and Business Aspects

Extrusion processing of food and feed products is a multibillion dollar industry in the U.S. and Europe. This course will cover the state-of-the-art technology including different types of extruders, dryers and control systems. The processing of various food, pet food and feed products will be described. Participants will be exposed to sensory evaluation of foods, a critical step in the product development process, through a special hands-on lab session. The intricacies of setting up an extrusion-based business will be addressed including capital decision making and strategic planning. Case studies will be conducted with emphasis on both U.S. and developing world markets.

### Speakers

**Martin Talavera**, Assistant Professor  
Sensory Analysis Center, KSU

**Sajid Alavi**, Professor  
Grain Science and Industry, KSU

**Vincent Amanor-Boadu**, Professor  
Agricultural Economics, KSU

**Topher Dohl**, Research Coordinator  
Wenger Manufacturing, Inc., Sabetha, KS

**Keith Erdley**, Drying Technical Service  
Wenger Manufacturing, Inc., Sabetha, KS

**Eric Maichel**, Extrusion Lab Manager  
Grain Science and Industry, KSU

**Brian Plattner**, Director, Process Technology  
Wenger Manufacturing, Inc., Sabetha, KS

**Brad Strahm**, Principal  
The XIM Group, LLC, Sabetha, KS

**Note:** A significant feature of the IGP-KSU Extrusion Course is a hands-on session on the science and practice of sensory evaluation and consumer acceptance studies for new products.

## Course Outline

### Day 1 – August 13 (Tuesday)

- 7:30 am Registration/Continental Breakfast
- 7:45 am Opening Remarks and Course Overview
- 8:00 am Ingredient Functionality
- 9:00 am Extrusion Hardware and Design
- 10:00 am Break
- 10:15 am Extrusion Operation and Process Variables
- 11:15 am Extrusion Applications – Food
- 12:15 pm Group Luncheon
- 1:15 pm Extrusion Applications - Feed and Petfood
- 2:30 pm Hands-on Session on Pilot-Scale Extruders
- 6:00 pm Banquet at Holiday Inn at the Campus

### Day 2 – August 14 (Wednesday)

- 8:00 am Continental Breakfast
- 8:30 am Business Plan: Capital Decision Making
- 9:30 am Business Plan: Strategic Planning
- 10:30 am Break
- 10:45 am Business Plan: Case Study and Active Interaction
- 11:30 am Principles of Die Design
- 12:30 pm Group Luncheon
- 1:30 pm Extrusion Troubleshooting
- 2:30 pm Hands-on Session on Pilot-Scale Extruders

### Day 3 – August 15 (Thursday)

- 8:00 am Continental Breakfast
- 8:30 am Plant-based Meat -Raw Materials
- 9:30 am Plant-based Meat -Applications
- 10:30 am Break
- 10:45 am Instrumental/ Analytical Techniques to Troubleshooting
- 12:00 pm Group Luncheon
- 1:00 pm Plant-Based Meat Applications Hands-on Session on Pilot-Scale Extruders (KSU Extrusion Lab)
- 3:30 pm Lab Discussion

### Day 4 – August 16 (Friday)

- 7:30 am Continental Breakfast
- 8:00 am Sensory Aspects of Extrusion Products - I
- 9:30 am Break
- 9:50 am Sensory Aspects of Extrusion Products – II
- 10:30 am Drying and Toasting
- 11:30 am Q&A Session
- 12:30 pm Group Luncheon and Certificate Distribution

## Optional Supplement

### Pet Food Workshop August 12, 2024

Register for an optional supplemental one-day Pet Food Workshop on August 12, 2024. This workshop can be attended as a stand-alone participation or together with the Extrusion Processing: Technology and Commercialization Course.

The Pet Food Workshop will consist of industry experts and academic speakers from the area of pet nutrition and processing, and will provide latest information on pet food ingredient trends, nutritional requirements for dogs and cats, specialty treats, sensory evaluation/palatability tests and safety/HACCP issues. It will also include a “capstone lab session” involving formulation exercises for pet food recipes.

### Registration Information

*(Only for Optional Supplement:  
Pet Food Workshop)*

\* \$375 Early-bird Registration Fee (U.S.)  
by June 14, 2024

\* \$425 Regular Registration Fee (U.S.)

No registration discounts other than the “Early-bird” discount applicable for the Optional Supplement. To register for the Pet Food Workshop on August 12, visit the IGP website ([www.grains.ksu.edu/igp](http://www.grains.ksu.edu/igp)) and under “Upcoming Courses” click on the “IGP-KSU Pet Food” link. For more details on this Supplemental Pet Food Workshop, please contact Dr. Sajid Alavi ([salavi@ksu.edu](mailto:salavi@ksu.edu)).