

# IGP-KSU Practical Flour and Dough Testing

IGP Institute / Kansas State University

August 5 - 9, 2024

Course Agenda

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## Day 1 - Monday

8:00 Depart hotel for KSU Waters Hall Annex (IGP shuttle)

**Welcome and Introductions:** *Dogan*

- IGP Overview and Offerings
- Overview of Flour and Dough Testing and Course Outline

**Understanding U.S. Wheat Classes and Basic Grades** – *Dogan*

- Define the six classes of U.S. wheat and uses

Break

**Introduction to Flour Composition** – *Karkle*

- Review the basic components of wheat flour: starch, gluten proteins, arabinoxylans.

**NIR Moisture, Ash, and Protein** – *Karkle*

- Discuss the scientific principles used in NIR measurement of moisture, ash, and protein.
- Discuss the definition and importance of moisture basis.

12:00 Lunch (Shellenberger 204)

**Introduction to Lab Milling and Grinding Methods** – *Dogan / Blodgett*

- Overview of lab milling machines and uses.
- Understanding of particle size distribution.

**Quadrumat Junior** – *Dogan / Blodgett*

- Overview of machine principles and grinding operations
- Milling wheat samples

**Quadrumat Senior** – *Dogan / Blodgett*

- Overview of machine principles and grinding operations
- Milling wheat samples

**Buhler MLU** – *Dogan / Blodgett*

- Overview of machine principles and grinding operations
- Milling wheat samples

**Chopin Lab Mill** – *Dogan / Blodgett*

- Overview of machine principles and grinding operations
- Milling wheat samples

Depart for hotel / Goolsby's (IGP shuttle)

5:00 IGP sponsored social hour and dinner (drinks and appetizers provided)

- Goolsby's, 1212 Bluemont Ave

Adjourn as needed

## Day 2 - Tuesday

8:00 Depart hotel for KSU Waters Hall Annex (IGP shuttle)

**pH & TTA** – *Karkle*

- Recognize the difference between pH and TTA measurements
- Explain how to conduct pH & TTA testing

**Flour Color** – *Karkle*

- Explain which flour components contribute to color
- Discuss why measurement of flour color is important
- Describe the methods to measure flour color

Break

10:00 **Oven Moisture and Ash** – *Pezzali*

- Explain how oven moisture and ash tests are conducted.
- Measure moisture of flour

**LECO Protein** – *Pezzali*

- Discover the combustion method to measure protein.

12:00 Lunch (Shellenberger 204)

**Hand Gluten Washing** - *Clanton*

- Isolate gluten from several types of flour and use the information in conjunction with other analyses during the course to consider flour applications

**Glutomatic** – *Clanton*

- Evaluate the mechanized version of gluten washing

**GlutoPeak** – *Dogan / Clanton*

4:00 **Tour of Kansas Wheat Innovation Center** – *Gilpin*

5:00 Adjourn and depart for hotel (IGP shuttle)

**Day 3 - Wednesday**

8:00 Depart hotel for KSU Waters Hall Annex (IGP shuttle)

**Alpha-Amylase Determination** – *Karkle*

- Identify what alpha-amylase is and its role in baking
- Discover the scientific principles used in alpha-amylase measurement

**Falling Number** – *Karkle*

- Demonstrate and compare methods of alpha-amylase testing.
- Discover physical and chemical changes that occur when starch gelatinizes and then retrogrades.

**RVA** - *Dogan*

- Demonstrate and compare methods of alpha-amylase testing.
- Observe use of RVA to measure starch cooking and pasting behavior.

**Damaged Starch** - *Dogan*

- Identify how starch is damaged and its role in baking
- Explain the scientific principles used in damage starch measurement
- Test damaged starch and interpret test results using the SD Matic

12:00 Lunch (Shellenberger 204)

**SRC Manual Method** - *Dogan*

- Identify impact of flour components on water holding capacity
- Discover the scientific principles used in SRC measurement

**Mixolab** - *Dogan*

- Explain the measurements obtained from mixolab.

- Observe and describe how the mixolab test differs from other recording dough mixers

5:00 Adjourn and depart for hotel (IGP shuttle)

#### **Day 4 - Thursday**

8:00 Depart hotel for KSU Waters Hall Annex (IGP shuttle)

##### **Dough Lab – Dogan**

- Test flour samples, interpret the data from dough lab and discuss applications.

##### **Farinograph - Dogan**

- Test flour samples, interpret the data from farinographs and discuss applications

12:00 Lunch (Shellenberger 204)

##### **AlveoLAB – Karkle**

- Explain the scientific principles of the alveograph test
- Explore how the alveograph test is conducted

##### **Review Testing Data from Prior Days – Karkle**

5:00 Adjourn and depart for hotel (IGP shuttle)

#### **Day 5 - Friday**

8:00 Depart hotel for Shellenberger Baking Lab (IGP shuttle)

##### **Test Baking Methods and Applications – Karkle / Clanton**

- Conduct sponge and dough and straight dough bread test baking methods.

12:00 Lunch (Shellenberger 204)

##### **Test Baking Continued - Karkle / Clanton**

- Make sugar snap cookie and layer cakes with test baking methods for soft wheat flours.
- Evaluate breads, cakes, and cookies made during the test baking process.
- Perform volume, Ccell measurement, and texture on produced samples.

##### **Course Review and Wrap-Up – Dogan / Karkle / Clanton**

##### **Course Evaluations & Presentation of Certificates – Dogan / Karkle / Clanton**

5:00 Adjourn and depart for hotel (IGP shuttle)

## **Course Instructors**

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