

January 2023

## Department Newsletter

### **Now Hiring!**

Come join us in the Department of Grain Science and Industry.

#### **Feed Mill Manager**

<https://careers.k-state.edu/cw/en-us/job/514028/oh-kruse-feed-mill-manager>

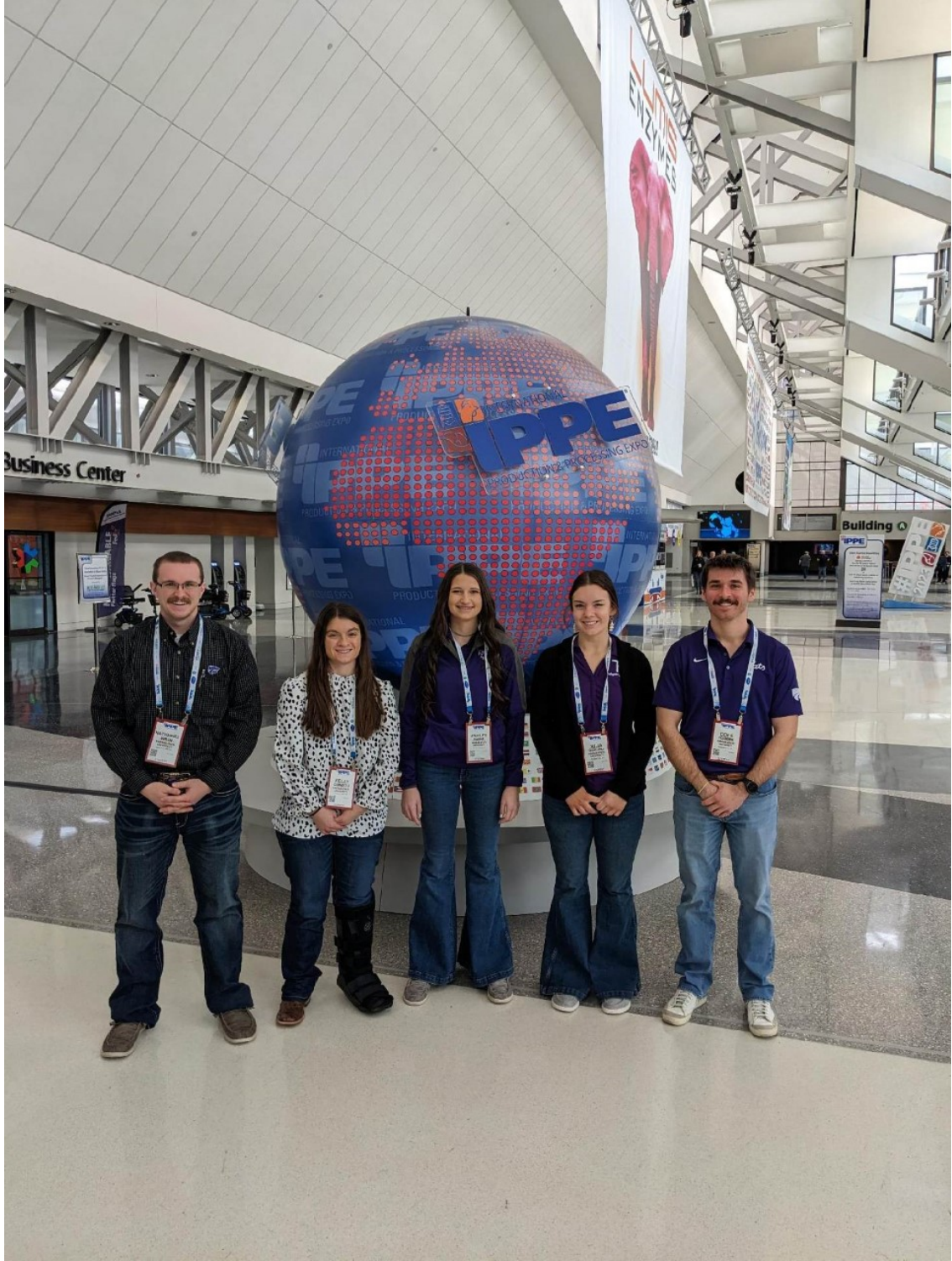
#### **IGP Institute Academic Program Specialist**

<https://careers.k-state.edu/cw/en-us/job/513027/academic-program-specialist>

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### **Feed Students Attend IPPE**

Members of the Feed Science Club attended IPPE – International Production & Processing Expo in Atlanta, Georgia, during the last week of January.









*Congratulations to Garrett Friesen, senior in Feed Science, for winning the Undergraduate Research Oral Presentation Competition at IPSF/IPPE.*

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### **Yonghui Li Named Associate Editor of Two Publications**

Yonghui Li has been invited and appointed as an Associate Editor for both the Journal of Food Science and Cereal Chemistry. This is a significant accomplishment and a recognition of Li's expertise and contributions to the field of cereal and food science. As an associate editor, Li will not only have the opportunity to shape the quality of the journals but also provide valuable insights and feedback to



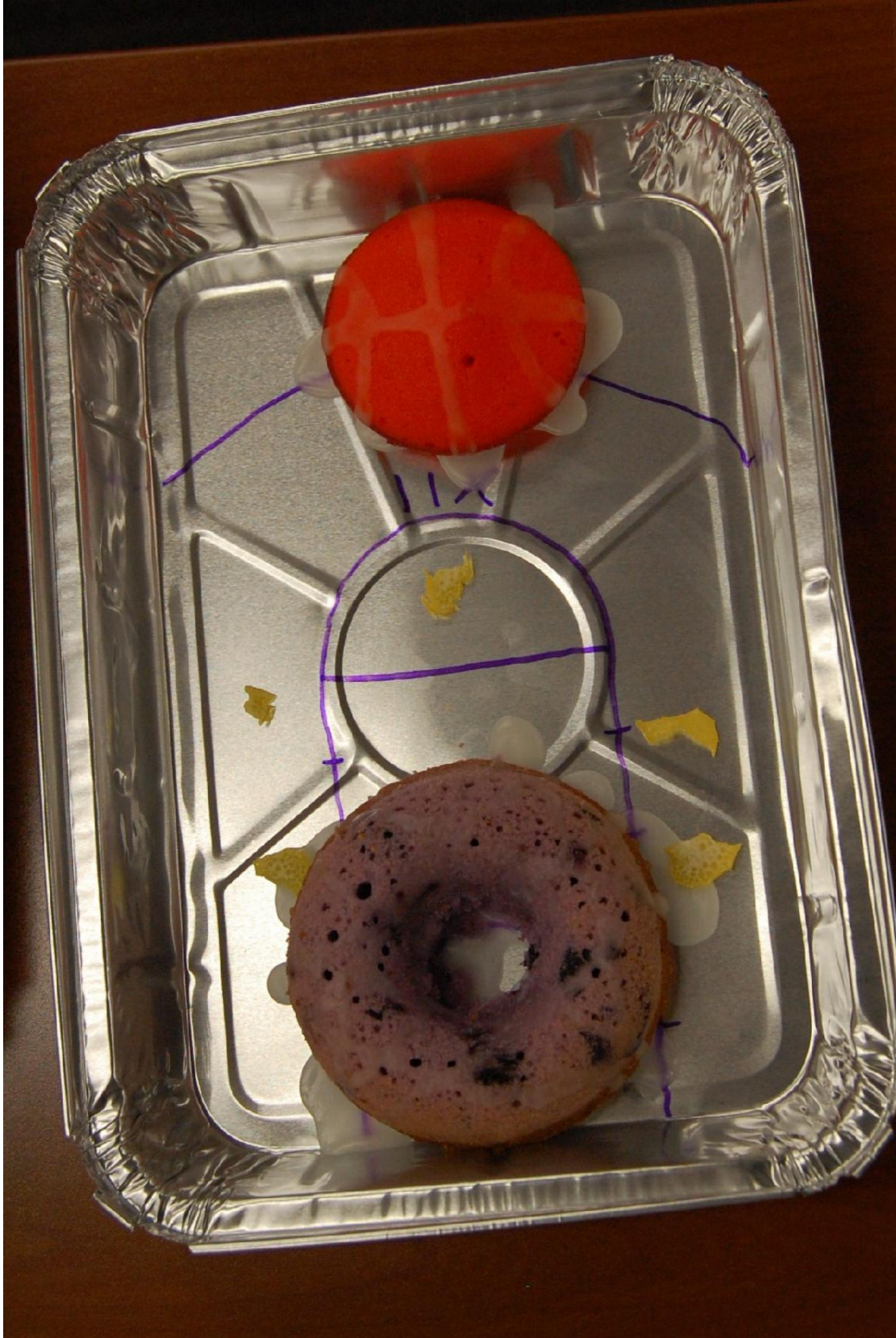
authors. This prestigious appointment is a testament to Li's commitment to advancing the field and making a meaningful contribution to the scientific community.



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### **Annual Baked Competition Returns**

For their January meeting the Bakery Science Club hosted their annual Baked competition. Four teams competed to make a baked treat using one of the following ingredients: Tang, lemons, frozen blueberries, and sourpatch kids candy. Each team had 90 minutes to mix, bake, and plate their creation. The entries were judged by a panel of students and a company visitor from Bakerly, who talked about their company to the group. The winning team was Jessie McClellan, Hiba Rasheed, Grace Walenta, and Mary Kate. They made a blueberry doughnut and a tangy cookie with a creative display.



*The winning entry.*





The winning team of Jessie McClellan, Hiba Rasheed, Grace Walenta, and Mary Kate.

### Evaluation of wheat kernel and flour quality as influenced by chlorine dioxide gas treatment

Rania Marie Buenavista<sup>1</sup>, Xinyi E<sup>2</sup>, Bhadriraju Subramanyam<sup>1</sup>, Jared Lou Rivera<sup>1</sup>, Mark Casada<sup>3</sup>, Kaliramesh Siliveru<sup>4</sup>  
<sup>1</sup>Department of Grain Science and Industry, Kansas State University, Manhattan, KS, USA; <sup>2</sup>PureLine, Bensenville, IL, USA; <sup>3</sup>USDA-ARS, Center for Grain and Animal Health Research, Manhattan, KS, USA

#### BACKGROUND

- Insect infestation negatively affects both quantity and quality of wheat supply.
- Various insect species develop increasing resistance to commonly used fumigant – phosphine.
- Chlorine dioxide (ClO<sub>2</sub>) gas is a potential alternative fumigant that can kill various stored-product insect species.
- Although high insect mortality can be achieved, ClO<sub>2</sub> gas application still needs to be evaluated in terms of wheat end-product quality.

#### OBJECTIVE

- To evaluate the effect of ClO<sub>2</sub> gas treatment on wheat kernel and flour quality

#### METHODS

- Fumigation
- Wheat Kernel Germination Test
- Milling
- Flour Quality Assessment

- ClO<sub>2</sub> gas concentrations: 0, 200, 300, 400, 500 ppm
- Fumigation conducted for 24 h in gas-tight bucket assembly half-filled with hard red spring wheat (68.8% wet basis)
- Each vial contains 10 g hard red spring wheat and 20 live lesser grain borer (*Pyrausta nivalis*) adults
- Mortality and adult progeny production assessment were performed at 5 days and at 30 days after treatment, respectively. Insects were held at 25°C and 65% RH.
- Germination rate was determined through filter-paper method.
- Flour quality was assessed in terms of microbial dough behavior, color, pH, germination rate, falling number, and starch damage.
- Statistical Analysis: Analysis of Variance (Statistical Analysis Software 9.3); Tukey's Honestly Significant Difference (p < 0.05)

#### RESULTS

Treatment	Mortality (%)			Number of Adult Progeny (% reduction relative to control treatment)		
	Top	Middle	Bottom	Top	Middle	Bottom
Control				96.67 ± 8.52 <sup>a</sup>		
200 ppm	71.7 ± 5.8 <sup>b</sup>	61.7 ± 2.9 <sup>b</sup>	90.0 ± 0.0 <sup>b</sup>	37.7 ± 17.8 <sup>b</sup>	50.6 ± 33.1 <sup>b</sup>	48.7 ± 12.2 <sup>b</sup>
300 ppm	91.7 ± 7.0 <sup>c</sup>	66.7 ± 2.9	95.0 ± 5.0 <sup>b</sup>	2.7 ± 1.2 <sup>c</sup>	17.4 ± 2.9 <sup>c</sup>	3.0 ± 1.0 <sup>c</sup>
400 ppm	100 ± 0.0 <sup>d</sup>	66.7 ± 5.8	100 ± 0.0 <sup>b</sup>	27.1 ± 2.0 <sup>c</sup>	23.9 ± 2.1 <sup>c</sup>	37.9 ± 4.0 <sup>c</sup>
500 ppm	100 ± 0.0 <sup>d</sup>	100 ± 0.0 <sup>d</sup>	100 ± 0.0 <sup>b</sup>	3.3 ± 1.5 <sup>c</sup>	13.4 ± 1.2 <sup>c</sup>	11.6 ± 1.0 <sup>c</sup>
F	23.39	2.83	11.00	62.91 <sup>*</sup>	22.05	107.70 <sup>*</sup>
P	0.0003	0.1962	0.0033	<0.0001	<0.0001	<0.0001

#### CONCLUSION

- Exposure to ClO<sub>2</sub> gas at 500 ppm killed 100% adults of lesser grain borers.
- ClO<sub>2</sub> gas treatments (300-500 ppm) decreased wheat kernel germination rate by 37%.
- ClO<sub>2</sub> gas treatments did not negatively affect wheat flour quality in terms of milling yield and flour functionality.
- ClO<sub>2</sub> gas treatment (300-500 ppm) increased lightness of straight-graded wheat flour.

## Buenavista Wins Best Poster Award

Kudos to Rania Buenavista who won the best poster/paper award at the ICFOST Conference in India this week. A total of 317 posters were presented with hers earning the Best Paper Award.

Rania is a Ph.D. student in Grain Science. Her major professor is Kali Siliveru.

## Bakery Science Students Visit Industry Locations

During the January intersession, the Practicum in Bakery Technology class visited two



bakeries and one ingredient company in Kansas City. On January 12, they toured Farm to Market Bread Company and Tippins Pies. The group also spent the afternoon in Corbion Ingredient's Innovation lab observing demonstrations of a continuous mixer for cakes and a tortilla press. The following day, several BSM alumni from IFF/Danisco came to campus to present about their ingredient solutions.







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## Our Mission

*The mission of the Department of Grain Science and Industry is to advance the global grain and plant-based food, feed, and bioproduct industries through scholarship, research, and outreach.*

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## Connect With Us

### Department of Grain Science and Industry

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