ABSTRACT
I worked on value-added bioprocessing research. We look for ways to improve the bioprocess in the US, as well as around the world. My research focused on the effects of moisture content on extruded white corn. We mixed white corn flour with different levels of moisture and extruded 2 trials of each sample using a 3mm and 2mm die. Physical properties were taken and compared to see what effects the moisture had on the extrudates. We hoped to find consistency in the effects of moisture, but as seen in our results, moisture effect did not stay consistent in the second trial.

RESEARCH QUESTIONS
- How would the presence of moisture in white corn flour affect the extruded white corn?
- Does the effects of moisture improve bioprocessing?

BACKGROUND
The extrusion machine used was a single-screw extruder with a 1:1 ratio. In agriculture, extruders can be used to make animal and human feeds. This research focuses on the effect of water on the extrusion of white corn.

METHODS
- 2mm ground white corn was mixed into 40%, 30%, 20% moisture content.
- Samples were extruded at 50 and 100 rotations per minute (RPM). First trial used a 3mm die, second used a 2mm die.
- Physical Properties (unit density, expansion, etc.) were recorded and compared.

DISCUSSION
The first trial, extruded at 3mm, had most of the expansion occur when moisture was at 40% and RPM at 50. Unit density was highest when moisture was at 40% and RPM increased to 100. High moisture and low RPM caused color to be lighter. Adding moisture to the mixes causes extrusion to be smoother and causes extrudates to expand and condense.

The second trial, extruded at 2mm, did not extrude the 40% moisture sample. We speculate it was because too much moisture made it too dense for the small die. Most of the expansion occurred when moisture was at 20% and RPM at 100. Unit density was highest when moisture increased to 30% and RPM remained at 100. Low moisture and high RPM caused color to be lighter. Unlike the first trial, adding water did not show consistent effects. More research is needed to know why effects were not consistent in the second trial.

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