EFFECT OF SUGAR SYRUP INFUSION ON FRUIT

Kevin Chen, Daryoosh Entrikin and Audrey Oldenkamp, OSU
Dennis Bell, Ryan Bell, Steve Meyerowitz, and Louis-Jean Vixamar, Meduri Farms

PROJECT INTRODUCTION
The infusion process is the most crucial step in dried fruit production. Fruit infusion is a diffusion process where sugar replaces water within a fruit. Fruit infusion is very similar to the process of making tea, except the sugar is transferred to the fruit. Fruit is soaked in highly concentrated syrup, which creates a concentration gradient for mass transfer.

OPPORTUNITY
1. Develop a theoretical understanding of process
2. Influence process development
3. Reduce process variability
   i. Serial batch process
4. Provide information for transitioning to continuous process

TERMINOLOGY
Brix: Sugar solution concentration (1 °Bx = 1 g sugar in 100 g water)
Syrup: High brix sugar solution
Infusion: The process of replacing water in fruit with sugar. A mass transfer process
Turn: Individual batch length

FRUITS
Apples
Cherries

PROCESS FLOW DIAGRAM

EXPERIMENTAL RESULTS

CONCLUSIONS
• Successfully modeled infusion process for apples and cherries
• Identified opportunity to reduce turn times for apple process
• Apple infusion model falls within 9% of experimental data when tuned after each turn
• Cherry infusion model falls within 7% of experimental data when tuned after each turn
• Determined turn length and syrup concentration for apples and cherries

ACKNOWLEDGEMENTS
The team thanks Dennis Bell, Ryan Bell, Steve Meyerowitz and Louis-Jean Vixamar from Meduri Farms for collaboration and support and Dr. Phil Harding for his project guidance.