



Dehydrating Mustard Seed Extract

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Objective

Develop a flash evaporator that reduces the water content in a mustard seed extract slurry by half.

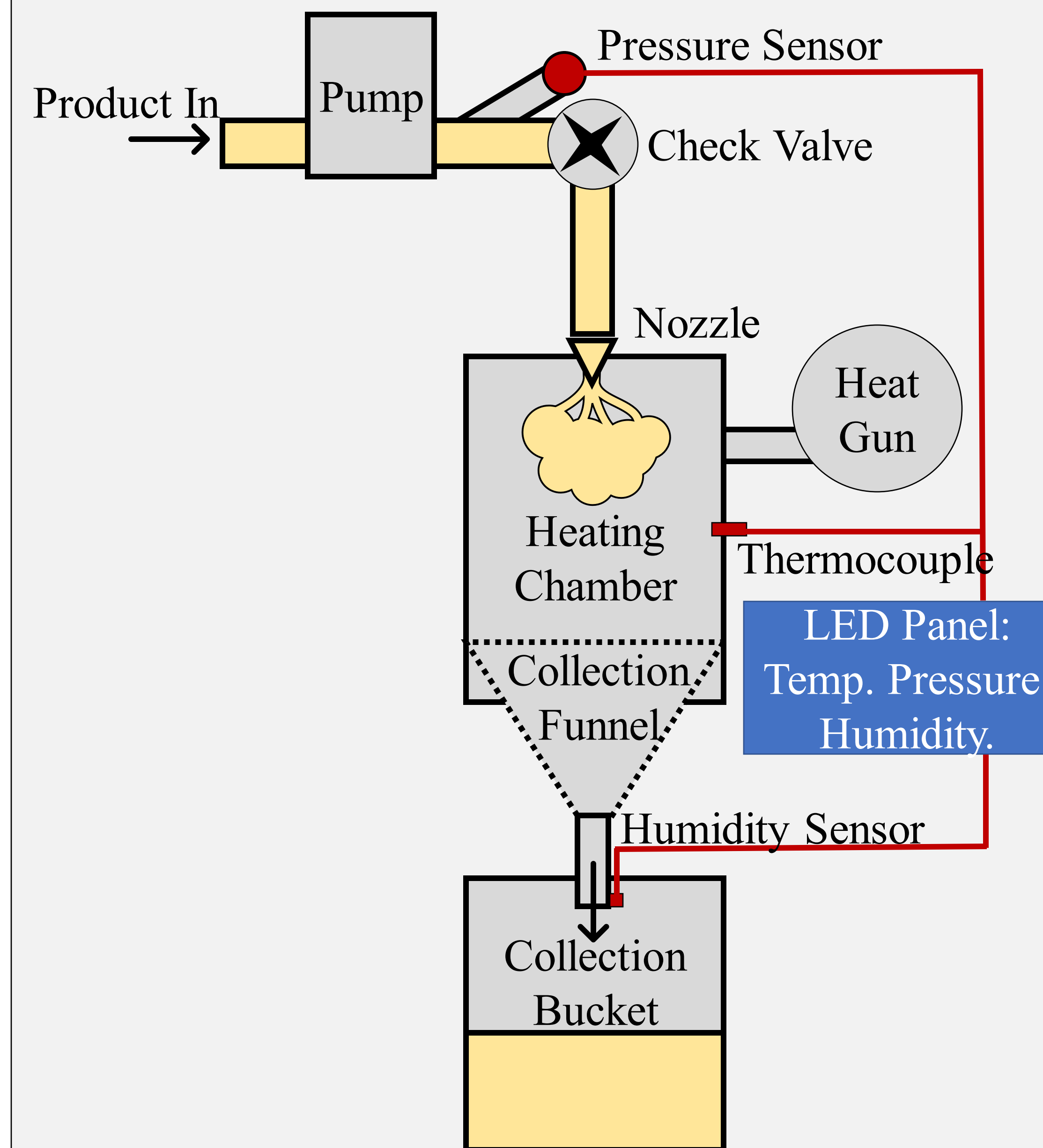
Background

- Mustard plants produce many useful chemical products
 - Oils that can be processed into biodiesel and glucosinolates - they show promise on being used as biopesticides
- Drying methods available
 - Drum dry, freeze dry, and spray dry
 - Freeze drying currently takes three days for a 10-gallon batch

Key Requirements

- Get extract 50% dry
- Reduce drying time by at least half
- No large drop in glucosinolate yields due to thermal degradation
- No chemicals due to organic farming use
- Handle up to 10 gallons of product a day

The Current Design



Concept Development

The idea was presented by Dr. Popova from a method of drying tomato sauce

- What parts will work best in our design?



Validation

✓	Test system in parts	Pump
		Nozzle
		Heating
		Drying
✚	Estimate calculations vs measurements	

Value Proposition

The current freeze-drying method takes 3 days and has created a significant bottleneck in the system, and to reduce this bottleneck, a flash evaporation will be created and will reduce the water content by half.

Summary, Conclusions, and Recommendations

- More testing will be done in Spring semester
- Selecting necessary materials and associated costs
- Building our design and making sure everything is what Dr. Popova had in mind

Acknowledgements

Thanks to Dr. Ina Popova for sponsoring the project. Additional thanks to Dr. Brian He, Dr. Dev Shrestha, Bishal Bhattarai, & Chad Dunkel