

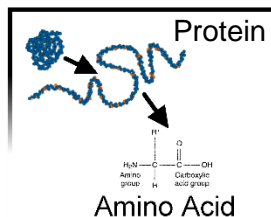
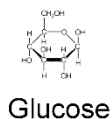
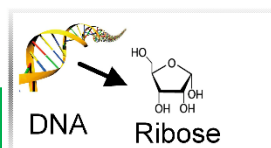
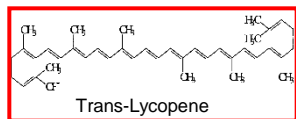
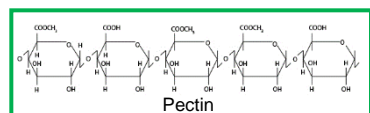
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**New engineering
concepts (technologies)
in tomato processing**

Tomato paste



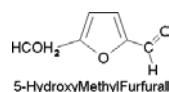
Sugars

Water Loss

104 °F (~ 40 °C)
Maillard Reaction
(High Heat)

New Flavors

Brown Color



Amino Acids



Tomato paste components



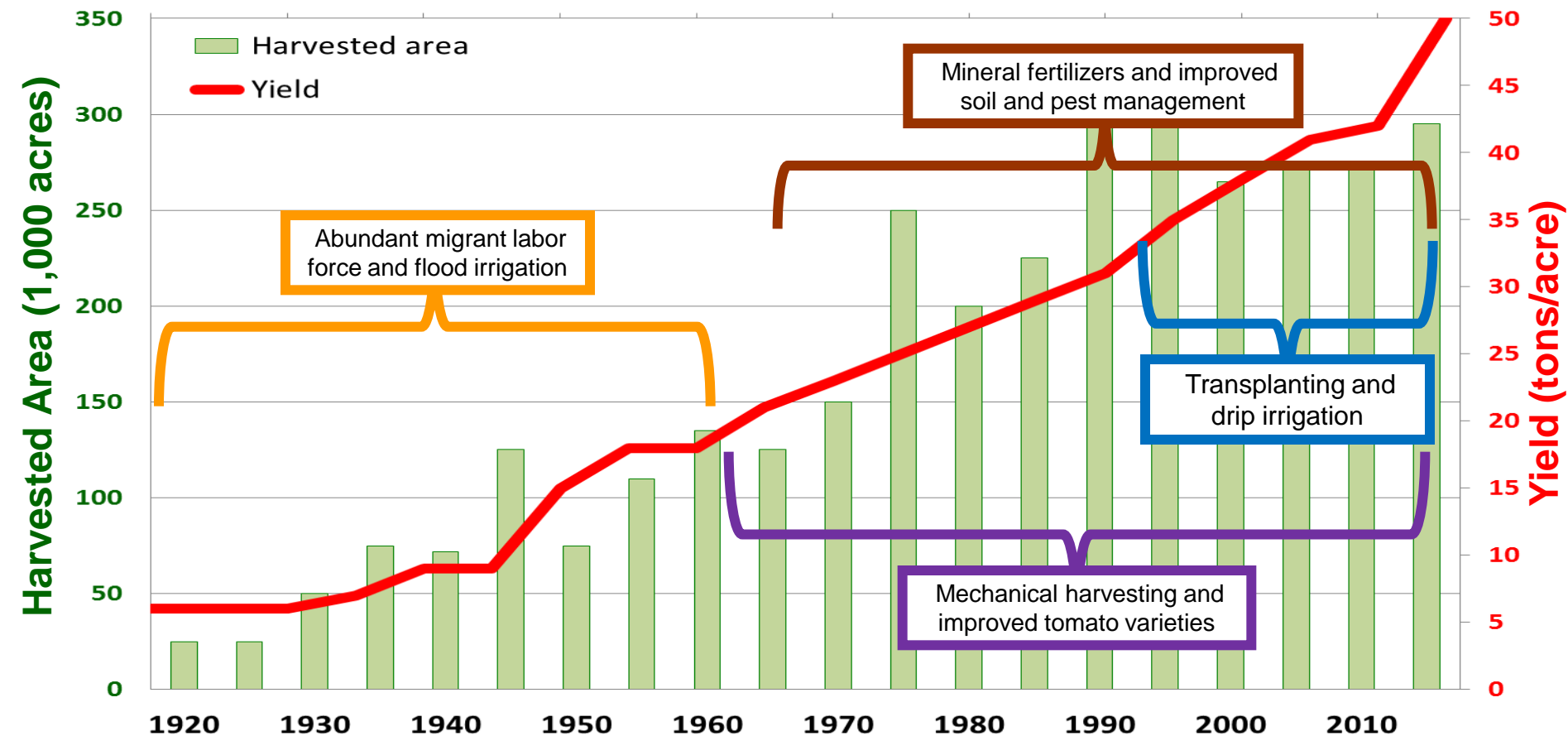
~6 hours



Revenue, energy, waste, costumer demands and satisfaction



NEW TECHNOLOGIES!



Before 1962
All hand-harvested



1962- First commercial harvester
Required 12 people to operate



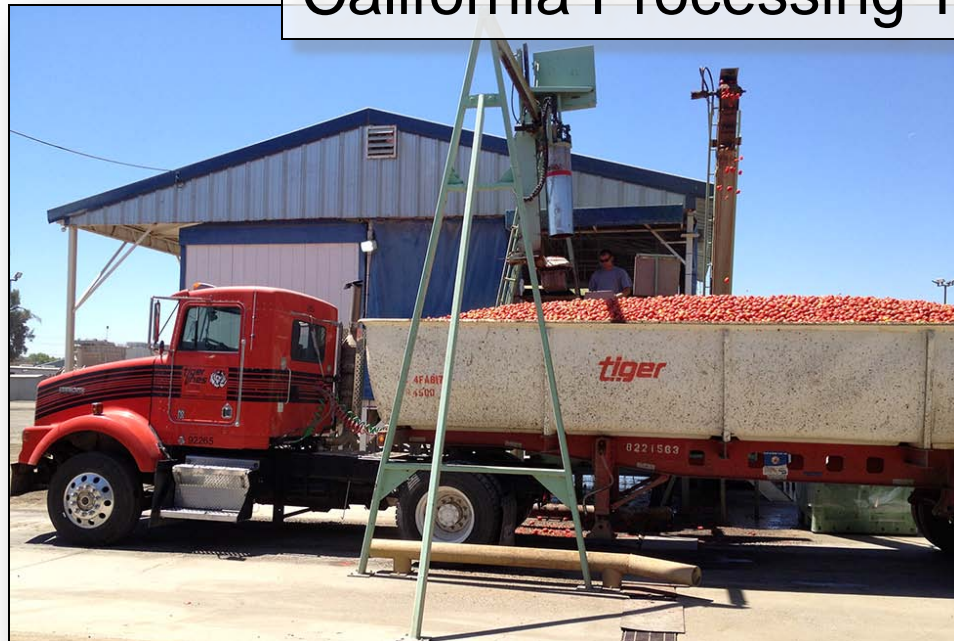
NOW Harvester
Single operator

Assessment of Tomato Quality

Mechanized
Harvest



California Processing Tomato Inspection Program



Random Sampling



Inspection

Example 1. Automated Inspection System for Processing Tomatoes (AIS-PT)

Processing Tomato Advisory Board
In association with
The University of California, Davis
Department of Biological Systems Engineering
(Lead PI: Professor David Slaughter)



TOMATO QUALITY ASSESSMENT



PHYSICAL

- Cleanliness
- Disease or decay
- Size
- Weight
- Color

TOMATO QUALITY ASSESSMENT

CHEMICAL

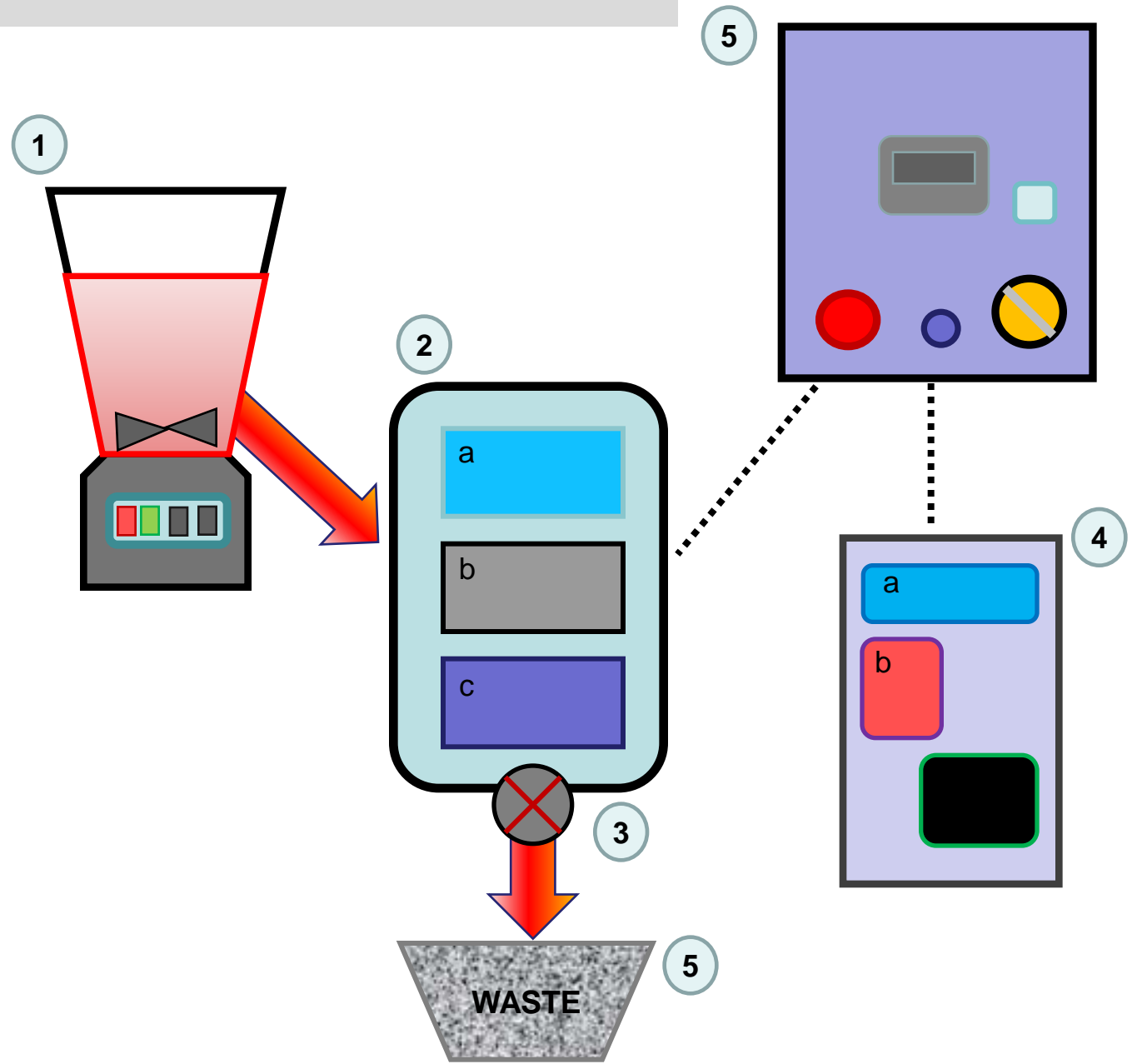
- Color
 - pH
 - Soluble Solids
 - Titratable Acidity
 - Bostwick consistency
 - Juice/Serum Viscosity
- AIS-PT



OPERATIONS OVERVIEW

MAJOR COMPONENTS

1. Blender
2. Analysis Chamber
 - a) Colorimeter
 - b) pH Meter
 - c) Refractometer
3. Valve/Pumps
 - a) Air vacuum
 - b) Water Pump
 - c) Flowmeter
4. Logic Controller & Touch Panel
5. Waste stream



MAJOR COMPONENTS

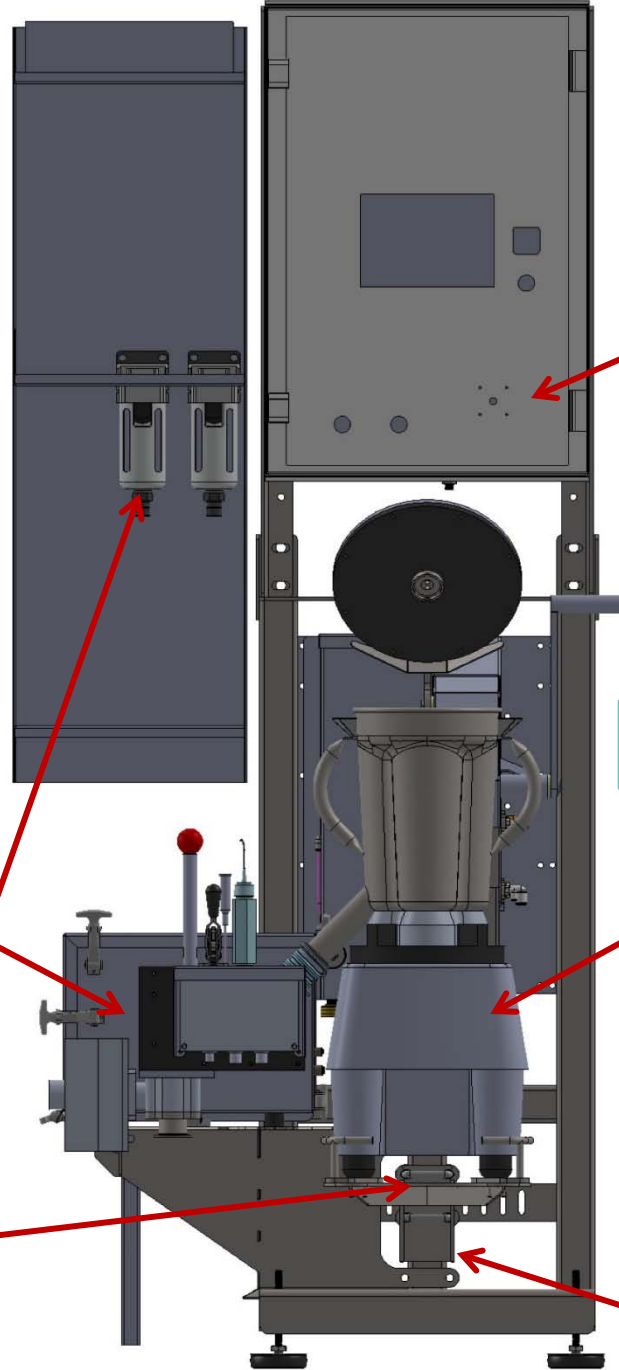
2. Analysis Chamber

3. Valve/pumps

4. Logic Controller & Touch Panel

1. Blender

5. Waste stream



COMPARISON: OLD vs NEW (AIS-PT)

Reduced from **3 min** to **1 min**
Grading Time

560 lifting events
vs

420 events per shift

- Sampling and system cleaning is inspector independent
- More analyses points recorded

Worker Safety:
lifting events
per shift

**15 MILLION
lb difference!**

1/2 million lifting events

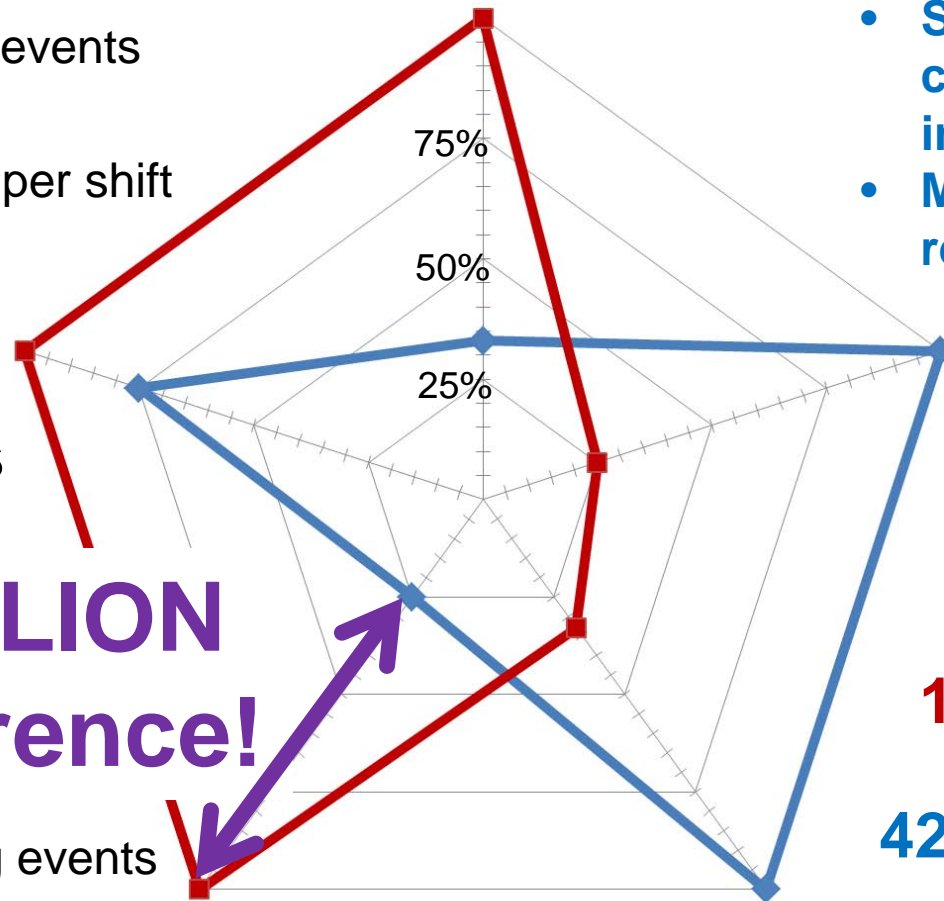
Worker Safety:
lifting events total season

Consistency

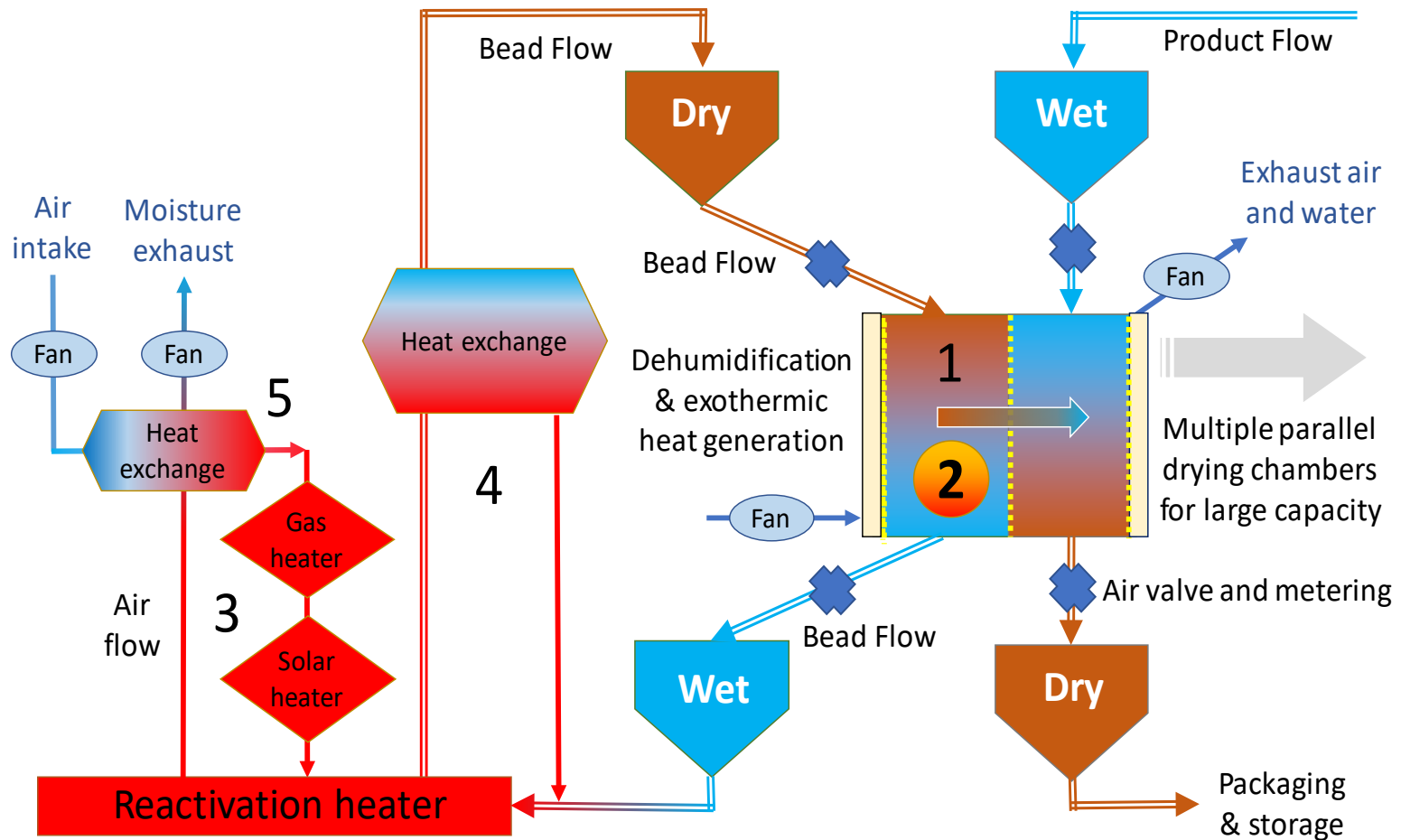
140 load inspections
vs

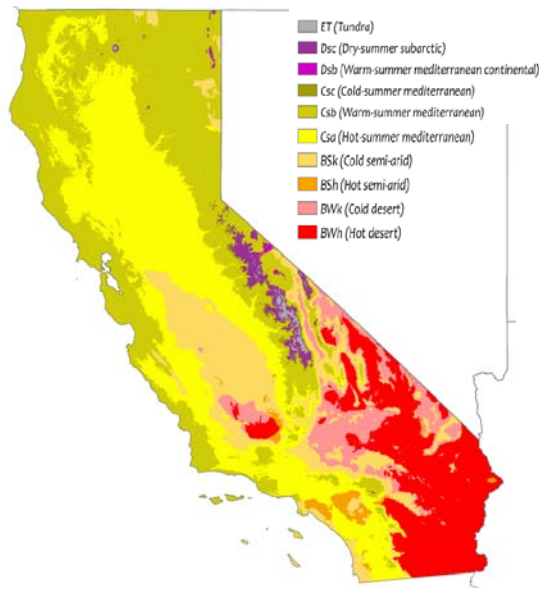
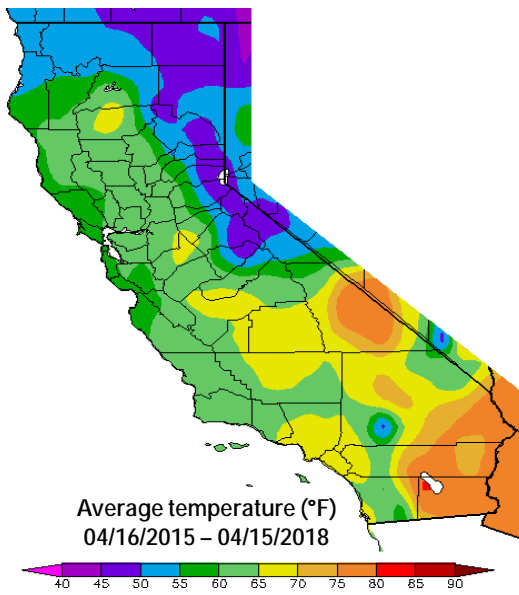
420 inspections per shift

Efficiency

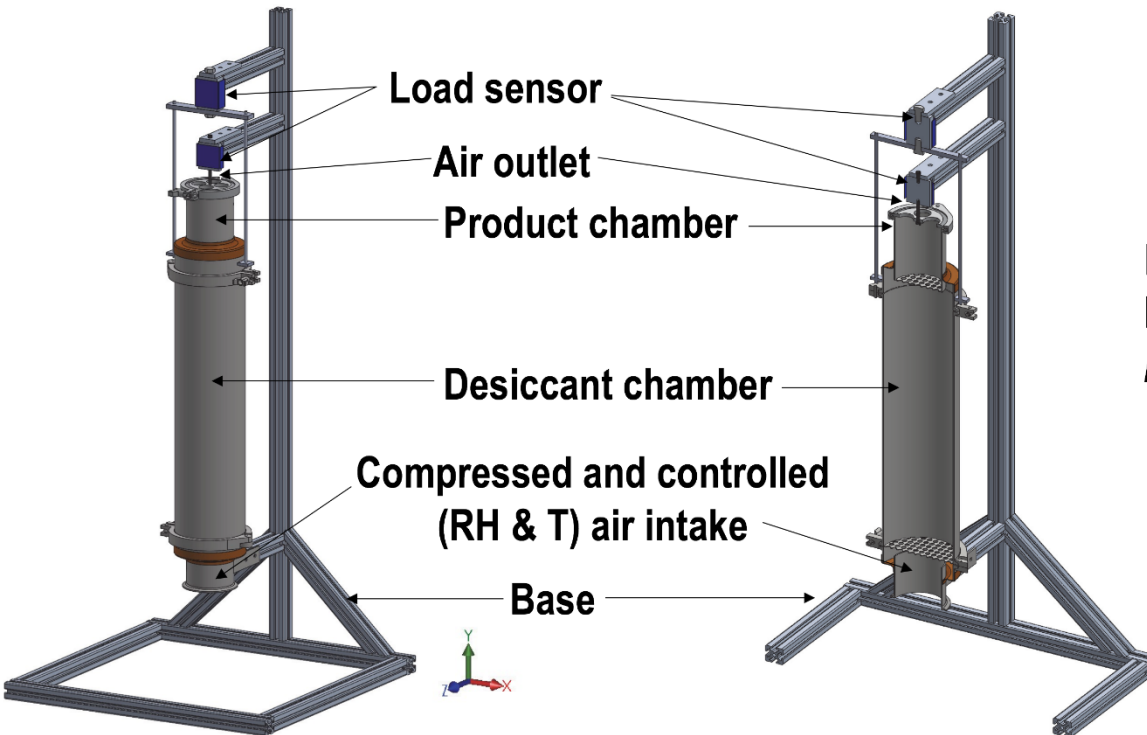


Example 2. Desiccant-based drying/dehydration system with continuous flow of both hygroscopic materials and product





Different drying conditions



THANK YOU!

CONTACT INFORMATION:

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