Product Recovery at Seneca Foods

Daniel Chang

MnTAP Advisor: Matthew Domski

On-Site Supervisor: John Sigrist

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Company Background

- One of the leading producers of packaged produce in North America
- 24 Plants in the East, West, and Midwest
- Rochester plant operates seasonally

SENECA

Farm Fresh Goodness Made Great

Motivations for Change

- **Recovery Program**
  - Started in 2016
  - Reducing product loss across production process
  - Not only Rochester, but for plants across Minnesota and Wisconsin
- **During full-operation, over 2,000 cans per minute are produced!**

Reasons for MnTAP Assistance

- **Focus on reducing solid waste in Food Manufacturing**

- **Improving recovery boosts efficiency of:**
  - Water usage
  - Chemical usage
  - Electrical demand
  - Labor
  - Silage waste management

MINNESOTA POLLUTION CONTROL AGENCY

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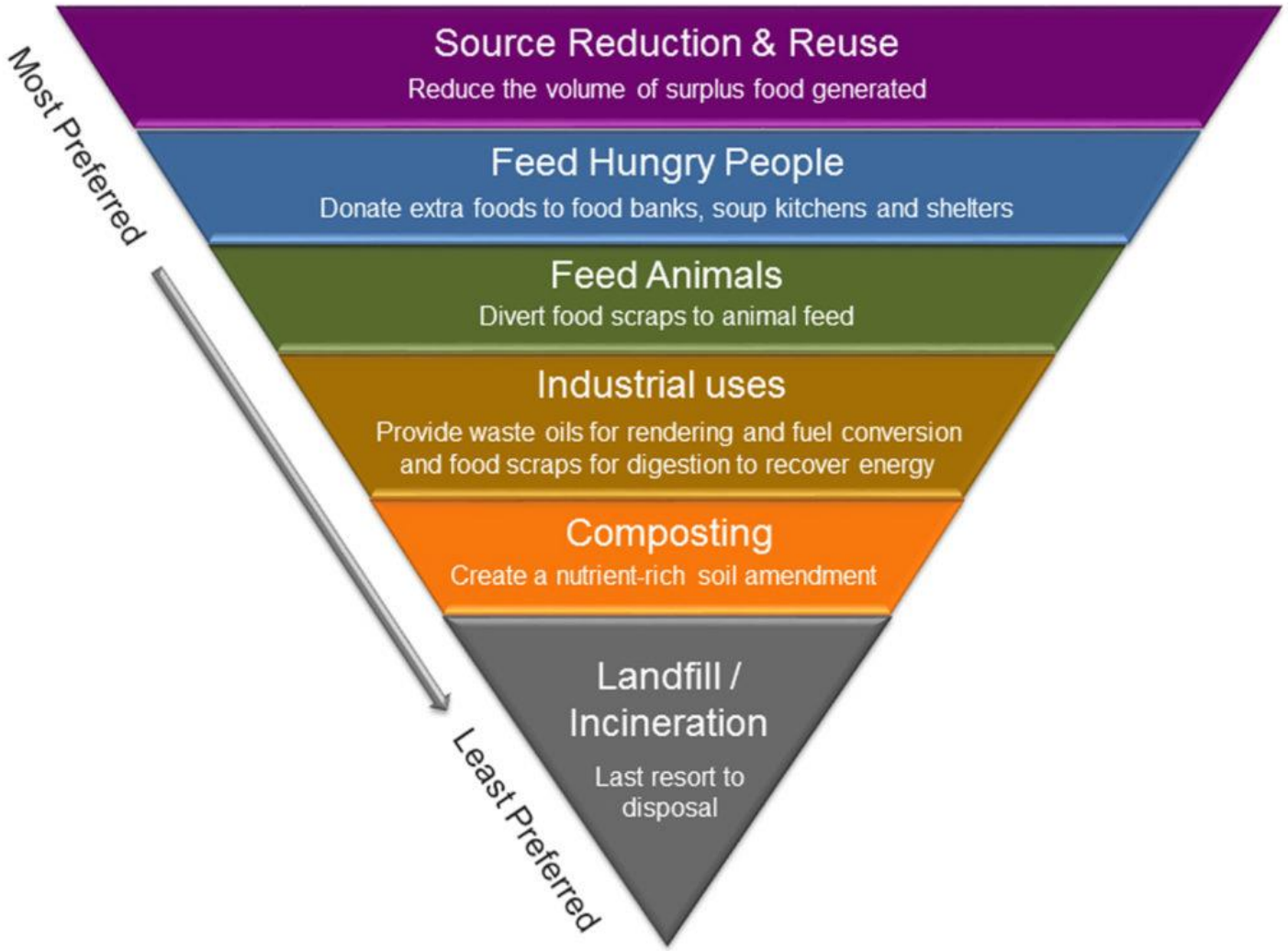
Food Recovery Hierarchy



Process Description – Canned Peas

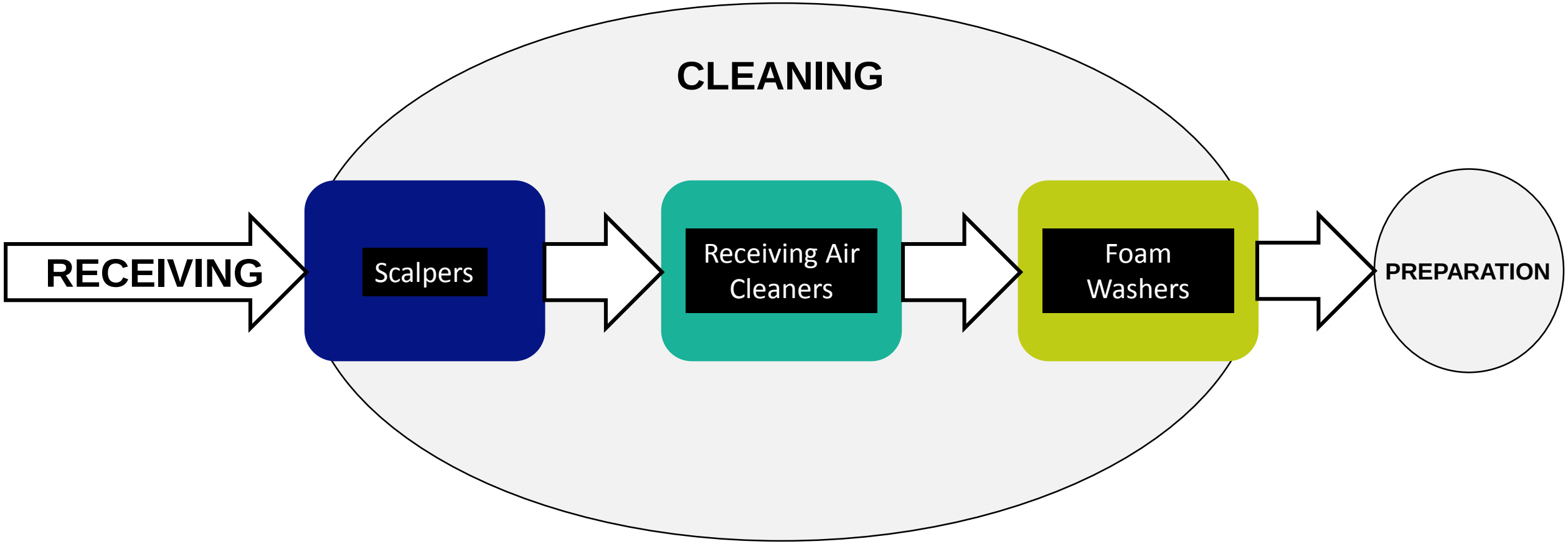
- Receiving
- Cleaning
- Preparation
- Fill and Close
- Processing

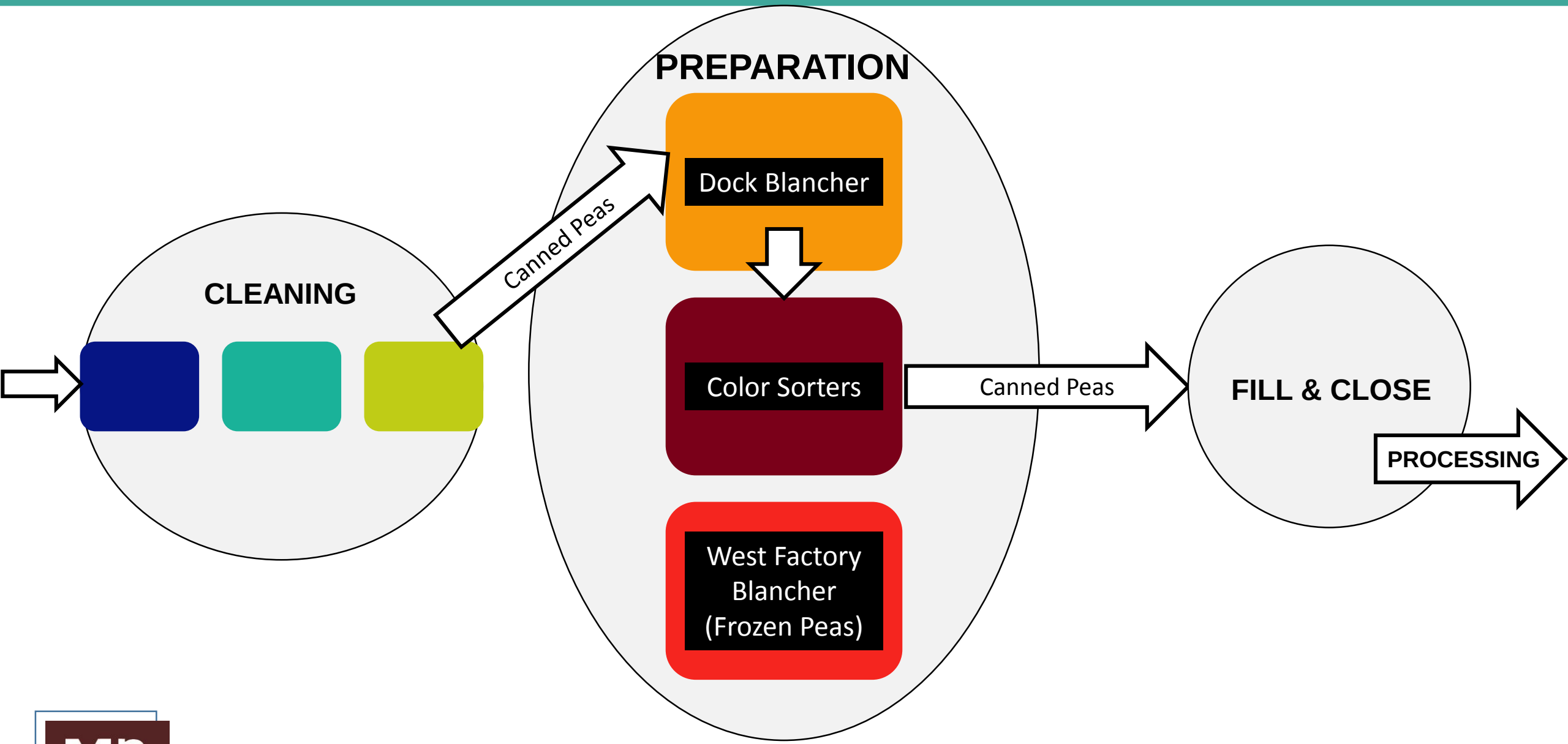
Approach

Primary question:

"Where are we losing peas?"

-Daniel Chang, 2017

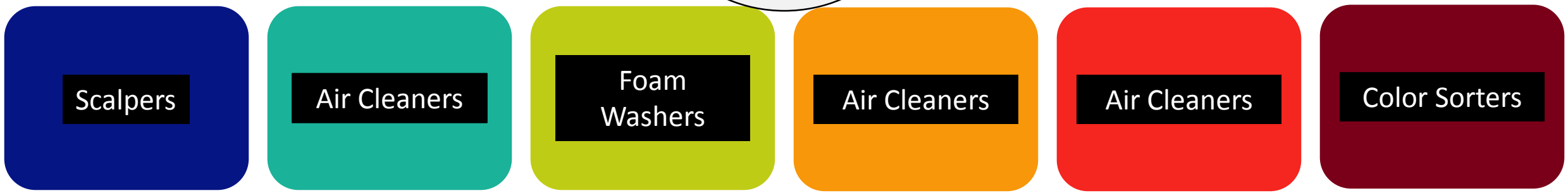

CLEANING
RECEIVING
Scalpers
Receiving Air Cleaners
Foam Washers
PREPARATION


PREPARATION
Dock Blancher
Color Sorters
West Factory Blancher (Frozen Peas)
CLEANING
Canned Peas
Canned Peas
FILL & CLOSE
PROCESSING

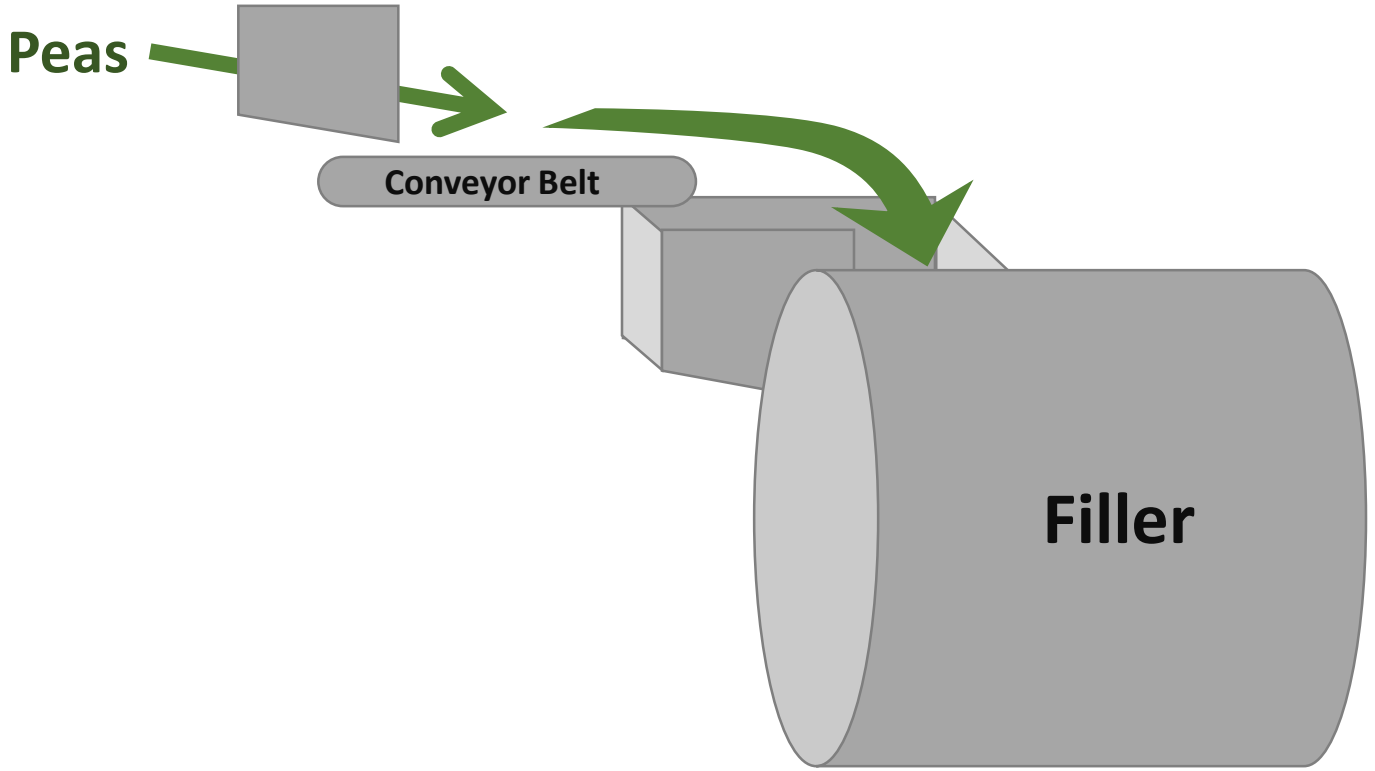
Approach – Pea Waste Checks

- **Sample waste streams every hour**
- **Measure total sample weight a… …t of defective (or good) product**
- **Determine:**
  - Efficiency (Weight % Good Pe…
  - Pounds per hour of Good Pea…
  - Cost per hour of Good Peas

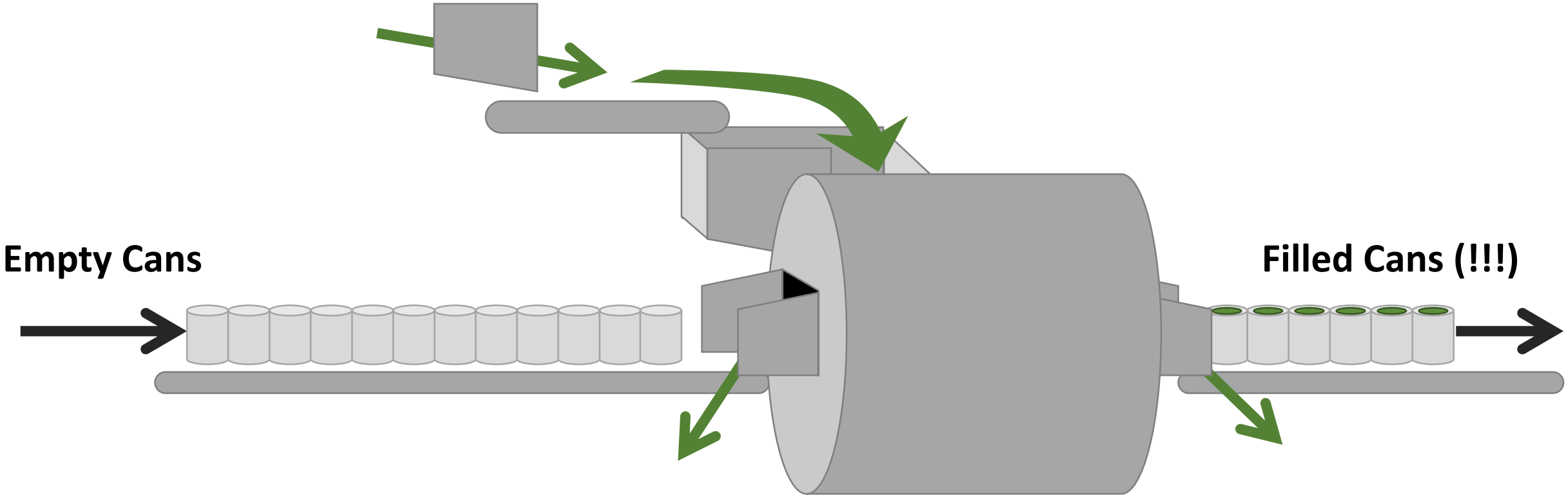
FILL & CLOSE



Fill & Close



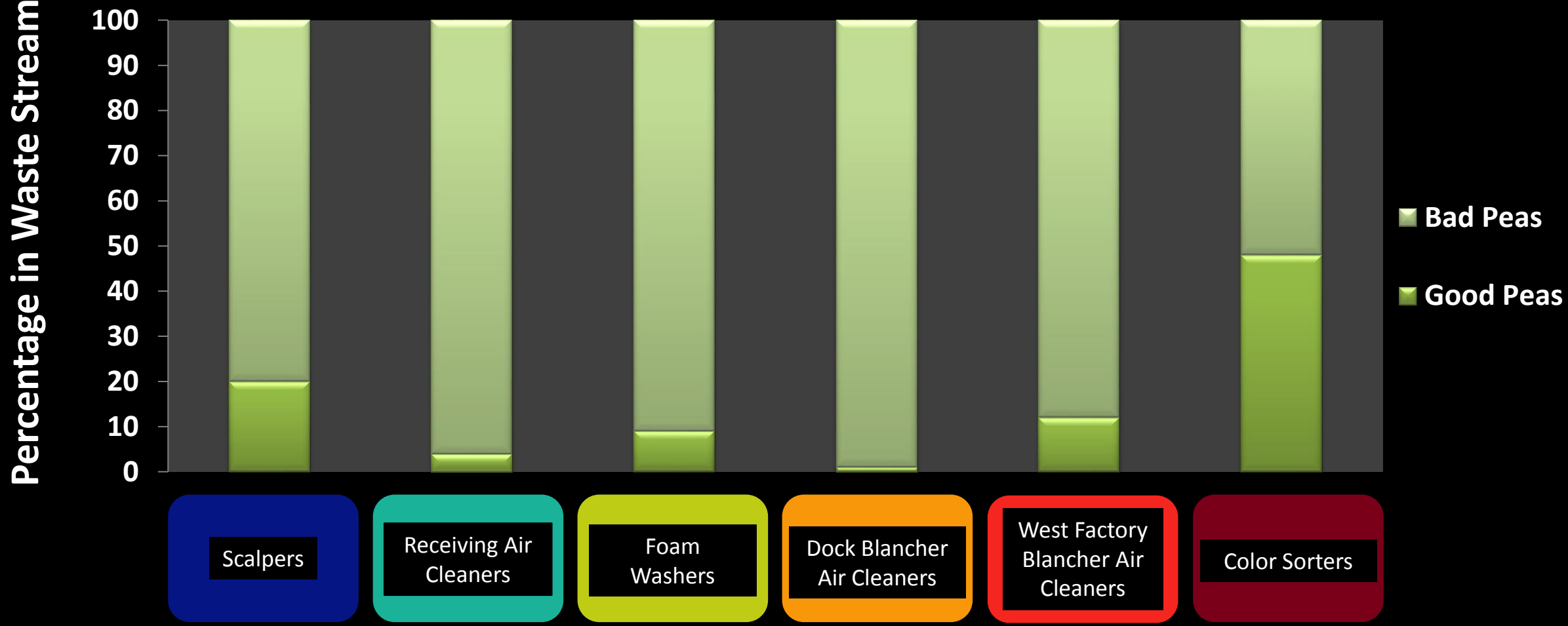
Fill & Close



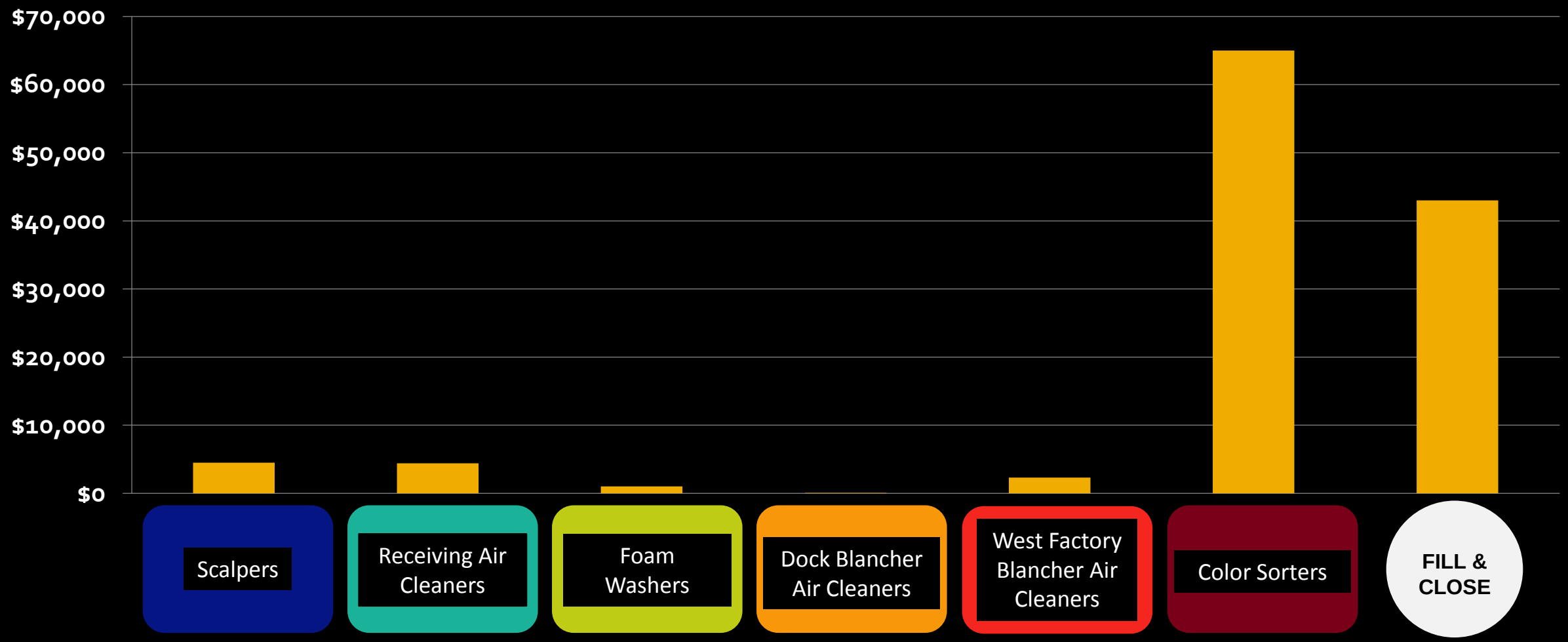
Approach – Fill & Close

- **How much product is lost from falling out of the filler?**
  - Determine hourly loss and cost

Results


Efficiency of Separating Machinery
Percentage in Waste Stream
100
90
80
70
60
50
40
30
20
10
0
Bad Peas
Good Peas
Scalpers
Receiving Air Cleaners
Foam Washers
Dock Blancher Air Cleaners
West Factory Blancher Air Cleaners
Color Sorters

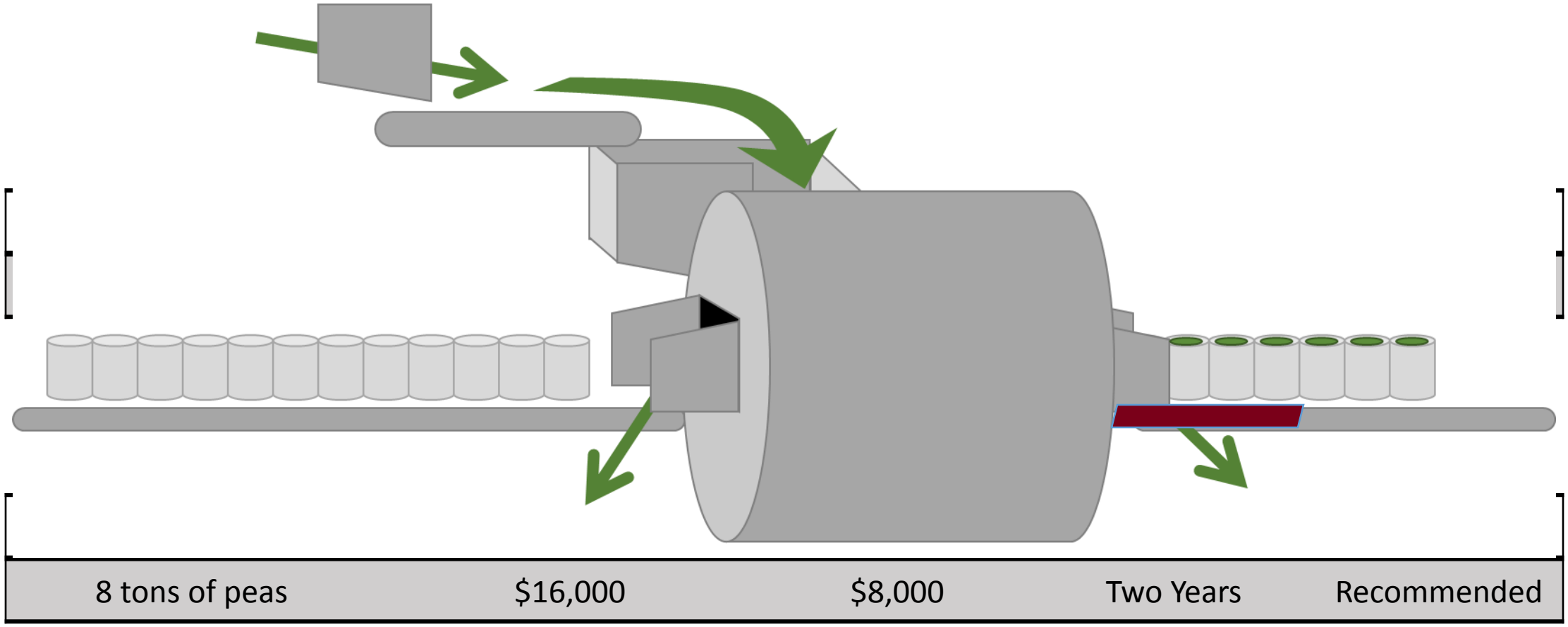
Results


Loss Costs by Area
$70,000
$60,000
$50,000
$40,000
$30,000
$20,000
$10,000
$0
Scalpers
Receiving Air Cleaners
Foam Washers
Dock Blancher Air Cleaners
West Factory Blancher Air Cleaners
Color Sorters
FILL & CLOSE

Recommendation – Color Sorters

- [Continue to] use display monitors
- Implemented this year at the start of the season
- Allow daily communication of color sorter performance to mechanics for day-to-day adjustment
- Cost: $10,000
- Results:
  - 33 tons of peas saved this season
  - $33,000 saved

Recommendation – Fill & Close



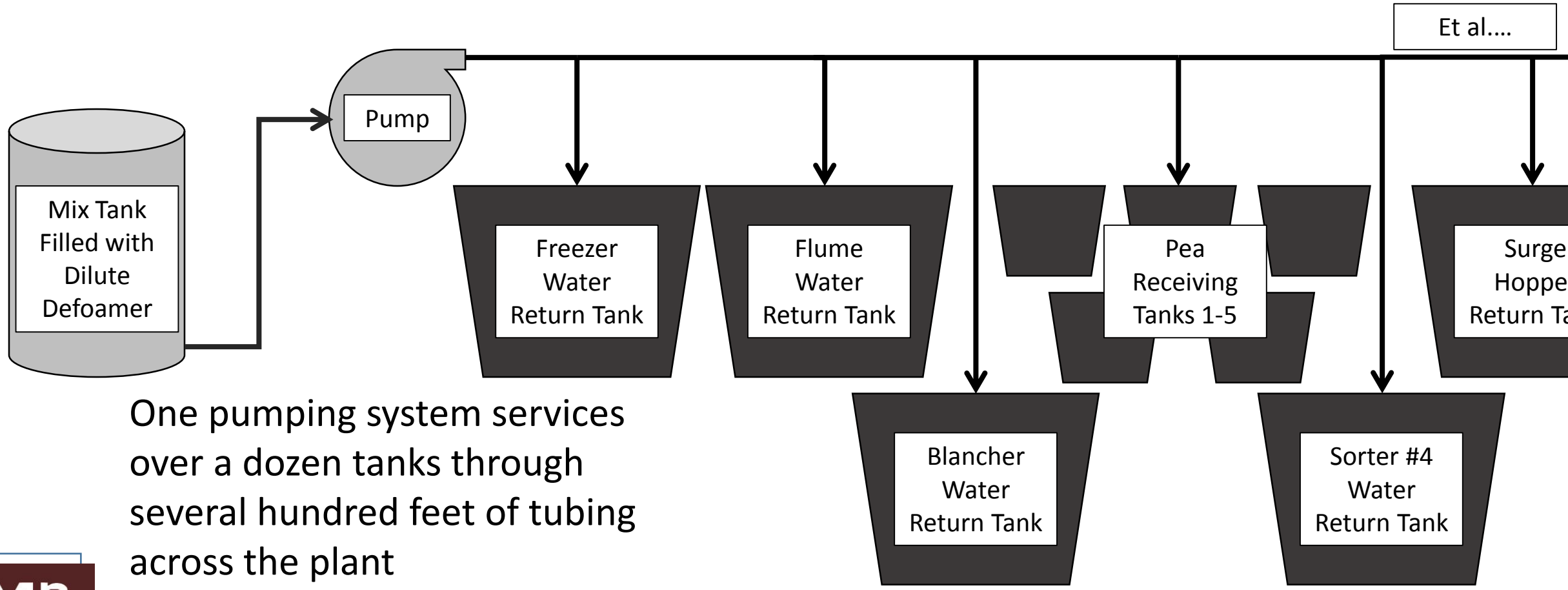
8 tons of peas	$16,000	$8,000	Two Years	Recommended

Recommendation – Defoamer

- **Chemical that is sprayed on top of water tanks to knockdown foam**
- **Foam buildup results from starchiness of the peas**
  - Causes water tanks to overflow

- **Challenges:**
  - Inefficient use by workers
  - Current dosing system does not effectively control foam

Recommendation – Defoamer



One pumping system services over a dozen tanks through several hundred feet of tubing across the plant

Recommendation – Defoamer

- **Prescribe training for workers**
  - Estimated 50% reduction

Waste Saved per Year	Implementation Cost	Savings per Year	Payback Period	Status
1,200 gallons	None	$7,000	Immediate	Recommended

- **Upgrade dispensing system with an improved pump and new tubes**
  - Estimated 25% reduction in usage

Waste Saved per Year	Implementation Cost	Savings per Year	Payback Period	Status
600 gallons	$7,000	$3,500	Two Years	Recommended

Summary

Recommendation	Waste Saved per Year	Implementation Cost	Savings per Year	Payback Period	Status
Continue Using Display Monitors	33 tons of peas	$10,000	$33,000	Four Months	Implemented
Fill and Close					
Increase height of guard walls	4.5 tons of peas	$200	$4,500	Two Weeks	Recommended
Add conveyor belts	8 tons of peas	$16,000	$8,000	Two Years	Recommended
Defoamer					
Implement worker training	1,200 gallons of chemical	None	$7,000	Immediate	Recommended
Upgrade dispensing system	600 gallons of chemical	$7,000	$3,500	Two Years	Recommended

Total Savings: 45 tons of peas, 1,800 gallons of defoamer, and $56,000 annually

Personal Takeaways

- **Vision**
  - Importance of having a driven, improvement-oriented mindset
  - Recognizing problems and seeing solutions
  - Respect for complexity of industrial processes
- **Leadership through communication**
  - Communication is a building tool
  - Involve others, especially those who will be directly affected by changes you want to make

Questions?