Wheat Cleaning System Design

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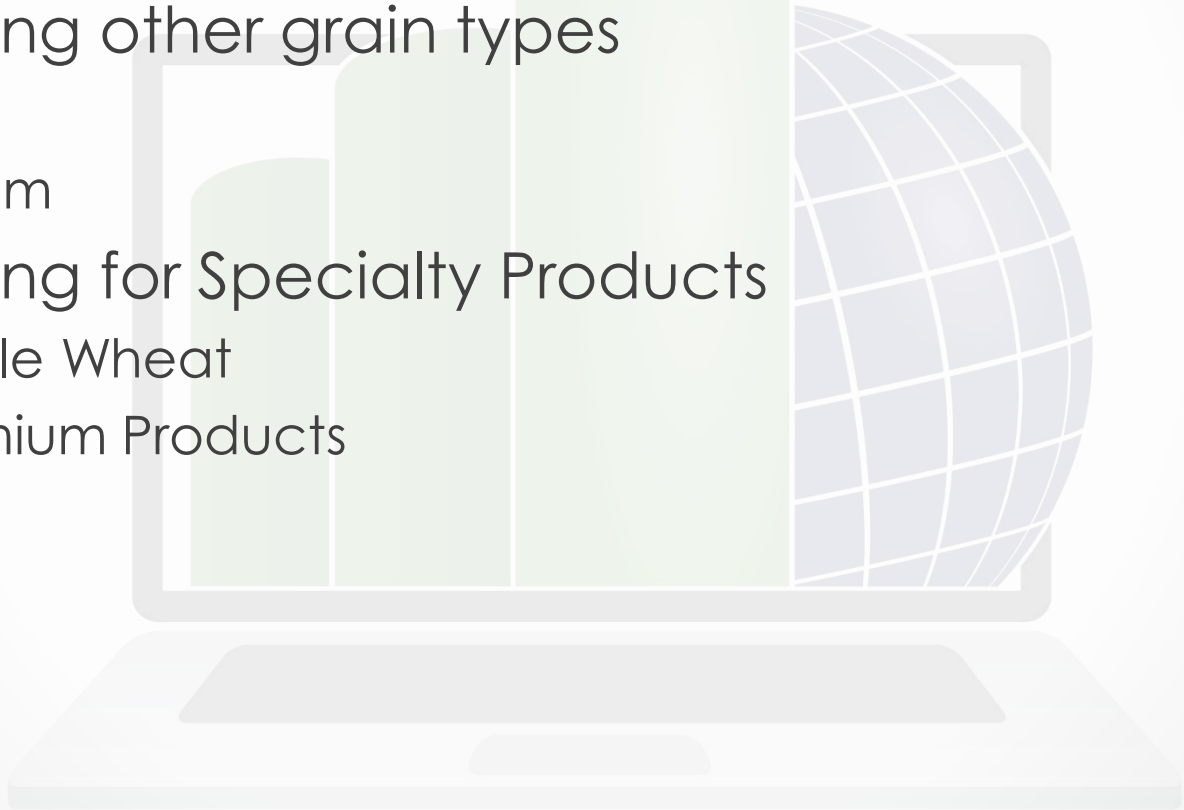
Lesson Objectives

- Cleaning process design parameters and considerations
- Impact of grain cleaning on finished product quality
- Cleaning other grain types
  - Rice
  - Durum
- Cleaning for Specialty Products
  - Whole Wheat
  - Premium Products



Process Design

Priorities of a cleaning system

- Safety
  - Food, process equipment and employees
- Sanitation(dust and chaff)
- Quality
- Process Efficiencies

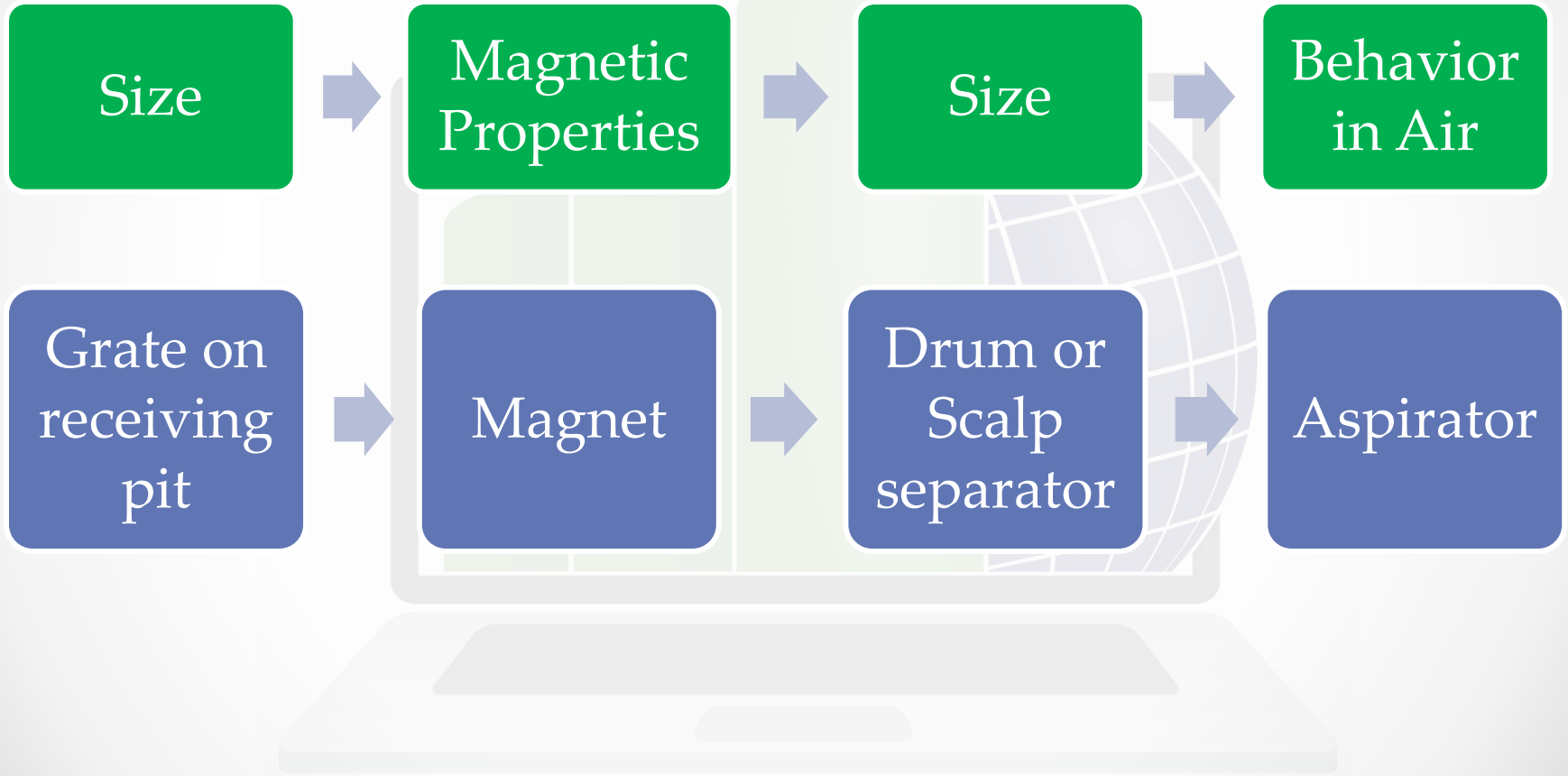
Benefits of Pre-Cleaning

- Decrease infestation risk
- Improve sanitation and dust control
- Decrease microbial growth
- Improves flow of grain through the bin
- Increases storage life of grain

Principles of Separation

- Magnetic Properties
- Flow in Air (Terminal Velocity)
- Size
- Shape
  - Length
  - Width
- Specific Gravity
- Surface Characteristics (color and texture)
- Friability (Internal Strength)
- Abrasion

Pre-Cleaning Design Logic



Choosing Cleaning Equipment

- Type of grain or class of wheat
  - Different classes = different physical attributes
- Origin
  - Different growing areas = different impurities
- Desired end product
  - Cleanliness of the grain will impact finished flour quality and extraction

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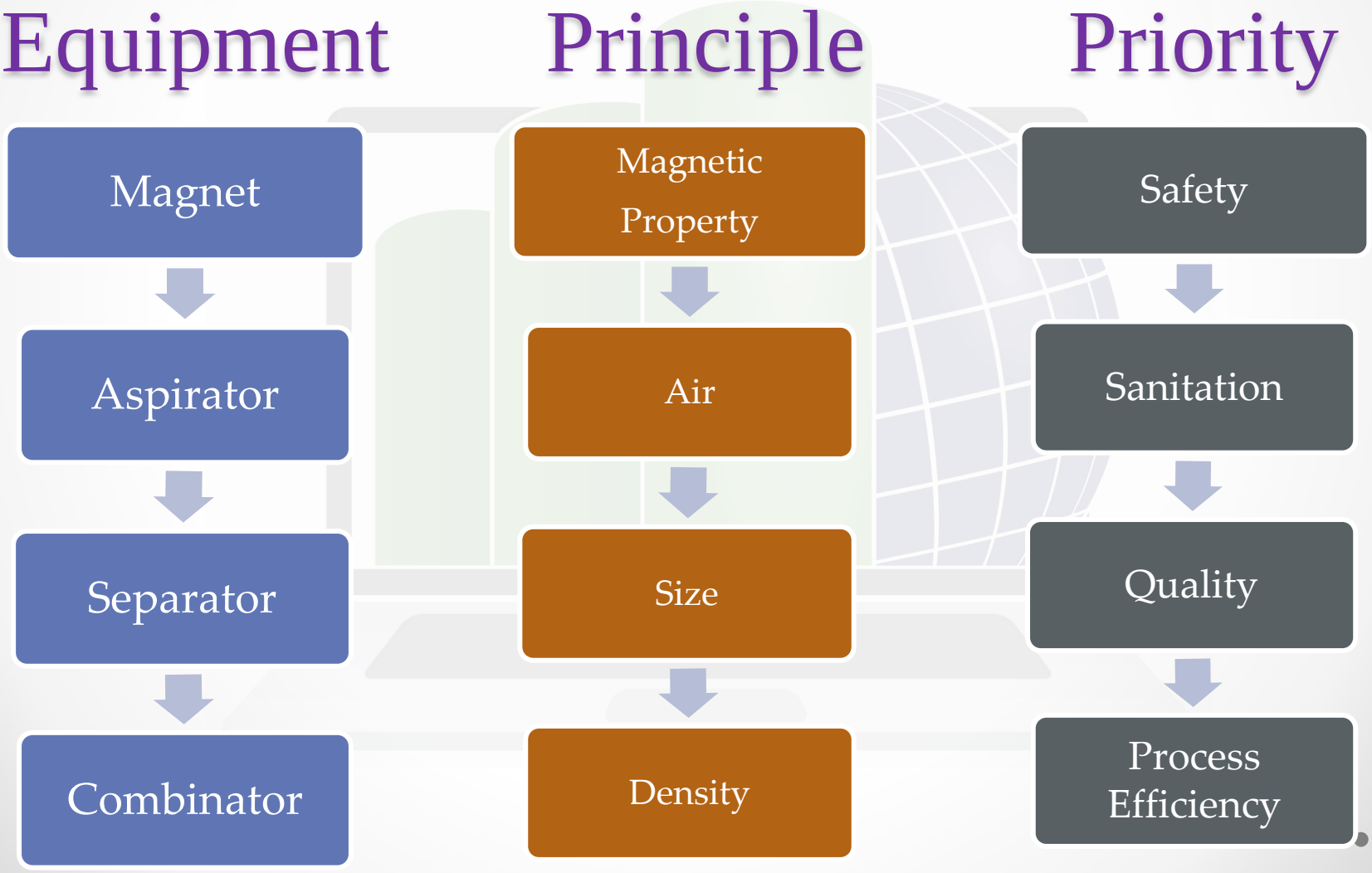
Impact on Quality

- Color
- Ash
- Microbial

Grain Cleaning System – Pre-Processing



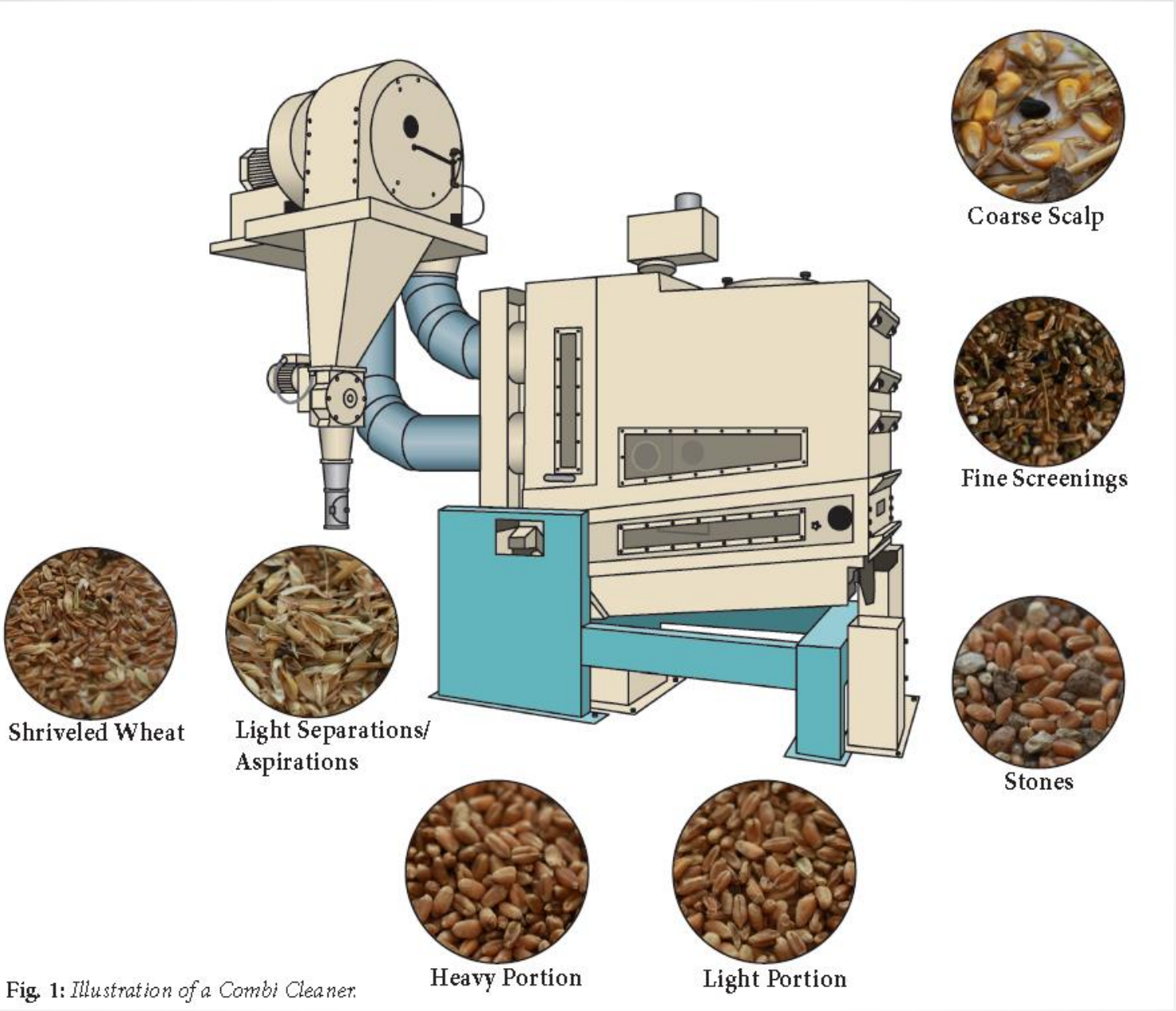
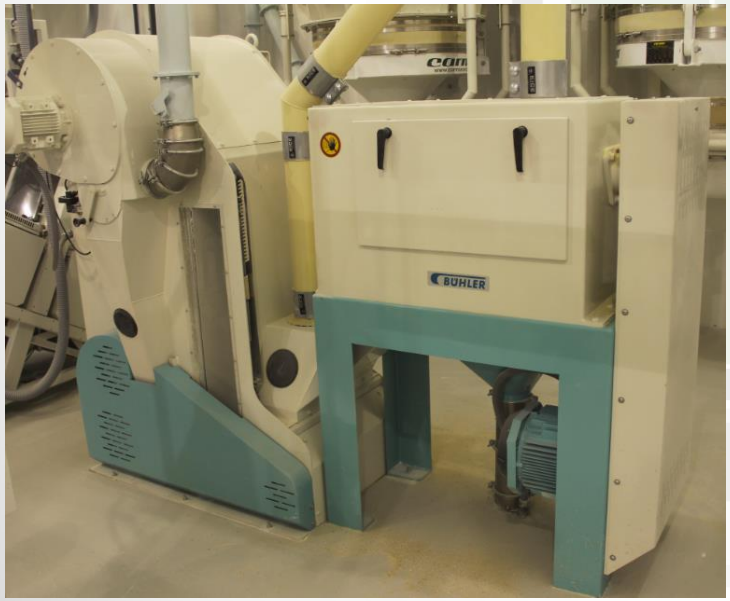


Fig. 1: *Illustration of a Combi Cleaner.*

Wheat Cleaning Principle

- Cleaning by abrasion
  - Scouring
  - Peeling
  - Pearling



Cleaning for Specialty Products

- Durum Wheat
  - Granular vs. Powder
- Whole Grain Systems
  - 100% product
  - Grinding style
- Over-cleaning as a design principle (to ensure food safety and product quality)

In Summary

- Cleaning process design parameters and considerations
  - Type and Origin of Grain
  - Quality of end product
- Wheat cleaning for specialty products
  - Focus on what is to be removed vs. what is remaining
  - "Over clean" if necessary, but understand the cost of lost product

Thank you