


FLOUR: INGREDIENT FOR BAKERY INDUSTRY

MILLING PROCESS AND QUALITY

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WHEAT AND FLOUR



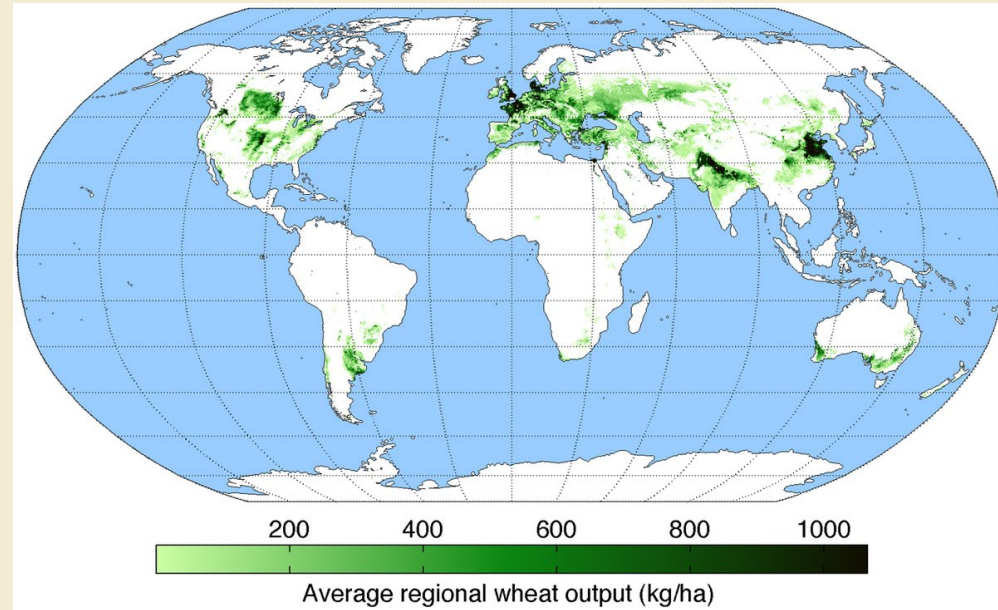
- Flour, used in baking industry, is obtained by **milling cleaned and conditioned wheat**
- Flour quality depends upon **wheat quality**
- It is possible, but **not necessarily easy**, to make good quality flour from **proper wheat**
- It is **impossible to make a proper flour** of good quality from **wheat of inappropriate characteristics**



Types of Wheat

- 1 Triticum Aestivum
- 2 Triticum Durum
- 3 Triticum Didocum

Key Wheat growing Regions



Defining Wheat Quality

Farmer's perspective

- ✓ Disease Resistance
- ✓ Yield per acre
- ✓ Protein content

Miller's perspective

- ✓ High HLW
- ✓ Low amount of foreign material
- ✓ Protein content

Baker's perspective

- ✓ High water absorption
- ✓ Good strength
- ✓ Extensibility

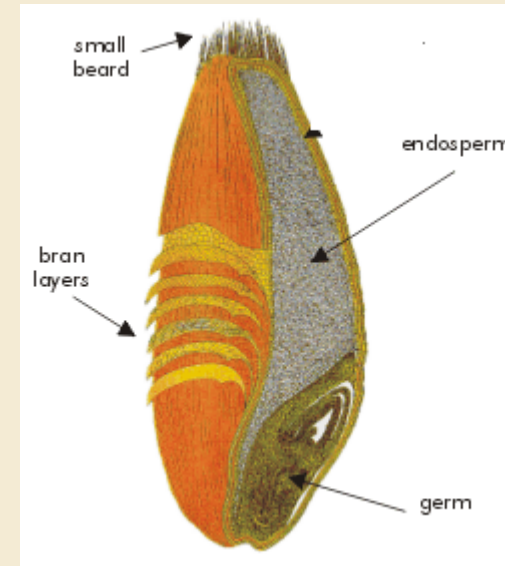
Physical Characteristics of Wheat

T. Aestivum is the most common variety of wheat, which has 21 pairs of chromosome

T. Durum is less commonly available, which has 14 pairs of chromosome

Approximate **physical composition**:

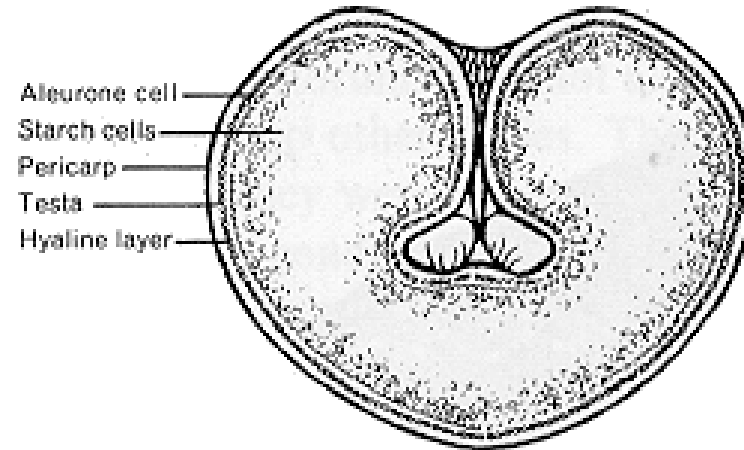
- 82.5% - Endosperm
- 15% - Bran (Pericarp, Testa, Nucellar Layer, Aleurone Layer)
- 2.5% - Germ



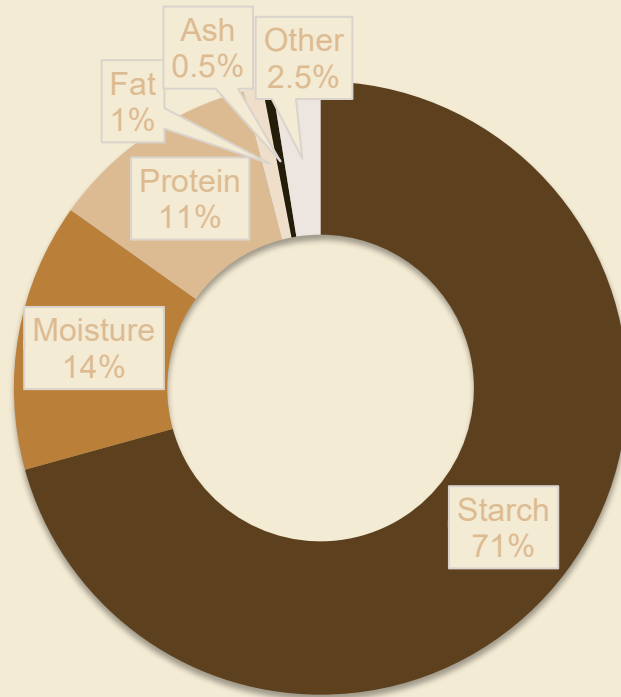
Chemical Characteristics of Wheat

	Min.	Max.
Protein (Nx5.7)	7.0	18.0
Ash	1.5	2.0
Fats	1.5	2.0
Moisture	8.0	18.0
Starch	60.0	68.0
Pentosans	6.2	8.0
Saccharose	0.2	0.6
Maltose	0.6	4.3
Cellulose	1.9	5.0

A grain of wheat cut across the middle



Composition of Wheat Flour



- All flours are **not of same composition**, percentage wise
- Variations are due to **effects of climate, breed of seed, type of seed, type of wheat blended and proportions of wheat** used during blending
- It also varies with **milling process, extraction profile, storage conditions, period of storage, etc.**

Stages of Wheat Processing

CLEANING

Wheat received in gunny bags is opened and stored in raw wheat silos

Then, wheat is cleaned by passing through machines using following principles:

- Size
- Specific gravity
- Shape
- Natural peculiarities
- Air resistance

CONDITIONING

Water is added in controlled quantities to increase moisture content of wheat

Then the wheat is allowed to rest for conditioning

Aim of conditioning:

- Toughen bran layer
- Mellow endosperm to improve rheological properties of the flour to be produced

Due to inadequate infrastructural facilities for blending flour in the country, the Miller needs to blend the wheat to get the desirable flour of a consistent quality over a long period of time

MILLING

Grinding section

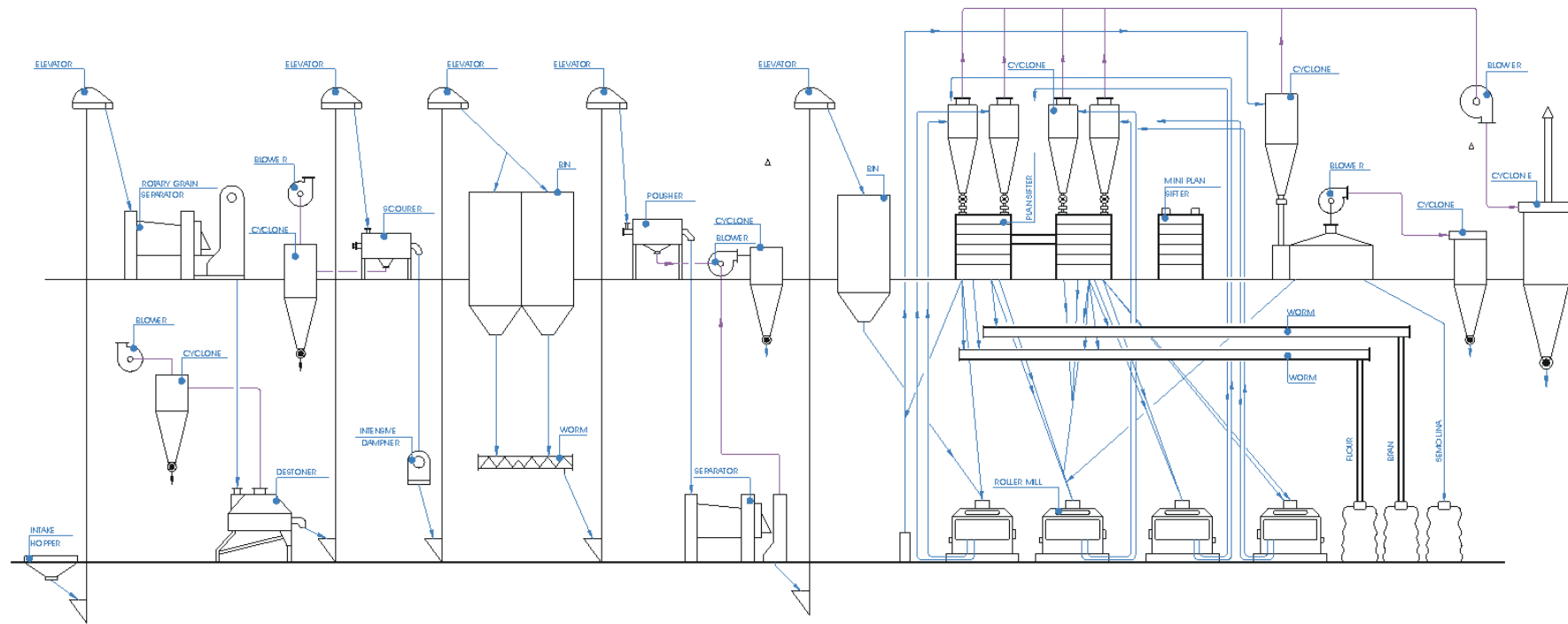
- Break
- Reduction



Purification section


Sifting section

FLOW DIAGRAM FOR ROLLER FLOUR MILL






Function of Protein

- The protein of interest is **gluten-forming protein**
 - Gluten is made up of two proteins: **gliadin** and **glutenin**
 - When wheat flour is mixed with water, gluten forms. Gluten gives the dough **gas-retaining ability, imparts strength and elasticity to the dough**
 - **Protein-Starch interactions:**
 - Gluten protein is the continuous phase of a dough
 - Starch granules are imbedded into the gluten network
 - Heating causes starch to gelatinize and protein to denature
 - Dough retains gas
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Classification of Flour

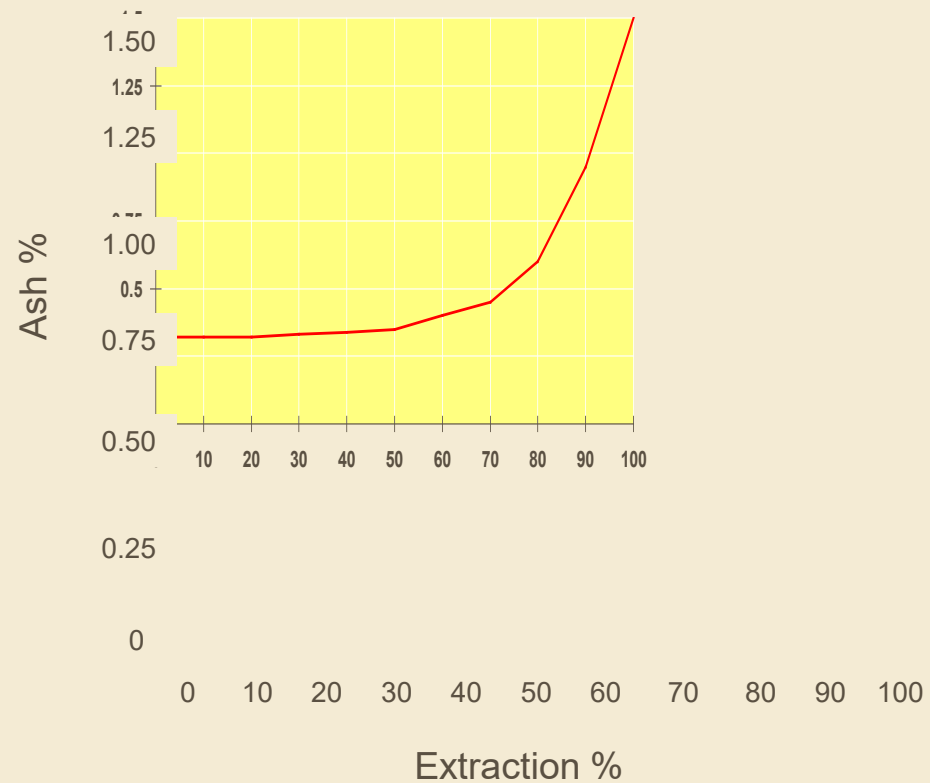
- **Bread Flour**
 - Good extensibility and resistance to extension
 - Good color
 - High Gluten
 - High WAP
 - **Biscuit flour**
 - Harsh gluten
 - Low color
 - **Patent Flour**
 - A mix of both of the above
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Analysis

- **Chemical analysis**
 - Moisture
 - WAP
 - Ash
 - Acid Insoluble Ash
 - Alcoholic Acidity
 - Proteins
 - Sedimentation Value
 - Gluten
 - Maltose
 - Damaged Starch
- **Physical Analysis**
 - Pekar Test
 - Granularity
- **Rheological Analysis**
 - Amylograph
 - Farinograph
 - Extensograph
- **Test Baking**

Cumulative Ash Curve

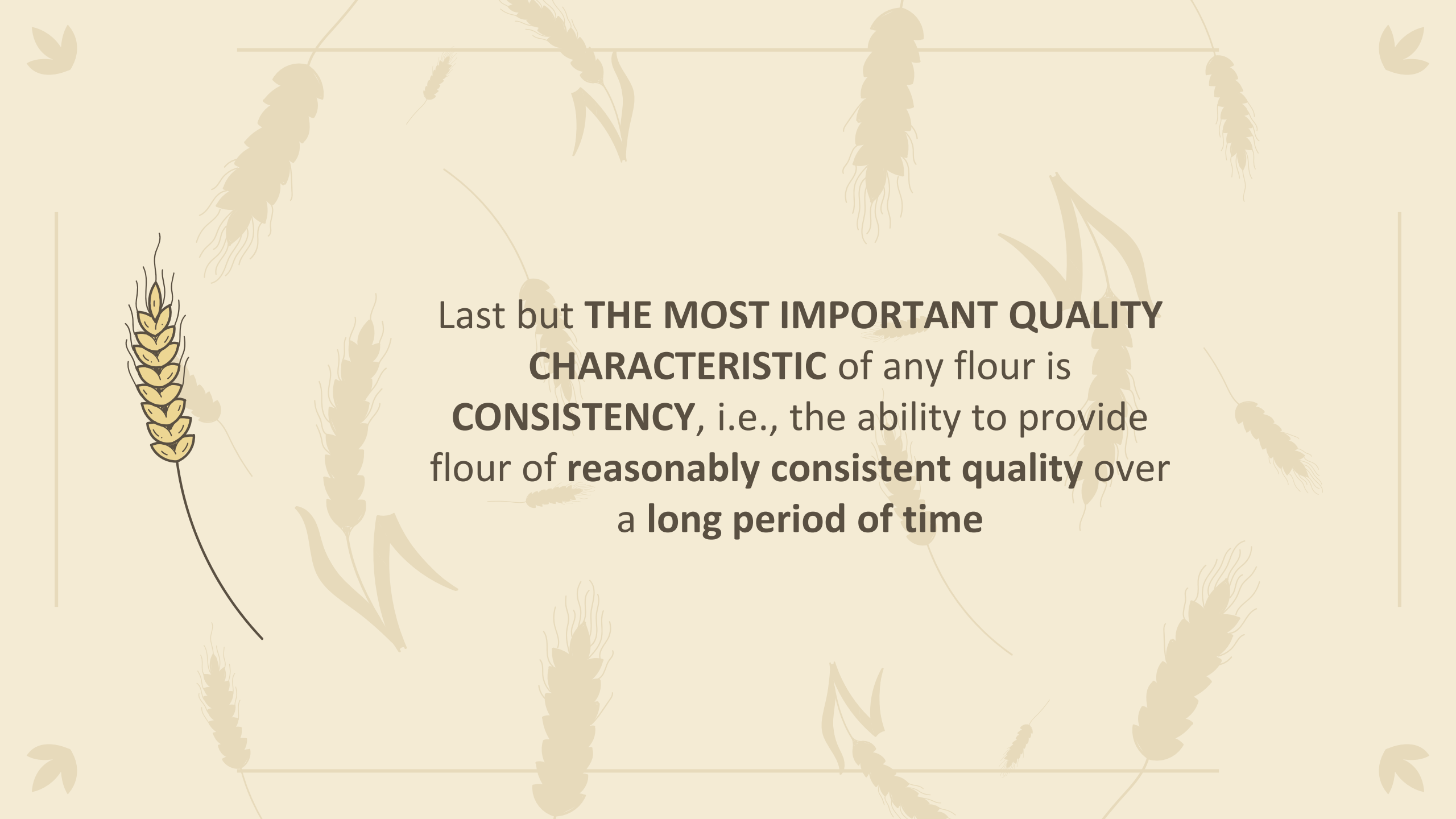


Simple Practices

- Cleaning and Sanitation
 - House Keeping
 - Personal Hygiene
 - Washing and Disaffection
 - Uniforms, Head Covering
 - Health Records
 - Control on Entry
 - Cleaning Facilities and Schedule
 - Pest Control
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Key Points to be Considered

- Site selection
 - Factory layout, area segregation, flow of work
 - Plant, machinery design and cleaning
 - Storage facilities
 - Records and paper-work, authorization
 - Maintenance and repair practices
 - Roles and responsibilities
 - Control on suppliers
 - Finished goods storage and dispatch
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The background is a light beige color with several faint, stylized wheat stalks and leaves scattered across it. Some stalks are more prominent than others. There are also four small, dark green leaf icons in the corners of the page. A thin horizontal line is visible near the top, and a thin vertical line is visible on the left side.

Last but **THE MOST IMPORTANT QUALITY CHARACTERISTIC** of any flour is **CONSISTENCY**, i.e., the ability to provide flour of **reasonably consistent quality** over a long period of time



Thank
You