Milling of wheat

Lecture No. 3

Dr. Hradesh Rajput

Assistant Professor,

Dept. of Food Technology, CSJMU, Kanpur

OUTLINES

- Introduction of Milling
- Objective
- Types of wheat milling
- Assignment/exercise
- Learning Outcomes
- References

WHAT IS MILLING????????

- Most cereal grains are used either for the production of animal feed or for the milling of flour for human consumption
- The grinding of wheat for human consumption has to meet higher standards of quality and is called milling
- The aim of milling is two fold;
    1. To grind cleaned and tempered cereal
    2. To completely separate the bran and germ from the mealy endosperm and to thoroughly pulverize the mealy endosperm into middings, semolina and flour in case of wheat.

SELO: 1 Reference No.: R1

OBJECTIVE

- To be understand the types of milling
- To be described the different milling techniques

SELO: 1

Reference No.: R1

NUTRIENT COMPOSITION

	Whole grain	Endosperm	Bran	Germ
Protein	16	13	16	22
Fat	2	1.5	5	7
Carbs	68	82	16	40
Dietary fiber	11	1.5	53	25
Minerals	1.8	0.5	7.2	4.5
others	1.2	1.5	2.8	1.5

SELO: 1

Reference No.: R1

WHEAT MILLING

- Wheat is commonly consumed in the form of flour obtained by milling the grain while a small quantity is converted into breakfast foods, such as wheat flakes, puffed wheat and shredded wheat

- Two types of milling process are;

1. Traditional milling
2. Modern milling

SELO: 1

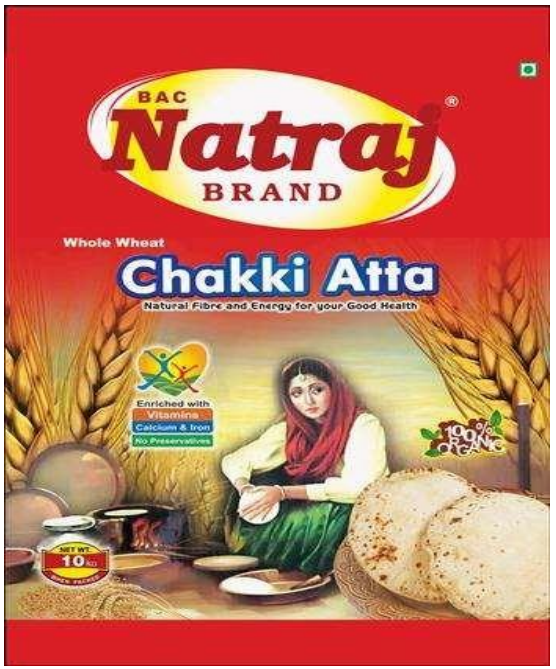
Reference No.: R1

1. TRADITIONAL MILLING

- The traditional procedure for milling wheat in India has been stone grinding (chakki) to obtain whole meal flour (Atta). It contains bran, germ and endosperm.
- This is an ordinary method of milling. In this method, two circular thick stones are used, one lying on top of the other. The surface of the stones are rough. This rough surface helps to crush the wheat.
- This method results in 90-95% extraction rate flour which retains almost all the nutrients of the grain while simultaneously eliminating that part of the grain which is most indigestible like cellulose and phytic acid which binds and carries away minerals

SELO: 1 Reference No.: R1

TRADITIONAL MILLING



SELO: 2

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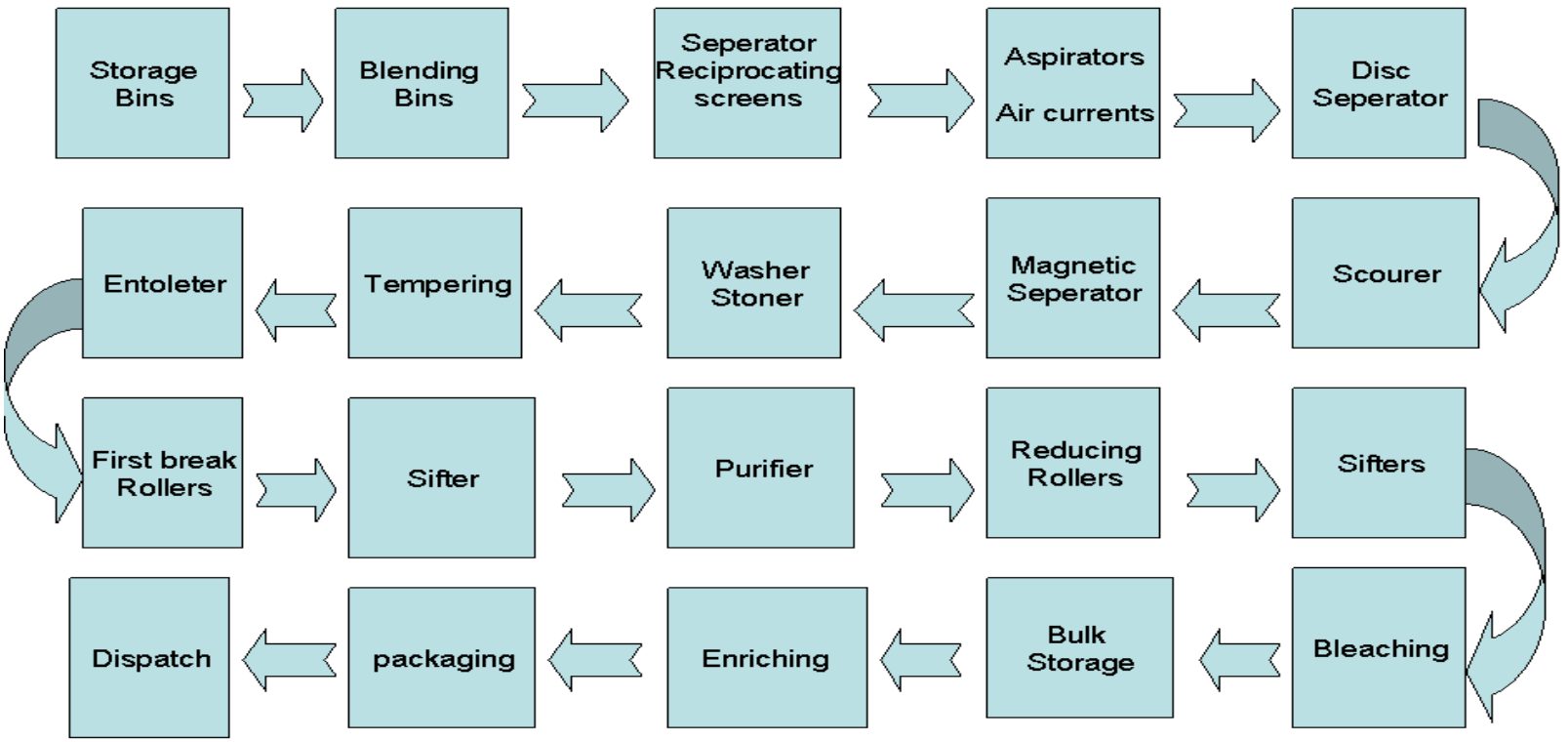
2. MODERN MILLING

Wheat Flour Milling Process Flow diagram



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MODERN MILLING

- Wheat is subjected to cleaning – remove various types Of impurities and damaged kernels
- 12 steps are involved

1. VIBRATING SCREEN

➢ Removes bits of straw and other Coarse materials and also foreign particles like seeds

SELO: 2

Reference No.: R2

2. ASPIRATOR

- Lifts of lighter impurities in the wheat
- Stream of grains directed across screen while air sucks of dust and lighterparticles

SELO: 2

Reference No.: R2

3. DISC SEPARATOR

- Discs revolving on horizontal axis
- Surface of disc catch individual grains but reject larger/ smaller materials

SELO: 2

Reference No.: R2

4. SCOURER

- Machine in which beaters attached to central shaft
- Throws wheat violently against surrounding drum
- Buffs each kernel and breaks kernel hairs

SELO: 2

Reference No.: R2

5. MAGNETIC SEPARATOR

- Pulls out iron and steel particles

  Contaminated during harvesting

6.WASHER STONER

- High speed rotators spin the wheat in the water bath
- Excess water thrown by centrifugal force
- Stones drop to bottom and removed
- Lighter materials float off leaving only

  the clean wheat

SELO: 2

Reference No.: R2

7.TEMPERING

- Wheat tempered before the start of grinding
- Process in which moisture is added
- Aids in separation of bran from endosperm and helps to

Provide controlled temperature and moisture throughout Milling

- 3 important factors in tempering

% of moisture, length of soaking, time of temperature

- Outer layer- tend to brittle
- Tempering toughens the bran coat permit complete Separation of endosperm

SELO: 2

Reference No.: R2

8. ENTOLETER

- Entoleter mills use centrifugal force to break and remove hulls from grains and seeds. The controlled speed of specially designed rotors breaks the hull.

SELO: 2

Reference No.: R2

9. GRINDING BINS

- The wheat kernels are milled into flour. The 'first break' rolls begins the separation of bran endosperm and Starch

10. SIFTER

- Broken particles of wheat and bran go into a boxlike sifter where they are shaken through a series of cloth/screens to separate larger from smaller particles

SELO: 1

Reference No.: R2

11. PURIFIER

- Divide them into bran and endosperm according to their quality
- Cloth / screen separate and grade coarse fractions by size and quality

SELO: 1

Reference No.: R2

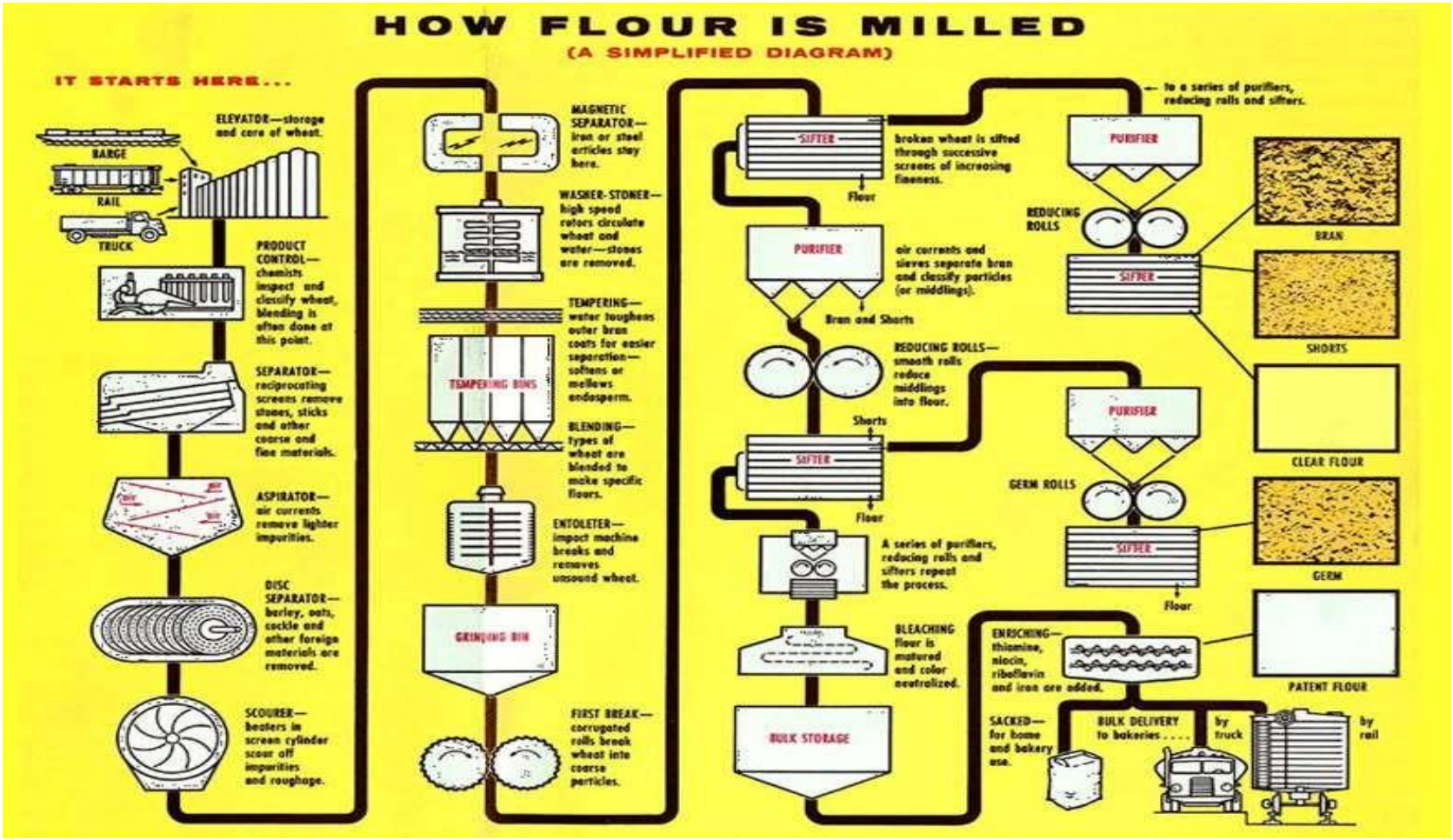
12. DOWN PURIFIER

- Reduce the wheat particles as free from bran as possible
- Germ particles being somewhat

SELO: 1

Reference No.: R2

Sifters, purifiers process is repeated over and over again until maximum amount of flour is separated consisting of about 72% of wheat



SELO: 1

Reference No.: R2

References

1. https://www.slideshare.net/NimishaK4/wheat-milling-nimisha-and-nesna?from_action=save

2. https://www.slideshare.net/FaseehaFaseeha/wheatmilling-technology-and-wheat-processed-products?from_action=save


Thank You!