

Raw Sugar

By

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Raw Sugar can be defined as Brown Sugar produced in a raw sugar mill generally destined for further processing to refined sugar.

- a). It is unwashed centrifugal sugar with minimum polarization 96.5.
- b). Raw Sugar surrounded by the original film of molasses to be further refined or reprocessed for making it direct consumption sugar.

Raw Sugar is producing from sugarcane or beat by ordinary process known as Defecation Process.

Defecation Process-

- a). This is the oldest and cheapest method of juice clarification.
- b). In this process lime and heat are two basic agents.

There are various methods of addition of lime & heating but all have a similar process excepting on the changes in physical characteristics of the systems.

1. Cold Liming –

Milk of lime added to raw juice to a pH 7.4 around and heating to 101 °C settle and decanted.

2. Hot Liming –

Raw juice is heated to 70 °C, then milk of lime is added to pH 7.4-7.5 again heated to 102-103 °C settled and decanted 15-20 % less lime is required and better clarification.

3. Fractional Liming with Double Heating –

The juice is limed to 6.2-6.4 pH then heated to 100-102 °C again limed to 7.6pH again heated to 100-102 °C settled and decanted.

In all the above clarification process juice is treated with lime and heated to boil prior to concentration by Evaporation Stress has been laid on increasing purity, prevention of inversion elimination of colloids, removal of non-sugars and production of a limpid juices.

Stress has been attached on increase in purity with prevention of inversion etc. But basic importance has to be attached to increase the pH to neutralizing where inversion of sucrose becomes negligible. Since increasing the pH by lime gives rise to other problems so an optimum dose has to be fixed according to characteristic and constituent of cane juice. When producing raw sugar no great values has to be attached to be a clear sparkling juices other than indication of an effective clarification.

The lime and heat treatment forms a heavy precipitate of complex composition contains in soluble lime salts, coagulated albumin and varying proportion of the fats, waxes and gums.

Phosphoric acid is added to increase P_2O_5 content of juice to 300 ppm. Then lime added to neutralize organic acids.

Besides insoluble tricalcium phosphate $[Ca_3(PO_4)_2]$ is also formed which occludes colloids and suspended impurities.

Settling:

The limed juice is heated up to $102-103^\circ C$ and then sent to clarifier for settling and further filtration purpose. The different types of clarifier design to carry out this separation as completely and rapidly as possible. Normally settling aid is added so as to maintain the juice free from suspended matter and turbidity.

Evaporation:

The clarified juice sent to evaporator bodies to increase its solid concentration. After evaporation, it is called syrup.

Crystallization:

Straight three m/c boiling scheme is followed for raw sugar manufacture care has to be taken to ensure uniformity and proper size of sugar grains. The raw sugar crystals are surrounded by thin film of molasses and thus having brownish appearance.

A massecuite is boiled on B-seed footing while C-sugar is melted and used for A-boiling. Raw sugar have constant pol and free from undesirable impurities.

Centrifuging and drying :

No washing of 'A' massecuite sugar in the centrifugal to be followed. After centrifuging, the raw sugar drying followed by cooling on hoper by blowing hot and cold air. Bagging temp. should be maintained near to room temperature to prevent caking of raw sugar.

The raw sugar should be quickly moved to refined sugar process as for as possible or otherwise to be stored in humid proof go down.

SPECIFICATIONS OF RAW SUGAR

Sl. No.	Characteristic	Requirement
1.	Pol (min in %)	96.5
2.	R.S. by mass (max in %)	1
3.	Sulphited ash % by mass (max %)	0.8
4.	Ash % by mass (max %)	0.8
5.	Safety factor (min in %)	0.3
6.	Crystal size (material to be retain on 0.5 mm IS seave %)	95
7.	Sulphur dioxide (max in ppm)	20