SUGARCANE *VIS* SUGAR BEET: WHICH IS A BETTER OPTION?

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INTRODUCTION:

The sugar industry is at the second most important after textile industry in India. The table sugar we use on a regular basis in our kitchen, comes from the two sources i.e., sugarcane and sugar beet. The sugar obtained from the sugarcane accounts for about more than 80% of the total sugar produced in the world and the rest is obtained from the sugar beet. There are few countries like United States where there is an estimated 55-60% of the total sugar produced comes from the sugar beet. Both the cane sugar and the beet sugar are been found in the many of food items, consisting of many sweets, sodas, processed and baked foods, etc. There are many differences and similarities in these two types of sugar. This article deals with the few aspects of this comparison which will help us to choose our source of sugar in better way.

SUGARCANE

Sugarcane (*Saccharum* spp.) is a major cash crop, cultivated in the many tropical and sub-tropical zones. India is at the first position with respect to the production followed by Brazil (According to the news published in the Business Insider India on May 25, 2022). Sugarcane is the major source of the sugar produced in India and in also worldwide. Along with sugar, the other products like juice, jaggery (gur), khandsari (unrefined or brown sugar) is also been produced. Sugarcane also been used as a renewable source of energy used for bio-electricity, biofuels, etc.

to a variety of fine consistencies, each with a specific use. Interestingly, the varied shades of commercial brown sugar are created by re-mixing various volumes of molasses into refined white sugar (light, golden or dark brown).
The table sugar is extracted from sugarcane in mills. It is used as a sweetener for drinks, a finishing touch for cakes and pastries, a preservative in jams and preserves, a raw material in the food sector, or it can also be fermented to make ethanol.

Many of us don't know much about the beet sugar so first let's take a brief idea about it:

SUGAR BEET

The sugar beet is a tropical crop with scientific name *Beta vulgaris* spp. *vulagris* var. *altissima* Doll. It is a biennial sugar producing tuber crop which is grown mainly in temperate countries. Nowadays sugar beet hybrids, being a promising energy crop is planted in many tropical and sub-tropical countries including Tamil Nadu. Sugar beet contains high levels of sucrose and it is next only to sugarcane as major crop for sugar production in the world.
Sugar beet is a cross pollinated crop and many high yielding polyploid varieties have been developed in this crop. In US and other countries, the commercially grown sugar beets are mostly genetically modified.

Sugar beet have been grown by humans for thousands of years, making them possibly the most ancient root crops in Europe and the Middle East. But it wasn't until the 1500s that their sucrose-producing potential was understood and it took many more centuries for a beet variety with a constant high sugar content to be created. Processing facilities for beet sugar started popping up in Europe in the early 1800s and they gradually migrated to the United States.

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WHAT DO YOU MEAN BY BEET SUGAR?

content to be created. Processing facilities for beet sugar started popping up in Europe in the early 1800s and they gradually migrated to the United States.
Sugar beet can be grown in temperate areas and are highly hardy, which is one of the main benefits of using them to make sugar. Since many people enjoy taking vacations in the tropics, tropical land is frequently in high demand. Sugar cane demands a tropical atmosphere. Sugar beets are an appealing alternative to cane because they can be produced in cooler climates and on less desirable ground and they are also less expensive to grow. Beet sugar is also simpler to make because it just needs very basic processing in one facility, as opposed to the two steps required for cane sugar.
The beet is 'topped' (the top is removed) and then delivered to the factory for processing. The sugar is then extracted from the sugar beets by washing, slicing and boiling them in water. After that, it is crystallized and filtered.
Apart from the beet sugar this crop is also been valued for the byproducts such as ethanol which is used as bio-fuel, it can be blended with petrol or diesel up-to the extent of 10%. The other waste materials viz., beet top is used as green fodder, filler cake obtained from industry is used as organic manure and the beet pulp as cattle feed. It is also been used to produce refined sugar, molasses and brown sugar.

CANE SUGAR V/S BEET SUGAR

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Moreover, a lot of bakers and pastry chefs state that brown sugars made from sugarcane and sugar beets differ from one another. In sugar beet processing, the molasses is not been produced which gives brown color to brown sugar and its then added externally, the one made from sugarcane. As a result, molasses from sugarcane is added during production of brown sugar made from sugar beets. Many chefs only use brown sugar made from sugarcane because they believe brown beet sugar has a negative impact on their goods, despite the fact that the industry claims they are similar products. Although some claim that the difference between the two plants trace minerals is what makes them different, it is more likely that there is a variation in moisture that could have an impact on baked products and other delicacies.

EXTRACTION PROCESS

The pure juice of ripened sugarcane is essentially what is used to make cane sugar. In the stalks, sugar builds up during the ripening process. The cane is run through crushing machinery in order to extract the sugar that is kept in the stalk as sweet juice. To reduce the water content and encourage crystallisation, the cane juice extraction is followed by purification and evaporation. After crystallisation, raw sugar is created, along with molasses, a viscous, sticky, dark material. The molasses is separated from raw sugar during the refining process to produce the finished good, often known as white sugar.

For extracting the beet sugar, the beets must first be carefully washed to get rid of all the dirt before being used. Beets are then cut into thin slices after this. The beets surface area is increased during the slicing process, which makes it easier to extract sugar. After that, the slices are put in a diffuser, where hot water and the thin beet slices are combined. This beet "washing" in hot water aids in eliminating the sugar. However, the produced sugar solution contains contaminants such as beet flesh. A thick sugar syrup is created by filtering the solution, then evaporating it. Finally, the syrup is heated to eliminate any remaining water, leaving only the crystals of beet known as beet sugar.

DIFFERENCE IN PROCESSING

Unlike beet sugar, which doesn't require this process, cane sugar must be filtered through charcoal in order to attain its pure white hue. And as it turns out, the charcoal used to filter cane sugar is often generated from a substance known as bone char, which is derived from animal bones. Even if bone char isn't present in the finished product, those who prefer to eat less food manufactured with animal ingredients, such as vegans or vegetarians, might want to take this into account. Remember that other materials, such as coal-based activated carbon, are frequently employed in the production of white sugar as a vegan substitute for bone char.

WORKS DIFFERENTLY IN RECIPES

Despite having essentially identical nutritional profiles, cane sugar and beet sugar could perform differently in recipes. This is partially brought on by noticeable variations in taste, which can change the flavour of your food. While cane sugar has a sweeter aftertaste and a fruitier aroma, beet sugar has an earthy, oxidised aroma with a subtle burnt-sugar aftertaste. Additionally, some bakers and chefs discover that the texture and appearance of the finished result in various recipes vary depending on the type of sugar used. Most significantly, compared to beet sugar, cane sugar is reported to caramelise more quickly and produce a more homogeneous product. Beet sugar, on the other hand, can provide a crunchier texture and has a distinct flavour that complements some baked dishes.

TASTE

Cane sugar and beet sugar are both equally sweet, yet only a few people can tell the minor difference between the two. Professionals in particular are capable of detecting this complexity in taste.

NUTRITIONALLY SIMILAR

Although cane sugar and beet sugar have certain differences, they are almost nutritionally similar. Whatever is its source, refined sugar is fundamentally just sucrose, a substance made of molecules of glucose and fructose. Because of this, ingesting a lot of beet or cane sugar can lead to weight gain and the emergence of chronic diseases like diabetes, heart disease and liver issues. Health organisations like the American Heart Association advise keeping added sugar intake to less than 6 teaspoons (24 grammes) for women and fewer than 9 teaspoons (36 grammes) for men per day. All cane and beet sugar varieties, such as white sugar, brown sugar, molasses, turbinado and the sugar present in a variety of processed meals such desserts, soft drinks and sweets, are included in this.

OFTEN GENETICALLY MODIFIED (GMO)

Due to concerns regarding genetically modified organisms, many customers favor cane sugar over beet sugar (GMOs). Approximately 95% of sugar beets in the US are thought to be genetically engineered. In 2018, the United States legalised the use of genetically altered sugar cane. Some people support genetically modified crops as a sustainable food source that is incredibly resistant to pesticides, herbicides or extreme weather. Others, however, want to stay away from GMOs because they worry about potential negative impacts on their health or the environment. Despite the fact that some scientists are concerned that some GMOs may have harmful health impacts, there hasn't been much research on how they affect people. However, some studies have found that GMO crops are safe for humans to consume and have a similar nutrient profile to conventional crops. To help reduce your exposure to GMOs if you're concerned about GM crops, it's better to choose cane sugar or non-GMO beet sugar.

CONCLUSION

In above article, we have gone through the various differences and similarities between the cane sugar and the beet sugar. Both kinds of sugar have the same taste and texture. The vegans and vegetarians can opt for beet sugar as it doesn't make use of bone char for its filtration, which is obtained from animal bones. If someone is concerned about the GM crops, the cane sugar is the better option than beet sugar. Both of these sugars are similar nutritionally and both can cause certain health related issues, if consumed in more amount than the optimum. Some bakers and chefs go for cane sugar rather than the beet sugar because the former one caramelise more quickly and produce more homogenous product. So, both these types of sugar have their own benefits and drawbacks, so one can choose their desired source based on their needs and preferences.