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A Review on Nutritional Value of Maize/Baby Corn

Priti N. Girawale.[1], Shruti T. W.[2], Nikita S. D.[3], Prof. Avhad P. R[4], Dr. Sanjay Ingale[5]
Student[1,2,3], Professor[4] and Principal[5]
Dharmaraj Shaikshanik Pratishthan Collage of Pharmacy, Walki, Ahilyanagar, , Maharashtra, India

Abstract: *Maize is gaining popularity in both food and feed sectors. Every component of a corn cob has economic value and the ability to be employed for a variety of tasks. Because baby corn is nutrient-dense and provides farmers with a great alternative source of income, its demand is rising as lifestyles change. Baby corn is a commercial crop that was developed in the late 1970s. It is used as a vegetable crop and is known as a catch crop. Because of its wonderful flavour, nutritional benefits to human health, and rising demand in the market, baby corn quickly turned into a cash crop.Being a perishable product, the shelf life of baby corn is less. It's a good organic food that can be utilized to make many different value-added baby corn products. The value addition of baby corn makes it available during the off-season, gives people living in poverty job opportunities, and allows for the possibility of foreign exchange in the food and feed industries.*

Keywords: Maize/Baby corn, Utilization, Classification, Cultivation, Nutritional value, Benefits, Medical Properties

I. INTRODUCTION

Archeological remains indicate that maize cultivation began almost 5000 years ago in America. This food was the basis of many ancient American culture. The very name derives for the world “Mahis” which the native of “Haiti” means “life-sustaining”. Maize cultivation was already fully established in America when Europe setters arrived. Maize demand in India will continue to increase because of its diversified uses and increasing population. Maize is highly versatile crop with high yield and fast growth. Its cultivation is popular in urban and peri-urban areas due to high market demand.Earlier, baby corn was a delicacy, and its recipes were available only in star hotels and big restaurants. Now, it is becoming popular even among masses due to the revolution in information technology, increase in baby corn production and hence easy availability in the market. Now a day’s baby corn is more available in shopping malls which are available under one broad umbrella world “Baby corn is a young finger like unfertilized cobs with 1-3cm emerged silk preferably harvested within 1-3 days of silk emergence depending upon the growing season. It can be eaten raw as salad and in preparation of different recipes such as chutney, pakora, mix vegetables, pickles, candy, marabi, kheer, halwa, raita and Chinese preparations, etc”. Baby corn is free from insect, pests, and diseases and its nutritional value is comparable with other vegetables available at high price”Farmers can increase their income within a short period of time by cultivating baby corn. Factors affecting optimum production of baby corn are poor germination, scanty rainfall and slow growth in winter season. To deal with these, farmers should be made aware about the improved cultivation technologies of baby corn.

SCIENTIFIC CLASSIFICATION OF MAIZE:
Scientific Name: Zea Maize L
Kingdom: Plantae
Subkingdom: Trachiobionta (vascular plant)
Family: Poaceae
Subfamily: Panicoideae
Genus: Zea
Species: Zea mays

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Sub species: Mays
Order: Cyperales
Class: Liliopsida (Monocotyledon)
Super division: Spermatophyta (seed plant)
Division: Magnoliophyta (Flowering Plant)

Fig No 1: Maize farming

MAIZE UTILIZATION IN INDIA AND OTHER COUNTRISE: Bihar, Karnataka, Maharashtra, Madhya Pradesh, Uttar Pradesh, Andhra Pradesh, Rajasthan.

Table No 1: Maize utilization in India

States	Areaunder hybrid(%)	Area under cultivation (mm hector)	Yield (tones/hector)
Karnataka	100	1.3	3.5
Rajasthan	25	1.1	1.8
Madhya Pradesh	16	0.8	1.2
Maharashtra	100	0.9	2.9
Andhra Pradesh	100	0.7	5.3
Uttar Pradesh	21	0.8	1.5
Bihar	80	0.6	2.2
Gujarat	21	0.5	1.6
Tamil Nadu	100	0.2	4.5
Others	60	1.5	2.1
All India	60	8.6	2.5

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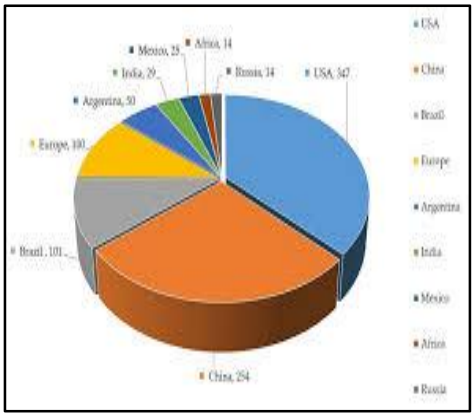

Fig No 2: Maize utilization in other countries

BOTANICAL DESCRIPTION:

Root: The root system of maize is fibrous and deep.

Seminal or Temporary roots: First set of roots.

Crown roots: Permanent roots.

Brace, prop or Arrival roots: For anchorage.

Fig No 3: Roots of Maize Plant

Stem: Made up of approximately 12-18 altering nodes and inter nodes. Inter nodes are some what flattened or grooved on the side next to the leaf sheath.

Fig No 4:Stems of Maize Plant

Leaf: The leaves developed alternately on opposite sides of the stem.

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The number of leaves varies from 12-20.

Stomata are present on both the surfaces of the leaf (Isobilateral).

Fig No 5: Leaves of Maize Plant

Inflorescence: Monoecious flowering habit

Female inflorescence – Pistillate flower – develop into and ear (cobs).

Female influencer – Silk

Fig No 7: Female Inflorescence

Male inflorescence – It is containing staminate flower

Male inflorescence –Tassel

Fig No 6:Maize inflorescence

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CLASSIFICATION OF MAIZE:

Flint corn
Dent corn
Pop corn
Sweet corn
Flour corn
Pod corn
Waxy corn
Bt corn

Fig No 8:Maize classification

Flint corn:

Flint corn is grown in the US, Asia, Central America, Europe and South America.
In temperate zones, flint corn mature earlier, has better germination, and the plant Vigor is earlier than in dent.

Bt corn:

The susceptibility of maize to the European corn borer, and the resulting large crop losses, lead to the development of transgenic expressing the Bacillusthuringiensis toxin.
Bt maize is widely grown in the US and has been approved for release in Europe.

Popcorn:

Popcorn is an extreme foem of flint
It has a very small proportion of soft starch.
It is a very minor crop and is grown mostly for human to eat.
The reason is pops so well is because of the horry endosperm, which is a tough, stretchy material that can resist the pressure of steam which is generated in the hot kerneal until it has enough forced to explored or pop.

Waxy corn:

This kernelappears waxy.
Chemically it has a different type of starch than normal corn starch.
It has developed in China and some waxy mutations have occurred in America dent strains
Very little is grown is used for producing a starch like tapioca starch.

Dent corn:

Getting its name from the dent in the crown of the seed.
Is grown more than any other type of corn
Is used for human and industrial use and for lovestruck feed
The starch reaches the summit of the seed, and the sides are also starchy
The denting is caused by the drying and shrinking of the starch.

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CULTIVATION OF MAIZE:

Wet milling: Industrial starch production – sweetener's
Paper lamination
Textile wrap, sizing and laundry finishing
Dry milling: Dry milled product is
Animal feed, brewing, breakfast cereals, other food
In India dry milling is the predominant process for both floor and animal feed
Origine at Mexico and South America

Whole yellow maize grain
↓
Cleaning/sorting
↓
Soaking (48 h)
↓
Wet milling
↓
Wet sieving
↓
Fermenting and setting (24 h)
↓
Sedimentation/Decantation
↓
Bagging/Dewatering
↓
Granulating/drying
↓
Dry milling (0.5 mm) / cooling
↓
Packaging/ Ogi powder

SOIL AND CLIMATE REQUIREMENTS:

Climate:
Most suitable temperature is 21°C for germination and for growth 32°C.
Grows from sea level to 3000mtr altitude.
In north India mainly grown "kharif" (monsoon) season crop.
In south India any time from April-October.
Soils:
Red sandy loams to medium black soils with good drainage facilities are preferable.
Maize does not comeup well heavy clay in saline, alkaline and waterlogged soil.
Optimum pH range should be 5.5 to7.5.

PRE HAEVESTING:

Make sure the drying place or equipment is clean and disinfected, ready to receive the cobs.
Remove old grain and dirt from anything that will come in contact with the good or new grain. This includes harvesting tools, carts, wheelbarrows, bags and baskets.
Where possible fumigate them or at tret them with boiling water to kill insects or their eggs.
Organize enough laborto reap and carry the cobs to the drying place.

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POST HARVESTING:

Drying: The systematic reduction of crop moisture down to safe levels for storage, usually 12%-15.5% moisture content. It is one of the key post-harvestoperations since all down-stream operation depends on it.

Shelling: It is commonly donebybeating maize cobs with stick in a sack or a confined floor space where farmers can afford it.

Storage: To maintain the Stord grains in good condition so as to avoid deterioration both in quantity and quality.

Fig No 9:Maize meal milling

MEDICAL PROPERTISE OF MAIZE:

Treating urinary track infection, kidney stone, and bladderproblems: Decoction of maize silk, roots and leaves can help with this condition.

Improving blood pressure: Maize oil containing essential fatty acids that can help regulate blood cholesterol level and maintain blood pressure.

Supporting liver function: Maize can helpsupport liver function and produce bile.

Treating stomach complaint: Decoction of maize cop can help with stomach complaints.

Treating wounds, swelling and ulcer: Maize can act as an emollient for these conditions.

Treating hypercondition high blood pressure: Ayurvedic scripture praise maize's ability to treat hypertension.

Treating depression

Treating skin and hair: Vitamin B complex in maize can help treat skin hair and digestion

Treating bone formation and blood clotting

Preventing and undoing damage to collagen in the skin.

NUTRITIONAL VALUE OF MAIZE:

One cup chopped raw baby corn gives 26calories, 0.2gm fat, 2.5gm protein,3.1gm carbohydrate.

Table No 2: Nutritional value in maize

Nutrient	Baby corn	Popcorn	Sweet corn	Maize(white)
Energy	73.13 kcal	334.13kcal	96.79kcal	119.98kcal
Carbohydrates	11.66gm	64.77gm	16.42 gm	22.69gm
Protein	2.69gm	8.8gm	4.16gm	3.57gm
Total fat	1.33gm	3.77gm	1.35gm	1.4gm
Calcium	76.51mg	8.91mg	6.37mg	6.35mg

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Phosphorus	8.69mg	279.0mg	121.0mg	163.0mg
Total fiber	6.09mg	12.24gm	3.3gm	3.67gm
Omega 3	25.69mg	40.76mg	7.65mg	10.46mg
Potassium	260.0mg	291.0mg	297.0mg	167.0mg
Natural sugar	0.49gm	1.66gm	4.67gm	1.47gm

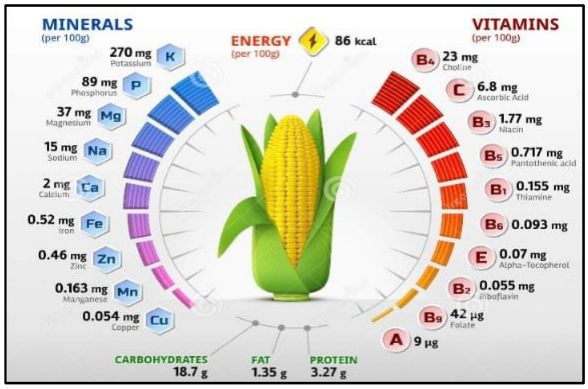

Fig No 10: Nutrient found in maize

BENAFITS OF MAIZE:

Soaked in antioxidant: Corn is an excellent source of lutein and zeaxanthin, two antioxidants that are essential for eye health.

High in Protein: One serving (one medium ear or a half cup cooked or frozen) provides about 3.5 gm of protein.

Control diabetes: The health benefits of corn include in treating diabetes. A corn containing phenolic phytochemicals that control the release of insulin in the body.

The gold of eyes: They protect the retina from blue light and maintain vision.

Prevent anemia: Anemia is the health issue that occurs for lacking sufficient red blood cells in the blood. Corn should lower the possibility of anemia because this food is filed with the iron, folic acid and vitamin B12.

Maintain blood sugar level: Corn has a lot of nutrients as well as vitamin B1, B5, folic acid that are helpful in controlling blood sugar level. It is suggested that eating 1 or 2 cups of corn every day.

Might help in weight loss:low in calories (86 kcal per 100 gm), high water content keeps hydrated, abundant in vitamins and antioxidants, rich in fiber for weight management.

Goods for guts: Acts as a prebiotic, enhancing gut health, studies show it may prevent gut disease from eating baby corn.

Boost digestion: Corn has a high amount of both soluble and insoluble fiber. Daily eating of corn can help digestive process. Soluble fiber stop cholesterol by making a gel consistency. Insoluble fiber is helpful in making stool soft, so it help to decrease the possibility of diarrhea, constipation, irritable bowel syndrome, along with stomach trouble.

Skin health: Beta-carotene and vitamin A in corn may help in improving skin health.

Corn also supplies a variety of vitamins and minerals, including magnesium, potassium, vitamin B and Vitamin A and C.

Corn oil has been found to benefit heart health.

Prevent cancer.

Protect your heart.

Speed up weight loss.

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Boost immune system.

II. CONCLUSION

Baby corn has become more and more popular in normal vegetable markets in both urban and rural areas in recent years. Still, there's a need to better popularize baby corn given its nutritional significance. Even though baby corn is sold domestically, it isn't properly processed before being marketed. When breeding for baby corn, focus must be maintained on producing plants with a light-yellowcolour and a regular row arrangement, as these traits increase market value. The quality of the cobs is significantly reduced as a result. When growing baby corn for the market and export, it is important to carefully process and can the cobs within two to three hours of harvest to prevent loss of their nutritional value. Additionally, it serves as a vegetable that offers an extra source of nutrition for humans. Due to its excellent taste and texture, baby corn is anticipated to attract an increasing number of consumers and farmers. To access these advantages, it is necessary to have research and development assistance and suitable policies at the national level. The cultivation of baby corn also offers employment opportunities to numerous farmers. Additionally, the post-harvest processing of baby corn is advantageous for both the private and public sectors.

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