

AMARANTHUS PRODUCTS



AATMANIRBHAR BHARAT

**PM Formalisation of Micro Food Processing
Enterprises Scheme (PM FME Scheme)**

- The most common leafy vegetable grown during summer and rainy seasons in India.
- Fits well in a crop rotation because of its very short duration nature and large yield of edible matter per unit area.
- Stem green to purple or with mixed shades of these two colours glabrous and succulent, leaf simple, alternate or opposite, exstipulate, entire obovate to lanceolate with acute tip green to purple or with shades of these two colors, purple coloration prominent in young leaves and fades away at maturity.





AMARANTHUS

- Amaranthus Botanical Name- *Amaranthus tricolour* L. Family- Amaranthaceae Origin – India.
- Both green and red varieties are suitable for culinary preparations.
- Leaf amaranth is a warm season crop adapted to hot humid climatic conditions. It is grown throughout the year in tropics and in autumn, spring and summer seasons in temperate regions.
- Suitable for preparing products like Squash (using leaves of Red variety), Pakoda(leaves and tender shoots of both varieties), Cutlet, Pickle(stem of both varieties) and Pakkavada (using leaves of both varieties).



CULTIVARS

- **Co-1(A. dubius)** This cultivar has been developed by selection from a local type at TNAU, Coimbatore, India in 1968. It is mainly grown for tender green as well as matured stems. It yields 2.150 kg of greens per 3 sq m area (7165 kg/ha). Takes 50 days for flowering.
- **Co. 2 (A. tricolor)** Selection from local type at TNAU, Coimbatore and released in the year 1976. Particularly suited for early harvest. It yields 3.230 kg of greens per 3 sq m area (10780 kg/ha) Takes 42 days for flowering.



CULTIVARS

- **Co. 3 (A. tristis)** Selection from local type at TNAU in 1981. Average yield of 30716 kg of greens per hectare . This cultivar flowers in 35-40 days
- **Chhoti Chaulai (A. blitum)** Selection at IARI, New Delhi. Suitable for its leafy shoots. Flowers are borne in clusters in leafy axils.
- **Badi Chaulai (A. tricolor)** Developed at IARI, New Delhi through selection. The economic product is leafy shoots. It is best suited for summer season.



CULTIVARS

- **Pusa Kirti** (*A. tricolor*) This cultivar developed at IARI ,New Delhi is suitable for summer. It flowers in 30-35 days.
- **Pusa Kiran** Developed through hybridization at IARI,New Delhi. This cultivar is most suitable for rainy season. It flowers in 21-25 days.
- **Pusa Lal Chaulai** (*A. tricolor*) A high yielding, red pigmented cultivar developed at IARI, New Delhi. It is suitable for growing in both summer and rainy seasons.



CULTIVARS

- **Arka Suguna** A pure line selection from Taiwanese introduction (IIHR 13560) made at IIHR, Bangalore. It flowers in 25 days.
- **Arka Arunima** . A multicut, purple cultivar with brown and dark purple leaves . Developed at IIHR, Bangalore. The first cutting becomes ready at 30 days after sowing. Leaves contain low antinutrient factors like oxalate and nitrates. It grows well in rainy and summer seasons and yields about 240 q/ha of greens.

HARVESTING AND POST HARVEST MANAGEMENT

- The first cutting can be made 3 weeks after sowing. Subsequent cuttings are made at 10–15 days interval depending upon the vegetative growth.
- The leaves lose water rapidly during storage, particularly at higher temperature resulting in rapid wilting, decrease in chlorophyll, ascorbic acid and soluble protein content and an increase in amino acid content.
- It can be stored for 6 days at 24°–28°C temperature.





MAJOR COMPONENTS OF AMARANTHUS IN 100 G

| Components | Red variety | Green Variety |
|-------------------|-------------|---------------|
| Moisture (g) | 85.5 | 91.6 |
| Protein (g) | 4.9 | 2.46 |
| Carbohydrates (g) | 10 | 4.02 |
| Energy (kcal) | 51 | 23 |
| Fat (g) | 0.5 | 0.33 |
| Dietary fiber (g) | 1 | 2.2 |





MAJOR COMPONENTS OF AMARANTHUS IN 100 G

| Components | Red variety | Green Variety |
|------------------|-------------|---------------|
| Calcium (mg) | 368 | 215 |
| Iron (mg) | 2 | 2.32 |
| Phosphorus (mg) | 111 | 50 |
| Sodium (mg) | 42 | 20 |
| Potassium (mg) | 340 | 611 |



MAJOR COMPONENTS OF AMARANTHUS IN 100 G

| Components | Red variety | Green Variety |
|-----------------|-------------|---------------|
| Vit. B1 (mg) | 0.08 | 0.03 |
| Vit. B2 (mg) | 0.3 | 0.16 |
| Niacin B3 (mg) | 1.2 | 0.66 |
| Vit C (mg) | 80 | 43.3 |
| Vit. A (IU) | 5560 | 2917. |

Source : USDA National Nutrient Data base



IMPORTANCE

Amaranthus is commonly consumed in all over India .The nutritional benefits offered by the leafy vegetable is extremely beneficial for not only our health but also for our skin and hair.

Amaranthus are rich in proteins and micronutrients such as iron, calcium, zinc, vitamin C, and vitamin A.



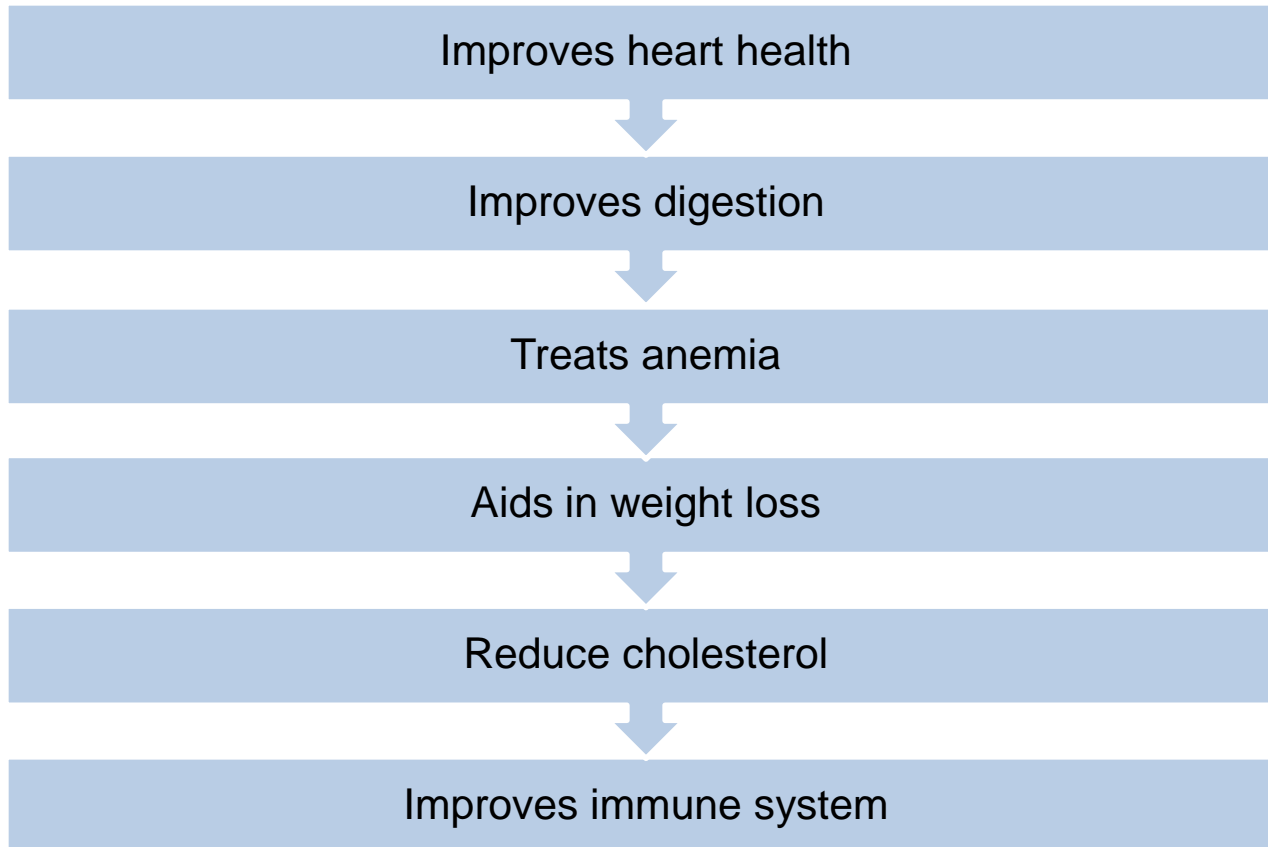
IMPORTANCE

Amaranthus is high in several antioxidants, such as gallic acid, *p*-hydroxybenzoic acid and vanillic acid, which may help protect against disease.

Amaranthus extracts have been used to treat several conditions including urinary infections, gynecological conditions, diarrhea, pain, respiratory disorders, diabetes and also as diuretic.

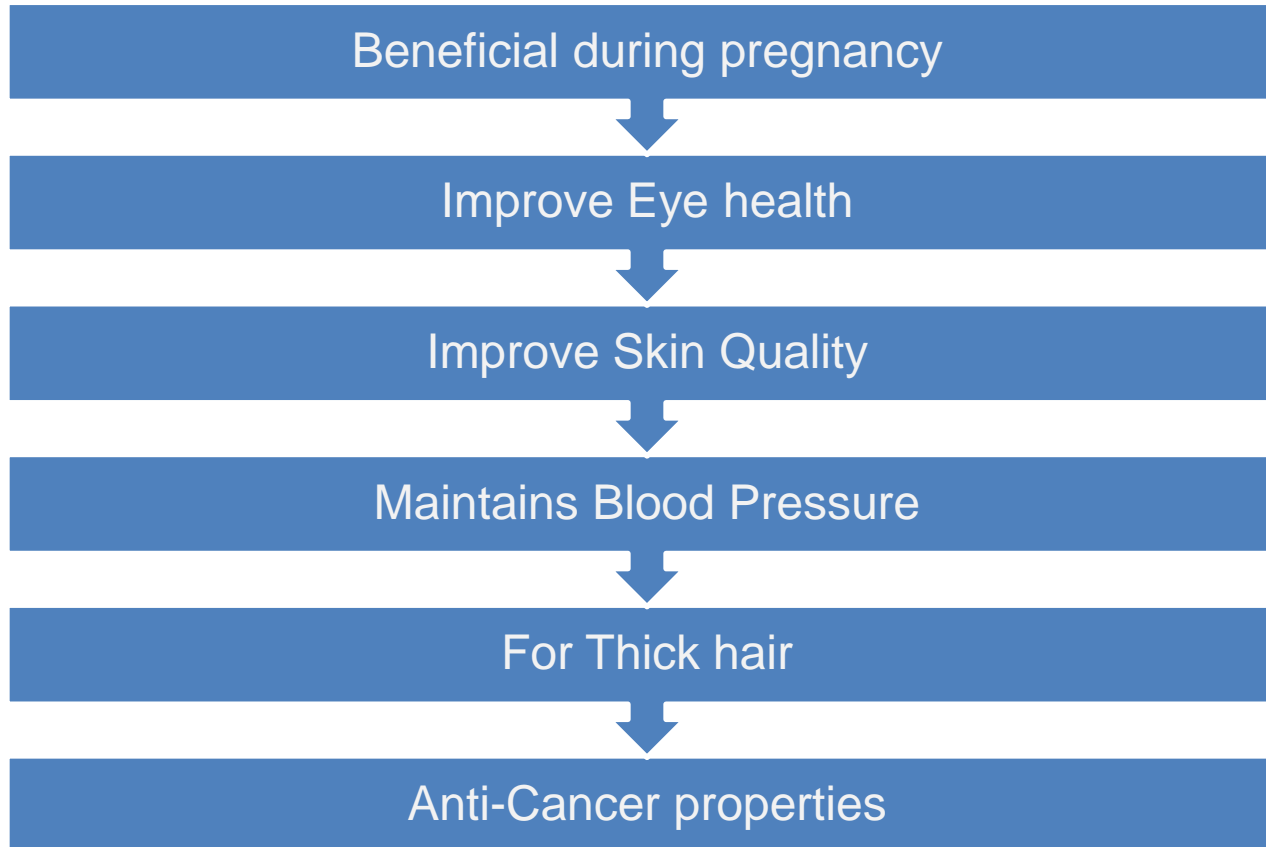


NUTRITIONAL IMPORTANCE OF AMARANTHUS





NUTRITIONAL IMPORTANCE OF AMARANTHUS





PRODUCTS OF AMARANTHUS

Leaf based products



Leaves

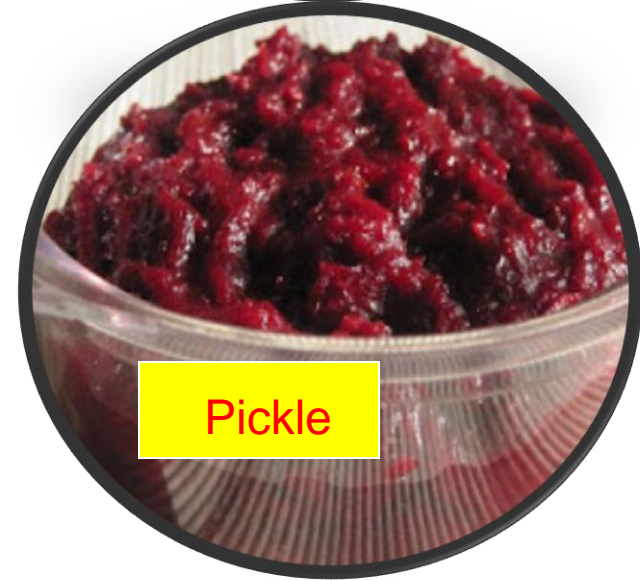


Squash



Pakkavada

AMARANTHUS STEM BASED PRODUCTS





AMARANTHUS LEAF SQUASH RECIPE

Ingredients

Amaranths leaves : 500 g

Sugar : 1.75kg,

Citric acid 15 g

water -1.5 litre

Straw berry essence- 1 teaspoon

Sodium Benzoate- 1.5 g / litre





PROCESSING TECHNOLOGY

1. Clean , wash , drain and cut the Amaranthus leaves
2. Boil 1 liter water and add leaves and 5 g citric acid to this and simmer for 15 minutes.
3. Take the extract and keep it for cooling
4. Boil remaining 500 ml water and dissolve sugar and citric (10 g) and add amaranthus extract , bring to boil (Temperature : 95-100 ° C)
5. Allow to cool and add Straw berry essence- 1 teaspoon / liter , Sodium Benzoate- 1.5 g / liter. Then Bottle and label.
6. Diluted to 5 times with cold water before use



AMARANTHUS LEAF SQUASH FLOW CHART

Harvest and clean Amaranthus leaves

Clean , wash , drain and cut the Amaranthus leaves

Boil 1 liter water and add leaves and 5 g citric acid, simmer for 15 minutes and take the extract

Boil 500 ml water and dissolve sugar and remaining citric acid and add the extract and bring to boil

Allow to cool and add Straw berry essence and preservative , bottle and label

MACHINERIES REQUIRED



Leafy vegetable cutting machine



Kettle/ Sautiner



Automatic Liquid filling machine



RO water unit



AMARANTHUS LEAF PAKAVADA RECIPE

Ingredients

Amaranthus leaves- 250 g

Basen flour-500 g

Rice flour-250 g

Maida-100 g

Salt- 10 g

Chilly powder-25 g

Asafoetida powder- 5 g

Water-300 ml

Vegetable oil-1liter





PROCESSING TECHNOLOGY

1. Clean , wash , drain and cut the Amaranthus leaves and boil to make it soft and mash.
2. Sieve basen flour, Rice flour, maida, salt, chilly powder, Asafoetida powder to get a uniform mixing.
3. Add the mashed amaranthus to the flour mix and ,make a dough by adding sufficient quantity water.
4. Take the Sev and fix the dye for Pakkavada and fill the dough to this.
5. Take a thick bottom vessel, heat oil and ,make ribbon like pakkavada to this, cook until it become crisp.
6. Take it out from oil allow to cool, remove excess oil and pack.



PAKKAVADA FLOW CHART

Harvest and clean Amaranthus leaves

Clean , wash , drain and cut and cook Amaranthus leaves

Sieve basen flour, Rice flour, maida, salt, chilly powder , Asafoetida powder

Add the cooked amaranthus to the flour mix and ,make a dough by adding water

Take the Sev and fix the dye for Pakkavada and fill the dough to this

Heat oil in a thick bottom vessel ,make ribbon like pakkavada to this, cook until it become crisp, take out from oil, cool, remove oil and pack.



MACHINERIES REQUIRED



Leafy vegetable cutting machine



Dough mixing machine



Automatic dye for sev and namkeen



Automatic packing machine for namkeen



AMARANTHUS STEM CUTLET RECIPE

Ingredients

Amaranthus stem : 500 g
soya chunks-100g
Potato-500 g
Big onion-250 g
Ginger,garlic,green chilly (niucely) chopped-25 g each
Garam masala-10 g,

Turmeric powder-one pinch
Pepper powder-5 g
Vegetable oil-1 litre
Salt-to taste
Cornflour-100 g
Maida-150 g
Bread-1 packet





PROCESSING TECHNOLOGY

- Clean, wash and chop Amaranthus stem, cook potato, peel and mash, boil soya to make it soft and squeeze excess water and mince.
- Heat 150 ml oil in a thick bottom vessel and saute chopped onion and ginger, garlic, green chilly until cooked, add turmeric powder and Garam masala.
- Add the chopped amaranthus to this, saute and add ,minced soya,cook it well and finally add mashed potato and pepper powder adjust salt to taste. Keep aside for cooling.
- Make a thin batter using corn flour and maida by adding water
- Powder the bread nicely.
- Shape the cutlet mix to desirable form, dip in corn flour-maida batter and roll in bread powder
- Heat oil in a Kadai and fry the cutlet till golden brown.



CUTLET FLOW CHART

Clean, wash and chop Amaranthus stem

cook potato, peel and mash, boil soya and squeeze excess water and mince

Heat oil and saute chopped onion and ginger, garlic, green chilly until cooked and turmeric powder and Garam masala

Add chopped amaranthus and minced soya cook till done add potato and pepper powder and adjust salt, keep it for cooling

Make a thin batter using corn flour and maida , powder the bread

Make the cutlet mix to desirable shape dip in corn flour-maida batter and roll in bread powder

Heat oil in a Kadai and fry the cutlet till golden brown or bake it



MACHINERIES REQUIRED



Cutting and chopping machine for vegetables



Automatic Cutlet/ Burger Pati making machine



Frying unit

AMARANTHUS STEM PICKLE RECIPE

Ingredients

Amaranthus stem : 1 kg
ginger, garlic, green chilly (nicely) chopped-50 g each
Gingelly oil- 300g
Asafoetida powder -20 g
Fenugreek powder-10 g

Kashmiri chilly powder- 50g
turmeric powder- 2 g
Salt-50g
Vinegar-300 ml
Sodium benzoate-2g
boiled water-200ml





PROCESSING TECHNOLOGY

- Clean, wash and chop Amaranthus stem to 1 cm length steam or blanch to remove the raw taste.
- Heat 300 ml gingelly oil in a thick bottom vessel and saute ginger, garlic, green chilly until cooked, add turmeric powder and Kashmiri chilly powder.
- Add blanched amaranthus to this, saute till cooked by stirring, add salt and adjust the taste.



PROCESSING TECHNOLOGY

- Add asafoetida and fenugreek powder.
- Boil 200 ml water in a steel vessel and add vinegar heat and add one teaspoon sugar to this.
- Pour the vinegar to the pickle adjust the consistency and taste. Change the Pickle to a steel vessel add Sodium benzoate when cooling.
- Pack it in glass bottle and pour sufficient oil on the top of the pickle..



PICKLE FLOW CHART

Clean, wash and chop Amaranthus stem to 1 cm length steam or blanch to remove the raw taste .



Heat gingelly oil and saute ginger, garlic, green chilly until cooked, add turmeric powder and Kashmiri chilly powder.



Add blanched amaranthus saute till cooked , add salt and adjust the taste



Add asafoetida and fenugreek powder



Boil water in a steel vessel and add vinegar to this, heat and add one teaspoon sugar .



Pour vinegar to the pickle adjust the consistency and taste.



Add Sodium benzoate and pack it in glass bottle and pour sufficient oil on the top of the pickle



MACHINERIES REQUIRED



Cutting and chopping machine



Automatic picklePacking machine



Automatic pickle blending machine



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