

# **BIODATA**



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## **Research Articals – 11**

<b>S.No</b>	<b>Title of paper</b>	<b>Name of journal</b>	<b>Year of publication</b>	<b>ISSN number</b>	<b>Link to article/paper/abstract of the article</b>	<b>Is it listed in UGC Care list/Scopus/Web of Science/other, mention</b>
1	A Study on Nutrient Intake and Prevalence of Anaemia	Kaav International Journal of Arts, Humanities & Social Sciences	2020	2348-4349	<a href="http://www.kaavpublications.org">www.kaavpublications.org</a>	Yes
2	Comparison of dietary intake and nutritional status of adolescent girls residing at home and hostel	Shodh Sanchar Bulletin Bi – Lingual Inter National Journal	2020	2229-3620		UGC Care Listed Journals

3	Comparative analysis of health status of selected 16-18 years adolescent girls	International Journal of Home Science	2020	2395-7476	<a href="http://www.homesciencejournal.com">www.homesciencejournal.com</a>	Yes
4	Prevalence of under nutrition associated with socio demographic Characters	International Journal of Recent Scientific Research	2020	0976-3031	<a href="http://www.recentscientific.com">www.recentscientific.com</a>	Yes
5	Anthropometrically determinant of undernutrition among selected adolescent girls	International Journal of Development Research	2020	2230-9926	<a href="http://www.journakijdr.com">www.journakijdr.com</a>	Yes
6	Impact of family income on physical status, dietary pattern and nutrient intake among urban and rural adolescent	International Journal of Science and Research (IJSR)	2020	2319-7064	<a href="http://www.ijcrt.org">www.ijcrt.org</a>	Yes
7	Screening of adolescent girls for nutritional status as per food habit	International Journal of Creative Research Thoughts (IJCRT)	2020	2320-2882	<a href="http://www.ijcrt.org">www.ijcrt.org</a>	Yes
8	A study on commonly observed deficiency	KAAP International Journal of Economics, Commerce	2020	2348-4969	<a href="http://www.kaavpublications.org">www.kaavpublications.org</a>	Yes

	symptoms among adolescent girls	e and Bussiness Management				
9	A cross sectional study on anthropometric variables on growth & nutritional status of adolescent girls	International Journal of Current Research	2020	0975-833X	<a href="http://www.journal.com">www.journal.com</a>	Yes
10	Impact of climate change on Agriculture : in view of India	Vidyabharati International Interdisciplinary Research Journal	2022	ISSN :2319-4979	<a href="http://www.viral.org/specialissues/2022/SP2022">www.viral.org/specialissues/2022/SP2022</a>	Yes
11	Skill Development A need for Career oppourtunity	International Journal of Scientific Research in Social Science and Technology	2023	ISSN: 2395-602 X ISSN:2395-6011	<a href="http://www.technoscienceacademy.com">www.technoscienceacademy.com</a>	Yes

### Book Chapters – 3

Sl. No.	Title of the paper	Title of the book/chapters published	Year of publication	ISBN/ISSN number of the proceeding	Publication International/ National/ Local
1	Kartoli (Spine gourd) Amazing Wild vegetable	Wild Vegetables, Kalon Maple Publishing	2022	ISBN: 978-93-91141-18-9	International
2	Entrepreneurship through Home Science	Home Science skills in Industrial Entrepreneurship For Upliftment Of Life	2022	ISBN-978-1-4357-6491-0	International
3	A Review on Health Benefits Of Millets	Emerging Trends In Science, Social Science, Engineering And Management - A Multidisciplinary Approach Volume - 1	January, 2023	ISBN:978-1-387-57678-4 ISBN-10:1-387-57678-X	International

**Book-1**

Book Title	Publication	ISBN No.	Publication International/ National/ Local
Age of Miracles- Teenagers	KAAV Publication,Delhi	978-81-952435-0 5	National

# 「WILD VEGETABLES」



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33.	<b>औषधी रातमाज्यांचा आहार वाढवा आणि निरोगी रहा</b> <i>डॉ. गीता जांबटकर</i>	
34.	<b>आरोग्यदायी रातमाज्या</b> <i>प्रा. रिता खोब्रागडे</i>	
35.	<b>महिला स्वास्थ्य और वाईल्ड वेजीटेबल</b> <i>डॉ. सुजाता साखरे</i>	
36.	<b>आरोग्यदायी जंगली अजूवा</b> <i>डॉ. संगमित्रा बोरसाकर</i>	



# Kartoli (Spine gourd) Amazing Wild vegetable

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**Scientific name:** *Momordica dioica*

**Family :** Cucurbitaceae

**Local Name:** Kartoli

Kartoli which is known as spiny gourd because of its odd texture. The spiky green vegetable makes it naturally unattractive but it is a monsoon vegetable which is not just healthy but also low in calories. Kartoli is wild vegetable that grows naturally without any cultivation or care. Kartoli mainly grows in forests, wilderness, edges of farmlands, and barren fields.

Although the kartoli genus is originated from the Indo-Malayan region, it is now found to grow in India, Bangladesh, Sri Lanka, Myanmar, China, Japan, South East Asia, Polynesia, Tropical Africa, and South America. Its cultivation is up to an altitude of 1500 meters in Assam and Garo hills of Meghalaya. It is commonly known as spine gourd, teasel gourd or small bitter gourd worldwide whereas in Bangladesh it is known as kakrol and in India as kankro, kartoli, kantoli, kantola, kantroli, ban karola, or janglee karela. Kartoli is about 5–7 meters in length, a popular summer vegetable of which its fruit, young twigs and leaves are used as vegetable. (Sattya and Mohammad (2014) )

## **Climate Conditions Required for Kartoli Farming**

Kartoli is a warm and low humid season crop. This vegetable can be cultivated in both tropical and sub-tropical regions. This crop requires good sunshine for better growth and yield. The optimal temperature of about 27 °C to 32 °C is suitable for its cultivation.

## **Soil Requirement for Kartoli Farming**

Kartoli can be grown on sandy loam to clay soils with pH values 5.5-7.0. Soils with well drainage and good organic matter are best suited for its cultivation.

### Harvesting of Kartoli

These vegetables will be ready for harvesting for 75-80 days of sowing. In second year, they will become available for picking in 35-40 days. Fruits are picked when they are in tender stage. Alternate days are recommended for harvesting to avoid over mature of vegetables. Hand harvesting can be carried without disturbing the vine. If growing for seed production then leave the fruits on the vine until they ripen fully. Usually, after ripening Kartoli turn the colour from green to orange. One can easily identify matured seeds when the pulp inside the fruit turns into red colour. (Anjana 2020).

### Nutrient content of Kartoli

S.No.	Parameter	Nutrient content
<b>Proximate composition</b>		
1.	Water	87 g
2.	pH	6.5
3.	Crude protein	52.06 g
4.	Crude lipid	4 g
5.	Crude fibre	15.36 g
6.	Ash	14 g
7.	Carbohydrate	14.58 g
8.	Total solids	12.9 g
9.	calorific value	302.56 kcal
<b>Vitamin composition</b>		
1.	Vitamin A	2.5
2.	Vitamin B1 (Thiamine)	1.8
3.	Vitamin B2 (Riboflavin)	3.5
4.	Vitamin B3 (Niacin)	1.9
5.	Vitamin B5 (Pantothenic Acid)	18
6.	Vitamin B6(Pyridoxine)	4.3
7.	Vitamin B9 (Folic Acid)	3.6
8.	Vitamin B12 (Cyanocobalamin)	4
9.	Vitamin D2 & 3	3



	(Cholecalciferol)	
10.	Vitamin H (Biotin) g/100g	6.5
11.	Vitamin K (Phytonadione)	15
<b>Mineral Composition</b>		
1	Calcium	26000 mg
2	Magnesium	14000 mg
3	Potassium	370 mg
4	Sodium	58 mg
5	Copper	1.7 mg
6	Zinc	8.5 mg
<b>Fatty acid composition</b>		
1.	Myristic Acid	3.589 %
2.	Palmitic Acid	12.157 %
3.	Stearic Acid	3.547 %
4.	Oleic Acid	56.253 %
5.	Linoleic Acid	22.511 %
6.	alpha-Linolenic Acid	1.943 %

(Salvi and. Katewa 2015)

#### Phytochemical constituents of Kartoli

Total phenols mg/g	Phytic acid (mg/100g)	Trypsin inhibitors (tiu/g)
3.69	284.2	9.3

(Ali Aberoumand 2012)

### Here are some health benefits of the vegetable

According to Ayurveda not only kartule fruits have diuretic, laxative, hepatoprotective, antivenomous, antihypertensive, anti-inflammatory, antiasthmatic, antipyretic, antileprosy, antidiabetic, and antidepressant properties but also its leaves have antihelminthic, aphrodisiac, antihemorrhoidal, hepatoprotective, antibronchitic, antipyretic, antiasthmatic and analgesic properties (Sattya and Mohammad (2014)).

- Reduces blood sugar level in diabetic patients
- Reduces the chances of cancer
- Helps anti-aging
- Improves eyesight
- Reduces excess sweating (Hyperhidrosis)
- High in fiber and anti-oxidants and thus very useful for easy digestion
- Lactating mothers can eat this veggie to decrease the problem of vomiting in infants.
- Great source of phytonutrients and low in calories ( Dr.Richa Garge 2016)
- Prevention from Infection
- Helps maintain weight
- Prevents kidney stones
- Improve Eye Vision
- Helps in Skin Problems
- Help for brain health

### Tips for Cooking

- Kartoli wash with water and cut .
- Kartoli contain high moisture should be cooked in closed lid pans and by adding a bit of water so that their water content does not evaporate while cooking.
- Also add a bit of water and avoid overcooking. The watery gravy should be consumed as the possible nutrients are actually present in its gravy

### Referances

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# **"HOME SCIENCE SKILLS IN INDUSTRIAL ENTREPRENEURSHIP FOR UPLIFTMENT OF LIFE"**



**Dr. Chhaya N. Vidhale**  
**Dr. Sharmila R. Kubde**





**Price: 200/-**

**"HOME SCIENCE SKILLS IN INDUSTRIAL  
ENTREPRENEURSHIP FOR UPLIFTMENT OF LIFE"**

**Dr. Chhaya N. Vidhale & Dr. S. R. Kubde**

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# ENTREPRENEURSHIP THROUGH HOME SCIENCE

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### UNDERSTANDING OF HOME SCIENCE

When we discuss about Home Science faculty or education it is very necessary to understand about Home Science is a combination of two words i.e. home and science as the word home refers to the place of residence where the family lives while word science refers to knowledge based on facts, principles and laws. Home science can be defined as education for better living and core of all human development and the society at large ([www.wikipedia.com](http://www.wikipedia.com)).

Home Science means the art of managing your resources efficiently and the science of achieving a healthy and happy home as well as successful career. Home Science draws an important part of its content from pure science disciplines such as physics, chemistry, biology, physiology and hygiene. It also draws its content equally from economics, sociology, anthropology, psychology, community development, communication, media and technology. Thus, making it an interdisciplinary field which draws from the strengths of science and arts courses. (Anonymous A). Home science covers a few areas of specialization such as food and nutrition, communication and extension, resource management, human development, fabric and apparel science (Roy et al 2015).

Home science at college level offered in 1932 at the Lady Irwin College at the initiative of All India Women's Conference.

Today, home science is being offered by over 150 institutions of higher learning through private colleges as well as public universities (Vyas and Shastri, 2011).

Education is the most significant instrument for women's development should include education self-reliance, personal development, social development, productive capacity. Home Science education is not only developed to educate the girls merely to obtain the degree but also it provides all over development for enhancing earning capability of women.

One of the major recommendations of the National Policy on Education in 1986 is to promote Empowerment of Women through education. Empowerment is self-governance, self-sufficiency and self-maintenance.

The concept of Women Empowerment was introduced at the International Women's Conference at Nairobi in 1985. Empowerment is a process which includes:

- Equal access to opportunities for using societies resources.
- Prohibition of gender disparity
- Freedom from violence
- Economic independence
- Participation in all decision making bodies.
- Freedom of choice in matters relating to one's life.

Home Science education designed all aspects of personality and other treads for betterment of life .It attained the fullest development in all prospects, personality, socially and economically (Nasareand Tembhare 2019). The study of home science helps each people to lead a more satisfying personal, family and community life because of the knowledge, understanding, skills and appreciation of cultural and spiritual values a pupil acquire through home science education (Ahlawat and Shekhar, 2010).Home Science training realises women their capacity to play a major role in community development. Now-a-days a leadership of women has been recognised by society also.



## **Scope of Entrepreneurship through Home Science**

Before focussing on Entrepreneurship through Home Science it is necessary to understand the need of Women Entrepreneurship as our first Prime minister Pandit Jawaharlal Nehru said that when women move forward, family moves and the village moves and the nation moves. Employment gives economic independence to women. As per census of India 2011 women constitute 48% of Indians population out of this total 78% engaged in agriculture, 16% in other non-agricultural pursuits with only 6% in household industries. Amongst women workers in rural area 88% are employed in agriculture area as labors and cultivators. In urban area 80% are employed in unorganized sector like household industries, petty trades and service building and construction etc. Women are actively participating in various agro based and non-agro based enterprise preservation, tailoring, embroidery, knitting, weaving soap and detergent making, candle making, soft toys making rakhi making, painting etc (Nasare and Tembhare 2019).

The role and degree of integration of women in economic development is always an indicator of women economic independence and social status. For economic independence of women there is tremendous scope for Entrepreneurship through Home Science.

The word 'entrepreneur' is derived from the French word 'enterpredre' which means to undertake. In early 16th, the Frenchmen who led military expeditions were referred to as 'entrepreneurs'. According to Mazuyka and Birley entrepreneurship is the process of creating something new of value by devoting the necessary time and effort, assuming the accompanying financial; psychic and social risks and receiving the resulting rewards of monetary and personal satisfaction and independence. Entrepreneurship is seen as any novel activity which creates organizational change and economic value (Mazuyka and Birley, 2012). The term 'entrepreneurship' refers to the functions performed by an entrepreneur. It is the process

involving various actions to be undertaken by the entrepreneur in establishing a new enterprise. Entrepreneurship play a significant role in the socio-economic development of a society.

### **Skill required for Entrepreneurship:**

Entrepreneurs assemble resources including innovations, finance and business acumen in an effort to transform innovations into economic goods. Each era has made entrepreneurs in its age. There are some basics to establish a business. Basics of entrepreneurship these are Calculated Risk-taking, Management skills, Effective Communication, Vision, Connection with efficient people and Strategy.

For success of any Entrepreneurship there is a need of Entrepreneurial skills which helps in build the confidence to see value in their own ideas thus can then make enterprising choices that are transferable into the workplace the economic development of the country. Skills needed for Entrepreneurship are technical skills, managerial skills and entrepreneurial skills are needed for entrepreneurship.

#### **(1) Soft skills Soft Skills:**

- **Communication:** It is a process of exchanging information among people. It needs effective language, presentation skill, environment etc.
- **Interpersonal relations :** It is a skill to communicate with each other. It is used not only in offices but in our day to day social life. People with good interpersonal skills are perceived as confident, calm and charismatic.
- **Environmental Observation:** Environmental observation is one of the technical skills. This skill helps in understanding job objective and current scenario of the society with respect to the business that one wants to start
- **Coordination:** It is a skill that helps in understanding other people and work together to achieve the set goal. Coordination must exist among the team members in order to achieve best possible results.



- **Specific operation Technology** : Sometimes specific technology is required for achieving specific goal e.g. Knowledge about computer.

**(2) Managerial skills Managerial Skills include the following:**

- **Planning** : It is a basic management method involving formulation of one or more detailed plan to achieve the best result. The planning process is to identify goal, formulate strategy and decide the process to be followed to achieve the goal on the same strategy
- **Motivation**: Motivation is defined as goal oriented behaviour. It is frequently used to describe why a person is interested in doing a particular work. Following points help to stay motivated:
  - Surround yourself with positivity
  - Create a vision board
  - Marketing
  - Accounting
  - Negotiating
  - Make smart goals
  - Reward yourself
  - Believe in yourself
  - Acknowledge your positive attributes
  - Recognize your progress
  - Visualize accomplishing your goals
  - Be kind to yourself
  - Don't compare yourself to other
- **Marketing** : It is an ability through which you sell something or create awareness about something e.g. any product. For example T.V. commercials are a part of marketing. It tries to satisfy needs of clients. It includes the coordination of product, price, place and promotional strategy. These are known as 4 P's of marketing. You have to follow the points mentioned below to ensure maximum sale of your product/service.
  - Identify the product
  - Determine its price

- Reach the customer
- Implement the of promotional strategy
- **Accounting** : It is a process of keeping financial record or preparing financial record. It includes analysis, verification and reporting of records.
- **Negotiating** : It is a process through which people settle all the problems which occur between two or more parties. Parties try to reach at mutual beneficial outcome through negotiation. Process of negotiation includes following stages:
  - Preparation
  - Discussion
  - Goal clarification
  - Arriving at mutual beneficial point
  - Agreement
  - Implementation of strategy

### (3) Entrepreneurial skills It includes the following:

- **Innovation and Risk Taking Ability** : It is a process of translating new ideas into services that create value. An idea must be replicable at economical cost and satisfy customer's need. Innovation is synonymous with risk taking. An organization that creates new idea, takes great risk of implementing a new market.
- **Persistency**: In this skill, you continue to do something even though it is difficult or even if other people are against it. This skill requires lot of patience and determination.
- **Visionary**: Someone who can visualize the future and take action according to that is visionary. A visionary has clear ideas about what should happen and what strategy can be formed to achieve best possible results.
- **Flexibility**: Flexibility is willingness to change as per the changing environment, for betterment. One should not be stringent about his/her way of working; rather should be able to adapt new ways easily.

Economically, entrepreneurship invigorates markets and promotes job creation through the formation of new businesses. History has shown that economic progress has been advanced by



pragmatic people who are entrepreneurial able to exploit opportunities and willing to take risks. Hence, transforming ideas into opportunities is the crux of entrepreneurship which undoubtedly raises productivity and enhances the transfer of technology. So in this context Home science education knowledge which is an interdisciplinary field of knowledge with focus earlier it focused on industrial view recent scientific information to cope with the day to day problems but today efforts are being made to provide facilities to invigorate. The theoretical knowledge of the students through field training & research laboratories so that they are able to launches entrepreneurship programs successfully.

#### **Specialization of Home Science:**

<b>Main Branch</b>	<b>Area for specialization</b>
<b>Food and Nutrition</b>	Food Science Nutrition- Clinical Nutrition and Community Nutrition Institutional food service
<b>Fabric and Apparel Science</b>	Clothing Construction Textile Science Textile Designing Garment Designing Care and Maintenance of Clothes
<b>Resource Management</b>	Resource Management Housing and Equipment Interior Decoration Consumer Education
<b>Human Development</b>	Child - Welfare Adolescence, Marriage and Family Guidance Care of the Elderly Care of special children
<b>Communication and Extension</b>	Media for communication Programme planning and evaluation Training and capacity building Management of community service organisations



### **Food & nutrition**

**Catering:** Catering could be provided to fulfill needs of the society.

- Service could be extended for parties arranged at home such as kitty parties, birthday parties or anniversary parties etc.
- Catering could be made at special places like school and hospitals. Besides these, it will be very useful in running canteen in various types of settings.
- The trained professionals can also undertake catering services for people who are working in factories, offices and do not have time or arrangement to cook meals, particularly unit days meals.

**Confectionery and Bakery:** The Home Science graduates/postgraduates can set up confectionery, ice-cream Parlors and Bakery.

- They can use innovation skill to evolve their own products which are more nutritive and different from the conventional ones and add variety at parties or at dining table.

**Preservation:** Preservations of vegetables and fruits in the form of pickles, jams, jellies, marmalades etc.

**Ready to cook/Serve food:** small units could be established to clean/cut/shell the vegetables so as to make these ready for cooking by the house wife.

- A variety of salads could be prepared to set up salad bar along with fast food to promote healthy living.

**Health centers:** Health Centre could provide special advice for the dietary needs of people suffering from different diseases.

- Suitable therapeutic nutrition and physical education would enable the home science graduate to set up support centers for people with special dietary needs.

- Guidance could be given to the individuals for keeping through diet and exercise and management of obesity related conditions.

**Hobby centers:** Hobby Centers could be started to interested people in various culinary art of different regions/continents.

- Graduates / Post-Graduates can seek jobs as Dietician in hospitals, nursing homes and fitness centers; else become Nutrition Counselors and Nutrition Experts in national and international agencies like ICMR, NIN, CARE, WFP, UNICEF, Chetna etc.
- Food technologists and researcher entrepreneurs offer health and nutrition consultancy services; in mass media industry as Nutrition Journalists.

#### **Fabric and apparel designing:**

- Boutique.
- Dyeing and Printing unit
- Readymade Garment unit
- Embroidery centre
- Weaving unit.

#### **Resource management:**

**Interior designing:** They can impart training in the art of interior decoration.

- Such centres can also provide services for decoration of various settings like offices, hospitals, school.

**Hobby centres:** Hobby Centres could be started where interested persons could learn

- candle and paper flower making,
- preparation of decorative articles,
- soft toys,
- Rangoli,



- jewellery designing,
- pot making,
- wall painting and making useful articles from the household waste products.

**Grooming centres:** This area has vast potential to develop among masses.

- Training could be imparted under Home Science education to open grooming centres where they could provide services for skin and hair care.
- The individualized guidance could be extended according to the unique characteristics to select jewellery, hair style and face make up.

### **Human development:**

**Child care center:** Women participating in income generation actively outside the home had led to the need of child care outside the family. Children usually require care by adults till they are 12 year of age and should not be left alone at home with the basic knowledge of child development, the Home Science graduates can run childhood care units like

- day-care centre
- creche and nursery school
- after school centres.

**Old age homes:** Increase in the nuclearization of families has compelled many old people to stay in old age homes away from their families. Such old age home can be managed by Home Science graduates where various kinds of activities could be arranged for old people with proper food services and psycho-emotional enrichment.

**Rehabilitation centres for children with special needs:** Home Science graduate can open rehabilitation centres for children with impaired senses. These centres will not only be a service to the community but would help them create employment for themselves and others.

### **Communication and Extension:**

- Counsellors,
- Running NGOs,
- Consultancy services in consumer protection, savings, investment, etc.

(Source: Entrepreneurship In Home Science  
(scholarshipsinindia.com))

Home science syllabus draw its strength from both science and arts discipline. This enables the students to develop the ability and understand the concept as well as apply them in various situations. This gives home science students an edge above all other disciplines, this prepares them for vast range of opportunities.

Home science is a combination of both art and science that is not only confined to food and nutrition, but also wraps housekeeping, textiles, dietetics, clothing, family relations, community living, sociology, economics, child development and hygiene. Home science education provide skill and knowledge which makes them optimistic. Home Science offers more scope for self-employment compared to other subjects.

Home science can enrich the student economically and can make them independent as well as self-reliant. At the end it can be noted that home science which is an interdisciplinary field of knowledge having lots of opportunity for women entrepreneurship and thus make a particularly strong contribution to the economic well-being of the family and communities, country poverty reduction.

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# **MULTIDISCIPLINARY**

**APPROACH**

**Volume-1**

EDITED BY  
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- A MULTIDISCIPLINARY APPROACH  
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## CHAPTER 14

# A REVIEW ON HEALTH BENEFITS OF MILLETS

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*Dr. Archana Madhavrao Bhoyar*

### Abstract:

Year 2023 is declared as "Millet Year" in this context it is important to know about the millets, health benefits of millets. Using secondary data assessed the health benefits of Millets. Millets tolerant to drought and extreme weather condition was rich in nutrients. Its unique characteristics makes health prompting. Millets were beneficial for diabetes management, CV, celiac, obesity etc. Hence it is recommended that Millets should be consumed in regular diet for maintain good health.

*Key words: Millets, climate, production of Millets, nutritional composition, health beneficial.*

### Introduction:

Government of India had proposed to United Nations for declaring 2023 as International Year of Millets (IYOM). The proposal of India was supported by 72 countries and United Nation's General Assembly (UNGA) declared 2023 as International Year of Millets on 5<sup>th</sup> March, 2021. In this view it is necessary to about the Millets. Millets are known as one of the most important cereal grains. Millets are consumed by more than 1/3rd of the world's population. It is the 6th cereal crop in terms of world's agricultural production. According to Oxford Dictionaries Millets are defined as a type of plant that grows in hot countries and produces very small seeds. The seeds are used as food, mainly to make flour, and also to feed to birds and animals.

### History:

Millets are cultivated for a thousand years and used throughout the world, in the Middle Ages the Romans and Gauls were consuming porridges made of millets eaten than wheat. A majority of the world's commercial millet crop is produced by China, India, Greece, Egypt



and Africa. (Kimeera Ambati and Sucharitha K V, 2019). Millets are traditional grains, grown and consumed in the Indian subcontinent from the past more than 5000 years. India is the world's largest producer of millet. (Sujata Bhat, C. Nandini, V. Tippleswamy and Prabhakar 2018).

#### Climate:

Millets are small - grained, annual, warm - weather cereals belonging to grass family. They are rain - fed, hardy grains which have low requirements of water and fertility when compared to other popular cereals. Millets are highly tolerant to drought and other extreme weather conditions.

#### Production of Millets:

As per worldwide production of Millets it was found that out of the total 93 millet growing countries of the world), only 7 countries (India, Niger, Sudan, Nigeria, Mali, Burkina Faso, and Chad) have more than 1 M ha harvested area, whereas around 25 countries have more than 0.1 M ha harvested area. Together all contribute around 97% of the total world millet harvested area (34.1 M ha). Among the top seven millet growing countries of the world, India ranked first with 15.29 M ha harvested area followed by Niger (7.03 M ha), Sudan (3.75 M ha), Nigeria (2.7 M ha), Mali (2.15 M ha), Burkina, Faso (1.39 M ha), and Chad (1.22 M ha). India being the largest grower of millets contributes about 26.6% of the global harvested area (FAOSTAT 2018).

#### Common name for Millets:

S.No	English Name	Scientific name	Local Name
1	Pearl millet	<i>Pennisetum glaucum</i>	Bajra
2	Finger millet	<i>Eleusine coracana</i> ,	Ragi / Nachani
3	Foxtail millet	<i>Setaria italica</i> :	Korra/Navane
4	Little millet	<i>Panicum sumatrense</i>	Sama
5	Sorghum	<i>Panicum sonorum</i>	Jowar
6	Kodo	<i>Paspalum scrobiculatum</i> :	Haarka
7	Proso millet	<i>Panicum miliaceum</i>	Chena
8	Barnyard millet	<i>Echinochloa frumentacea</i>	Sanwa / Bhagar

#### Nutritional Composition of Millets:

Kimeera and Sucharitha (2019) reviewed that Millets have 65% carbohydrates, 9% proteins, 3% fat, and 2- 7% crude fibre and vitamins and minerals. Millets are a good source of vitamin B, magnesium, antioxidants, manganese, phosphorus and iron. Millets



are good source of essential amino acids except for lysine and threonine but are relatively high in sulphur containing amino acids methionine and cysteine also good source essential fatty acids like linoleic, oleic and palmitic acids found in their free form and monogalactosyl, diacylglycerols, digalactosyl diacylglycerols, phosphatidylethanolamine, phosphatidyl serine and phosphatidyl choline in the bound form present in millets. Other fatty acids i.e. arachidic acid, behenic acid, erucic acid are found in trace amounts. Millet oil a good source of linoleic acid and tocopherols. Millet is an alkaline forming grain that is gluten-free. Vitamin B such as Niacin, folacin, riboflavin, and thiamine and phosphorus are present in millets that play a key role in energy synthesis in the body. So, it is essential to aware about nutritional composition of Common Millets.

**Nutritional Composition of Millets per 100 g**

Crop/ nutrient	Protein (g)	CHO (g)	Energy (Kcal)	Fiber (g)	Minerals (g)	Iron (mg)	Calcium (mg)
Sorghum	11	70.7-72.9	329-349	6.7	2.7	3.4	13
Finger millet	7.3	71.52-72	328-336	3.6	2.7	3.9	344
Foxtail millet	12.3	60.9-67.3	352-391	8	3.3	2.8	31
Kodo millet	8.3	63.82-66.6	349.5-353	9	2.6	0.5	27
Little millet	7.7	60.9-67	329-341	7.6	1.5	9.3	17
Pearl millet	10.6	67.0-69.10	361-363	1.3	2.3	16.9	38
Proso millet	12.5	67.09	352.5	2.2	1.9	0.8	14
Barnyard millet	11.2	55-65.5	300-307	10.1	4.4	15.2	11

**Table 2. Micronutrient contents of millets**

Crops	Na (mg)	K (mg)	Mg (mg)	Zn (mg)	Carotene (µg)	Thiamine (µg)	Riboflavin (µg)	Niacin (µg)
Pearl millet	10.9	307.0	137.0	3.1	132.0	0.33-0.38	0.21-0.25	2.3-2.8
Foxtail millet	4.6	250.0	81.0	2.4	32.0	0.59	0.11	3.2
Finger millet	11.0	408.0	137.0	2.3	42.0	0.42	0.19	1.1
Proso millet	-	-	-	-	-	-	-	-
Barnyard millet	-	-	82.0	3.0	0	0.33	0.10	4.2
Kodo millet	-	-	-	-	-	0.15	0.09	2.0
Little millet	8.1	129.0	133.0	3.7	0	0.30	0.09	3.2
Sorghum	7.3	131.0	171.0	1.6	47.0	0.37-0.38	0.13-0.15	3.1-4.3

**Source:** Nutrient value of millets, Nutritive value of Indian Foods, Gopalan (2010)

**Table 3. Essential amino acid content in millets.**

Amino acids	Foxtail Millet (defatted flour)	Proso Millet (dehulled grain)	Pearl Millet (true prolamine)	Finger Millet (native grain)	Foxtail Millet (defatted flour)
Histidine	1.3-2.11	2.1	1.4-1.7	1.3-2.3	1.3-2.11
Lysine	1.4-1.59	1.5	0.5-1.9	2.2	1.4-1.59
Isoleucine	4.59-4.8	4.1	2.6-5.1	4.0-4.3	4.59-4.8
Threonine	1.9-3.68	3	2.4-3.3	2.4-4.3	1.9-3.68
Methionine	1.8-3.06	2.2	1-1.5	2.5-2.9	1.8-3.06
Valine	4.3-5.81	5.4	3.3-4.2	4.8-6.3	4.3-5.81
Tryptophan	0.6	0.8	1.1-1.2	1	0.6
Leucine	10.4-13.6	12.2	7.5-14.1	6.5-10.8	10.4-13.6
Phenylalanine	4.2-6.27	5.5	2.9-7.6	3.1-6	4.2-6.27



### **Health benefits of Millets:**

Millets are highly adaptive to a wide range of ecological conditions and thrive well in rain-fed; arid climate and the minimal requirement of water, fertilizers, and pesticides.

### **Health-promoting nutritious crop:**

Compared to other cereals they have superior micronutrient profile and biflavonoids. Millets are high in nutrition and dietary fibre. They serve as good source of protein, micronutrients and phytochemicals. The millets contain 7-12% protein, 2-5% fat, 65-75% carbohydrates and 15-20% dietary fibre. The essential amino acid profile of the millet protein is better than various cereals such as maize. Millets contain fewer cross-linked prolamins, which may be an additional factor contributing to higher digestibility of the millet proteins. Similar to cereal proteins, the millet proteins are poor sources of lysine, but they complement well with lysine - rich vegetables (leguminous) and animal proteins which form nutritionally balanced composites of high biological value. Millets are more nutritious compared to fine cereals. Small millets are good source of phosphorous and iron. Millets contributes to antioxidant activity with phytates, polyphenols, tannins, anthocyanins and phytosterols present in it having important role in aging and metabolic diseases. All millets possess high antioxidant activities.

### **Diabetes :**

Diabetes mellitus is a chronic metabolic disorder characterised by hyperglycaemia with alteration of protein, carbohydrate and lipid metabolism. Use of natural inhibiting diet is preferably safer in the management of hyperglycaemia as dietary glycaemic load is directly correlated with increased risk of diabetes. Further, fibre plays a significant role in glycaemic control. Richness of millets in dietary fibre and minerals and slowly digestible starch with leucine make millet a healthy diet for diabetics.

Diabetes is a disease is found in millions of people throughout the world. Millets help in prevention of Type II Diabetes due to their significant levels of magnesium. Magnesium is an important mineral which helps in increasing the efficiency of Insulin and glucose receptors by producing many carbohydrate digesting enzymes, which manages insulin action. (O.S.K.Reddy, 2017).

Millets have a low Glycaemic Index (GI) and also associated with the prevention of diabetes.



### Type of Millet Glycaemic Index Score

Name of Millets	GI
Barnyard millet	50
Little millet	52
Proso millet	50-64
Pearl millet	54
Foxtail millet	59
Kodo millet	58-67
Finger millet	104

- **Millets are gluten-free and can be consumed by celiac disease patients.**

Millet is gluten-free, therefore an excellent option for people suffering from celiac diseases often irritated by the gluten content of wheat and other more common cereal grains. It is also useful for people who are suffering from atherosclerosis and diabetic heart disease (Gélinas et al., 2008).

- **Millet has a beneficial effect on the management and prevention of hyperlipidemia and risk of CVD**

Obesity, smoking, unhealthy diet and physical inactivity increase the risk of heart attacks and strokes. Most of the world countries face high and increasing rates of cardiovascular disease. It has been demonstrated that rats fed with diet of native and treated starch from barnyard millet had the lowest blood glucose, serum cholesterol and triglycerides compared with rice and other minor millets (Kumari and Thayumanavan 1997). Finger millet and proso millet may prevent cardiovascular disease by reducing plasma tri glycerides in hyper lipidemic rats (Lee et al., 2010)

- **Millets are found to be helpful with the reduction of weight, BMI, and high blood pressure :**

Kimeera and Sucharitha (2019) revealed in their review study on millets with the help of various studies that Obesity is the biggest emerging problem in India and it is associated with several chronic diseases including diabetes and CVD. Recent studies show that intake of high dietary fibre decreases the incidence of obesity The dietary fibre content present in millets is 22% which is comparatively higher than other cereals like wheat having 12.6%, rice having 4.6%, maize having 13.4%. According to Chethan, et al., (2007), reported that there is 15.7% insoluble dietary fiber, 1.4% soluble dietary fiber, in



finger millet grain. As we know that dietary fibres are classified into soluble fibres and insoluble fibres. Now a days it is seen that Obesity has become an emerging problem which is associated with several other diseases like Diabetes, Blood pressure and Cardiac problems. Studies suggested that consuming high fibre food helps in improving the bowel function and reduce the prevalence of Obesity by improving the digestion and absorption in the body thereby reducing the risk of chronic diseases. Millets helps in satiating hunger satisfaction and helps in weight management reducing obesity. With high fibre content, millets help to reduce problems like constipation, flatulence, bloating and stomach cramping.

### Conclusion:

Millets is considered as minor crop which survive extreme weather and climatic condition known by ancient era. Millets are nutritious and beneficial for resistance of life style disease. Its consumption and use in commercial production should be increase. As this year is celebrating Millet year so, it is most important to aware about millets for getting its benefits.

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# Age of Miracles- Teenagers

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