ISBN: 978-81-19149-19-3

5. Millets in Food and Nutrition Security

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Abstract:

Millets have a big part in the diets of people across the nation today. They have gained popularity due to qualities including drought resilience, strong yielding in dry places, and good nutritional properties. Pesticides and fumigants are not necessary for millets. More than one-third of people on Earth have been found to consume millets. Millet have been grown traditionally for many years and are consumed all over the world; the majority of the millet crop grown commercially worldwide is produced in China, India, Greece, Egypt, and Africa. India is currently the fifth-largest exporter of millets worldwide, with a CAGR of 4.49% during an eight-year period, from 2021 to 2029. The market for millet is projected to grow from $ 9 billion in 2019 to $ 14.14 billion in 2028. Except for teff and fonio, India is home to many other leading millet crops.

The current markets for drought-tolerant millet are in the urban, nutritional, and functional sectors (APEDA, 2020). The majority of millets grown for human consumption in rural areas, such as finger millet, sorghum, etc., are utilized as animal feed. Amazing nutritional and health-promoting qualities may be found in millet. Millets are also well known for offering numerous security benefits, including food, nutrition, livelihood, animal feed, and other things, making them an agricultural security crop. Millets contain a large number of micronutrients, such as vitamins and beta carotene, which are employed in the nutraceutical industry. Millet is rich with phytochemical, having therapeutic and health-promoting effects, specifically in terms of life style disorders like diabetes, obesity and cardiovascular diseases etc.

Keywords:

Millet, Millet Anatomy, Nutritional Security, Health Benefits, Millet Production, Millet based Foods.

5.1 Introduction:

Throughout the beginning of time, Asia, Africa, and Europe have all ingested millets as a staple food grain. These might have been one among the earliest crops grown during the "Hoe Age" and "Plow Age."Before, "Food security" was the primary concern in poor nations, and the Green Revolution's primary motivation was to end world hunger (Behera, 2017). The issue of hidden hunger then gained attention, and "nutrition security" was addressed.

The objective of the UN and other organisations is to define the targets for moving towards "sustainable diets," also known as "diets with low environmental impacts that contribute to food and nutrition security."

By meeting the requirements for becoming a smart food, many millet products are now referred to as Nutricereals in an effort to create "smart food" solutions for people, the environment, and farmers. They help the farmer and the environment by bringing diversity to the farm, are better crops for a variety of nutrient-rich grains, and can be grown on marginal soils with a minimal number of pesticides and fertilizer. All of these millets may be harvested more quickly and are easily adaptable to the challenging environmental circumstances. In agriculture, millets are also known as famine crops. These crops make a significant contribution to the nation's food security.

Because they contain the majority of the nutrients needed for the body to operate normally, millet crops are also referred to as "nutri-cereals" in popular culture. These underutilized crops are significant because they help the impoverished in different regions of the world have access to food, nourishment, and a means of subsistence. They also help to diversify our food supply.

5.2 Types of Millets:

Millets are traditional grains usually grown and being consumed in the Indian subcontinent since more than 5000 years. These grass family cereals with small grains are suitable for warm climates. These are extremely drought tolerant crops and need less rainfall to grow. Sorghum, pearl millet, and finger millet are examples of major millets. Lesser millets include foxtail millet, kodo millet, small millet, proso millet, and barnyard millet.

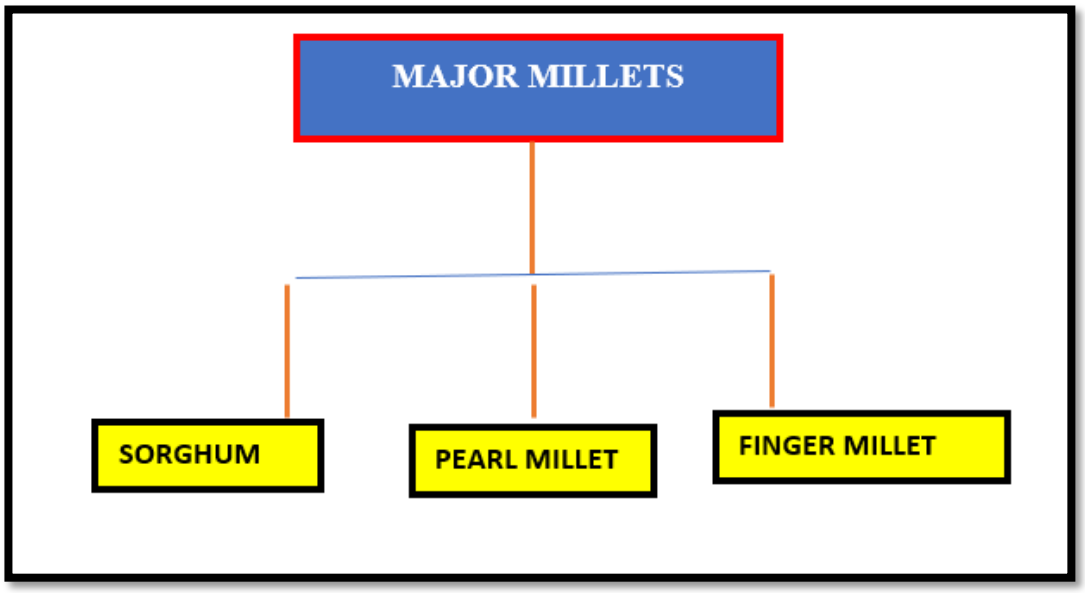

Figure 5.1: Major Millets

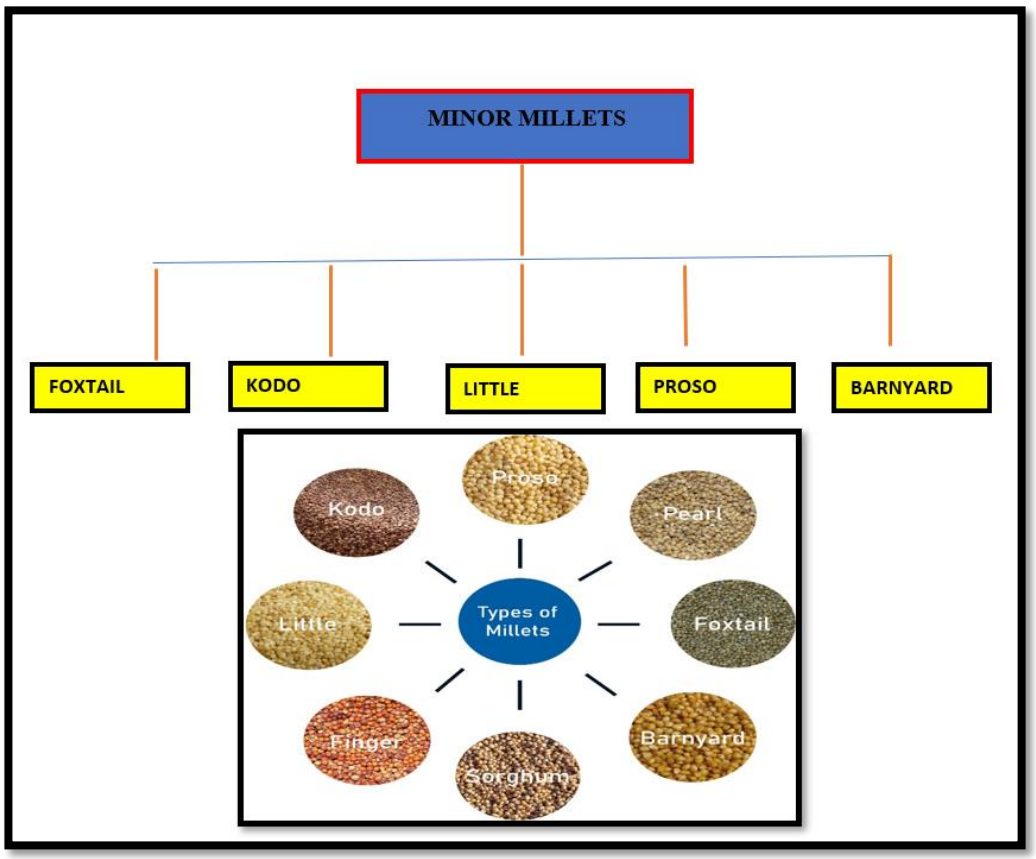

Figure 5.2: Minor Millets

5.3 Anatomy: A Whole Millet Grain Kernel:

a. **Bran:** Bran of a millet consists of multi-layered exterior skin that provides shielding to the other two kernel segments from various factors like disease, water, pests, and sunlight. There is presence of important antioxidants, as well as other micronutrients like vitamins and minerals such as iron, zinc, copper, and magnesium, as well as fibre and phytonutrients, are there in the bran portion.
b. **Germ:** Germ is the embryo that develops and fortify a new plant after being fertilized by pollen. B vitamins, vitamin E, antioxidants, phytonutrients, and unsaturated fats are abundantly present in the germ.
c. **Endosperm**: Endosperm serves as a source of energy and serves as nourishment for germs. Starchy carbs, proteins, and trace amounts of vitamins and minerals can also be found in the endosperm.

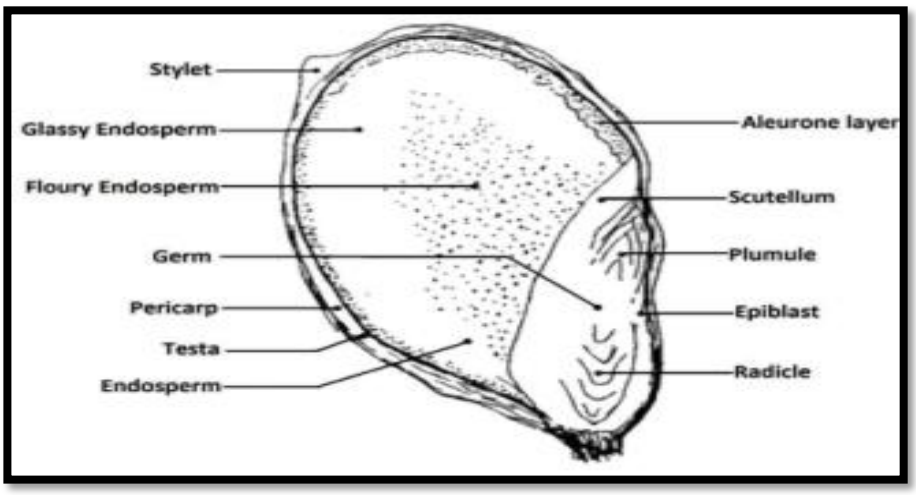

Figure 5.3: General Structure of Millet Grain

5.4 History:

Ethiopia is the place where millet originated and evidence suggests that people have been eating it there since the dawn of time. One of the primary crops in Africa is millet, which serves as the foundation for the Injera, a type of traditional flatbread. Since ancient times, millet has been consumed frequently in both Asia and India. In the Middle Ages, millet was becoming a common grain in Europe, particularly in Eastern European nations. The Setaria variety of millet was brought into America sometime in the 19th century. While millet has primarily been used in Western Europe and North America as birdfeed and livestock fodder, it is now becoming more and more popular as a healthy grain. Millet is replaced due to its unique virtues as well as the fact that it is coming under grain those are gluten-free an alternative to wheat or other gluten rich grains. The majority of the world's commercial millet production is found in India, China and Nigeria.

Regions	AREA (lakh ha)	Production (lakh ton)
Africa	489 (68%)	423 (49%)
Americas	53 (7%)	193 (23%)
Asia	162 (23%)	215 (25%)
Europe	8 (1%)	20 (~2%)
Australia & New Zealand	6 (~1%)	12 (~1%)
India	**138 (20%)**	**173 (20%)**
WORLD	**718**	**863**

- India produces >170 lakh ton (80% of Asia's & 20% of global production)
- Global average yield: 1229 kg/ha, India (1239 kg/ha)

Figure 5.4: Global Scenario of Millets

Source: FAO Statistics 2021

There are top 5 States in India for producing Millet Crops-

A. Rajasthan Bajra/Sorghum
B. Karnataka Jowar/Ragi
C. Maharashtra Ragi/Jowar
D. Uttar Pradesh Bajra
E. Haryana Bajra

5.5 Nutrients in Millet:

Millets include 2-7% crude fibre, vitamins, and minerals, as well as 65% carbs, 9% proteins, and 3% fat. They are an excellent source of iron, manganese, phosphorus, magnesium, vitamin B, and antioxidants. With the exception of lysine and threonine, millets are a strong supply of essential amino acids; nonetheless, they are also high in the sulfur-containing amino acids methionine and cysteine (Singh KP et al., 2012).

Millets are a fair supply of phosphatidylethanolamine, phosphatidyl serine, and phosphatidyl choline, as well as important fatty acids including linoleic, oleic, and palmitic acids that can be found both in their free form and bound form. Arachidic acid, behenic acid, and erucic acid are among the other fatty acids that are present in minute levels.

Linoleic acid and tocopherols, two important fatty acids, may also be present in millet fats. Gluten-free millet is an alkaline-forming grain. Millets include phosphorus and vitamin B compounds like niacin, folacin, riboflavin, and thiamine that are essential for the creation of energy (Sarita, et al., 2016).

Millet is rich in important vitamins like thiamine, riboflavin, folic acid, and niacin. Similar to rice and wheat, millets are rich in certain minerals and fatty acids. The edible millet kernel contains 0.2-0.3% polyphenols and dietary fibre, among other phytochemicals.

A. Phytochemicals in millets:

Millets contain more than 50 phenolic compounds from various classes, including phenolic acids and their derivatives, dehydro-triferulates and dehydro diferulates, flavan-3-ol monomers and dimers, flavones, flavonols, and flavanonols. Whole kodo, finger, foxtail, proso, little, and pearl millets were also found to contain these compounds. Anthocyanins, condensed tannins, and finger millet are all present in sorghum and furthermore a strong source of phenolic compounds is the finger millet seed coat.

B. Importance of Millets in terms of Health:

Millets contribute in many nutritional, nutraceutical and healthwellness industries,

- Particularly because of its high fibre content, starch plays a critical function in preventing degenerative diseases and maintaining the health of our gastrointestinal tract.

- About 65% of the carbohydrates in the millet grain are in the form of non-starchy polysaccharides and dietary fibre, which help to i. avoid constipation.
- Decreasing cholesterol levels
- Triglyceride and C-reactive protein levels are managed, preventing cardiovascular disease.
- Reduced glycemic load as a result of the bloodstream's gradual absorption of glucose after digestion.
- Regular millet eaters who meet the aforementioned parameters have lower rates of diabetes, duodenal ulcers, and cardiovascular illnesses.
- Millets do really maintain the health of the microflora in our gut by acting as a prebiotic and feeding it.
- Millet contains a lot of tryptophan, which turns into the neurotransmitter serotonin.
- Vitamin B3 present in millet can help lower cholesterol.
- All millet varieties show high antioxidant property due to presence of phytochemicals.
- Millet is also gluten free and non-allergenic to celiac other antinutritional problems.

Antioxidant, antibacterial, protein glycation inhibition, and enzyme inhibitory capabilities are a few of the health-beneficial qualities that have been discovered in considerable amounts. Moreover, millet aids in wound recovery. As previously indicated, this characteristic lower cholesterol while also reducing blood sugar.

- A problem with cataractogenesis that develops slowly.
- Anti-carcinogenic and anti-ulcerative.
- Homemade remedies for diarrhea using probiotics

Children's hemoglobin levels are improving, and their insulin sensitivity is also improving.

Parameter	Protein (g)	Fat (g)	Minerals (g)	Total Dietary fiber (g)	Insoluble Dietary fiber (g)	Soluble Dietary fiber (g)	CHO (g)
Rice milled	7.94	0.52	0.6	2.81	1.99	0.82	78.2
Whole Wheat	10.6	1.5	1.4	11.2	9.6	1.6	64.0
Finger	7.2	1.9	2.0	11.2	9.5	1.7	66.8
*Proso	12.5	1.1	1.9	-	-	-	70.4
*Foxtail	12.3	4.3	3.3				60.9
*Little	10.4	3.9	1.3	7.7	5.5	2.3	65.6
*Kodo	8.9	2.6	1.7	6.4	4.3	2.1	66.2
*Barnyard	6.2	4.4	2.2		-	-	65.5
pearl	11.0	5.4	1.4	11.5	9.1	2.3	61.8
Sorghum	10.0	1.7	1.4	10.2	8.5	1.7	67.7

Figure 5.5: Macro Nutrient and Fiber composition of millets and cereals (100gm raw form)

Source: IFCT 2017, Nutritive value of Indian foods, 2009.

Parameter	Finger	Proso	Foxtail	Little	Kodo	Barnyard	Pearl	Sorghum	Rice raw milled	Wheat
Vitamins										
Total Carotenoids	154	-	32	120	272	-	293	212	16.9	287
Thiamine	0.37	0.20	0.59	0.26	0.29	(0.33)	0.33	0.35	0.05	0.45
Riboflavin	0.17	0.18	0.11	0.05	0.20	(0.10)	0.25	0.14	0.05	0.17
Niacin	1.34	2.3	3.2	1.29	1.49	4.2	2.3	2.1	1.69	5.5
Minerals and trace elements										
Calcium	364	14	31	16.06	15.27	20	42	27.6	7.49	41
Phosphorus	283	206	290	220	188	280	296	274	160	306
Iron	4.62	0.8	2.8	1.26	2.34	5.0	8.0	3.95	0.65	5.3
Magnesium	137	153	81	133	147	82	137	1.33	64	138
Sodium	11	8.2	4.6	8.1	4.6	–	10.9	5.42	–	17.1
Potassium	408	113	250	129	144	–	307	328	–	284
Copper	0.67	1.60	1.40	0.34	0.26	0.60	1.06	0.45	0.23	0.68
Zinc	2.3	1.4	2.4	3.7	0.7	3.0	3.1	1.96	1.3	2.7

Figure 5.6: Vitamins and Minerals Composition of Millets, 100gm

Source: IFCT 2017, Nutritive value of Indian foods, 2009.

Table 5.1: Glycemix Index of Some Millet Based Foods

Sr. No.	Millets	Glycemic Index
1.	Foxtail barnyard millet upma	17.6
2.	Foxtail millet ladoo	23.5
3.	Foxtail barnyard millet dhokla	35
4.	Heat treated and dehulled barnyad millet	41.7
5.	Sorghum flakes poha	45
6.	Sorghum pasta	46
7.	Foxtail millet biscuit	50.8
8.	Sorghum course semolina upma	53
9.	Sorghum biscuits	54
10.	Bajra roasted bread	55
11.	Sorghum fine semolina upma	56
12.	Multigrain sorghum roti	68
13.	Barnyad millet biscuit	68
14.	Jowar roasted bread	77
15.	Barnyard and kodo millet-based noodles	84
16.	Finger millet roasted bread	104

Source: IFCT 2017, Nutritive value of Indian foods, 2009.

5.6 Millets in Relation to Different Health Conditions:

A. Millets-Diabetes:

Millets have been seen to reduce levels of -glucosidase and pancreatic amylase, which in turn decreased postprandial hyperglycemia by slowing down the enzymatic degradation of complex carbs. Certain enzymes, such as aldose reductase, which stop the accumulation of sorbitol also lower the risk of cataract illnesses brought on by diabetes. Millets are therefore beneficial for regulating blood sugar levels and, thanks to their antioxidant content, for promoting cutaneous wound healing (Rajasekaran NS, *et al*., 2004).

After evaluating the Glycemic Index (GI) of foods based on sorghum in 2010 as part of the National Agricultural Innovation Project (NAIP), the National Institute of Nutrition (ICMR) and the Indian Institute of Millets Research, Hyderabad, concluded that these foods have a low GI and lower postprandial blood glucose levels. Due to the high fibre content of finger millet, diets also demonstrated reduced glycemic response.

They aid in the healing of cutaneous wounds as well. There is good evidence from studies indicating the finer millets' proteins play a significant role in preventing the development of cataracts in people. Since diabetes is a lifestyle disease, it affects millions of individuals worldwide.

Millets aid in the prevention of Type II Diabetes because they contain considerable amounts of magnesium, a vital element that enhances the effectiveness of insulin and glucose receptors by generating numerous enzymes that manage insulin action. 2017 (O.S.K. Reddy).

B. Millets-CVD:

Consuming porso-millet protein concentrate has a very positive influence on plasma lipid levels, according to millets, which also clearly demonstrated that adiponectin and high-density lipoprotein cholesterol levels are enhanced (Kyung, et al., 2008). Millets are an excellent source of magnesium, which helps to prevent heart attacks. By lowering plasma triglycerides, millets, which are known to be rich in phytochemicals containing phytic acid, aid in lowering cholesterol and preventing cardiovascular disease (Lee, et al., 2010).

This is why regular ingestion of whole millet grains lowers the risk of CVD, according many research. Magnesium, a vital trace element for lowering blood pressure and the risk of heart attacks and strokes, especially in the case of atherosclerosis, is abundant in millet. Moreover, millets are a good source of potassium, a vasodilator that further lowers blood pressure.

One of the finest strategies to safeguard cardiovascular health is to manage your blood pressure and improve your circulatory system. Additionally, millets contain plant lignans that are rich in prebiotic fibre. These lignans are fermented by bacteria in our intestines and can then be changed back into animal lignans by the microflora in our digestive system. Animal lignans have been shown to act as barriers against a number of chronic diseases.

They are fermented to produce enterolactone, a substance with a reputation for preventing heart disease and some types of breast cancer. O.S.K. Reddy (2017).

C. Millets and Cancer:

Millets have demonstrated in studies that their abundance in phenolic acids, phytates, and tannins reduces the chance of developing colon and breast cancer. It has been demonstrated that the phenolics in millets are efficient at stopping the development and spread of cancer in test tubes (Chandrasekara A, et al., 2011). Linoleic acid, an important fatty acid found in millets, has anti-tumor properties (nubiform, et al., 2007). Sorghum's anti-carcinogenic qualities are well established. In addition to having positive melanogenic activity, the polyphenols and tannins found in sorghum exhibit anti-mutagenic and anti-carcinogenic qualities (Grimmer et al., 1992). They can also work against human melanoma cells. Sorghum has been discovered to reduce the incidence of esophageal cancer in China and other regions of the world (Van Rensburg, 1981). t is also observed consumption of sorghum demonstrated lower mortality against esophageal cancer than wheat and corn. Several of the antioxidants present in millets not only have a positive effect on scavenging free radicals, which can result in cancer, but they also have the ability to remove other toxins from the body, including those found in the human kidney and liver. By encouraging correct excretion and reducing enzymatic activity in those organs, quercetin, curcumin, ellagic acid, and a number of other advantageous catechins can aid in the removal of any foreign substances and toxins from the human system. O.S.K. Reddy (2017).

D. Millets and Celiac Disease:

Celiac disease is a genetically predisposed condition brought on by the impact of the plant protein gluten. Millets, which don't contain gluten, aid in lowering celiac disease by lessening the irritation brought on by popular cereal grains that do. Saleh ASM, et al. (2013). Consuming millets helps regulate the digestive system very well, boosts nutrition retention, and lowers the risk of developing more serious gastrointestinal diseases like gastric ulcers or colon cancer. Millets' high fibre content aids in preventing problems including constipation, excessive gas, bloating, and cramps. Celiac disease is an immune-mediated enteropathic condition that, in susceptible people, is typically brought on by consuming gluten (Catassi and Fasano, 2008). A gluten-free diet mainly influences how much food is consumed. A gluten-free diet can be followed by substituting rice, corn, sorghum, millet, amaranth, buck wheat, quinoa, and wild rice for gluten-containing cereals like wheat, barley, and rye. 2009 (Thompson). Millets have a lot of potential in the food and beverage industries thanks to their gluten-free characteristics.

They can meet the rising demand for gluten-free diets and will be suitable for people with celiac disease. Millets are a good source of micronutrients and phytochemicals like dietary fibre, carotenoids, phenolics, sterols, lignans, inulin, resistant starch, and -glucan. The polyphones include phenolic acids, tannins, and flavonoids, which are key components of the body's immunological system and act as antioxidants (Chandrasekara A, et al., 2010). Many of the anti-oxidants in millet have a positive effect on scavenging the cancer-causing free radicals and clearing other toxins from the body that are eliminated through the kidney and liver.

By encouraging appropriate excretion and reducing enzymatic activity in those organs, quercetin, cucurmin, ellagic acid, and numerous other advantageous catechins can aid in the removal of unwanted substances and toxins. As a result of their importance to human health, polyphenol has received a lot of attention (Tsao R, 2010).

The soluble and insoluble bound phenolic extracts of numerous types of millet (kodo, finger, foxtail, proso, pearl and small millets) provide evidence of antioxidant, metal chelating, and reducing properties (Chandrasekara and Shahidi, 2010).

Proso millet contains 29 mg polyphenolics per 100 g and 2.22 mg tocopherol per 100 g, compared to foxtail millet's 47 mg polyphenolics and 3.34 mg tocopherol per 100 g (on a wet basis) (wet basis). Millets are very nutrient-dense and provide a number of health advantages. Millets support the fight against obesity (Ambati K., andSharita K V, 2019).

5.7 Millets in Food Industry:

The main diet in many Asian and African nations is millet. People in millet-producing regions used to make a variety of traditional dishes and drinks such idli, dosa, papad, cookies, porridges, breads, infant's food, and snack foods, which is a reflection of Asia Pacific's urban population's growing preference for healthy cuisine. Iron, calcium, and fibre found in millets aid to reinforce other nutrients necessary for children's healthy growth and development. Millets are increasingly being used in baby food and nutrition products.

Long-term strategies are being planned by several developing countries and their governments to implement nutrition programmes to combat malnutrition. The scale of the business is projected to increase due to the backing of government efforts and a variety of food and beverage items. Millets like quinoa and buckwheat are frequently utilized in the preparation of well-known foods including waffles, pizza, pasta, and sandwiches.

A shift in consumer preference for low-cholesterol and fat-free foods as well as increased awareness of healthy eating practices could increase millet demand. Manufacturers are being encouraged to utilize millet since consumers are becoming more and more interested in healthy baking products.

Growing consumer preference for low-calorie foods and the adoption of healthy eating practices might likely increase market share. Moreover, it has been used in drinks like beer. For people with celiac disease or gluten intolerance who need to reduce their intake of gluten, gluten-free beers are developed especially for them. A significant amount of millet is being produced, farmed in local level, and either consumed by humans or utilized as animal feed.

The remaining produce is utilized to make breakfast, baby food, and beer. Millets' typical grain texture and hard seed coat improve their ability to retain, but at the same time make them challenging to process and prepare in a convenient way. Absence of suitable primary processing technologies for ready-to-use or ready-to-cook (RTC) items as well as secondary and tertiary processing for ready-to-eat value added products has been one of the main obstacles to their increased economic status and wider range of food uses (Malleshi, 2014).

A barrier to entry into the urban food sector is high product prices. Thus, increased public knowledge of the health benefits of eating millets will spur industry expansion (Jaybhaye R.V., 2014). The challenges in millet grain processing create a difficulty, but at the same time consumer demand for healthy foods, nutritional benefits, and processing requirements necessitate the development of appropriate technologies for novel products and process mechanization.

This shift in technology and consumer food preferences will undoubtedly contribute to expanding the uses for millets, preserving the ecological balance, guaranteeing food security, preventing malnutrition, and expanding the potential for millet grains to be used on an industrial scale. Millets have so far been successfully used in a variety of traditional as well as fast-food health dishes, according to several studies on their processing. Based on this, numerous researchers have attempted to create processed goods like weaning foods, fermented, malted, flaked, puffed, extruded, and roller dried products.

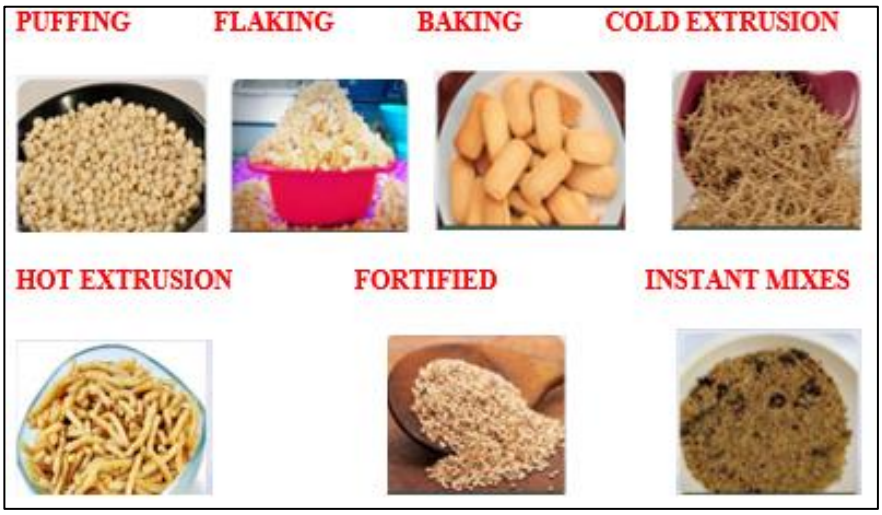

Figure 5.6: Different Food Products with Technologies Based on Millets

Source: IIMR, 2023

5.8 Steps Taken for Promoting Millets Since 2018:

As millets like jowar, bajra, ragi, and other millets are nutrient powerhouses and are referred to as super foods, the government decided to drop the term "coarse cereals" and rename them as "Nutri Cereals." This movement aims to dispel the myth that these grains are less valuable than rice and wheat, despite the fact that they contribute more to our health and nutrition. Millets have a big potential to significantly improve the food and nutritional security of the nation and the planet.

There are many initiatives undertaken by Government based on different interventions-

- On production through technology backstopping

- Diversification of processing technologies in contradiction with inconveniences, and development and standardization of millet-based value-added product technologies.

a. More than 60 processing technologies has been developed by retrofitting the existing machinery available for other cereals.
b. Primary processing and secondary processing methods developed and fine-tuned, with 32 commercialized products.
c. Processing innovations improved the nutritional value, convenience and shelf life of the products.

- Improvisation of processing technologies with value addition
- Nutritional Evaluation and Certification,
- Commercialization
- Promotion and Popularization
- Entrepreneurship Development

There are several Government initiative programs to secure millets and promote the popularity-

A. National Year for Millets 2018:

The "Sub Mission on Millets" under National Food Security Mission Named Sorghum (Jowar), Pearl Millet (Bajra), Finger Millet (Ragi/Mandua), Minor Millets i.e., Foxtail Millet (Kangani/Kakun), Proso Millet (Cheena), Kodo Millet (Kodo), Barnyard Millet (Sawa/Sanwa/ Jhangora), Little Millet (Kutki) and two Pseudo Millets (Buck-wheat (Kuttu) and Ameranthus (Chaulai) as "Nutri cereals" since 2018 and gave popularity. Several State initiatives have also been established, such as the POSHAN MISSION Abhiyan by the Ministry of Women & Child Development to promote. One type of quinoa (Him Shakti) was introduced by ICAR as a novel crop; ICAR also supported marketing it as nutri-cereals.

B. International Year of Millets (IYoM)-2023:

The Indian government had asked the UN to declare 2023 the International Year of Millets (IYOM). Then it was supported by the General Assembly of the United Nations and 72 nations worldwide (UNGA). Consequently, on March 5, 2023, the International Year of Millets was proclaimed. Following the mission, the Indian government has also planned to celebrate IYOM in 2023 in order to start a movement that will lead to the global acceptance and favouritism of Indian millets, their recipes, and value-added products.

C. Seven sutras based on theme by government of India:

- Harnessing the enhancement of production and productivity
- Focusing on Nutrition and health benefits.
- Prioritizing Value addition, processing and recipe development.
- Promoting areas of Entrepreneurship, startup and collective development.
- Working on Awareness creation, branding, labeling and promotion.
- Emphasizing International outreach.
- Implementation of Policy intervention for mainstreaming.

5.9 Conclusion:

Rich soils are not necessary for the life and development of millet. Therefore, it's a blessing for the large region of dry land. Synthetic fertilizers are not necessary to produce millet. So, use of farmyard manures and household-produced bio fertilizers are in trend by the majority of millet producers.

As a result, they can drastically lessen the government's enormous fertilizer subsidy burden. No pests are drawn to millet when it is grown using traditional techniques. These might be considered crops. Millets are also not getting affected by bugs during storage. As a result, they hardly ever need pesticides. As a result, they greatly benefit the agricultural environment. Millets provide an incredible amount of nourishment. In terms of nutrients proteins, minerals, and vitamins, each of the millets has three to five times the nutritional value of the extensively advertised rice and wheat. So, it is necessary to improve the miracle of millet grains, their processing capacity, the status of the current food product lineup, and the potential for future development of millet-based health, functional, and RTE goods.

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