International Year of Millets

Millets Nutritional Benefits for Humankind

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ABSTRACT

With the aim to create awareness and increase production & consumption of millets, United Nations, at the behest of the Government of India, declared 2023 the International Year Millets. The International Year of Millets (IYM) is a global initiative that aims to raise awareness about the nutritional and ecological benefits of millets and promote their cultivation, consumption, and trade. The initiative was launched by the Food and Agriculture Organization (FAO) of the United Nations in 2023 to help improve food security and nutrition, particularly in developing countries. Millets are a group of small-seeded cereal grains that have been cultivated for thousands of years in various parts of the world, particularly in Africa, Asia, and Europe. They are known for their nutritional benefits and are considered to be highly nutritious and healthy.They are rich in a variety of essential vitamins and minerals, including iron, potassium, magnesium, zinc, and B vitamins. They are also a good source of dietary fibre, which can help to promote healthy digestion and prevent constipation. Raw millet has 378 calories per 100 grams and is a good source (20% or more of the Daily Value) of protein, dietary fibre, several B vitamins, and a variety of dietary minerals, including manganese at 76% Daily Value. There are 9% water, 73% carbs, 4% fat, and 11% protein in raw millet.In addition, millets are gluten-free and can be a good alternative for people with celiac disease or gluten intolerance. They also have a lower glycemic index compared to other grains, which can help to regulate blood sugar levels in people with diabetes.Millets are also high in antioxidants, which can help to protect the body against damage from free radicals and reduce the risk of chronic diseases such as cancer and heart disease.The International Year of Millets is an important initiative that aims to promote the use of millets as a nutritious and sustainable food source, and to help improve food security and nutrition in developing countries. In summary, millets are a nutritious and healthy food that can be enjoyed by people of all ages and dietary needs. They are a good source of essential vitamins and minerals, fibre , carbohydrates, and protein. They are also gluten-free and have a lower glycemic index which can be beneficial for people with diabetes.

Introduction

Millets are a group of small-seeded grasses belonging to the family Poaceae that are drought-tolerant and can grow in challenging environments. They have been grown for thousands of years, and are an important staple food in many parts of the world, particularly in Africa and Asia. Some common types of millets include:

- Pearl millet (Pennisetumglaucum): This is the most widely grown type of millet, and is a staple food in many parts of Africa and India
- Finger millet (Eleusinecoracana): Also known as ragi, this millet is a staple food in parts of Africa and India and is rich in iron, calcium and other minerals.
- Foxtail millet (Setariaitalica): This millet is popular in China and parts of Asia, and is often used to make porridge or fermented products.
- Proso millet (Panicummiliaceum): This millet is grown primarily in the United States and is used for feed and birdseed.
- Sorghum (Sorghum bicolor): This is a type of millet that is grown for grain, forage, and biofuel.

All millets are annual plants, and they typically have a short growing season, with most varieties maturing within 60-90 days. They have a shallow root system, which allows them to quickly absorb water in the soil. The leaves of millets are long and narrow, and are typically green or blue-green in colour. The flowers of millets are small and inconspicuous, and are typically wind-pollinated. The seeds of millets are small, round, and typically range in color from white to red or black, depending on the variety.

Millets are a type of cereal grain that are grown for their edible seeds, which are usually ground into flour or used whole to make porridge or fermented products. They are also grown as a cover crop, forage crop, and biofuel crop. They are well adapted to poor soil, low rainfall and high temperature. They can grow in a wide range of soil types, including sandy soils, clay soils, and saline soils. They are also tolerant to high temperatures and low rainfall, which makes them well-suited to growing in semi-arid regions.

Health benefits of Millets-The Nutri-cereals

Given their high nutritious content, millets are regarded as the next generation of superfoods or "nutri-cereals" worldwide. They may be helpful as a long-term solution for nutritional security.

Millets are gluten-free and are a good source of dietary fibre, minerals and vitamins. They are also rich in antioxidants and phytochemicals which may help to prevent chronic diseases. They are also considered as a good alternative to the traditional wheat and rice in terms of food security and climate change adaptability. According to ICAR-Indian Institute of Millets Research, Hyderabad, Millets contain 7-12% protein, 2-5% fat, 65-75% carbohydrates and 15-20% dietary fibre.

Niacin, which is abundant in millet, aids your body in controlling more than 400 enzyme reactions. Niacin is crucial for healthy skin and proper organ operation. In reality, it's a crucial substance that is frequently added to processed foods as an enrichment.The darker kinds of millet are particularly good sources of beta-carotene. This organic pigment supports the health of your eyes and functions as both an antioxidant and a precursor to vitamin A, assisting your body in fending off free radicals.

They are both allergy-free and gluten-free. They are high in bioactive chemicals and essential amino acids and have a low Glycemic Index (GI), a measurement used to assess how much a particular diet raises blood sugar levels. They are beneficial for diabetics because of their low GI. Millets are three to five times more nutritious than wheat and rice in terms of proteins, minerals, and vitamins. They are also rich in micronutrients like calcium, iron, zinc, iodine, and others. Heart disease, anaemia, calcium insufficiency, and other conditions can all be fought using millets.

Nutritive value of millets (per 100g)

Crop/Nutrient	Protein (g)	Fat (g)	Minerals (g)	Iron (mg)	Calcium (mg)	Phosphorus (mg)	Fibre (g)
Rice	6.4	0.4	0.7	1.0	9.0	143	0.2
Sorghum	10.4	1.9	1.6	4.1	25	222	1.6
Pearl Millet	11.6	5.0	2.3	8.0	42	296	1.2
Finger Millet	7.3	1.3	2.7	3.9	344	283	3.6
Foxtail Millet	12.3	4.3	3.3	2.8	31	290	8.0
Proso Millet	12.5	1.1	1.9	0.8	14	206	2.2

World Scenario of Millet

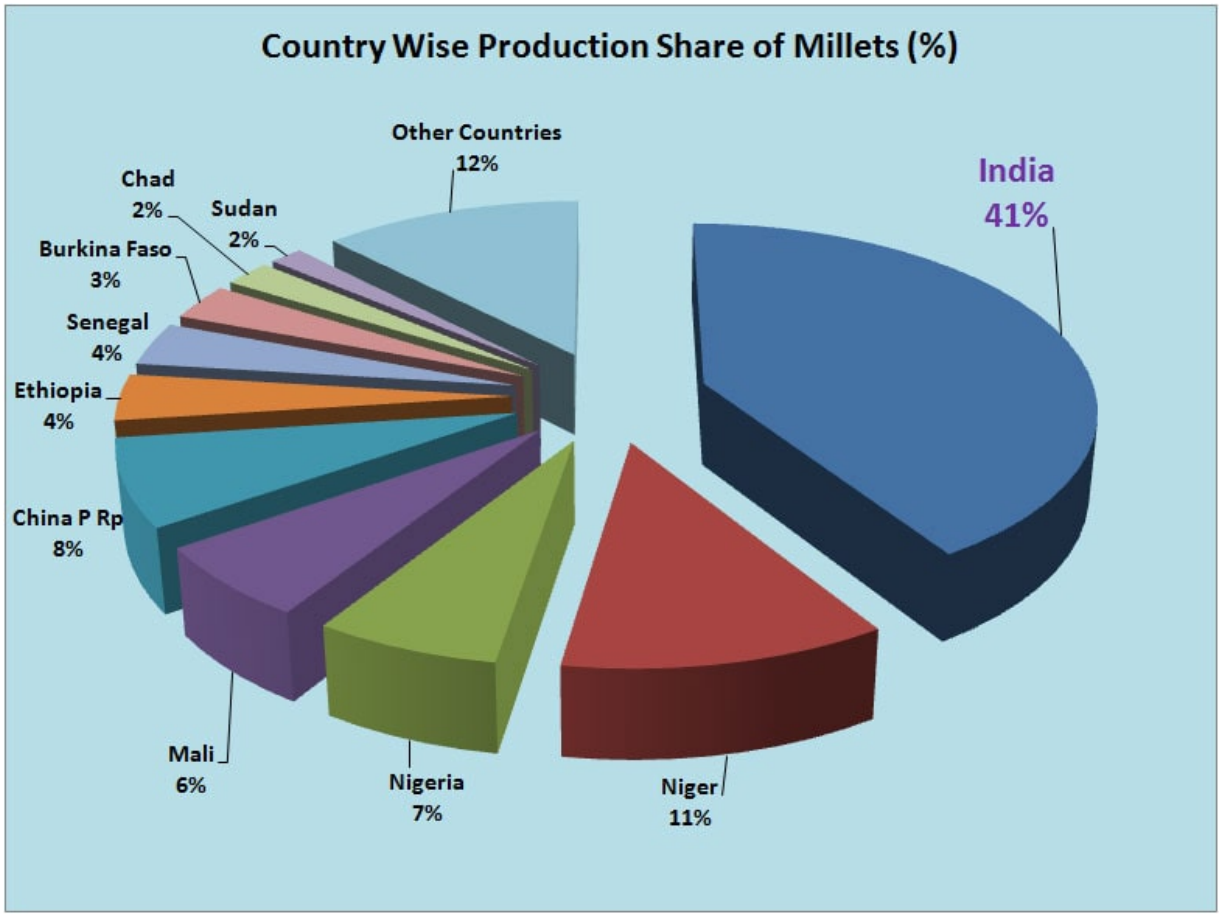
Millets have been grown for thousands of years in many parts of the world, but in recent times they have lost popularity as a staple food crop due to the rise of wheat and rice. However, there has been a renewed interest in millets in recent years due to their potential to improve food security and adapt to climate change.

In India, pearl millet and finger millet are the most widely grown types of millets and are a staple food for many people in the country. In Africa, pearl millet is also an important staple food crop, particularly in the Sahel region. In China and parts of Asia, foxtail millet is a popular food crop.

Globally, the area under millet cultivation has been decreasing over the last decades, but still, the total area of millet cultivation is around 42 million hectares. The major millet producing countries are India, Nigeria, China, Sudan, Niger, Burkina Faso, Mali, Chad, and Senegal.

Despite the decline in production, there has been a renewed interest in millets in recent years due to their potential to improve food security and adapt to climate change. Millets are drought-tolerant and can grow in challenging environments, making them well-suited to growing in regions that are prone to drought and climate change. Also, the nutritional values and gluten-free properties of millets make them suitable for people with celiac disease, and other gluten-intolerance.

As the world's population continues to grow, and the effects of climate change become more pronounced, it is likely that the demand for millets will increase in the future. This could lead to an expansion in millet cultivation and an increase in the use of millets as a staple food crop in many parts of the world.



Millet Production in India

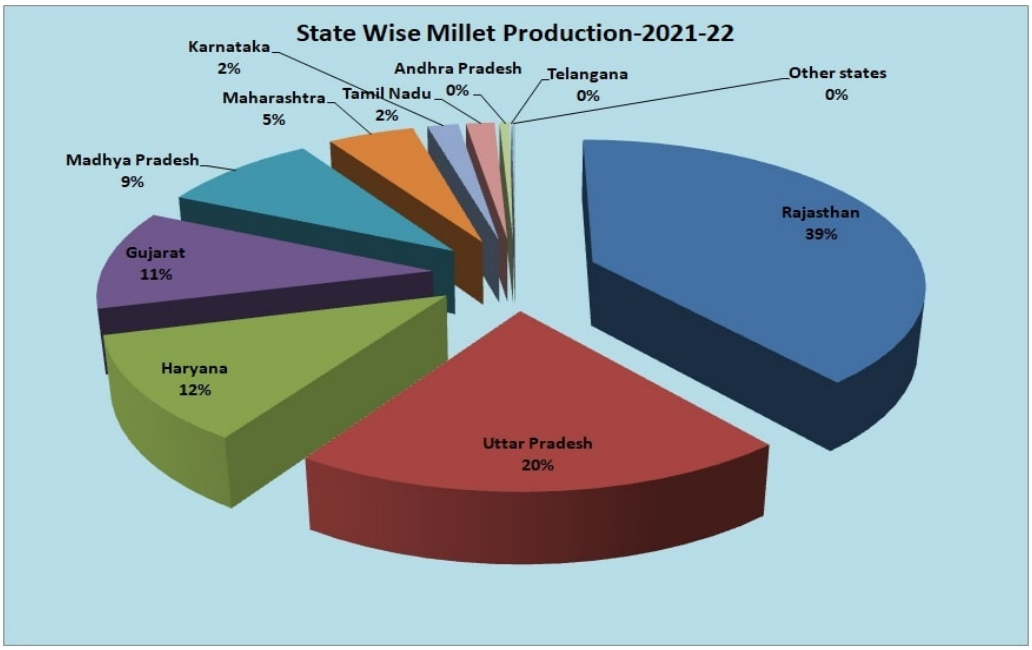
Millet production in India is a significant part of the country's agriculture sector. India is one of the world's largest producers of millets, with the crop being grown in several states including Rajasthan, Maharashtra, Andhra Pradesh, and Karnataka. The most commonly grown millets in

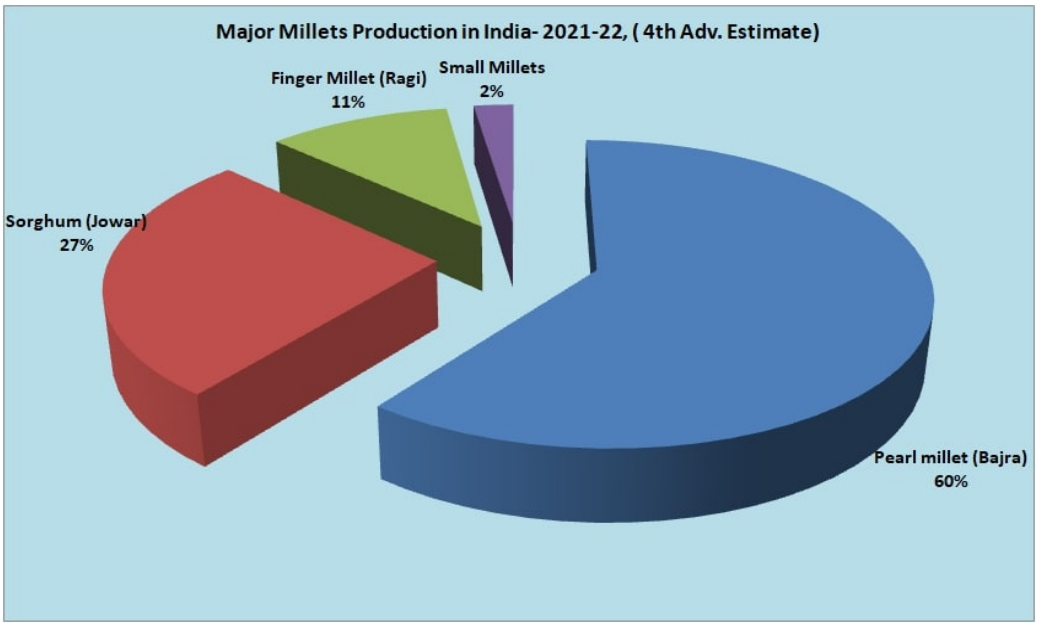
India are pearl millet, finger millet, and foxtail millet. The government of India has been promoting millet cultivation in order to increase the production and consumption of these nutritious grains. This includes initiatives such as the National Millets Mission and the National Food Security Mission.

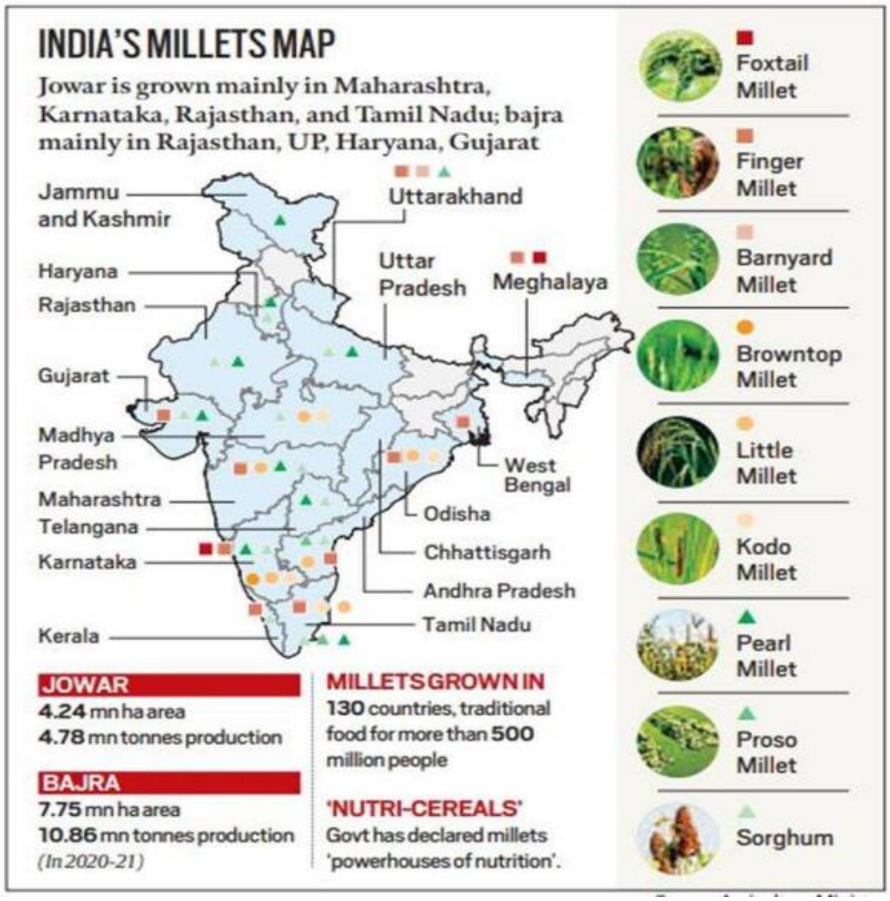
In recent years, there has been a renewed interest in millets as a nutritious and sustainable alternative to rice and wheat, and the government has been promoting millet cultivation and consumption as a part of its efforts to improve food security and reduce dependency on rice and wheat imports.

According to the Food and Agriculture Organization (FAO), global millet production in 2019 was estimated to be around 17.8 million metric tons. India is one of the largest producers of millet in the world, with an estimated production of 7.5 million metric tons in 2019 and with a share of 41 percent in the year 2020.

Due to the millets' high nutritious value, the government designated them as nutri-cereals in April 2018. The millets have a low glycemic index and are a good source of protein, fibre, minerals, iron, and calcium. In 2018, the National Year of Millets was observed. The Indian government has requested the UN to declare 2023 the International Year of Millets in order to increase demand on a national and international level and to provide people with nourishing food (IYoM). In March 2021, the United Nations General Assembly (UNGA) declared 2023 to be the International Year of Millets after receiving support from 72 nations. Through funding for research and development and the establishment of 3 Centers of Excellence, the government is increasing public awareness of nutri-cereals (CoE).Additionally, start-ups are also offered support.




Major Millets Production in India- 2021-22, (4th Adv. Estimate)
Finger Millet (Ragi)
11%
Small Millets
2%
Sorghum (Jowar)
27%
Pearl millet (Bajra)
60%


INDIA'S MILLETS MAP
Jowar is grown mainly in Maharashtra, Karnataka, Rajasthan, and Tamil Nadu; bajra mainly in Rajasthan, UP, Haryana, Gujarat
Jammu and Kashmir
Uttarakhand
Haryana
Uttar Pradesh
Meghalaya
Rajasthan
Gujarat
Madhya Pradesh
West Bengal
Maharashtra
Odisha
Telangana
Chhattisgarh
Karnataka
Andhra Pradesh
Tamil Nadu
Kerala
JOWAR
4.24 mn ha area
4.78 mn tonnes production
BAJRA
7.75 mn ha area
10.86 mn tonnes production
(In 2020-21)
MILLETS GROWN IN
130 countries, traditional food for more than 500 million people
'NUTRI-CEREALS'
Govt has declared millets 'powerhouses of nutrition'.
Foxtail Millet
Finger Millet
Barnyard Millet
Browntop Millet
Little Millet
Kodo Millet
Pearl Millet
Proso Millet
Sorghum

Challenges Faced by Farmers during Millet Cultivation

1. Drought: Millet is a drought-tolerant crop, but it still requires a certain amount of water to grow. Drought conditions can reduce crop yields and make it difficult for farmers to produce a good harvest.
2. Pest and Disease: Pests and diseases can also be a problem for millet farmers. The most common pests include stem borers, armyworms, and aphids, while diseases such as leaf spot and rust can also cause damage.
3. Soil fertility: Millet is a crop that can grow in poor soil conditions, but it still needs a certain amount of nutrients to grow well. Poor soil fertility can lead to low crop yields and make it difficult for farmers to produce a good harvest.
4. Limited access to markets: Small-scale farmers may face challenges in selling their millet due to limited access to markets, lack of information about prices and buyers, and lack of transportation infrastructure.
5. Lack of knowledge and technology: Many farmers lack knowledge about the best practices for growing millet, including appropriate planting, fertilization, and pest management techniques.
6. Low priority: Millet is often considered as subsistence crop and is grown by small farmers. It is seen as a low-priority crop, which is often neglected in terms of research and development, as well as extension and advisory services.

Actions to be Performed to Increase Millet Production

- Manufacturing, processing and storage: Cultivation of millet should be encouraged due to its climate resilience, short growing season and ability to grow in poor soils, mountainous areas and low rainfall. Millet farmers in rain-fed areas need to be empowered through capacity building and skills training.
- Marketing: For the entrepreneur's sourcing of quality millet and its stable marketing, small and marginal millet farmers should be connected to online marketing platform such as the Electronic Agriculture National Market (e-NAM).
  The setting up of farmer producer organisations (FPOs) can also enhance the millet producers' bargaining power in both the domestic and global markets. There is need to learn from the last-mile experiences of approximately 200 millet start-ups that have been incubated in the last few years by young agri-entreprenuers.
- Awareness raising and capacity building: We need to work with multiple diverse stakeholders, including doctors, chefs, and nutritionists across the country. Both farmers and consumers need to be educated about the benefits of millet. To increase demand for millet, researchers need to put more emphasis on its nutritional benefits to consumers concerned about immunity and health, especially in a post-pandemic world. Solutions

also need to be developed to improve the shelf life of millets (cereals, processed grains and flour) and bring it in par with competing crops.

- Branding to spread: Not only do we need to improve our marketing strategies to increase consumption, but we also need to improve the recipes for putting millet on people's tables and making it part of their daily diet. Companies like MTR, which makes breakfast mixes, are a good place to start.
- Public procurement and distribution: (a) Increase the amount of coarse grain procured for central pools and distributed under NFSA; According to the latest inventory data from Food Corporation of India (FCI), as of 1 November 2022, only 2.64 rough metric tonnes (LMT) of coarse grain was available in the central pool. In contrast, stocks of rice, wheat and unpolished rice were 265.97 LMT, 210.46 LMT and 263.70 LMT respectively.
  (b) Millet should be included in the Anganwadi lunch program or PDS to improve the nutritional status of preschool children and women of childbearing age.
  (c) Only Jowar, Bajra and Ragi qualify for the Minimum Support Price (MSP) set by the government. Other millet should also be included.
    - Other steps:

  (a) The International Fund for Agricultural Development (IFAD) has supported the development of agriculture in Kodo and Kutuki , Dindri , Madhya Pradesh. Dindri models need to be replicated beyond one district and other millets.
  (b) Many millet cultivars suitable for different agro-ecological zones have been documented. A diverse seed bank should be created to facilitate this and ensure the availability of planting material.

Conclusion

It is a well-known truth that fibre-free foods are a major contributor to the global health problems. Additionally, it is evident to thousands of patients that all lifestyle disorders can be avoided by simply consuming millets for their meals and avoiding refined foods like rice, wheat, refined flours, processed meats, refined oils, packaged and ready-to-eat foods and milk. Efforts need to be scaled up to further improve millet acreage. Among the millets, the Union government declared a minimum support price for jowar, bajra and ragi. It is important to make people realize the importance of food by introducing millets as a nutritious food, fulfilling the nutritional requirement of the global population and effectively reducing the problems of hunger, malnutrition and other health problems. It has multiple benefits in several diseases and disorders, and contains anti-oxidants. It is also considered as ‘superfood’ now-a-days due to its unending perks. Large-scale millet farming has the potential to help farmers secure their livelihoods in the face of climate change. Widespread use of millet also helps combat lifestyle diseases such as diabetes due to its nutritional value. The government has taken several commendable initiatives to promote millet production. Despite the challenges faced by farmers, they should be supported and a way forward should be paved for the increase in the production of the millets. The declaration of the year 2023 as the ‘International Year of the Millets’ should be seen as an opportunity and the right steps should be taken to grasp it by overcoming the problems faced till date. All the nutritional benefits should be exploited to the best of their use for the development and benefit of the humankind.

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