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Research Article

GROWTH TRENDS IN MUSHROOM PRODUCTION; AN ANALYSIS OF INDIAN AND GLOBAL SCENARIO

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Abstract- Mushrooms are the fleshy fungi usually formed on the soil or at its food source above ground. Mushrooms have grown as an important food over the years especially for vegetarians. Mushrooms are widely cultivated throughout the world with raising demand from the consumers. The growth in the production of mushroom in global and Indian level were examined from 2000-01 to 2018-19 using information collected from secondary sources. The CAGR was found to about 5.55 percent at global level and 6.13 percent at Indian level for the period of 2000-01 – 2018-19. Increase in consumption level, introduction of new technology, varieties have contributed for the growth in production of mushrooms.

Keywords- *Mushroom, Compound annual growth rate, Trend, Production*

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Introduction

Indian agriculture remains a crucial strength of the Indian economy. India is self-sufficient in production of milk, vegetables and fruit but still need to do more to sustain food and nutritional security. With the depleting land, water and other resources there has been significant emphasis on moving to production of crops promoting sustainability but still providing nutritional security to ever increasing population worldwide. Mushrooms are excellent source of nutrition, produced and consumed throughout the world. According to Thakur (2020) [1], Mushroom growing is a potential activity for conversion of waste into best nutritional food with high protein conversion efficiency. Mushroom farming has gained importance over the years due to its multitude of benefits both for human and environment.

Mushrooms have their nutritional value packed with vitamins, minerals etc. They are low in calories with great sources of fibre and protein. The [Table-1] represents the nutritional composition of mushroom per 100 g.

Materials and Methods

The secondary data regarding global production of mushroom was collected from FAOSTAT. Data on mushroom production in India was collected from India Stat, Directorate of Economics and Statistics, Ministry of Agriculture, National Horticulture board between 2000-19. The exponential compound annual growth rates were estimated using linear log function on the time series data on production of mushroom. The CAGR was worked out by using,

$Y_t = AB_t$

Where,

Y_t =Production under mushroom during the year 't'

A = Constant term

B = Parameter to be estimated

t = Time measured in years

By taking the natural logarithms on both the side of the equation, the following form was obtained.

$\text{Log } Y = \text{Log } A + t \text{ Log } B$

Taking log A = a, log B = b,

$\text{Log } Y = a + bt$

The CAGR is given by, CAGR = [(Antilog of b) -1]*100.

Review of Literature

Thakur (2020) reviewed about the advances in mushroom production and its link to food, nutritional and employment security. The author opined that mushroom growing was a potential activity to convert waste into best nutritional food with high protein conversion efficiency. The results of the study revealed that mushroom cultivation has witnessed a tremendous growth and has proved a potential source for employment generation, food, and nutrition security in tribal dominating rural India. Sharma *et al*., (2017) analyzed the status of global mushroom industry and the opportunities and challenges for development of mushroom entrepreneurship in India. The results showed that the mushroom industry in India has registered an average growth rate of about 4.3 percent over the years from 2010-2017. Wakchaure (2011) examined the production and marketing of mushroom at global and national level and provided the detailed information about trading of mushroom. The result revealed that china was the largest producer and consumer of mushrooms. Around 95 percent of the production in china was consumed locally and per capita consumption(10 kg / person/year) was highest compared to India (30-40g /person/year). Sachan *et al*., (2013) conducted a study to identify the marketing practises and channels involved in marketing of mushroom. The results of the study revealed that women co-operative society played an important role in marketing of mushrooms. Rosmiza *et al*., (2016) evaluated the mushroom industry prospects in Malaysia while exploring the issues and challenges faced by the industry using SWOT and critical analysis. The study revealed that poor supply and increased pricing of raw materials were the major problems faced by the industry in Malaysia.

Table-1 *Nutritional Composition of Mushroom (per 100g)*

Vitamins		
S. No	Nutrient	Unit/100g
1.	Folate	9.00 ug
2.	Niacin	2.252 mg
3.	Pantothenic acid	0.440 mg
4.	Riboflavin	0.205 mg
5.	Thiamin	0.069 mg
6.	Vitamin B6	0.136 mg
7.	Vitamin D	206.00 IU
8.	Vitamin D2	5.10 ug
Minerals		
S.No	Nutrient	Unit/ 100g
1.	Calcium (Ca)	43.00 mg
2.	Copper (Cu)	0.625 mg
3.	Iron (Fe)	12.18 mg
4.	Magnesium (Mg)	19.00 mg
5.	Manganese (Mn)	0.587 mg
6.	Phosphorus (P)	194.00 mg
7.	Potassium (K)	411.00 mg
8.	Selenium (Se)	2.20 ug
9.	Sodium (Na)	21.00 mg
10.	Zinc (Zn)	2.03 mg
Proteins		
S.No	Nutrient	Unit/ 100g
1.	Protein	3.12 g
Carbohydrates		
S.No	Nutrient	Unit/ 100g
1.	Carbohydrate	5.10 g
2.	Fiber	2.8 g
3.	Sugars	0.60 g
4.	Glucose (dextrose)	0.60 g

Mushroom Production

Global scenario

Mushroom production and consumption have widely spread around the world. The production of mushroom throughout the world has increased very rapidly in the last 20 years. The Asia Pacific is the leading region among the global mushroom production market. The top ten countries in production of mushroom globally are presented in [Table-2]. The world production of mushroom was 11.89 MT in the year 2019. The top ten countries accounted for nearly 90 percent of world mushroom production. China was the leading producer of mushroom with 75 percent of the total world production followed by Japan, USA, Poland etc. The production of mushroom in china was 8.93 MT (2019). India ranked sixth in production of mushroom with 0.18 MT. The consumption of mushroom in India, Japan and others Asian countries were found to be increasing at a significant rate due to increasing in population and shifting trends.

Table-2 *Mushroom Production in Top Ten Countries (2019)*

SN	Countries	Production (tonnes)	Percent
1	China, mainland	8938814	75.13
2	Japan	470000	3.95
3	United States of America	383960	3.27
4	Poland	362400	3.05
5	Netherlands	300000	2.52
6	India	182000	1.53
7	Spain	170160	1.43
8	Canada	145631	1.22
9	Iran (Republic of Islamic)	101365	0.85
10	United Kingdom	101339	0.85

(Source: FAOSATAT)

Indian scenario

Mushroom has become an integral part of Indian food and it is cultivated throughout the country. Mushroom production has grown manyfold from 0.04 MT (1997) to 0.18 MT (2019). The per capita consumption was also found increased from 42 gms to 80 gms during the period between 2006-2016. The five major mushroom species cultivated in India widely are white button, oyster, paddy straw, milky mushroom and shiitake mushroom. Sharma *et al* (2017)[2] reported that mushroom production is dominated by white button mushroom (73 Percent) followed by oyster mushroom (16percent), paddy straw mushroom (7percent) and milky mushroom (3percent). The state wise production of mushroom is presented in [Table-3]. Haryana was the major producer(20.05 tonnes) followed by Odisha (19.53 t), Maharashtra (18.38 tonnes),Himachal Pradesh(14.41 Tones).

Table-3 *State wise Production of Mushroom in India (2019)*

States	Production ('000 t)	Percent to Total
Haryana	20.05	12.8
Odisha	19.53	12.5
Maharashtra	18.38	11.8
Himachal Pradesh	14.51	9.32
Punjab	12.75	8.19
Gujarat	12.0	7.71
Uttarakhand	11.67	7.50
Tamil Nadu	11.48	7.37
Uttar Pradesh	7.60	4.88
Bihar	5.60	3.59
Goa	4.47	2.87
Andhra Pradesh	3.65	2.34
Delhi	3.16	2.03
West Bengal	3.00	1.92
Rajasthan	1.40	0.89
Karnataka	1.22	0.78
Jharkhand	1.00	0.64
Kerala	0.91	0.58
Jammu & Kashmir	0.77	0.49
Chhattisgarh	0.54	0.34
Madhya Pradesh	0.50	0.32
Nagaland	0.41	0.26
A & N Island	0.39	0.25
Assam	0.22	0.14
Tripura	0.12	0.07
Manipur	0.07	0.04
Mizoram	0.07	0.04
Arunachal Pradesh	0.06	0.03
Meghalaya	0.04	0.02
Sikkim	0.01	0.006
Total production	155.58	100.00

Source: www.indiastat.com (2019)

Trend in Mushroom Production in Global and National level

Global Mushroom production was around 4.54 million tonnes and it increased to the level of 11.89 MT in the year 2019. Royse *et al* (2017) [3] reported that world production of cultivated mushrooms has increased more than 30-fold since 1978 (from about 1 billion kg in 1978 to 34 billion kg in 2013). The CAGR for production of mushroom at global and Indian level was calculated for the period 2000 to 2019 and presented in [Fig-1] & [Fig-2]. The world-wide production of mushroom showed an increasing trend. Globally Mushroom production was expanding with a compound growth rate of 5.55 percent per annum during 2000 to 2019. The mushroom production in India has grown from miniscule. The consumption of mushroom in India was found to be increasing but still low when compared with other nations. The trend analysis for India showed positive trend with significant growth rate of 6.13.The results implied there is significant increase in production of mushroom both globally and nationally. Mushroom cultivation is widely promoted in India a promising small scale Agribusiness activity.

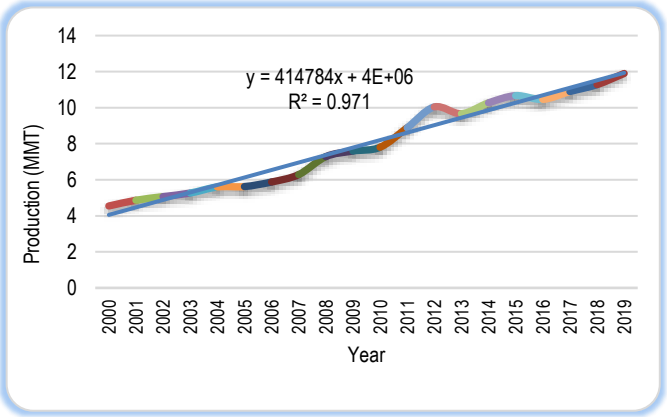

Fig-1 Trend in Production of Mushroom -Global (2000 -2019)

Increase in consumption level, introduction of new production technologies, varieties, trainings etc have contributed for the growth in mushroom cultivation. The trend in production also shows tremendous potential for promoting mushroom cultivation in India.

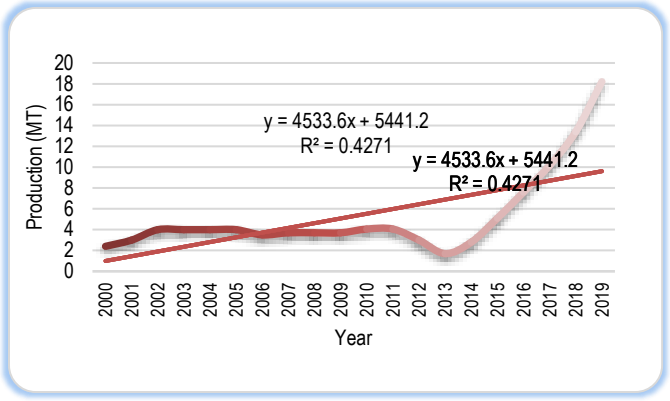

Fig-2 Trend in Production of Mushroom - India (2000 -2019)

Conclusion

Mushroom cultivation has become one of the most important agro-based industries and has potential for increasing opportunities, steady employment and income which is still in a nascent stage. The results of the Compound annual growth rate showed a positive and significant trend both at Global (5.55percent) and Indian level (6.13percent) during the period of 2000-2019.Promoting mushroom production will help in enhancing the nutritional and livelihood security in both rural and urban areas.

Application of research: The study attempted to examine the growth trend in Mushroom Production.

Research category: Mushroom Production

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Cultivar / Variety / Breed name: Nil

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Ethical Committee Approval Number: Nil

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