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Consumption pattern of millets in Amravati district of Maharashtra

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Abstract

Millets are nutritionally rich and climate-resilient cereal crops that have traditionally been an important component of the Indian diet. They are valued for their nutritional qualities, adaptability to diverse agro-climatic conditions and relatively lower water requirements. However, changing dietary preferences, urbanization and increasing dependence on rice and wheat have contributed to relatively low millet consumption. In this context, the present study was undertaken to examine the consumption pattern of millets and determine the factors influencing millet consumption among selected cultivators in Amravati district of Maharashtra. The study was based on primary data collected from 120 respondents selected from eight villages of two randomly selected tehsils of Amravati district for the year 2025. Simple tabular analysis, multiple linear regression and Garrett's ranking technique were used for analysing the data. The findings revealed that average annual household consumption increased with farm size, from 2520.40 kg among small farm households to 3369.14 kg among large farm households. Non-food items constituted the major share of total household consumption, accounting for 75.64 per cent, whereas food items accounted for 24.36 per cent. Among the selected millets, jowar was consumed in substantially greater quantity than bajra across all farm-size groups. Overall, jowar accounted for 3.00 per cent of total household consumption, while bajra accounted for 0.67 per cent. Household expenditure also increased with farm size, and non-food items accounted for 56.46 per cent of total expenditure. Jowar expenditure was higher than bajra, accounting for 2.62 and 0.39 per cent of total household expenditure, respectively.

The regression analysis showed that education was the only significant factor influencing millet consumption. Education had a negative and significant effect on both quantity-wise and expenditure-wise millet consumption, while age, family size and income were statistically non-significant. The R^2 values of 0.09 in both models indicated that the selected socio-economic variables explained a limited proportion of the variation in millet consumption. The Garrett ranking analysis identified habitual consumption of other cereals as the major constraint to millet consumption, followed by taste preferences and limited knowledge regarding millet culinary preparation. Health concerns and high price were other important constraints, whereas lack of availability was ranked as the least important constraint.

Overall, the study indicated that millet consumption among the selected households remained relatively low, with jowar being more preferred than bajra. The findings highlighted the importance of addressing traditional cereal preferences, taste-related concerns and limited culinary knowledge to promote millet consumption. Nutrition awareness programmes, recipe demonstrations, consumer education and promotional activities focusing on the nutritional benefits and diverse uses of millets could contribute to increasing their consumption, improving dietary diversity and strengthening household nutritional well-being in Amravati district.

Keywords: Millets, Consumption, Regression, Constraints

Introduction

Millets are small-seeded cereal crops that have traditionally formed an important part of the food systems of many regions, particularly in Asia and Africa. They are valued for their nutritional composition, adaptability to diverse agro-climatic conditions and relatively lower water requirements. In recent years, growing awareness of healthy diets, nutritional security and climate-resilient agriculture has renewed interest in millet consumption. Millets provide carbohydrates, dietary fibre, minerals, vitamins and other beneficial nutrients, making them suitable for inclusion in balanced diets.

In India, millets have historically been consumed in the form of traditional foods such as rotis, porridges and other preparations. However, changes in dietary preferences, urbanization, rising incomes and the increasing availability of rice and wheat have influenced millet consumption patterns over time. Despite their nutritional and environmental advantages, their consumption has remained relatively limited compared with major cereals. Factors such as taste preferences, limited knowledge of millet-based recipes, changing food habits, availability and price may influence consumer demand.

The renewed emphasis on millets, particularly following the declaration of 2023 as the International Year of Millets, has encouraged greater attention towards their production, processing and consumption. Understanding consumption trends is therefore important for assessing the changing role of millets in household diets and nutritional security. Studying millet consumption can also help identify the factors influencing consumer choices and the constraints limiting wider adoption. Against this background, the present study examined the trends and changes in millet consumption and explored the factors influencing consumption behaviour, with a view to understanding the emerging consumption pattern of millets in India.

The study was undertaken to examine the consumption pattern of millets in Amravati district and to determine the factors influencing millet consumption among the selected respondents.

Methodology

Sources of data

The study is based on primary data of consumption of millets. The annual data on consumption patterns of millets in Amravati district was collected for calendar year 2025.

Collection of data

The study was conducted in the Amravati district of Maharashtra state for the year 2025-2026. There are fourteen tehsils in Amravati district, out of which two tehsils were selected randomly. From each tehsil, four villages were selected i.e. total eight villages. Fifteen farmers from each village were selected. As such total 120 respondents were selected for present study.

Sampling procedure

A well-structured interview schedule was used for the collection of data. The schedule was prepared by taking into consideration the objectives of the study. The schedule was pre-tested, modified and then the personal enquiry can be done in the selected villages for obtaining information. The primary data for this study was collected through a survey.

Method of Analysis

The collected data were analyzed and the results were presented in the tables in order to bring out generalization of facts from which meaningful inference could be drawn.

Tools of Analysis

The choice of the statistical and econometric tools of analysis was decided with reference to the objectives of the study and the nature of data collected. The analytical techniques used in the study are presented below.

Consumption pattern

The simple tabular analysis, frequency and percentage was used for study the consumption pattern of millets in Amravati district and that pattern was studied on the basis of primary data collected from 120 farmers from Amravati district for the calendar year 2025.

Factors influencing the consumption of millets

Multiple linear regression model was used to determine the factors affecting millet consumption in Amravati district. The regression function used in this regard as follows:

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4$$

Where,

Y = Total annual household quantity/ expenditure

a = Constant term

b_1, b_2, b_3, b_4 = Coefficient of variables

X_1 = Age

X_2 = Education

X_3 = Family size

X_4 = Income

Garrett's ranking technique

Garrett's ranking technique was adopted for analyzing the factors affecting the consumption pattern of millets. In this method the respondents were asked to rank the factors identified for the purpose of study according to their preferences. Thus, the assigned ranks were calculated by using the following formula:

$$\text{Percent position} = \frac{(R_{ij} - 0.5)}{N_j} \times 100$$

Where,

R_{ij} - Rank given for the i^{th} item by the j^{th} , respondent and

N_j - Number of items ranked by the j^{th} , respondent

Results and discussion

Consumption pattern of selected households in Amravati district

The study of consumption patterns helps understand household spending behaviour, income allocation and living standards. In Amravati district, it provides insights into expenditure on food and non-food items and reflects the socio-economic conditions and consumption preferences of households.

Composition of average annual household food quantity consumption

The composition of average annual consumption of food and non-food items among small, medium and large farmers in Amravati district is presented in table 1.

Table 1: Composition of average annual household food quantity consumption (Kg/ Household/ Annum)

Sr No.	Particulars	Small	Medium	Large	Overall
A	Food items				
1	Jowar	75.85 (03.01)	102.26 (03.53)	85.88 (02.55)	263.99 (03.00)
2	Bajra	17.02 (00.68)	24.26 (00.84)	17.44 (00.52)	58.72 (00.67)
3	Fruits	138.64 (05.50)	147.13 (05.08)	159.00 (04.72)	444.77 (05.06)
4	Vegetables	112.77 (04.47)	122.26 (04.22)	128.50 (03.81)	363.53 (04.14)
5	Edible oil	103.58 (04.11)	120.26 (04.15)	107.25 (03.18)	331.09 (03.77)
6	Milk & its products	115.28 (04.57)	129.39 (04.47)	123.00 (03.65)	367.67 (04.19)
7	Spices	4.63 (00.18)	4.93 (00.17)	6.62 (00.20)	16.18 (00.18)
8	Sugar	87.51 (03.47)	98.35 (03.40)	102.75 (03.05)	288.61 (03.28)
9	Dry fruits	1.76 (00.07)	2.17 (00.07)	2.02 (00.06)	5.95 (00.07)
	Sub-total	657.04 (26.07)	751.01 (25.93)	732.45 (21.74)	2140.5 (24.36)
B	Non-food items				
1	Fuel	130.49 (05.18)	174.70 (06.03)	198.75 (05.90)	503.94 (05.74)
2	Electricity	1699.65 (67.44)	1925.22 (66.48)	2400.00 (71.23)	6024.87 (68.58)
3	Entertainment	3.31 (00.13)	4.26 (00.15)	4.06 (00.12)	11.63 (00.13)
4	Clothing	17.98 (00.71)	24.43 (00.84)	21.00 (00.62)	63.41 (00.72)
5	Footwear	11.93 (00.47)	16.22 (00.56)	12.88 (00.38)	41.03 (00.47)
	Sub-total	1863.36 (73.93)	2144.83 (74.07)	2636.69 (78.26)	6644.88 (75.64)
	Total (A + B)	2520.40 (100.00)	2895.84 (100.00)	3369.14 (100.00)	8785.38 (100.00)

(Figures in parenthesis indicate the percentages to total)

The average annual household consumption increased with farm size, from 2520.40 kg for small farms to 3369.14 kg for large farms. Food consumption was highest among medium farm households (751.01 kg), while non-food items constituted the major share of total consumption (75.64%). Among millets, jowar consumption was higher than bajra across all farm-size groups, accounting for 3.00 per cent and 0.67 per cent of total consumption, respectively. Overall,

non-food items dominated household consumption, while millet consumption remained relatively low.

Composition of average annual household food consumption expenditure

The composition of average annual food and non-food consumption expenditure among small, medium and large farmers in Amravati district is presented in table 2.

Table 2: Composition of average annual household food consumption expenditure (Rs/ Household/ Annum)

Sr No.	Particulars	Small	Medium	Large	Overall
A	Food items				
1	Jowar	2675.80 (02.43)	4017.91 (03.18)	3028.13 (02.26)	9721.84 (02.62)
2	Bajra	418.86 (00.38)	608.09 (00.48)	430.13 (00.32)	1457.08 (00.39)
3	Fruits	6761.85 (06.15)	7415.65 (05.86)	7775.00 (05.81)	21952.50 (05.93)
4	Vegetables	5063.09 (04.61)	5737.04 (04.54)	6197.50 (04.63)	16997.63 (04.60)
5	Edible oil	16140.25 (14.68)	15969.57 (12.62)	14235.00 (10.63)	46344.82 (12.51)
6	Milk & its products	7415.06 (06.75)	7774.78 (06.15)	8763.75 (06.54)	23953.59 (06.47)
7	Spices	5317.28 (04.84)	5785.22 (04.57)	7418.75 (05.54)	18521.25 (05.00)
8	Sugar	4368.64 (03.97)	4915.65 (03.89)	5100.00 (03.81)	14384.29 (03.89)

9	Dry fruits	2472.72 (02.25)	2914.78 (02.30)	2509.38 (01.87)	7896.88 (02.13)
	Sub-total	50633.56 (46.06)	55138.70 (43.59)	55457.63 (41.41)	161229.89 (43.54)
B	Non-food items				
1	Fuel	12924.35 (11.76)	17260.87 (13.65)	19875 (14.84)	50060.22 (13.52)
2	Electricity	16996.54 (15.46)	19252.17 (15.22)	24000.00 (17.92)	60248.71 (16.27)
3	Entertainment	10837.04 (09.86)	12991.30 (10.27)	13050.00 (09.75)	36878.34 (09.96)
4	Clothing	13945.68 (12.69)	17095.65 (13.51)	16575.00 (12.38)	47616.33 (12.85)
5	footwear	4591.36 (04.18)	4760.87 (03.76)	4950.00 (03.70)	14302.23 (03.86)
	Sub-total	59294.96 (53.94)	71360.87 (56.41)	78450.00 (58.59)	209105.83 (56.46)
	Total (A+B)	109928.52 (100.00)	126499.57 (100.00)	133907.63 (100.00)	370335.72 (100.00)

(Figures in parenthesis indicate the percentages to total)

The average annual household expenditure increased with farm size, from ₹1,09,928.52 for small farm households to ₹1,33,907.63 for large farm households. Food expenditure was highest among large farm households (₹55,457.63), while non-food items accounted for the major share of total expenditure (56.46%). Among food items, edible oil recorded the highest expenditure, followed by milk and milk products and fruits. Jowar expenditure was higher than bajra across all farm-size groups, accounting for 2.62 per cent and 0.39 per cent of total household expenditure, respectively. Overall, non-food items dominated household expenditure, and total expenditure increased progressively with farm size.

Factors influencing consumption of millets

Food consumption patterns were influenced by various socio-economic and demographic factors such as age, education, family size, occupation and household income. These factors affected the quantity, quality, variety and expenditure on food. Therefore, an attempt was made to identify and analyse the major factors influencing the food consumption pattern of the selected households.

Factors influencing food consumption pattern of millets (Quantity wise)

The factors influencing food consumption pattern of millets (Quantity wise) is presented in table 3.

Table 3: Factors influencing food consumption pattern of millets (Quantity wise)

Particulars	Coefficient	Standard Error	t- value
Constant	123.72	44.17	2.80
Age (X ₁)	-0.01	0.611	-0.01
Education (X ₂)	-3.90**	1.63	-2.39
Family size (X ₃)	2.17	2.59	0.83
Income (X ₄)	5.40	6.06	0.89
R ²	0.09		
F value	2.78		

Note: ** is Significant at 5% level

The regression analysis showed that education was the only factor significantly influencing the quantity of millet consumption, with a negative coefficient of -3.90, significant at the 5 per cent level. Age (-0.01), family size (2.17) and income (5.40) had non-significant effects, indicating that these variables did not have a meaningful

influence on millet consumption. The R² value of 0.09 indicated that the selected variables explained 9 per cent of the variation in millet consumption. The F-value of 2.78 indicated that the model had overall explanatory power. Overall, education emerged as the major significant determinant of quantity-wise millet consumption among the selected respondents.

Factors influencing food consumption pattern of millets (Expenditure wise)

The factors influencing food consumption pattern of millets (Expenditure wise) is presented in table 4.

Table 4: Factors influencing food consumption pattern of millets (Expenditure wise)

Particulars	Coefficient (β)	Standard Error	t- value
Constant	3740.76	1596.08	2.34
Age (X ₁)	-3.70	22.07	-0.17
Education (X ₂)	-114.49*	58.91	-1.94
Family size (X ₃)	154.79	93.86	1.65
Income (X ₄)	183.91	219.13	0.84
R ²	0.09		
F value	2.94		

Note: * are Significant at 10% level

The regression analysis indicated that education was the only significant factor influencing expenditure on millet consumption, with a negative coefficient of -114.49, significant at the 10 per cent level. Age (-3.70), family size (154.79) and income (183.91) had positive or negative but statistically non-significant effects. The R² value of 0.09 indicated that the selected variables explained 9 per cent of the variation in millet consumption expenditure. The F-value of 2.94 indicated the overall explanatory power of the model. Overall, education emerged as the only significant determinant of expenditure-wise millet consumption among the selected respondents.

Constraints in consumption of millets

Food consumption patterns are influenced by economic, social and market-related factors such as taste preferences, limited availability, health concerns, dependence on conventional cereals, lack of culinary knowledge and high prices. Identifying these constraints is important for understanding household food behaviour and developing

suitable strategies to promote millet consumption, dietary diversity and nutritional well-being.

The Garrett ranking analysis was undertaken to identify and prioritize the major constraints influencing the food consumption pattern of millets among households and presented in table 5.

Table 5: Constraints in consumption of millets

Sr. No.	Constraints	Garrett score	Rank
1	Taste	56.47	II
2	Lack of availability	39.01	VI
3	Health issue	49.96	IV
4	Habituated to other cereals	60.73	I
5	Limited knowledge regarding millet culinary preparation	52.46	III
6	High price	41.30	V

The Garrett ranking analysis revealed that habitual consumption of rice and wheat was the major constraint to millet consumption, with the highest Garrett score of 60.73, followed by taste (56.47) and limited knowledge of millet preparation (52.46). Health concerns (49.96) and high price (41.30) ranked fourth and fifth, respectively, while lack of availability (39.01) was the least important constraint. Overall, habitual food preferences, taste and limited culinary knowledge were the major barriers to millet consumption, indicating the need for nutrition awareness, recipe demonstrations and promotional programmes to encourage wider consumption of millets.

Conclusion

The study concluded that millet consumption among the selected households in Amravati district was relatively low, with non-food items accounting for the major share of household consumption and expenditure. Jowar was consumed and purchased in greater quantity than bajra across all farm-size groups, indicating its greater preference among the selected households. Total household consumption and expenditure increased with farm size, while food expenditure formed a comparatively smaller share than non-food expenditure. The regression analysis revealed that education was the only significant factor influencing both the quantity and expenditure on millet consumption, whereas age, family size and income were not statistically significant. The major constraints affecting millet consumption were habitual consumption of rice and wheat, taste preferences and limited knowledge of millet preparation, while lack of availability was the least important constraint. Overall, the findings indicated that millet consumption could be encouraged through nutrition awareness, promotion of millet-based recipes, culinary demonstrations and measures to improve consumer acceptance of millets.

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