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Consumption pattern of turmeric and turmeric based products among the respondents of Pusa block

Sumiran Pandey and Dr. Usha Singh

Abstract
Turmeric is one of the most commonly used spice in the Indian kitchen. Curcumin is the principal phytochemical present in turmeric which is responsible for its numerous therapeutic and medicinal benefits. Apart from curcumin, it also contains considerable amount of other phytochemicals like polyphenols, flavonoids and tannins. The present study was conducted to analyse the consumption pattern of turmeric and turmeric based products among the respondents of Pusa block to get an overview of how people make use of this star Indian spice in their daily lives. The survey results showed that the most common processing method used for processing turmeric was one and a half hour followed by one month drying in sun and manual polishing. The mean of total turmeric consumed per consumption unit per day was 3.25 gm and the mean of amount of curcumin consumed per day per consumption unit came out to be 0.13 grams. Consumption pattern of turmeric among people is such that, they use turmeric for various reasons like, for the sake of adding colour to their daily meals, as a matter of belief, for taste, wound treatment, for feeding cattle, for treating cold and cough etc.

Keywords: Curcumin, phytochemical, therapeutic, consumption

Introduction
Curcuma longa is a popular Indian medicinal plant of the family *Zingiberaceae*. The rhizomes of the plant are not only used in Indian curries but also has varied pharmacological and therapeutic uses. The presence of curcumin in turmeric accounts to its innumerable antibacterial, anti-inflammatory, anti-helminthic, anti-cancer, anti-pyretic, anti-viral properties. Therefore, it is often referred to as queen in Indian kitchen. The average Indian diet provides 2000-2500 mg turmeric per day that comprises 60-100 mg curcumin per day. However, according to World Health Organization, intake of 1.4 mg per pound (0-3 mg/kg body weight) has been considered acceptable (Amalraj *et al*. 2016) [1].
Since ages, turmeric has been used as a spice in many foods. Apart from enhancing the colour and taste of the food, it also increases the shelf life by preventing it from deterioration by inhibiting contamination by food borne pathogens. Studies have proved that meat, when treated with 1-2 percent curcumin rich turmeric oil was found to be safe from microbial contamination. (Javad *et al.* 2020) [2].
Maryam *et al.* (2019) [3], did a study to establish the relationship between the consumption of various spices including turmeric with the health and cause specific mortality of the people in Iran. The spice consumption was analysed through a structured questionnaire comparing the turmeric consumers to non-consumers. During the study period of 11 years, it was found that the turmeric consumption was found to significantly decrease the overall mortality risk along with cardiovascular mortality and cancer mortality to 95 percent.
Srivastava (2017) [4] studied the consumption of turmeric in India per consumption unit and found it to be 343 grams per annum. Turmeric consumption was found to be more in northern region than the southern region.
Vasanthi *et al.* (2015) [5] conducted a study to assess the consumption pattern of different Indian spices in 100 urban households of Hyderabad. With the help of a consumption questionnaire. The results of the survey showed that the most commonly consumed spice was turmeric and red chilli powder. Maximum amount of spice was used in preparing curry and rice.

Material and Methods
The survey has been carried out among 50 families of university campus and Harpur village for which a detailed questionnaire was developed.

The detailed information has been gathered from 30 families of university campus. For comparison, information has also been gathered from 20 farm families of Harpur village who were involved in turmeric cultivation. Male and female both were interviewed for gathering the information. General information of the respondents like age, occupation, family type and family size were gathered. Apart from this, details of production and processing of turmeric was collected from the respondents. Information was gathered regarding the land area for turmeric production, amount of produce and whether the produce is used for home consumption or is sold. They were also asked questions about various processes they followed while processing raw turmeric rhizomes. These included details such as the time for boiling, drying, polishing methods adopted etc. People were also asked about various uses of turmeric that they do be it for food purposes or for medicinal purposes. Also, they were asked about the reasons of adding turmeric to food. An analysis of curcumin consumption per day per consumption unit was also done from the information obtained about turmeric consumption.

Table 1. Information on production of turmeric

S.No	Particulars	Subjects (N=50)	
		Frequency	Percentage
1.	Production		
	Cultivator	31	62.00
	Non-cultivator	19	38.00
2.	Place of cultivation		
	Field	19	61.29
	Backyard	12	38.70
3.	Land area for turmeric production		
	Below 1000 Sq. ft	12	38.70
	Up to 5000 Sq. ft	2	06.45
	Up to 10,000 Sq. ft	6	19.00
	Above 10,000 Sq. ft	11	35.00
4.	Amount of produce		
	Up to 50 Kg	12	38.70
	60 Kg to 500 Kg	8	25.00
	Above 500 Kg	11	35.48
5.	Fate of Produce		
	Only Home Consumption	12	38.70
	Home consumption and sale	19	61.29

Table 2: Information about processing of turmeric

	Particulars	Subjects(N=31)	
		Frequency	Percentage
1.	Boiling		
	15-30 minutes	03	09.68
	1 hour	06	19.35
	1.5 hour	12	38.71
	2 hours	10	32.26
2.	Drying		
	15-20 days	06	19.35
	1 month	25	80.64
3.	Polishing		
	Manual	16	51.61
	Using machine	15	48.39

Table 3. Information about uses of turmeric

	Particulars	Subject (N=50)	
		Frequency	Percentage
1.	For treating wounds	12	24.00
2.	For cold and cough	10	20.00
3.	For feeding cattle	15	30.00
4.	Relieving menstrual cramps	05	10.00
5.	Treatment of skin disease	05	10.00
6.	As medicine	24	48.00
7.	Immunity booster	11	22.00

Table 4.Information about reasons of adding turmeric to food

	Particulars	Subject (N=50)	
		Frequency	Percentage
1.	For health purpose	25	50.00
2.	As a matter of belief	10	20.00
3.	For taste	08	16.00
4.	For colour	20	40.00

Table 5. Information on curcumin consumption

	Subjects	Turmeric consumption	Curcumin content
1.	n=22	less than 3 gm	0.1-0.12 gm
2.	n=19	4-5 gm	0.16-0.2 gm
3.	n=9	more than 5 gm	more than 0.2 gm

3. Results and Discussion

3.1. Production and Processing of turmeric

Information about production have been recorded and presented in Table 1. Of the total 50 respondents interviewed, 31 respondents (62 percent) cultivated turmeric and 19 (38 percent) did not cultivate turmeric. Among the 31 people who cultivate turmeric, 19 of them (61.29 percent) were large scale producers and 12 of them (38.70 percent) cultivate turmeric in backyard on a very small scale. About 38.70 percent of the respondents grew turmeric in an area of <1000 Sq. ft, 6.45 percent people cultivated on land area of up to 5000 Sq. ft, 19 percent cultivated on land area of up to 10,000 Sq. Ft and rest 35 percent cultivated on land area of above 10,000 Sq. ft. A small percentage of people cultivated turmeric on a large scale as the survey included respondents both from Pusa campus and Harpur village. Out of the total 31 respondents who were found turmeric cultivator majority of them grew turmeric on small piece of land. The amount of produce of 38.70 percent people was up to 50 kgs these people produced only for their home consumption. About 25 percent people produced up to 500 kg of turmeric. These people sell a small part of their produce. And 35 percent of the respondents produced above 500 kg of turmeric and sold a major portion of their produce. Information on processing (Table 2) revealed that, different people adopt different methods for curing rhizomes. For boiling raw turmeric rhizomes, among total 31 cultivators, 3 people (9.68 percent) boiled turmeric for 15-30 min, 6 people (19.35 percent) boiled it for 1 hour, 12 (38.71 percent) boiled it for 1.5 hour and the remaining 10 (32.26 percent) people boil turmeric for 2 hours. The drying time of turmeric rhizomes as told by the people depend upon the intensity of sunlight. Based on the responses obtained about drying time of the rhizomes, people were categorised into 2 categories viz, among total 31 cultivators, 6 people (19.35 percent) dry turmeric for 15-20 days and rest 25 respondents (80.64 percent) dry it for about one month. Method of polishing adopted varied from traditional method i.e., using hands or sack and modern mechanized methods

Among total 31 cultivators, 16 people (51.61 percent) polished cured rhizomes manually and rest 15 people (48.39 percent) polished it using machine.

As far as the purpose of using turmeric and reasons of adding turmeric to food is concerned as presented in Table 3 and Table 4, it was found that people use it for a variety of other uses like 22 percent use it as immunity booster, 10 percent for skin diseases, 10 percent for relieving menstrual cramps, 20 percent as cold cough medicine, 25 percent people use it for treating wounds and about 30 percent respondents also used turmeric for feeding their cattle. Reponses on reasons of adding turmeric to food shows that, 50 percent people used turmeric for colour, 20 percent used it for taste, 16 percent used it in food as a matter of belief and 42 percent people used turmeric for health purpose.

3.2. Curcumin consumption per day

According to the recommendation by WHO (Amalraj *et al.* 2016) [1], an intake of 0-3 mg per kg body weight is considered safe for consumption. Considering this, an average Indian man of 65 kg can consume about 195 mg of curcumin per day safely. The analysis of consumption of curcumin per day per consumption unit as presented in Table 5, was done by allotting the family members C.U according to the type of work viz. sedentary, moderate and heavy and then the average consumption pattern was analysed.

A total of 50 families were surveyed and the results were such that the mean of total turmeric consumed per consumption unit per day was 3.25 gm and the mean of amount of curcumin consumed per day per consumption unit came out to be 0.13 grams. The consumption level of turmeric and curcumin among different families has been illustrated in Fig 1 and Fig 2. This calculation was done on the basis of the fact that 5 grams of turmeric contains 200 mg of curcumin. So, by simple unitary method it was calculated that 1-gram turmeric contains 0.04 grams curcumin.

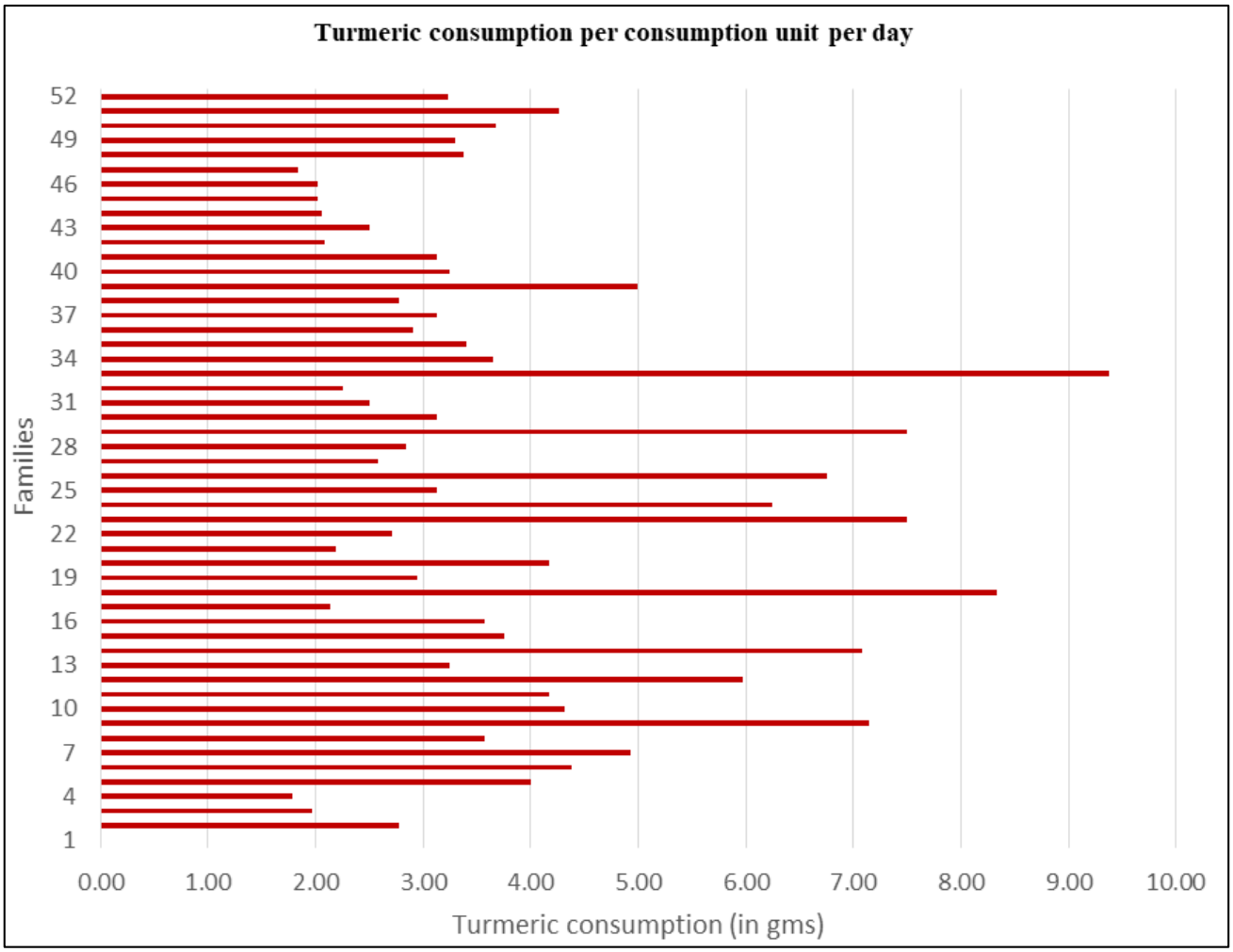

Fig 1: Turmeric consumption per consumption unit per day.

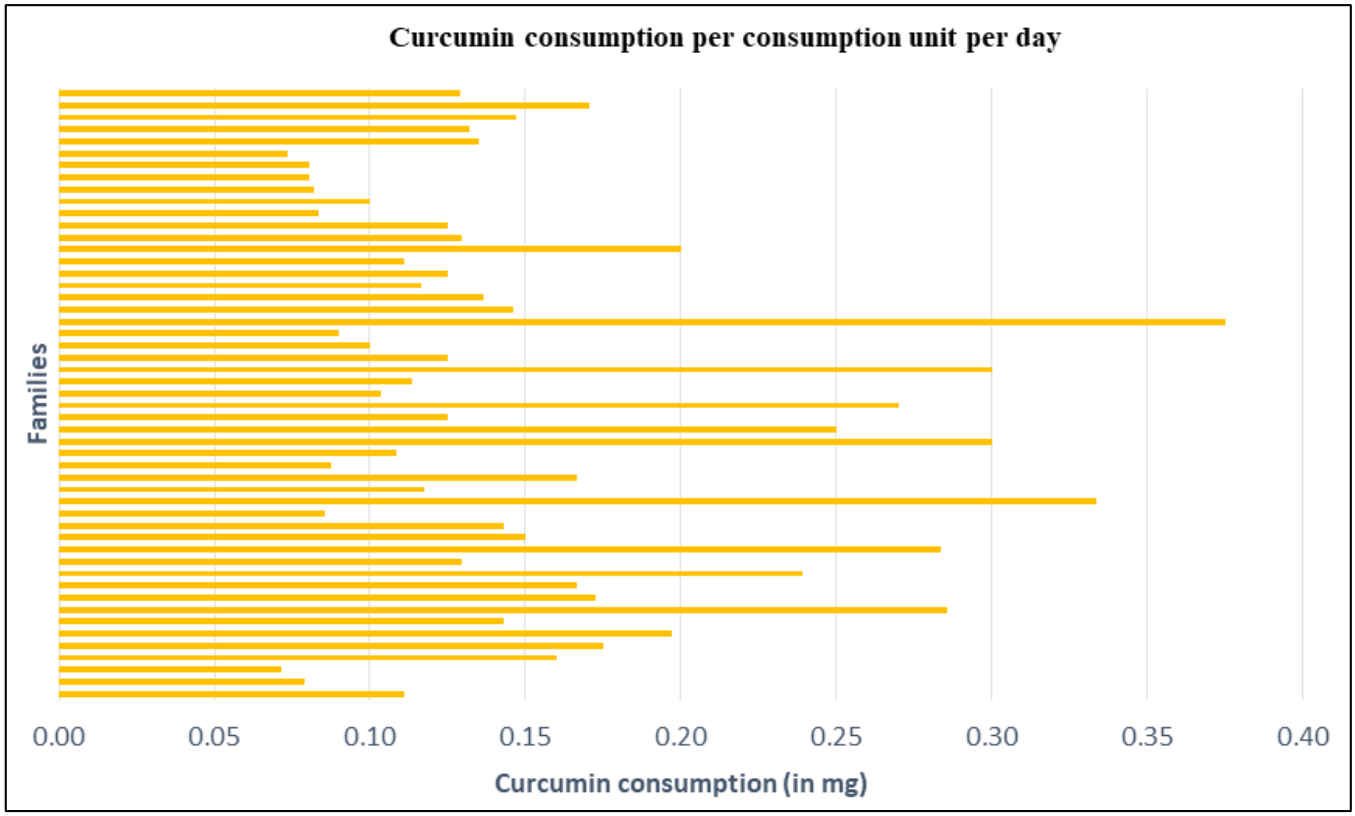

Fig 2: Curcumin consumption per consumption unit per day

4. Conclusion

From the present investigation it can be concluded that, of the total 50 families surveyed, 62% of the respondents were found to be cultivators majorly growing turmeric in their fields. 38.70% respondents had land area below 1000 Sq. ft producing below 50 Kgs of turmeric and 35% had land area above 10,000Sq. ft. producing above 500 kgs of turmeric. For the rest 25% respondents, the production varied between 60 Kg to 500 Kgs.

Colour, taste, health and belief were found to be the major reasons of adding turmeric to food. Other reasons for which turmeric was used were, wound treatment, for cold and cough, for feeding cattle, relieving menstrual pain, immunity booster and treating skin diseases.

Results on total curcumin consumption per day per consumption unit showed that, the mean of total turmeric consumed per consumption unit per day was 3.25 gm and the mean of amount of curcumin consumed per day per consumption unit came out to be 0.13 grams.

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