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## Availability patterns of nutrients obtained from food crops in rural areas of Jalgaon district

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### Abstract

Good health needs enough nutrients; these are the basic component of health. Availability of food and nutrition is more unevenly distributed in the world. In fact, there is significant nutritional gap between developed and developing nations. It is said that nutritional hazards can often be associated with cropping pattern, season or culture realm. Because of fast increasing population and frequent failure of crops due to natural calamities of floods and drought food security is the major concern of India. In the present research paper an attempt has been made to assess the nutrients availability obtained from seven major food crops grown in the study area. Secondary data of food crops has been collected of all the 15 tehsils of the Jalgaon district. The availability of various nutrients is compared with the standard requirement recommended by the ICMR. The study reveals that, availability of nutrients is deficit to the rural population of Jalgaon district.

**Keywords:** Nutrition, food crops, availability, requirement

### 1. Introduction

Nutrition involves the study of all processes of growth, maintenance and repair of living body which depend upon intake of food. It is very much related to prevailing landuse and cropping pattern. The widespread nutritional problem prevalent among poor socio-economic groups is largely attributable to economic factors. The status of nutrition in rural areas of Maharashtra is not satisfactory.

The situation in Jalgaon district is not different from the status as mentioned above. In view of above an attempt has been made to understand nutritional status available in the rural areas of Jalgaon district.

### 2. Objectives

There are some important objectives of the present study...

1. To assess the availability of nutrients from different food crops to rural population.
2. Compares the availability of nutrients to the standard requirement.
3. To study the spatial distributional pattern of nutrients in the study region.

### 3. The Study Area

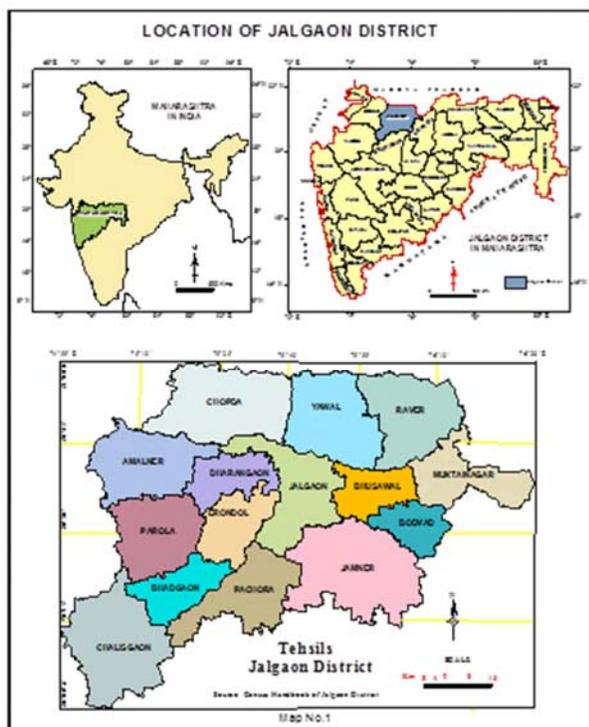
The Jalgaon district, lies between 20° N and 21° N. latitudes and 74° 55' E and 76° 28' E longitudes (Map No. 1). The total area of the district is 11765.00 sq. km. As per the census 2011, the total population of district is 42, 29,917 persons including 21, 97,365 males and 20, 32,552 females. The district comprises 15 tehsils. The Satpuda upland in the north and Ajanta hills and Chalisgaon plateau in the south has demarcated the study region. In between these physiographic units, valley basins and residual hills are significant. Piedmont plain stretches east-west direction developed along the banks of river Tapi and its major tributaries like Purna, Waghur, Girna, Bori, Panzra to the south and Gul, Mor, Aner etc. to the north or river Tapi.

### 4. Data Source and Methodology

The present study is based on secondary source of data. Taking district as a unit of study and tehsil has been selected as spatial unit of analysis. Secondary data regarding area under different food crops during the year 2012 has been collected from the respective tehsil

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offices. Per hectare production of these food crops have been collected from the Jalgaon district Statistical Abstract, 2012. On this basis estimated food productions has been calculated and divided by the total number of population in each tehsil. Secondly, per day availability of food production has been calculated to the total number of days in the year. The value per hundred grams of these available food items have been converted in the different nutrients with the help of table proposed by the National Institute of Nutrition and ICMR, Hyderabad (*Gopalan C. et. al. 1989*) [2]. Since the authentic data of meat, and milk products is not available only cereals, pulses and vegetables have been taken into consideration.



**5. Availability of Nutrients**

**5.1 Calories:** Calories are the fundamental requirement of the cell and therefore of the whole body. Without calories the functioning of the cells as well as the body as a whole would stop. Calories are needed to keep the body active. As per recommended dietary allowance standard requirement of calories are 2400 Kcal. per head per day. The average caloric availability calculated for the study region is 2327.51 Kcal per head per day which is 3.02 percent less than the standard requirement. The availability of calories ranges between 803 Kcal (lowest) in Bhadgaon tehsil and it is 4035 Kcal (highest) in Erondol tehsil. There are ten tehsils in the study region are deficit in the availability of calories. Surplus availability of calories is observed in including Erondol, Amalner (3904), Bodwad (3758) and Chalisgaon

(2880) tehsil. The highest availability of calories in these tehsils is due to the cultivation of different food crops. While deficiency in the availability of calories is observed in many tehsils it may be due to the more area under various cash crops like banana, cotton etc.

**5.2 Proteins:** Proteins are primarily structural and functional components of every living cell. Plant foods such as pulses and legumes are rich sources of proteins. The average per head per day availability of proteins in the rural population of the study region is 101.31 gm against 60 gm as standard requirement.

The availability of protein ranges between 26.21 gm in Bhadgaon tehsil (lowest) and 159.31 gm in Bodwad tehsil (highest). Except Bhadgaon all the tehsils in the study region have surplus availability of proteins. The study region as a whole is surplus in the protein availability. The surplus availability of protein indicates the intensive cultivation of various pulses in the study region.

**5.3 Fats:** The standard requirement of fats is 25 gm per head per day. The average availability of fats for the rural population of Jalgaon district is lower by 32.35 percent than the recommended. Out of 15 tehsils of the district 13 are deficit in the availability of fats. The maximum availability of fats is recorded in Erondol tehsil (32.91 gm), followed by Amalner (27.11) and Chalisgaon (22.64). The lowest availability is recorded in Bhadgaon tehsil (5.81 gm).

**5.4 Carbohydrates:** The average availability of carbohydrates in the rural population of the study region is 436.35 gm against the recommended 440 gm. The carbohydrates availability is less than the recommendation by 0.83 percent. The availability ranges from 751.76 gm (< 70.85%) highest in Erondol tehsil to the lowest 157.85 gm (> 64.13%) in Bhadgaon tehsil. Out of 15 tehsils 9 tehsils are deficit in terms of availability of carbohydrates. Low availability of carbohydrates in many tehsils of the district is because of less area under vegetables and roots.

**5.5 Calcium:** The dairy products are the most obvious source of calcium. Further, yoghurt and beverages with calcium added such as orange juice and rice beverages are also the source of calcium. The standard requirement of calcium per person per day is 400 mg.

In the study region per head per day availability of calcium from the food crops is only 103.90 mg against the standard requirement of 400 mg, which is less by 74.03 percent than the recommended. The availability of calcium ranges between 51.20 mg (< 87.20%) in Dharangaon tehsil (lowest) and 212.39 mg (< 46.90%) in Amalner tehsil (highest). All the fifteen tehsils of the district are deficit in the availability of calcium. As stated dairy products are the main sources of calcium.

**Table 1: Jalgaon District: Per Head per Day Availability and Percent Departure of Nutrients from Standard Requirement**

Sr. No.	Nutrients Tehsil	Calories	Proteins	Fats	Carbohydrates	Calcium	Iron	Thiamine	Riboflavin	Niacin
		(2400Kcl)	60 (gm)	25 (gm)	440 (gm)	400(gm)	20(mg)	1.2(mg)	1.3(mg)	16 (mg)
1	Chopda	2621.77	132.22	19.26	479.05	83.07	55.03	3.28	1.45	17.50
		9.24	120.36	-22.94	8.87	-79.23	175.16	173.45	11.32	9.37
2	Yawal	2142.89	104.23	14.60	396.42	84.41	46.02	2.64	1.24	15.40
		-10.71	73.72	-41.59	-9.91	-78.90	130.08	119.58	-4.62	-3.77
3	Raver	1454.81	58.16	8.77	281.87	106.56	33.88	1.74	0.93	12.59
		-39.38	-3.06	-64.90	-35.94	-73.36	69.39	45.36	-28.35	-21.33
4	Muktainager	2338.35	97.55	16.06	443.50	119.40	47.57	2.63	1.32	16.79
		-2.57	62.58	-35.78	0.79	-70.15	137.86	119.38	1.15	4.95
5	Bodvad	3757.87	159.31	23.56	711.88	178.07	75.54	4.11	2.16	28.20
		56.58	165.52	-5.78	61.79	-55.48	277.70	242.08	65.77	76.22
6	Bhusawal	1747.14	70.37	11.46	333.47	81.64	31.69	1.90	0.95	11.83
		-27.20	17.28	-54.18	-24.21	-79.59	58.46	57.92	-27.31	-26.05
7	Jalgaon	2004.98	113.38	14.76	354.57	36.73	45.83	2.70	1.14	13.56
		-16.46	88.96	-40.97	-19.42	-90.82	129.16	124.67	-12.00	-15.26
8	Erondol	4035.09	181.13	32.97	751.76	148.47	72.03	5.21	2.03	20.79
		68.13	201.88	31.88	70.85	-62.88	260.17	334.17	55.90	29.96
9	Dharangaon	1618.21	75.19	11.83	299.30	51.20	30.41	1.94	0.85	9.85
		-32.57	25.31	-52.70	-31.98	-87.20	52.04	61.46	-34.42	-38.47
10	Amalner	3904.40	159.15	27.11	740.99	212.39	83.53	4.13	2.22	29.74
		62.68	165.25	8.46	68.41	-46.90	317.65	244.33	70.92	85.88
11	Parola	1797.26	75.25	13.51	340.03	97.96	38.05	2.11	1.01	12.51
		-25.11	25.41	-45.96	-22.72	-75.51	90.23	75.83	-22.69	-21.81
12	Bhadgaon	803.00	26.21	5.81	157.85	51.36	13.62	0.81	0.41	5.12
		-66.54	-56.32	-76.77	-64.13	-87.16	-31.93	-32.50	-68.27	-68.02
13	Chalisgaon	2880.51	109.10	22.64	550.66	196.00	67.33	2.97	1.64	22.61
		20.02	81.84	-9.42	25.15	-51.00	236.66	147.33	26.23	41.30
14	Pachora	1712.42	56.60	15.06	321.05	55.10	25.34	2.11	0.76	6.77
		-28.65	-5.66	-39.76	-27.03	-86.23	26.72	76.17	-41.69	-57.68
15	Jamner	2094.00	101.83	16.30	382.86	56.09	39.66	2.64	1.08	11.82
		-12.75	69.72	-34.79	-12.99	-85.98	98.28	119.88	-17.03	-26.10
<b>Average</b>		2327.51	101.31	16.91	436.35	103.90	47.03	2.73	1.28	15.67
		-3.02	68.85	-32.35	-0.83	-74.03	135.17	127.27	-1.67	-2.05

Source: Compiled by author

**5.6 Iron:** Iron is needed for hemoglobin synthesis, mental function and body defence. Deficiency of iron leads to anemia. Iron deficiency is common particularly in women of reproductive age and in children. Plant foods like legumes and dried fruits contain iron. Iron is also obtained through meat, fish and poultry products. Daily allowance of iron per head per day is 20 mg as recommended by the national institution of nutrition. In the study region per head per day availability of iron is 47.03 mg against the standard requirement of 20 mg. The availability of iron is surplus by 27.03 mg (135.15%) than the recommended. The availability of iron ranges between 13.62 mg (<31.93%) in Bhadgaon tehsil (lowest) and 83.53 mg (>317.65%) in Amalner tehsil (highest). Except Bhadgaon tehsil remaining fourteen tehsils from the district have shown surplus availability of iron.

**5.7 Thiamine:** Thiamine, also called Vitamin B<sub>1</sub> is a water soluble alcohol. It is the substance that was first called vitamin. It occurs most abundantly in most of the cereals grains. It helps to convert carbohydrates into energy. As per recommended daily allowance 1.20 mg of thiamine is required per head per day. Per head per day availability of thiamine in the study region is 2.73 mg against 1.20 mg as standard requirement. The availability of thiamine ranges between 0.81 mg in Bhadgaon tehsil (lowest) and 5.21 mg in Erondol tehsil (highest). The study region as a whole is surplus in thiamine availability.

**5.8 Riboflavin:** Riboflavin is also called as Vitamin B<sub>2</sub>. It is a yellow nitrogenous alcohol abundantly found in egg and a variety of plants. Riboflavin is a part of enzyme systems that oxidize carbohydrates. A normal human being requires 1.30 mg of riboflavin per day to lead a healthy life. The study region as a whole is deficit in the availability riboflavin. In the region per head per day availability of riboflavin is 1.28 mg which is less by 0.02 mg (<1.67%) than the recommended. The availability of riboflavin ranges between 0.41 mg in Bhadgaon tehsil (lowest) and 2.22 mg (>70.92%) in Amalner tehsil (highest). It is observed that out of fifteen tehsils nine tehsils are deficit in terms of availability of riboflavin. Remaining six tehsils have shown sufficiency in respect of riboflavin availability.

**5.9 Niacin:** It is pellagra preventive vitamin. Pellagra is a disease which is common among the people whose staple food is corn. Niacin is widely distributed among plants and animals. A person requires 16 mg niacin each day to remain healthy and to be free from pellagra. The study region as a whole is little deficit in the availability of niacin. In the region per head per day availability of niacin is 15.67 mg which is less by 0.33 mg (<2.06%) than the recommended. The availability of niacin ranges between 5.12 mg in Bhadgaon tehsil (lowest) and 29.74 mg in Amalner tehsil (highest).

## 6. Conclusion

It is concluded that population of the study region is mainly depends on cereal based diet. Above discussion clears that spatial disparities are observed in the availability of nutrients among the tehsil. The overall production of food grains like cereals, millets, pulses etc. recorded a significant increase in the district. The production of cereals, millets and pulses appears to be adequate but the per capita availability of various foods stuffs comparable to RDA, the distribution of foods, both within the community and the family, may be unfavorable to some vulnerable groups due to low income and purchasing power. Out of nine nutrients calculated above six are deficit in the diet of the rural population of Jalgaon district. Protein, iron and thiamine are the three nutrients are found surplus availability in the district. The overall deficiency of other nutrients availability ranging between 0.83 percent to 74.03 percent for riboflavin and calcium respectively in the district.

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