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Block-Wise Comparison of Daily Per Capita Food Consumption Pattern of Antyodaya Beneficiaries of Sirmour District in Himachal Pradesh

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ABSTRACT: The present study is designed to understand the consumption pattern of Antyodaya beneficiaries of Public Distribution System (PDS) in Sirmour district. In the study, PDS system of the district has been evaluated based on the daily per capita food consumption. Out of six blocks of the district, four blocks *viz.*, Rajgarh, Paonta Sahib, Pachhad & Nahan has been selected for the study. The multistage random sampling technique was used for selecting the sample of 100 rural beneficiaries those who belongs to the category of Antyodaya Anna Yojana. The finding of the study revealed that daily per capita food consumption of most of the food stuff like pulses, edible oil, vegetables, fruits and meat was less than the required daily recommended dietary allowances in all selected blocks. Whereas, daily per capita consumption of rice/wheat flour, sugar, salt & milk was more than the required amount in Rajgarh, Paonta Sahib and Pachhad blocks. While in Nahan block, milk consumption was less than the required amount. The major challenge of the study was to identify the needy people under the respective category of the PDS. The study also found that beneficiaries were not having the sufficient amount of food. Therefore, the study suggested that the government should increase the entitled quantity of the essential commodities and more employment opportunities should be generated for the particular category to improve the daily per capita food consumption, nutritional value, healthy life and standard of living of the beneficiaries.

Keywords: Public distribution system, beneficiaries, antyodaya, per capita food consumption.

INTRODUCTION

Since India's independence ensuring nutrition and food security has been the main agenda of the government for the development of the country (Srivastava and Chand 2017). The top priority of the government of India has been to keep the people safe with food & nutrition. To fulfil this objective, govt. launched public distribution system (PDS). Under this scheme, the govt. has made subsidized food available to the poor, controlled the prices of essential food commodities and tried to raise the production of food grains (Meenakshi and Vishwanathan 2003; Deaton and Dreze 2009; Patnaik, 2010; Basu and Basole 2012; Chand and Jumrani 2013). Food security at global, national and regional level is evaluated using per capita daily calorie intake (Kolady et al., 2021). Food consumption pattern of the people depends on their economic, cultural, social and educational status (Desbouys et al., 2014). PDS is the largest anti-poverty programme of the government of India (Kochar, 2005). The large number of poor don't have PDS access due to lack of awareness by the clients and corruption (Balkrishnan and

Ramaswami 1997). As corruption leads to failure of any social scheme of the government (Khadim et al., 2021). The government increased the purchase of total food grains from 1.4 per cent in 1963 to 11 per cent in 1983 (Radhakrishna, 1996). The highest wheat procurements were done from Punjab, Haryana and Uttar Pradesh (George, 1984). PDS contribute to India as 15 per cent of total availability of India's wheat and rice (Dutta and Ramaswami 2001). During 2004-2012, per capita food production grew at an annually 2.79 per cent and poverty line also declined to 21.9 per cent. However, over time there has been a rapid rate of growth in per capita income & food production and a rapid decline in poverty, but it could not root out malnutrition and food insecurity from the country (Chand and Jumrani 2013). In 2015, 58.57 per cent of children under who had 5 year of age suffered from anaemia and 38.4 per cent did not develop fully. Further, India's position in Global Hunger Index (GHI) is very bad (Bartell et al., 2020). Eighty crore of the world's population still consume less food than is required amount (Schofield, 2014). Most of the Indians

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consuming insufficient amount of vegetables, fruits and protein. Whereas, the amount of grains (Wheat & rice) consumer surplus (Sharma et al., 2020). As per Indian dietary guideline the consumption of sugar should not exceed 10 per cent of the total daily food intake. Sugar consumption in India is continuously increasing (Gulati and Misra 2014). Food also affects the daily routine, weight, mental wellbeing, physical condition and physical activities of human beings (Raynor et al., 2015; Rusu et al., 2020). The Knowledge of recommended consumption of daily calorie food selection can help the consumer make better choice about food (Crory et al., 2016). Adequate amount of food is required to lead a healthy & active life. According to Indian council of Medical research, the intake of 2100 calories per person per day in urban area people and 2400 calories for the people of rural area is necessary for an active and healthy life (Chand, 2014). Increase in per capita food consumption and poverty eradication is possible through many efforts such as increasing food production & its availability and increasing consumer income (Arifullah et al., 2008). The present study focused to know the status of PDS food contribution in daily per capita food consumption among four blocks (Rajgarh, Paonta Sahib, Pachhad & Nahan) beneficiaries of Antyodaya Anna Yojana in the study area. The study on the daily per capita food consumption pattern of Antyodaya Anna Yojana at block level of Sirmour district was lacking in the study area. Therefore, the study has been conducted to know the daily food intake status of Antyodaya beneficiaries and to suggest appropriate policy measures

METHODOLOGY

Both primary and secondary data used to support the current study. To accomplish the predetermined objective of the PDS, a multi-stage random technique has been used. The Sirmour district is a part of Southern Himachal Pradesh, where the initial survey was carried out. Out of 6 blocks, 4 blocks (Rajgarh, Paonta Sahib, Pachhad & Nahan) were randomly selected, and further five Fair Price Shops (FPSs) were randomly selected from each selected block. Finally, the selection of 5 Antyodaya Anna Yojana beneficiaries were randomly selected from each selected FPSs of the selected block's through equal allocation method. Thus, a total of 100 rural Antyodaya beneficiaries were selected for the study.

Secondary data were collected from the manual of Dietary guidelines for Indians. Data were presented through tabular & line graph and analyzed by percentage change. The daily per capita of food consumption of beneficiary and percent change of total intake of food over recommended dietary allowance has been calculated with the following formulae: Daily per capita food consumption = $\frac{\text{Total daily food cosumption}}{\text{Total population}}$

Percent change of total intake of food over recommended dietary allowance

= Total intake of food - Recommended dietary allowances × 100 Recommended dietary allowances

Daily per capita calorie intake = $\frac{\text{Total calorie}}{\text{Total population}}$

RESULTS AND DISCUSSION

The daily per capita food consumption pattern of beneficiaries of Rajgarh block (Table 1 & Fig. 1) indicates that the daily intake of rice & wheat flour (381.68 gm) of AAY is higher than (+18.17%) of the Recommended Dietary Allowances (RDA) because it is most essential food items. The share of rice/ wheat flour distribution was found large as compare to other food items provided through PDS. The average consumption of pulses which are important source of protein was less than (-38.59%) of the RDA. The consumption of sugar was more than (+35.37%) of the RDA. Whereas, salt intake was more than (+138.10) of the RDA as sodium plays a vital role in nerve conduction and fluid balance in the body. The intake of visible fat (edible oil) was inadequate (-10.81%) of the RDA and it provides, energy, essential fatty acids, induce satiety and promote absorption of fat-soluble vitamins. While milk intake was more than (+41.03%) of the RDA which provides calcium & protein. The consumption of vegetables was less than (-75.58%) of the RDA, which are rich source of antioxidants, fibre, micronutrients and carotenoids. Similarly, fruits intake was lower than (-98.90%) its required quantity. The average consumption of meat was also inadequate (-97.36%) as per recommended requirement because it is required for protein and fat. According to the required RDA of ICMR the actual daily per person food consumption of beneficiaries of Rajgarh block (Pulses, edible oil, vegetables, fruits and meat) was inadequate. The dietary gap arises due to low income and low purchasing power. Table also indicates that daily per capita calorie intake of Rajgarh block beneficiaries was 2253 calorie. According to ICMR, the daily per capita rural calorie intake of beneficiaries should not below than 2400 calories. It means that health status of beneficiaries of this block is poor in the study area. Intake of calories less than the RDA which is 2400 calories a day will lead to starvation & malnutrition. Similar results were observed in the study under taken by Deaton and Dreze (2009); Anonymous (2011); Gulati and Mishra (2014); Sharma et al. (2020); Kolady et al. (2021). The result shows that sampled beneficiaries of the study were not consuming adequate quantity of food.

| Particulars | From PDS | From market | Total intake of food | RDA | % change of total intake of food over RDA |
|---|----------|-------------|-------------------------|-----|---|
| Rice/ Wheat flour | 309.52 | 72.16 | 381.68 | 323 | +18.17 |
| Pulses | 27.47 | 14.29 | 41.76 | 68 | -38.59 |
| Sugar | 16.30 | 14.84 | 31.14 | 23 | +35.37 |
| Salt | 9.16 | 0.37 | 9.53 | 04 | +138.10 |
| Edible oil | 16.85 | 3.66 | 20.51 | 23 | -10.81 |
| Milk | - | 423.08 | 423.08 | 300 | +41.03 |
| Vegetables | - | 73.26 | 73.26 | 300 | -75.58 |
| Fruits | - | 1.10 | 1.10 | 100 | -98.90 |
| Eggs/Meat | - | 0.79 | 0.79 | 30 | -97.36 |
| Daily per capita calorie intake (Kilocalories) | 2253.00 | | | | |
| As per ICMR(Kilocalories) | 2400.00 | | | | |

Table 1: Daily per capita food consumption pattern of beneficiaries of Rajgarh block (Per person/gm/day).

Source: Field survey, 2021 and Manual of Dietary Guidelines for Indians, Hyderabad. **Note:** RDA-Recommended Dietary Allowances and ICMR-Indian Council of Medical Research



Fig. 1. Daily per capita food consumption pattern of beneficiaries of Rajgarh block.

The daily per capita food consumption pattern of beneficiaries of Paonta Sahib block (Table 2 & Fig. 2) shows that the daily intake of rice & wheat flour (378.62 gm) is higher than (+17.22%) of the Recommended Dietary Allowances (RDA) because it is most essential food items. The share of rice/ wheat flour distribution was found large as compare to other food items supplied through PDS. The average consumption of pulses which are important source of protein was less than (-41.57%) of the RDA. The consumption of sugar was more than (+47.12%) of the RDA. Whereas, the salt intake was more than (+144.11) of the RDA as sodium plays a vital role in nerve conduction and fluid balance in the body. Intake of visible fat (edible oil) was inadequate (-4.85%) of the RDA and it provides, energy, essential fatty acids, induce satiety and promote absorption of fat-soluble vitamins. While milk intake was more than (+41.03%) of the RDA which provides calcium & protein. The consumption of vegetables was less than (-75.58%) of the RDA, which are rich source of antioxidants, fibre, micronutrients and carotenoids. Likewise, fruits intake was lower than (-98.90%) its required quantity. The average consumption of meat was also inadequate (-93.40%) as per recommended requirement because it is required for protein and fat. According to the required RDA of ICMR the actual daily per person food consumption of beneficiaries of Paonta Sahib block beneficiaries (Pulses, edible oil, vegetables, fruits and meat) was inadequate. The dietary gap arises due to low income and low purchasing power. Table also indicates that daily per capita calorie intake of Paonta Sahib block beneficiaries was 2079.71 calorie. According to ICMR, the daily per capita rural calorie intake of beneficiaries should not below than 2400 calories. It means that health status of beneficiaries of this block is poor in the study area. Intake of calories less than the RDA which is 2400 calories a day will lead to starvation & malnutrition. The results were consonance with the findings of Deaton and Dreze (2009); Anonymous (2011); Gulati and Mishra (2014); Sharma et al. (2020); Kolady et al. (2021). The result shows that sampled beneficiaries of the study were not consuming adequate quantity of food.

| Table 2: Daily per capita food consumption pattern of beneficiaries of Paonta Sahib block (Per |
|--|
| person/gm/day). |

| Particulars | From PDS | From market | Total intake of food | RDA | % change of total intake of food over RDA |
|---|----------|-------------|-------------------------|-----|---|
| Rice/ Wheat flour | 284.51 | 94.11 | 378.62 | 323 | +17.22 |
| Pulses | 25.25 | 14.48 | 39.73 | 68 | -41.57 |
| Sugar | 16.50 | 17.34 | 33.84 | 23 | +47.12 |
| Salt | 8.42 | 1.35 | 9.77 | 04 | +144.11 |
| Edible oil | 15.49 | 6.40 | 21.89 | 23 | -4.85 |
| Milk | - | 423.08 | 423.08 | 300 | +41.03 |
| Vegetables | - | 73.26 | 73.26 | 300 | -75.58 |
| Fruits | - | 1.10 | 1.10 | 100 | -98.90 |
| Eggs/Meat | - | 1.98 | 1.98 | 30 | -93.40 |
| Daily per capita calorie intake (Kilocalories) | 2079.71 | | | | |
| As per ICMR (Kilocalories) | 2400.00 | | | | |

Source: Field survey, 2021and Manual of Dietary Guidelines for Indians, Hyderabad.

Note: RDA-Recommended Dietary Allowances and ICMR-Indian Council of Medical Research



Fig. 2. Daily per capita food consumption pattern of beneficiaries of Paonta Sahib block.

The Table 3 & Fig. 3 shows the daily per capita food consumption pattern of beneficiaries of Pachhad block indicates that the daily intake of rice & wheat flour (364.28 gm) of AAY is higher than (+12.78%) of the Recommended Dietary Allowances (RDA) because it is most essential food items. The share of rice/ wheat flour distribution was found large as compare to other food items provided through PDS. The average consumption of pulses which are important source of protein was less than (-40.48%) of the RDA. The consumption of sugar was more than (+36.05%) of the RDA. Whereas, salt intake was more than (+138.10%) of the RDA as sodium plays a vital role in nerve conduction and fluid balance in the body. Intake of visible fat (edible oil) was inadequate (-2.40%) of the RDA and it provides, energy, essential fatty acids, induce satiety and promote absorption of fat-soluble vitamins. While, milk intake was more than (+10.45%) of the RDA which provides calcium & protein. The consumption of vegetables was less than (-70.52%) of the RDA, which are rich source of antioxidants, fibre, micronutrients and carotenoids. Similarly, fruits intake was lower than (-94.90%) its

required quantity. The average consumption of meat was also inadequate (-87.80%) as per recommended requirement because it is required for protein and fat. According to the required RDA of ICMR the actual daily per person food consumption of beneficiaries of Pachhad block (Pulses, edible oil, vegetables, fruits and meat) was inadequate. The dietary gap arises due to low income and low purchasing power. Table also indicates that daily per capita calorie intake of Pachhad block beneficiaries was 1995.38 calorie. According to ICMR, the daily per capita rural calorie intake of beneficiaries should not below than 2400 calories. It shows that health status of beneficiaries of this block is poor in the study area. Intake of calories less than the RDA which is 2400 calories a day will lead to starvation & malnutrition. Similar results were observed in the study under taken by Deaton and Dreze (2009); Anonymous (2011); Gulati and Mishra (2014); Sharma et al. (2020); Kolady et al. (2021). The result shows that sampled beneficiaries of the study were not consuming adequate quantity of food.

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| Particulars | From PDS | From market | Total intake of food | RDA | % change of total intake of food over RDA |
|---|----------|-------------|-------------------------|-----|---|
| Rice/ Wheat flour | 287.41 | 76.87 | 364.28 | 323 | +12.78 |
| Pulses | 25.51 | 14.97 | 40.48 | 68 | -40.48 |
| Sugar | 16.50 | 14.80 | 31.30 | 23 | +36.05 |
| Salt | 8.50 | 1.02 | 9.52 | 04 | +138.10 |
| Edible oil | 15.99 | 6.46 | 22.45 | 23 | -2.40 |
| Milk | - | 331.63 | 331.63 | 300 | +10.54 |
| Vegetables | - | 88.44 | 88.44 | 300 | -70.52 |
| Fruits | - | 5.10 | 5.10 | 100 | -94.90 |
| Eggs/Meat | - | 3.66 | 3.66 | 30 | -87.80 |
| Daily per capita calorie intake (Kilocalories) | 1995.38 | | | | |
| As per ICMR (Kilocalories) | 2400.00 | | | | |

Table 3: Daily per capita food consumption pattern of beneficiaries of Pachhad block (Per person/gm/day).

Source: Field survey, 2021 and Manual of Dietary Guidelines for Indians, Hyderabad.





Fig. 3. Daily per capita food consumption pattern of beneficiaries of Pachhad block.

The daily per capita food consumption pattern of beneficiaries of Pachhad block (Table 4 & Fig. 4) shows that the daily intake of rice & wheat flour (347.71gm) of AAY is higher than (+7.65%) of the Recommended Dietary Allowances (RDA) because it is most essential food items. The share of rice/ wheat flour distribution was found large as compare to other food items supplied through PDS. The average consumption of pulses which are important source of protein was less than (-51.46%) of the RDA. Consumption of sugar was more than (+25.05%) of the RDA. Salt intake was more than (+136.93%) of the RDA. The sodium plays a vital role in nerve conduction and fluid balance in the body. Intake of visible fat (edible oil) was inadequate (-13.33 %) of the RDA and it provides, energy, essential fatty acids, induce satiety and promote absorption of fat-soluble vitamins. Milk intake was less than (-15.03%) of the RDA which provides calcium & protein. Consumption of vegetables was less than (-80.83%) of the RDA, which are rich source of antioxidants, fibre, micronutrients and carotenoids. Fruits intake was lower than (-99.02%) its required quantity. The average consumption of meat was also inadequate (-89.37%) as per recommended requirement because it is required for protein and fat. According to the required Recommended Dietary Allowances of ICMR the actual daily per person food consumption of beneficiaries of Nahan block (Pulses, edible oil, milk, vegetables, fruits and meat) was inadequate. The dietary gap arises due to low income and low purchasing power. Table also indicates that daily per capita calorie intake of Nahan block beneficiaries was 1742.73 calorie. According to ICMR, the daily per capita rural calorie intake of beneficiaries should not below than 2400 calories. It shows that health status of beneficiaries of this block is poor in the study area. Intake of calories less than the RDA which is 2400 calories a day will lead to starvation & malnutrition. The similar trends were shown by the study of Deaton and Dreze (2009); Anonymous (2011); Gulati and Mishra (2014); Sharma et al. (2020); Kolady et al. (2021). The result shows that sampled beneficiaries of the study were not consuming adequate quantity of food.

| Particulars | From PDS | From market | Total intake of food | RDA | % change of total intake of food over RDA |
|---|----------|-------------|-------------------------|-----|---|
| Rice/ Wheat flour | 276.14 | 71.57 | 347.71 | 323 | +7.65 |
| Pulses | 24.51 | 8.50 | 33.01 | 68 | -51.46 |
| Sugar | 16.67 | 12.09 | 28.76 | 23 | +25.05 |
| Salt | 8.17 | 1.31 | 9.48 | 04 | +136.93 |
| Edible oil | 15.36 | 4.58 | 19.93 | 23 | -13.33 |
| Milk | - | 254.90 | 254.90 | 300 | -15.03 |
| Vegetables | - | 57.52 | 57.52 | 300 | -80.83 |
| Fruits | - | 0.98 | 0.98 | 100 | -99.02 |
| Eggs/Meat | - | 3.19 | 3.19 | 30 | -89.37 |
| Daily per capita calorie intake (Kilocalories) | 1742.73 | | | | |
| As per ICMR (Kilocalories) | 2400 | | | | |

Table 4: Daily per capita food consumption pattern of beneficiaries of Nahan block (Per person/gm/day).

Source: Field survey, 2021 and Manual of Dietary Guidelines for Indians, Hyderabad.

Note: RDA-Recommended Dietary Allowances and ICMR-Indian Council of Medical Research



Fig. 4. Daily per capita food consumption pattern of beneficiaries of Nahan block.

CONCLUSIONS

The daily per capita food consumption of most of the food stuff like pulses, edible oil, vegetables, fruits and meat were less than daily recommended dietary allowances required except rice/ wheat flour/ sugar, salt & milk of Rajgarh, Paonta Sahib and Pachhad blocks beneficiaries. Because rice/ wheat flour was the most necessary & demanded food items and share of its distribution was also more as compare to other food items through PDS. Whereas, in case of Nahan block milk consumption was also less than daily recommended dietary allowances required. Due to the low purchasing power & low income Rajgarh, Paonta Sahib, Pachhad and Nahan blocks beneficiaries were not consuming adequate quantity of food. Daily per capita calorie intake of beneficiaries of all the four blocks was less the than required calories. This indicates that economic status of all four blocks beneficiaries was very poor in the study area. To enhance daily per capita food consumption, nutritional value, healthy life, daily per capita consumption expenditure and standard of living of the beneficiaries

government should provide more employment opportunities and the entitled PDS ration quantity for the inadequate food items should be increased.

FUTURE SCOPE

In this study only rural beneficiaries were covered and result could not be generalized. The result could not be generalized for two reasons. The first one was that out of total 6 blocks only 4 blocks were selected for the study and the second was that the sample size was only 100 beneficiaries. Therefore, all the blocks should be covered and sample size should be increased for better results.

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Conflict of Interest. None.

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