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## Original Research Article

## Diversity in food consumption: Evidences from urban Kerala

P. K. Rethesh<sup>1</sup>, R. Santhosh<sup>2</sup>, N Karunakaran<sup>3,\*</sup><sup>1</sup>Dept. of Economics, EK Nayanar Memorial Government College, Nileshwar, Kerala, India<sup>2</sup>Dept. of Economics, University College, Thiruvananthapuram, Kerala, India<sup>3</sup>Dept. of Economics, People Institute of Management Studies, Munnad, Kasaragod, Kerala, India

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## ABSTRACT

Food is fundamental to human survival and it appears to be the first item of the family budget allocation of all irrespective of class to which they belong. Kerala ranks top among the major States of India in the MPCE on food in the post liberalized era. A perusal of NSS data exhibits that, MPCE of urban Kerala is ahead of the rural for the last few decades, however, a sharp decline is noted in the last decade (2001-2011). Along with an increase in MPCE on food, an increase in food diversity is being expected. The study probe into the extent of food diversity among different income strata of urban Kerala with the unit-level data from NSS 68<sup>th</sup> consumer expenditure survey. The findings indicate that the share of expenditure on cereal in total food expenditure is high in the low-income class and low in the high-income group. The state of Kerala has high food diversity across all income classes signals a better diet quality of people. It is revealed that food diversity is low in the high and low-income groups compared to middle-income group.

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## 1. Introduction

Food is the main item of the family budget across all income strata, especially for the poor. It is very basic to the physiological and emotional wellbeing of all, irrespective of the classes to which it belongs. Yet, there exists a wide disparity in the expenditure on food and quantity consumed among different rural and urban income strata, especially in less developed economies. Diet pattern across the world shows that as income increases people tend to maximize their intake of nutrients by spending more on easily available staples (Banerjee and Duflo, 2011).<sup>1</sup> As people get richer, they diversify their diet after a baseline expenditure on cereals (Santhosh, 2019).<sup>2</sup> To have diverse types of food is an internationally recommended protocol for a healthy diet. Food diversity refers to an increase in the variety of foods across and within food groups

(WHO/FAO, 1996) capable of ensuring adequate intake of essential nutrients that can promote good health (Ruel, 2002).<sup>3</sup> Since no single food can contain all nutrients, Labadarios, et al. (2011) noted that the more food groups included in daily diet the greater the likelihood of meeting nutrient requirements. With that background, Kennedy, et al.<sup>4</sup> (2009) argued that a sufficiently diverse diet may reflect nutrient adequacy. Moreover, food diversity can be viewed as a proxy measure of food security (Hoddinott, 2002).<sup>5</sup>

A society's food consumption pattern, in general, is shaped and reshaped by a complex set of socio-economic, demographic, physiological, psychological and environmental factors with inbuilt spatial and interpersonal variations (Morrison, et al, 2011; Karunakaran. N, 2013<sup>6</sup> and Karunakaran. N, 2014).<sup>7</sup> However, among them, lifestyle changes driven by urbanization and augmented disposable income have been identified as the two key factors contributing immensely to a change in diet pattern

\* Corresponding author.

E-mail address: [narankaran@gmail.com](mailto:narankaran@gmail.com) (N. Karunakaran).

across the world (Kennedy, et al.,<sup>6</sup> 2004). Kerala, one of the leading states in Monthly Per capita Consumption Expenditure (MPCE) has registered impressive growth in the MPCE on food and non-food items both absolute and real terms during the post liberalized regime<sup>4</sup> (Baiju, 2002, Santhosh, 2013).<sup>8</sup> Kerala also exhibits an increasing trend of MPCE of urban over rural for 40 (1961-2012) years however a sharp decline is noted in the last decade (2001-2011).<sup>9</sup> Along with an increase in MPCE on food an increase in food diversity is being expected in the state. India has experienced both incomes induced diet diversification and diet globalization on account of economic growth, urbanization and globalization (Pingali, 2012). It is evident from the declining share of cereal consumption across income strata in India over the years. The triple burden of malnutrition remains a significant concern with the high prevalence of undernutrition, widespread micronutrient deficiencies, and rising obesity despite this dietary transition (Santhosh, 2013).<sup>10</sup> At the same time, Kerala has witnessed a drastic reduction in the consumption of cereals which has its bearing on the food diversity of Keralites. An observation of NSS data on urban food consumption patterns shows that expenditure on food is increasing in real terms whereas the rate of growth in calorie intake not incommensurate with the rate of growth of expenditure. In this context, this paper attempts to understand the dietary habits of Keralites across different income strata in urban areas of Kerala based on NSS 68<sup>th</sup> round of consumer expenditure surveys.

## 2. Materials and Methods

The study is based on secondary data. The vital data source is the unit level NSS 68<sup>th</sup> round of consumer expenditure survey. The survey covers expenditure on food and non-food items incurred by the households. The technique of Fractile group analysis is used for the in-depth analysis of food consumption patterns across different income strata. F1 is called bottom fractile (Lowest 5 percent of the population) and F12 (the top 5 percent of the population) is termed top fractile. Food diversity is the average number of food items consumed by a household out of the total number of food items in a reference period of one month. The unit level data for the construction of food diversity indices is used. Food diversity is estimated by using (i) Herfindahl-Index, (ii) Simpson Index and (iii) Entropic Index.

- Herfindahl index (H) =  $\sum_{i=1}^n W_i^2$

Where  $i=1, 2, \dots, n$ ,  $n$  is the total number of food items, and  $w$  denotes the share of expenditure on the  $i^{th}$  food item. HI measures diversity inversely proportional, i.e., the higher its value, the lower is its diversity.

- Simpson Index (S) =  $1 - \sum_{i=1}^n S_i^2$

It is closely related to the HI index. The Simpson index has been applied in empirical economic studies to investigate

food diversity. It measures diversity proportional, i.e., high values indicate high diversity within the totality of items.

- Entropic Index (EI) =  $\sum_{i=1}^n W_i \ln(W_i)$

Concerning food diversity, EI measures diversity by weighting consumption shares of each food with the reciprocal of the logarithmical share.

## 3. Results, Analysis and Discussion

The estimates of average MPCE for income strata and the percentage allocation of expenditure on each broad group of food items in the urban area and diversity in food consumption among different income strata (fractile) of Kerala in urban areas are analysed.

**Table 1:** Average MPCE (URP) across fractile classes in Kerala

Fractile Class	Urban
F1	687
F2	956
F3	1159
F4	1437
F5	1738
F6	2132
F7	2592
F8	3198
F9	3959
F10	5436
F11	7812
F12	6624

Source: Estimated from NSS CES for 68<sup>th</sup> Round Unit level data

3.1. Estimation of average MPCE and percentage allocation of expenditure on each broad group of food items

shows, inequality in consumption expenditure in terms of average MPCE in rural Kerala.<sup>4,11-13</sup> The estimated average MPCE of the bottom group (first fractile) is only Rs. 687 and that of the top group (12<sup>th</sup> fractile) of population is Rs. 6424. There exist a wide disparity in the expenditure on food that MPCE on the food of the top group is 9 times of the poor. Hence, it is very essential to understand the diversity of food consumption in each income strata since a balanced diet is critical for leading a healthy life

Table 3 Shows the distribution of expenditure on each broad group of food items by 12 fractile classes in urban areas of Kerala. It is obvious that as income increases people diversify their budget by reducing the consumption of cereals and that the bottom 5 percent of the population allocate 19.1 percentage of their food expenditure for the purchase of cereals; while the top 5 percent spend only 12.2 percentage. Moreover, the share of expenditure on meat,<sup>1,2,14-16</sup> egg and fish is almost similar for all income classes in urban areas. This might be due to Keralites preference towards animal source food irrespective of the

**Table 2:** Distribution of expenditure on each broad group of food items across fractile classes in Kerala, (Urban) 2011-12

Itemclasses	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12
Cereal	19.1	20.1	18.7	17.8	15.9	16.9	15.8	14.3	14.1	12.9	12.7	12.2
Cereal substitutes	0.6	0.4	0.5	0.4	0.4	0.5	0.4	0.5	0.4	0.5	0.3	0.2
Pulses & pulse products:	5.7	5.0	5.7	5.2	5.0	4.9	5.0	4.2	4.5	4.2	3.7	3.9
Milk & milk products	6.9	9.1	9.2	10.3	11.2	11.6	12.1	13.0	12.5	12.9	12.8	11.9
Salt & sugar	4.1	3.8	3.6	3.7	3.2	3.1	2.8	2.5	2.2	2.1	2.1	1.9
Edible oil	6.8	6.0	6.3	5.7	5.4	5.8	5.1	4.5	4.2	3.7	3.4	3.6
Egg, fish & meat	16.8	20.9	19.0	19.1	20.0	19.3	18.9	20.4	18.6	19.8	19.5	20.2
Vegetables	7.7	6.6	7.1	6.7	7.2	6.7	6.8	6.3	5.9	6.4	5.6	6.2
Fruits (fresh)	7.5	8.5	8.6	9.3	9.2	9.4	9.8	9.4	10.2	10.5	10.6	10.6
Fruits (dry)	0.1	0.1	0.3	0.4	0.5	0.9	0.6	0.8	1.0	1.5	1.9	1.7
Spices	6.4	5.7	5.7	5.6	5.5	5.3	4.7	4.5	4.3	4.2	3.7	3.5
Beverages	4.0	4.0	4.0	4.5	4.6	4.2	4.7	4.3	4.8	4.7	4.3	3.6
Served processed food	11.6	7.1	7.6	7.9	8.3	7.3	9.3	11.5	13.2	12.3	15.2	16.9
Packaged processed food	2.8	2.8	3.6	3.5	3.7	4.0	4.0	3.9	4.2	4.3	4.1	3.7

Source: Estimated from NSS CES for 68<sup>th</sup> round unit-level data

**Table 3:** Food diversity indices across fractile classes in Kerala (Urban)

Index	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12
Herfindahl-Index	0.123	0.122	0.113	0.112	0.111	0.111	0.110	0.115	0.112	0.112	0.116	0.121
Simpson Index	0.877	0.878	0.887	0.888	0.889	0.889	0.890	0.885	0.888	0.888	0.884	0.879
Entropie Index	2.357	2.307	2.358	2.360	2.363	2.370	2.366	2.343	2.354	2.357	2.329	2.302

Source: Estimated from NSS CES for 68<sup>th</sup> Round unit level data

classes. It could be observed from the table that the high-income group consumes more milk and milk products than the low-income group. It is also interesting to note that in the case of served processed food, the 12<sup>th</sup> fractile group spend roughly 25 percent of their food expenditure on served processed food, packaged processed food and beverages. It is a fact that there is widespread intraclass inequality in the expenditure on various broad groups of food items. Hence, it calls for an analysis of the diversity of food consumption among different income strata in the urban area to investigate whether people follow a balanced diet

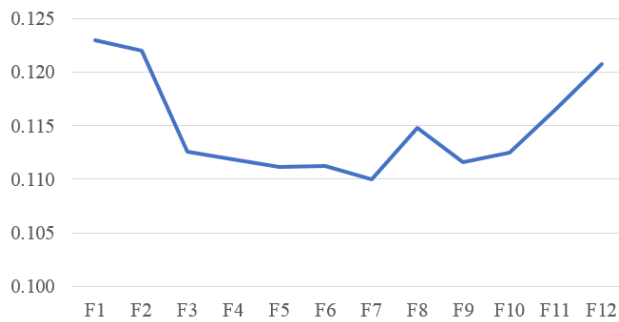
### 3.1. Diversity in food consumption among urban income strata of Kerala:

The value of Herfindahl, Simpson and Entropie index for the 12 income groups (fractile) is given in Table 3. The line graph is given separately for three indices (Figures 1, 2 and 3) for comparing diversity between fractiles. It is interesting to note that all indicators are showing diversity in food consumption in the middle-income group compared to the high and low-income groups. This is due to food concentration among richer classes mainly towards animal source food, packaged processed food and beverages.

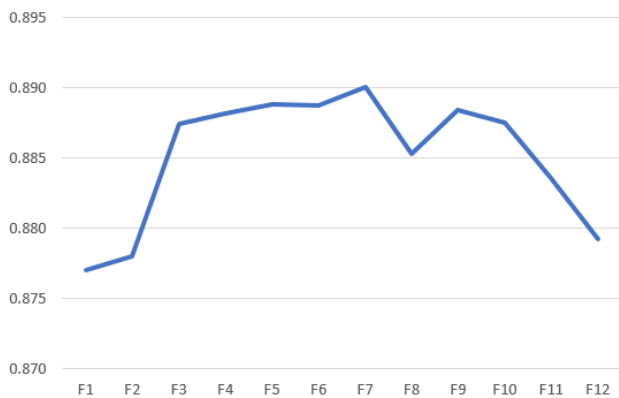
Furthermore, the low-income group concentrated their food consumption toward cereals, served processed. The diet diversification towards served processed food, packaged processed food and beverages in urban areas may have serious health implications since these items are costlier causes the cost of calorie intake to soar. Moreover, the westernization diet in the urban areas of Kerala leads to diet-related diseases.

It is to be noted that inter-class and intraclass concentration of expenditure is visible across classes. Albeit concentration is increasing with income (Table 3). Concentration in the expenditure on food is more intense among the bottom and top income groups.

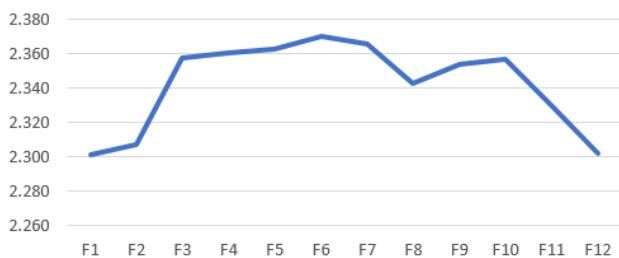
It is because the rich group is concentrating their expenditure in broad food groups like egg, meat and fish and also in the processed groups. At the same time, the poor concentrated on cereals consumption.<sup>10,17</sup> It is a signal of increasing food diversity among the poor. Simpson index also depicts the same trend that food diversity is comparatively low among the top and low-income group when compared to the middle-income group as the rich is concentrating more on egg, fish and meats and also on processed food while the poor are concentrated on the cereals and processed food (Figure 2). Entropie index also exhibits the same trend.



**Fig. 1:** Herfindahl index across fractile classes in Kerala (Urban)



**Fig. 2:** Simpson index across fractile classes in Kerala (Urban)



**Fig. 3:** Entropie index across fractile classes in Kerala (Urban)

#### 4. Conclusion

The analysis confirms the declining share of cereal consumption in total food consumption as income increases. Concerning the food diversity, the middle-income groups enjoying diversified food compared to the low and high-income groups in urban areas of Kerala. It is found that high-income groups prefer more served processed food, packaged processed food and beverages which then leads to food concentration. It signals the cause of declining calorie intake, micronutrient deficiencies and emergence of diet-related diseases in India on account of dietary transition. It is also revealed that Kerala's dietary pattern is unique in India as all income group satisfies high-level food diversity, a measure of diet quality. However, the declining food

diversity for the high and low-income group is a worrisome factor, which is paradoxical to the conventional belief that an increase in income promotes a balanced diet.

#### 5. Source of Funding

None.

#### 6. Conflict of Interest

None.

#### References

1. Padma P, Ramasamy EV, Muralivallabhan TV, Thomas AP. Changing scenario of household consumption pattern in Kerala: an emerging consumer State of India. *Soc Indicators Res.* 2018;135(2):797–812.
2. Labadarios D, Steyn NP, Nel J. How diverse is the diet of adult South African? *Nutr J.* 2011;10(1):33. doi:10.1186/1475-2891-10-33.
3. Arimond M, Ruel M. Summary indicators for infant and child feeding practices: An example from the Ethiopia Demographic and Health Survey 2000", Food Consumption and Nutrition Division Discussion Paper, Washington, D.C.: International Food Policy Research Institute ; 2002. Available from: <https://www.ifpri.org/publication/progress-developing-infant-and-child-feeding-index>.
4. Karunakaran N. Projected demand for rice in Kerala up to 2026 AD", *Agricultural Situation India.* 2014;71(1):21–5.
5. Food consumption patterns and economic growth. Increasing affluence and the use of natural resources. *Appetite.* 2002;55(3):597–608. doi:10.1016/j.appet.2010.09.013.
6. Das M. Healthy Eating Index: Evidence from India. Available at SSRN 2571173; 2015. Available from: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2571173](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2571173).
7. Banerjee A. Poor Economics: Rethinking poverty and the ways to end it; 2011. p. 464.
8. Berry CH. Corporate growth and diversification. *J Lawand Econ.* 1971;14:371–83.
9. Drescher L. Healthy food diversity as a concept of dietary quality: Measurement, determinants of consumer demand, and willingness to pay; 2007. Available from: [https://cuvillier.de/uploads/preview/public\\_file/3692/9783867273008.pdf](https://cuvillier.de/uploads/preview/public_file/3692/9783867273008.pdf).
10. Santhosh R. Influence of quality preference on urban food consumption pattern in Kerala. Kottayam; 2013. Available from: <http://103.135.131.71/vufind/Record/mgu.62406>.
11. Hoddinott J, Yohannes Y. Food and Nutrition Technical Assistance, Academy for Educational Development; 2002. Available from: <http://ghdx.healthdata.org/organizations/food-and-nutrition-technical-assistance-fanta-academy-educational-development-aed>.
12. Karunakaran N. Change in Cropping pattern and food security—a challenge to poor population: a Kerala experience. *Soc Action.* 2013;63(1):48–58.
13. Kennedy GL, Fanou N, Seghieri C, Brouwer ID. Dietary diversity as a measure of the micronutrient adequacy of women's diets: results from Bamako, Mali site. *Women's Dietary Divers Project.* 2009; Available from: <http://ghdx.healthdata.org/record/mali-dietary-diversity-measure-micronutrient-adequacy-women%E2%80%99s-diets-results-bamako-mali-site>.
14. Morrison KT, Nelson TA, Ostry AS. Mapping spatial variation in food consumption. *Appl Geography.* 2011;31(4):1262. doi:10.1016/j.apgeog.2010.11.020.
15. Pingali P, Khwaja Y. Globalisation of Indian diets and the transformation of food supply systems. *Eldis.* 2004;4(5):854.
16. Santhosh R. Changing food interest of rural India. *Literary Findings.* 2019;8(5):80–3.
17. Who/Fao. Preparation and use of food-based dietary guidelines. *United Nations.* 1996;p. 108.

**Author biography**

**P. K. Retheesh**, Assistant Professor

**R. Santhosh**, Assistant Professor and Research Guide

**N Karunakaran**, Principal and Research Guide in Economics

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