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Dietary Patterns of Agricultural Families in a Developing District of South India

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Introduction

- In India 70% of the population depend on agriculture and agriculture sector employs >60% of the workforce.
- Agriculture contributes 33% of the India's GDP
- Under Nutrition is a major problem of developing countries like India and is not only the result of low food quantities consumed, but also of poor dietary quality and diversity.
- Small farmers constitute 83% of India's agrarian-population & are more vulnerable to food insecurity.
- Although there is an established link between agriculture and nutrition but dietary patterns of Indian farmers is less known.

Research Questions

- To examine the food consumption patterns of farmer & non-farmer households in the context of a globalizing food environment.
- To determine the difference in the food consumption patterns among the different categories of farmers.

Data and methods

- The data used in this study is part of a larger study on drivers of food Choice in Indian Households conducted in Vijayapura district in the Southern state of Karnataka.

- Representative samples of 487 households from rural & urban areas.

- Based on land holding status, samples were identified as farmers(252) and non-farmers(235). These 252-farmers were further divided into 3-groups i.e. marginal and small(116), semi-medium(67) and medium and large(69) farmers *.

- A Food Frequency Questionnaire(FFQ) was administered to collect data on the consumption frequency of 69-foods and beverages, which were divided into 4-broad food groups:
  i) Local foods and snacks;
  ii) Animal source foods;
  iii) Non-local Indian/global foods;
  iv) Beverages.
Within each food group, items were categorized as local, non-local Indian, and Global.

- Farmers were asked about 3-major crops grown for household consumption purpose also.

Analysis

- For analysis, FFQ-data was converted into the number of times per week that the food item was consumed. A food variety score (FVS) was calculated (0-69) by summing the number of food items consumed.
- Statistical methods such as student's t-test and ANOVA-test were used to compare average frequency of intake and FVS between farmers and non-farmer households and between the three-farmer groups.

* : Goyal SP. Press Information Bureau, Government of India Ministry of Agricultural and Farmers Welfare. 2015. p. 1–3. Available from: https://pib.gov.in/Pressreleaseshare.aspx?PRID=1562687

Results

- Farmers reported that the 3 major crops they grow for own consumption were Jowar, Toor and Chickpeas.

- Farmer households consumed fruits, dairy and pulses more frequently (10-17 times/week) compared to non-farmer households (9.7-15.1 times/week), but consumed animal source foods such as eggs, mutton and chicken/fish, and beverages like, soda & energy drinks, less frequently (P<0.05).

Demographic and socio-economic profile of the Agricultural landholders (LH) & Non-landholders(NLH) families in Vijayapura district
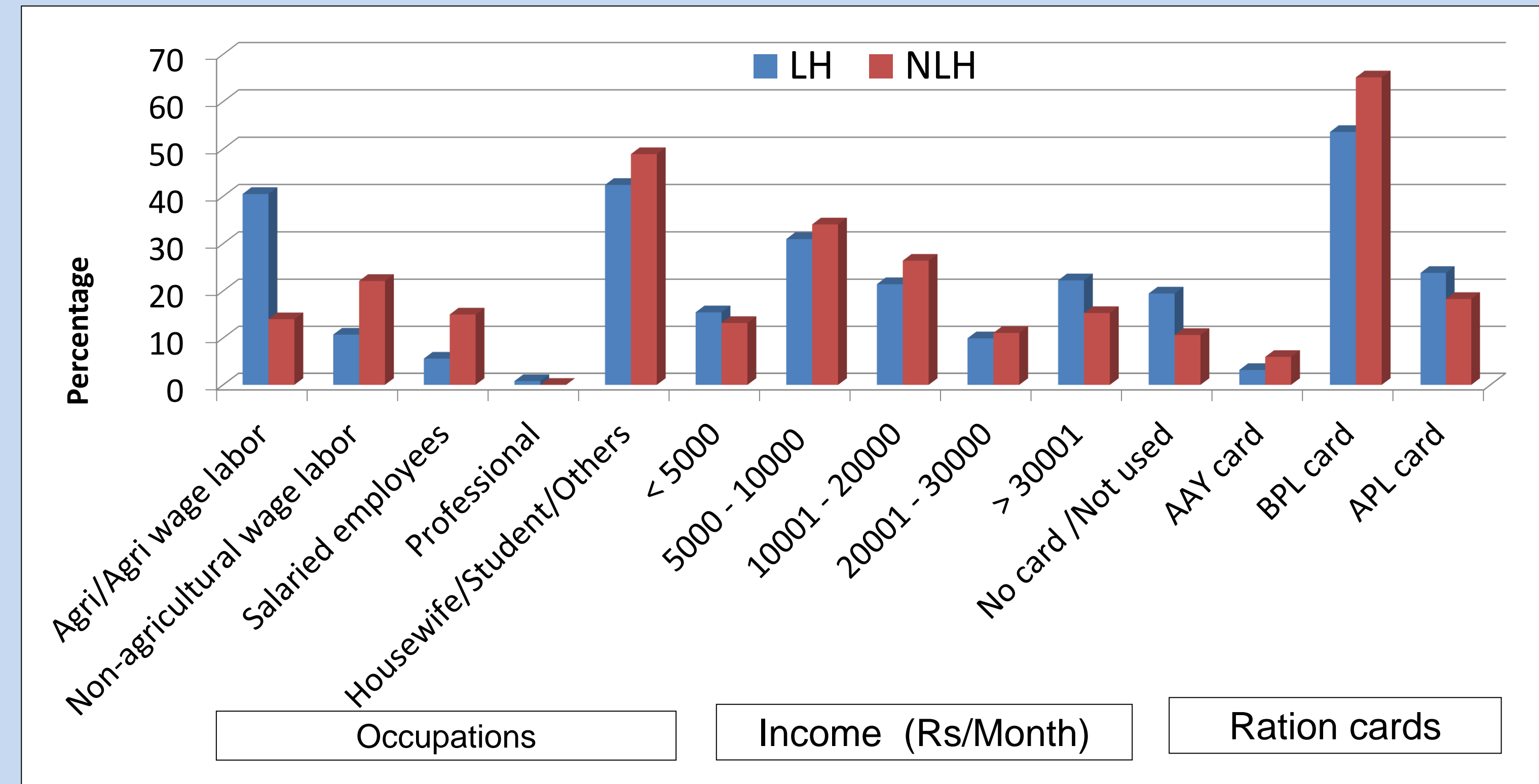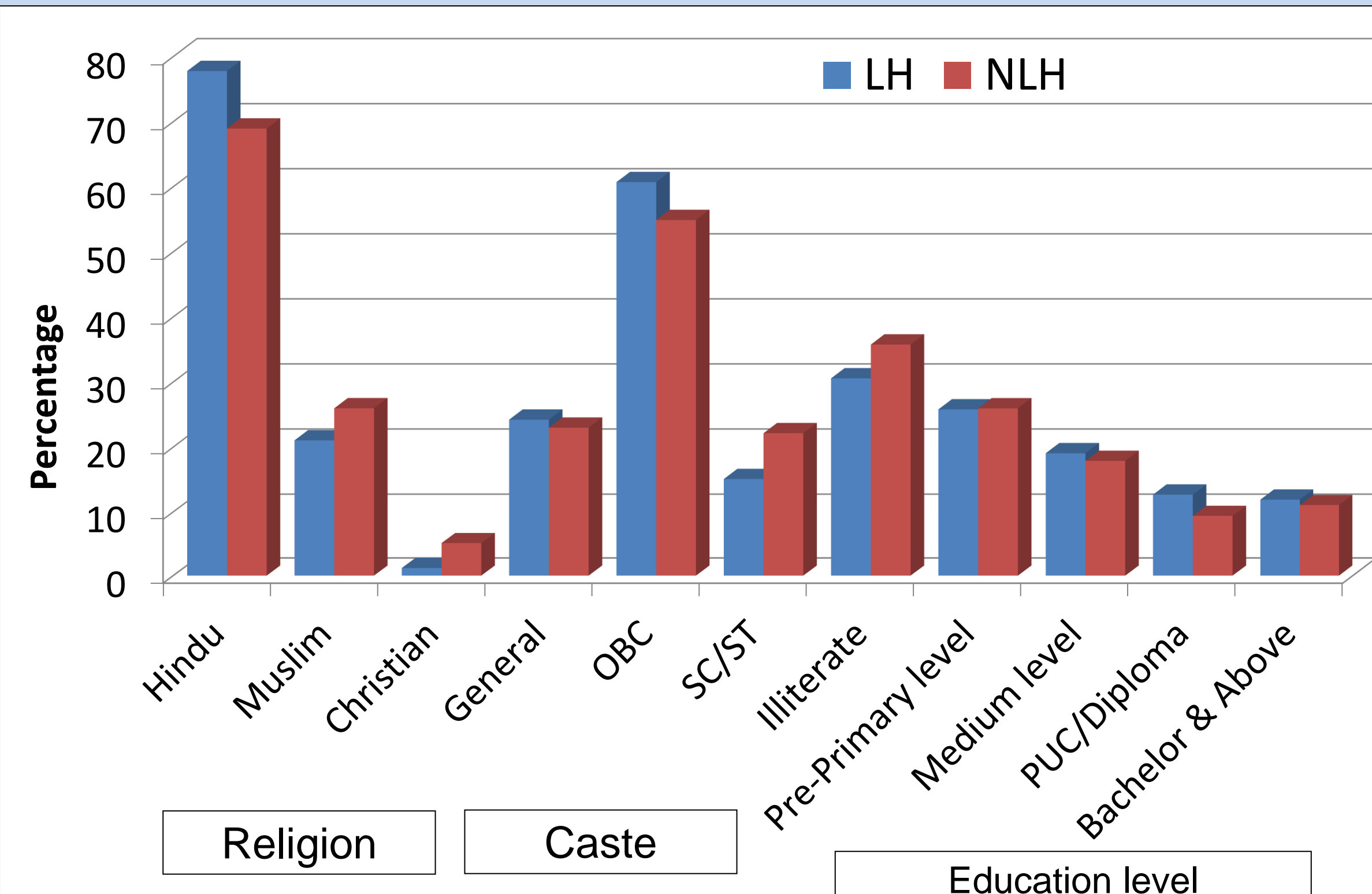
Religion | Caste | Education level

Occupations | Income (Rs/Month) | Ration cards

Food Consumption patterns (times_ week) and food variety score among agricultural land holders and agricultural non-land holders in Vijayapura district.

	Overall (N=487)	Land Holders (N=252)	Non-Land Holders (N=235)	Difference	P-value
Staples and Local Foods	Mean ± SD	Mean ± SD	Mean ± SD	(LH - NLH)	
Rice and rice-based dishes [a]	8.2 ± 2.2	8.2 ± 2.1	8.3 ± 2.3	-0.1	
Legumes and Pulses [b]	10.0 ± 2.2	10.2 ± 2.2	9.7 ± 2.2	0.5	*
Wheat, pearl millet, sorghum [c]	7.7 ± 0.8	7.8 ± 0.9	7.7 ± 0.6	0.2	
Fruits [d]	16.0 ± 10.5	16.8 ± 11.0	15.1 ± 10.0	1.7	
Vegetables [e]	9.5 ± 2.9	9.7 ± 3.0	9.4 ± 2.8	0.3	
Savory foods and snacks [f]	8.6 ± 4.2	8.7 ± 4.2	8.6 ± 4.1	0	
Nuts	4.0 ± 2.5	4.2 ± 2.6	3.8 ± 2.4	0.4	
Local sweets [g]	1.2 ± 1.5	1.3 ± 1.7	1.2 ± 1.4	0.1	
Sweeteners [h]	2.9 ± 3.0	2.8 ± 3.1	2.7 ± 2.8	0.2	
Animal Source Foods					
Mutton	0.3 ± 0.7	0.2 ± 0.5	0.4 ± 0.8	-0.1	*
Chicken or Fish	0.7 ± 1.2	0.7 ± 1.2	0.8 ± 1.1	-0.1	
Eggs	1.7 ± 2.0	1.5 ± 1.9	1.9 ± 2.0	-0.4	*
Dairy [k]	14.2 ± 8.2	14.9 ± 8.0	13.4 ± 8.3	1.5	*
Non-local foods (Global and Indian)					
Global breads and cereal [l]	2.0 ± 2.5	2.0 ± 2.3	2.0 ± 2.6	0	
Global savory foods and snacks [m]	1.4 ± 2.1	1.4 ± 2.1	1.5 ± 2.1	-0.2	
Global sweets [n]	3.3 ± 3.0	3.5 ± 3.2	3.1 ± 2.7	0.4	
Non-local Indian savory snacks [o]	3.4 ± 3.3	3.2 ± 3.3	3.6 ± 3.3	-0.4	
Non-local Indian sweets [p]	1.0 ± 1.5	1.1 ± 1.6	1.0 ± 1.4	0.1	
Beverages					
Tea and coffee	6.5 ± 1.8	6.4 ± 1.8	6.5 ± 1.7	-0.1	
Fruit juices [q]	1.3 ± 1.6	1.4 ± 1.7	1.2 ± 1.4	0.2	
Soda and Energy drinks	0.2 ± 0.7	0.1 ± 0.3	0.3 ± 0.9	-0.1	*
Food verity score (Mean ± SD)	50.7 ± 5.6	50.4 ± 5.3	51.1 ± 6.0	-0.7	
(mini-max)	28-64	33-63	28-64		

Food Consumption patterns (times_ week) and food variety score among agricultural land holders by land sizes in Vijayapura district.

Food Groups	Total Land Holders (N=252)	Marginal & Small farmers (0.5 - 1.99 Hctr) (N=116)	Semi-medium farmers (2- 3.99 Hctr) (N=69)	Medium & Large Farmers (4 - > 20 Hctr) (N=67)	One way ANOVA (F-test)	P-value
Staples and Local Foods	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD		
Rice and rice-based dishes [a]	8.2 ± 2.1	7.9 ± 2.2	8.5 ± 1.8	8.4 ± 2.0	2.312	
Legumes and Pulses [b]	10.2 ± 2.2	10.5 ± 2.1	9.9 ± 2.4	10.1 ± 2.3	1.706	
Wheat, pearl millet, sorghum [c]	7.8 ± 0.9	7.7 ± 0.9	7.8 ± 0.6	8.0 ± 1.1	2.413	
Fruits [d]	16.8 ± 11.0	15.3 ± 10.6	15.5 ± 9.6	20.9 ± 11.9	6.56	*
Vegetables [e]	9.7 ± 3.0	8.7 ± 2.8	9.8 ± 2.5	11.2 ± 3.1	16.962	**
Savory foods and snacks [f]	8.7 ± 4.2	7.8 ± 3.9	8.9 ± 3.7	9.8 ± 5.0	5.079	*
Nuts	4.2 ± 2.6	4.3 ± 2.6	3.8 ± 2.6	4.6 ± 2.7	1.627	
Local sweets [g]	1.3 ± 1.7	1.2 ± 1.6	1.1 ± 1.3	1.6 ± 2.0	1.819	
Sweeteners [h]	2.8 ± 3.1	2.5 ± 3.0	2.7 ± 3.0	3.6 ± 3.2	2.865	
Animal Source Foods						
Mutton	0.2 ± 0.5	0.4 ± 0.6	0.2 ± 0.5	0.1 ± 0.2	8.627	**
Chicken or Fish	0.7 ± 1.2	0.9 ± 1.4	0.6 ± 1.1	0.3 ± 0.9	5.382	*
Eggs	1.5 ± 1.9	2.0 ± 2.0	1.5 ± 1.8	0.7 ± 1.4	11.041	**
Dairy [k]	14.9 ± 8.0	12.7 ± 7.7	15.0 ± 7.7	18.5 ± 7.8	11.978	**
Non-local foods (Global and Indian)						
Global breads and cereal [l]	2.0 ± 2.3	2.0 ± 2.4	1.8 ± 2.1	2.1 ± 2.5	0.2965	
Global savory foods and snacks [m]	1.4 ± 2.1	1.5 ± 2.4	1.1 ± 1.6	1.3 ± 2.0	0.7975	
Global sweets [n]	3.5 ± 3.2	3.2 ± 3.2	3.3 ± 2.7	4.1 ± 3.6	0.3872	
Non-local Indian savory snacks [o]	3.2 ± 3.3	3.5 ± 3.7	2.9 ± 2.3	2.9 ± 3.5	1.023	
Non-local Indian sweets [p]	1.1 ± 1.6	1.1 ± 1.8	0.7 ± 0.9	1.3 ± 1.7	2.601	
Beverages						
Tea and coffee	6.4 ± 1.8	6.4 ± 1.8	6.4 ± 1.8	6.4 ± 1.9	0	
Fruit juices [q]	1.4 ± 1.7	1.2 ± 1.5	1.4 ± 1.5	1.8 ± 2.1	2.712	
Soda and Energy drinks	0.1 ± 0.3	0.2 ± 0.4	0.1 ± 0.2	0.1 ± 0.2	3.28	*
Food verity score (Mean ± SD)	50.4 ± 5.3	50.7 ± 5.5	50.4 ± 5.2	49.8 ± 4.8	0.6271	
(mini-max)	33-63	33 - 63	37 – 62	40 - 60		

*P<0.05, **P<0.001

Food crops grown for household consumption among agricultural land holders of different land sizes in Vijayapura

Crops grown for household consumption (yes/no)	Marginal & Small farmers 0.5 - 1.99 Hctr		Semi-medium farmers 2- 3.99 Hctr		Medium & Large Farmers 4 - > 20 Hctr		Overall		P value
	n=116	%	n=69	%	n=67	%	n=252	%	
No / DK	19	50.0	9	23.7	10	26.3	38	15.1	<0.0001*
Yes	97	45.3	60	28.0	57	26.6	214	84 .9	
Major crops									
Jowar/Pearl Millet	75	44.6	47	28.0	46	27.4	168	66.7	
Toor	55	40.1	41	29.9	41	29.9	137	54.4	
Chickpeas	51	49.5	29	28.2	23	22.3	103	40.9	0.5777
Wheat	38	41.8	20	22.0	33	36.3	91	36.1	
Fruits & Vegetables	11	47.8	7	30.4	5	21.7	23	9.1	

Results continued.. . . .

- Among all farmer households (n=252), marginal/small farmers consumed pulses more frequently (10.5times/week) than others farmers (9.9-10.1 times/week) suggesting that majority of small farmers depend on their own agricultural production.

- Marginal/small farmers consumed animal source foods such as, mutton, chicken/fish and eggs more frequently (0.4-2 times/week) than semi-medium and large-farmers (P=<0.005).

- Local foods such as fruits, vegetables, savory foods & snacks, and animal source foods like dairy items, were eaten more frequently (9.8-21 times/week) by the large-farmers compared to semi-medium and small-farmers (P= <0.05).

Conclusions

- Consumption of different food items/groups varies among farmers and non-farmers and between different types of farmers.

- Cereals, wheat, pearl-millet, fruits, vegetables and savory foods & snacks were consumed less frequently by small-farmers than other farmer groups, making them more likely to be nutritionally insecure.

- Food policies can focus more on marginal/small farmers to utilize maximum input subsidies to grow sufficient food crops and encourage large farmers to utilize minimum-support-price scheme to sell their crops.

- Government could make diverse food items available through Public Distribution System to small farmers/marginalized sections; this may help to increase their food security and diet quality.

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