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Examining Dietary Diversity Across Provinces In Pakistan Rabia Majeed^a, Wagar Qureshi^b, Muhammad Imad Khan^c, Muhsina Fazal^d

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Abstract: The present study analyzed household food consumption expenditure pattern across the four provinces of Pakistan. The study used Household Integrated Income and Expenditure Survey (HIIES) 2018. Food is categorized into eight groups: wheat's flour, dairy, rice, pulses, meats, ghee-oil, fruits-vegetables, and other foods. The study has used Analysis of Variance (ANOVA) to compute the F-statistics to find out whether there are significant changes in mean exists in food consumption expenditure of the four provinces. The study explored the dietary diversity by looking into the eight categories of food by calculating household's average monthly consumption expenditure for the eight food groups, average monthly shares of each food group and average monthly food quantity consumed. Results indicate that the proportions of expenditure on wheat flour and dairy are high. On the other hand, expenditure patterns dietary diversity exist across the provinces. However, households in KP and Baluchistan are more inclined to consume a larger proportion of their consumption expenditure on wheat and flour whereas Punjab and Sindh for pulses and ghee/oil. To meet the dietary diversity ingredients, all the provinces particularly KP and Baluchistan diversity their food consumption expenditures.

Keywords: Food Consumption expenditures, Dietary diversity, Analysis of Variance, households.

Introduction

In a developing country like Pakistan, household food consumption expenditure undergoes significant changes with the passage of time. In the beginning of economic development and low-level of per capita income, a household spends large portion of its disposable income on different food commodities such as, cereals, rice, milk, meat, vegetables, pulses and cooking oil and ghee. When per capita income rises, households spend a lesser proportion of their disposable income on food. This proposition is also forwarded by Engel, in its famous theory suggesting that the proportion of expenditure on food decreases as total income rises (Ahmed et al., 2015). Pakistan ranks fifth most populous country in the world (World Bank, 2020) and about 39 percent of its population is living below the poverty line (HIES, 2018-19). The country has been growing through structural transformation as the economy of Pakistan, being

primarily agricultural has now been witnessing growth in contributions of manufacturing and services sectors. However, the economic growth of the country has also not been stable, affecting the income of the people and as a result food expenditure. Hence, it is prime time to study food expenditure patterns of households in the country and study differences among the different regions of the country.

Food expenditure pattern shows the expenditure made on various commodities in the household. It is important to study food expenditure pattern because it directly measures wellbeing, poverty and living standard of households. Hence, policy makers can develop policies to tackle poverty in the country. It also measures the nutritional status of the population of the country. As a result, it helps in the development of food policies which can help promote nutritional aspects of food consumption. Having knowledge of the proportion of expenditure spent on various food items also helps in projecting demands of these items. Finally, the expenditure made on food also helps in understanding the expenditure made on services. Governments are able to know whether people have enough disposable income to access services like health, education, sanitation etc. Since access to these services are vital for healthy living, therefore, governments can offer food subsidy programs to free some expenditure from food to be spent on these services. Several factors influence food consumption. These include geographical and climate conditions, variations in natural resources endowments, changes in prices, income, tastes, demographic factors (size of households, composition of household etc) and urbanization. All these factors bring frequent changes in food expenditure pattern in one way or the other.

Food expenditure pattern has been a subject of research all over the world especially in developing countries where people spend a large share of income for food consumption. The analysis of consumption patterns provides an insight into the nutritional status of the people. Food expenditure in Pakistan has been an important issue because it is used in poverty and welfare measurements. It can also be used in analyzing the food security situation of the country. Hence, understanding household food consumption pattern in Pakistan is important for a variety of reasons but we are unaware of the recent changes took place in food consumption pattern. We also don't know how the consumption pattern differs across provinces of the country. However, the goal of this study is to examine household consumption expenditure pattern of Pakistan and compare the household food expenditure pattern among provinces. Therefore, the study will attempt to riposte the interrogation that, does current food consumption expenditure differ across the provinces of Pakistan?

Existing literature in South Asia and particularly in Pakistan mainly focuses on the dietary and food practices of either women or the children under the 5 years of age, ignoring the aggregate food consumption expenditure at districts level Therefore, to explore the dietary diversity in all four provinces of Pakistan it is essential to look in both monthly and weekly food consumption expenditure to have a clear insight. Thus, the result of the study helps in looking into the food insecurity and dietary diversity among the provinces of Pakistan. Moreover, the problem this study provides the most recent analysis of household's food expenditure pattern in Pakistan. Government policy is heavily concentrated on cereals production. But if there is a change in household's expenditure behavior overtime then the government policy needs to express these changes by increasing the production in accordance with the households' demand. The result of the study would help in identifying predominant food items consumed by households in Pakistan. This research could give guidelines in the formulation of future food policies and planning future investment decisions regarding demand and supply of food items in the country. The rest of the paper is organized into five sections. Following the review of the literature in the upcoming section, section 3 will explain the data and research methods. Results and discussion are given in section 4, followed by conclusions and policy implications in the fifth and last section.

Literature Review

Pakistan is not merely self-sufficient in most of the food sources but is also a net exporter of several agricultural products, yet it faces food insecurity at high levels. The calamity is evident by the "World Food program" report for Pakistan, stating that 18% of the Pakistani population are undernourished and this prevalence of undernourishment is also ranked "Serious" by the Global Hunger Map threshold (WFP, 2019). In Pakistan, almost 40% of children aged less than 5 years suffer from stunting (a key and extremely sensitive indicator of chronic malnutrition) and every third child is underweight (National Nutritional survey 2018). This indicates an alarming situation and mandates an immediate evidence-based comprehensive nutritional policy (UNICEF, 2018). Hashmi et al., (2021) investigate and explore the level of food insecurity and dietary diversity among all the ethnic groups of Karachi utilizing FAO standardized questionnaire. The study used multistage random sampling of 535 households from five major ethnic groups residing in Karachi. The study concludes that age, marital status, or educational attainment did not statistically significantly correlate with food diversity. The communities of Sindhi speakers were the least food secure, whereas Urdu-speaking people whose ancestors had immigrated from India were the safest. However, it suggests the development and implementation of culturally-appropriate interventions that should be implemented in large urban areas where diverse cultures coexist.

Food consumption patterns among households in Kenya was analyzed by Ofwona (2013). The data is obtained from the Kenya Integrated Household Budget Survey (KIHBS) for the year 2005-06. The study had revealed that cereals were the most popular food consumed among the food item groups. Fruits, pulses, vegetables, milk, and eggs were also popular food items in Kenya. The study suggested that the government should implement policies that can enhance the condition of population especially the poor by improving their nutritional food consumption and lowering the prices. It was also suggested that the government should develop the production, marketing and distribution of food production. This will alleviate poverty and improve access to food. A similar study conducted in Nigeria by Ogundari (2012) which examined income elasticity of demand for quantity and quality beef, chicken, and fish. The analysis is based on randomly selected 134 households in Ondo state. The empirical results show that income elasticity of demand for beef, chicken, and fish are inelastic. This suggests that these food items are considered necessities among households in the sample. The computed income elasticity of demand for quality was found to be positive for all food items. Another study related to food subsidy is conducted by Sharma (2012) in India using annual time series data from 1992-93 to 2011-12. The study used two alternative functional forms for determinants of food subsidy, namely, liner and Cobb-Douglas. Further, the study used the results of linear regression equation for interpretation as it was found better when it was compared with Cobb-Douglas production function. It is suggested that food subsidy is an effective and major tool of social safety net for the hungry and poor people, but on the other hand, food subsidy program is in severe criticism due to economic inefficiency and poor targeting. The study concluded that food subsidies help to reduce malnutrition and also plying a vital role in stabilizing the prices.

Molina (1994) investigated food demand in Spain using Almost Ideal Demand System (AIDS) model. Spanish annual time-series food consumption data was used in the estimation for the period 1964-89. They used several static and dynamic versions of the AIDS model. The study finds that there were differences in Spanish household's food consumption patterns. Bread and cereals, meat, fish, milk, and eggs were found to be necessities in household consumption whereas fruits and vegetables and other food items were found to be luxuries. Milk and eggs have highest own price elasticity whereas bread and cereals and fish were nonresponsive to change in their own prices. The cross-price elasticity was found to be low. Similarly, Agbola (2000) analyzed the demand for food and non-food items in India by employing Household Survey data for the year 1973-74 and 1993-94. An Almost Ideal Demand System model (AIDS) was used in estimation. The expenditure elasticity for food categories were found to be less than unity (inelastic), except for milk. Milk and non-food items are found luxury goods while cereals, pulses, edible oil, meats, fruits and vegetables and other foods are essential in Indian diet. It is examined

that the largest percentage increase in future expenditure will be allocated to non-food items. Future estimation suggests that the gap between supply and demand in India is large i.e. demand for food items exceed supply. As a result, it was expected that food items imports will increase in future in the country.

Haq et al. (2008) studied the effects of rising food prices on poverty in Pakistan. They used the linear approximate Almost Ideal Demand System (LA-AIDS). The study found that the food price shock of 2008 has increased 32.2 percent poverty in rural while 44.6 percent in urban areas of Pakistan. The study further explained that 2.3 million people are extremely poor, and they are unable to meet one half of the expenditure. In another study, Haq et al. (2009) estimated own and cross price compensated and uncompensated elasticities and expenditure elasticities using Linear Approximate Almost Ideal Demand System (LA-AIDS) model. Socio-economic and demographic issues were included in the estimated LAAIDS model. Estimation uses Household Integrated Economic Survey accompanied in Pakistan during 2004-05. Hence, several socio-economic characteristics were controlled while elasticities were derived. The demand for wheat, fruits, vegetables, milk and cooking oil was inelastic and demand for rice, meat and other food elastic. All the commodities were normal goods while rice, fruits, meat and other food products were found to be expenditure elastic as compared to wheat, vegetables, milk and cooking oil. Aziz and Malik (2010) conducted a study on household consumption patterns in Pakistan to estimate the impact of income, price, and household size on food consumption. A double-log specification of the Engel's curve is used in the estimation. Food products are categorized into 9 groups: cereals, pulses, fruits, edible oils, sugar and gur, meats, vegetables, tea coffee and soft drinks, milk, and milk products. The result of the study shows that estimated expenditure elasticities were statistically significant with the positive signs. Consumption expenditure increases with an increase in income but at a decreasing rate. Consumption of cereals has a stable position both in rural and urban sectors. As income increases, the consumption expenditure on vegetables and meats increases in rural areas as compared to urban areas. While the consumption expenditure on fruits, milk and milk products increase with an increase in income in urban areas as compared to rural areas. The study also concluded that household size has a significant effect on the food expenditures. As household size increases, the expenditure on food items increases at a decreasing rate. Another study conducted in the Nowshera district of Pakistan by Begum et al (2010) examine the consumption of food in rural areas. The results show that there is a positive relationship between food expenditure and household income. As the size of household exceeds, the expenditures on some food items also exceeds. In another study Haq et al. (2011) defined food demand patterns for urban and rural households of Punjab Pakistan. Data was collected from Household Integrated Economic Survey of Pakistan. Food products were categorized into eight groups containing wheat, rice, vegetables, fruits, cooking oil, milk, meat, and other food items. The study shows that households in both rural and urban areas along with head of family having agriculture as profession; consume less of all foods products apart from wheat. Further, the Households in both rural and urban areas with literate heads of family consume more of all food products apart from wheat and vegetables. Both uncompensated and compensated own price and expenditure elasticities are significant and have the estimated signs for both rural and urban consumers. The demand for all eight food groups is price inelastic with wheat having the most price inelastic demand. They concluded that all the expenditure elasticities are positive signifying that all goods are normal with the largest expenditure for milk followed by fruits, other food products rice, meat, wheat, vegetables, and cooking oil. Naheed and Hussain (2014) examined the food consumption patterns of 13 food items in four provinces of Pakistan. They used the cross-sectional household data for the year 2004-05. The adult equivalent (AE) approach was used for the estimation of regression equations. The study found that milk, meat and cereals were consumed by majority of the households in Pakistan. Milk was found to be major food item consumed in Punjab, while cereals were mostly consumed by households in Sind, KPK and Baluchistan. It was concluded that 75 percent households spend the highest relative share on cereals. Ahmad et.al (2015) had analyzed the rural urban food consumption patterns in Pakistan. The data is obtained from the Household Integrated

Economic Survey (HIES) of year 1998-99. Households were divided into five income groups. They found that the expenditure elasticities at national and provincial level tend to be higher in lower-income groups than higher-income groups. Household with lower income were found to be unable to fulfill their basic needs. The consumption of wheat, pulses and vegetables were higher in lower income groups while consumption of meat and fish were lower. Higher income groups found to have higher expenditure of rice, meat, fish and milk.

Research Methodology

The study uses Household Income Expenditure Survey (HIES) data for the year 2018. Pakistan Bureau of Statistics collects this data since 1963 but more recently it is merged with the Pakistan Integrated Household Survey (PIHS). The universe of HIES comprise all rural and urban areas of the four provinces of Pakistan excluding the restricted military regions. It gives imperative data at National/Provincial level with rural/urban breakdowns. The survey period 2018-19 covers 24,238 households collected from Khyber Pakhtunkhwa, Punjab, Sindh and Baluchistan. In the survey rounds of HIES, information was gathered on various socioeconomic variables including household's characteristics, income by source/profession/sectors, consumption expenditure and consumption pattern of households. This information enables us to estimate household food expenditure pattern across the provinces of Pakistan.

The data was used to study household food expenditure pattern for eight food groups. These food groups are wheat flour, dairy, rice, all pluses, meat (beef, mutton, chicken and fish), ghee-oil, fruits-vegetables and other foods. These groups were made up of 139 food items. HIES collected 15 days of data on household expenditure on food commodities which is then converted to monthly data. Food expenditures of individual commodity is calculated by multiplying its quantity with its price and then expenditure at group level is calculated.

The data is analyzed for descriptive statistics of all the groups. Comparison of means across provinces is carried using F-statistics. F- test provides a statistical analysis of whether the means of numerous groups are equal. F-test is helpful to compare more than two groups for statistical significance. The null hypothesis for F-test is as follows.

H₀: Household expenditure on food groups is same across provinces i.e.

$$H_0: \mu_{ijk} = \mu_{ijp} = \mu_{ijs} = \mu_{ijb}$$
(3.1)

$$H_1: \mu_{ijk} \neq \mu_{ijp} \neq \mu_{ijs} \neq \mu_{ijb}$$
(3.2)

where μ_{ijk} , μ_{ijp} , μ_{ijs} and μ_{ijb} represent expenditure of household *i* on food group *j* and Khyber Pakhtunkhwa, Punjab, Sindh, and Baluchistan, respectively.

Analysis of Variance (ANOVA) is carried to compute the F-statistics. Process of ANOVA is given in the following table. In the table, ESS stands for Explain Sum of Square, RSS for Residual Sum of Squares and TSS for Total Sum of Squares while MS represents Mean Sum of Squares.

Table 5.1: Analysis	of variance			
Source of variation	Sum of	Degrees of Freedom	Mean Square	F-Statistics
	Squares (SS)	(df)	(SS/df)	
Model/Group	ESS	k-1	$MS_E = ESS/k-1$	
Residual/Error	RSS	n-k	$MS_R = RSS/n-k$	ESS/k - 1
Total	TSS	n-1	$MS_T = TSS/n-1$	$\overline{RSS}/n-k$

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The sum of squares are calculated as follows.

$$ESS = \sum_{i=1}^{n} (\hat{Y}_{i} - \bar{Y})^{2}$$
(3.3)

The sum of squared residuals is calculated as follows.

$$RSS = \sum_{i=1}^{n} (Y_i - \hat{Y}_i)^2$$
(3.4)

Mean sum of squares (MS) are computed by dividing sum of squares by degrees of freedom, as follows.

$$MS_E = \frac{ESS}{K - 1} \tag{3.5}$$

$$MS_R = \frac{RSS}{N - K} \tag{3.6}$$

where N is number of observations and K is the number of parameters. The F-statistics is calculated as follows.

$$F = \frac{ESS/k - 1}{RSS/n - k}$$
(3.7)

The F-test follows the F-distribution with k-1 and n-k degrees of freedom in numerator and denominator. Least Significance Difference (LSD) test is used for the multiple comparison of the household food expenditure pattern of one province with all other provinces. When the F-test is statistically significant, then LSD is used to test whether one group differs from the other groups. The joint test does not indicate which group differs. This is most called "pairwise comparisons". The test is calculated as follows.

$$LSD = \frac{t(s\sqrt{2})}{\sqrt{n}}$$
(3.8)

Where t shows the *t*-statistic value, *s* the Residual Sum of Square and *n* the number of observation.

Results And Discussion

The first section presents the expenditure pattern, quantities of food consumed and overall comparison through F-test. The next section presents one to one comparison of the food items between provinces using LSD-test.

Household Food Expenditure

Table 4.1 shows the average monthly household food expenditure across the four provinces of Pakistan. The average monthly expenditure on food in the country is Rs. 12179. Food expenditure is highest in KP (Rs. 14315), followed by Punjab (Rs. 12177), Sindh (Rs. 11789) and Baluchistan Rs. 12177). The food items are wheat's flour, dairy, rice, pulses, meats, ghee-oil, fruits-vegetables, and other foods. The expenditure on wheat flour and dairy are the highest in all the provinces of Pakistan. The monthly expenditure on dairy is highest in KP (Rs.3396), followed by Punjab (Rs. 3387), Sindh (Rs.2779) and Baluchistan (Rs.2312). Wheat flour is the second most expensive food item after dairy. The expenditure on wheat flour is Rs. 2312 in Punjab, Rs. 2306 in KP, Rs. 1560 in Sindh and Rs. 1518 in Baluchistan. Interestingly, the expenditure on meat is highest in Baluchistan, followed by KP, Sindh and Punjab. F-

statistics show that the expenditure on food items are statistically significantly different across the four provinces of the country.

Food Group	KP	Punjab	Sindh	Baluchistan	Pakistan	F- Value
Wheat Flour	2306	1560	1518	2312	1782	887.675 (0 .000)
Dairy	3396	3387	2779	1992	3099	320.169 (0 .000)
Rice	502	461	812	480	561	519.223 (0 .000)
Pulses	294	249	244	381	270	385.538 (0.000)
Meat	1663	1160	1334	1760	1371	149.834 (0 .000)
Ghee-Oil	989	878	872	1001	912	102.573 (0 .000)
Fruits &	2109	1548	1517	1716	1677	453.546 (0 .000)
Vegetables						
Other foods	3056	2107	2713	2535	2507	324.751 (0 .000)
Total Expenditure	14315	11350	11789	12177	12179	
No of Household	5208	10498	6174	2345	24225	

Table 4.1: Nominal monthly households' food expenditure across provinces in Pakistan

Source: Author's own calculation

Food Budget Shares

Table 4.2 shows the monthly food budget shares of food groups of the four provinces in Pakistan. The food shares almost follow the expenditure made on food groups given in table 4.1. A household spends a little more than one-quarter (25.4%) on dairy products in the country. The proportion of food expenditure is highest in Punjab (29.8%), followed by KP (23.7%), Sindh (23.6%) and Baluchistan (16.4%). While households' expenditure on wheat flour is high in absolute terms, the proportion of expenditure spent on it is less than other food. On average, households spend 14.6 percent on wheat as compared to 20.6 percent on other food.

Food Group	KP	Punjab	Sindh	Baluchistan	Pakistan
Wheat flour	16.108	13.744	12.876	18.986	14.631
Dairy	23.723	29.841	23.572	16.358	25.445
Rice	3.506	4.061	6.887	3.941	4.606
Pulses	2.053	2.193	2.069	3.128	2.216
Meat	11.617	10.220	11.315	14.453	11.257
Ghee/Oil	6.908	7.735	7.396	8.220	7.488
Fruits &Vegetables	14.732	13.638	12.867	14.092	13.769
Other foods	21.348	18.563	23.012	20.817	20.584
Total	100	100	100	100	100
No of Household	5208	10498	6174	2345	24225
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Table 4.2: Monthly food expenditure shares on major food groups across Pakistan

Source: Author's own calculation

Food Consumption Pattern

The average monthly household consumed food quantity (kgs/month) of major food groups across the four provinces of Pakistan are given in table 4.3. The average highest quantity consumed in the country of fruits-vegetables is (46.34kgs/month). Food consumption is highest in Sindh (51.98kgs/month), followed by KP 51.67kgs/month, Baluchistan (44.05kgs/month) and Punjab 40.90kgs/month. The consumption of dairy and fruits-vegetables are the highest in all the provinces of Pakistan. The monthly consumption of dairy is highest in Punjab (46.15kgs/month), followed by KP 37.73kgs/month, Sindh 34.9kgs/month and Baluchistan 21.8kgs/month. Wheat flour is the most consumed food item after dairy. The consumption of wheat flour is 38kgs/month in Baluchistan, 34kgs/month in Sindh, 33.1kgs/month in Punjab and 18.13kgs/month in KP. Interestingly, the consumption of pulses is highest in Baluchistan, followed by KP, Sindh and Punjab.

Food Group	KP	Punjab	Sindh	Baluchistan	Pakistan
Wheat Flour	18.13	33.11	34.02	38.01	30.59
Dairy	37.73	46.15	34.89	21.76	39.10
Rice	12.86	22.33	19.93	10.42	18.53
Pulses	2.135	1.68	1.79	2.71	1.91
Meat	6.92	4.06	4.63	5.21	4.93
Ghee-Oil	6.86	5.83	6.02	7.34	6.25
Fruits & Vegetables	51.67	40.90	51.98	44.05	46.34
Other foods	26.01	17.92	24.81	22.10	21.82
No of Household	5208	10498	6174	2345	24225

Table 4.3: Monthly food quantity consumed (Kgs/Month) of major food groups across Pakistan.

Source: Author's own calculation

Table 4.4 shows the Khyber Pakhtunkhwa (KP) households' food expenditure comparison with other provinces. The food items are wheat flour, dairy, rice, pulses, meats, ghee-oil, fruits-vegetables and other foods. The Khyber Pakhtunkhwa comparison with Punjab the result found statistically insignificant for dairy (0.830). The Khyber Pakhtunkhwa comparisons with Sindh the result occur significant for all food items. With Baluchistan comparison for household food consumption expenditure the statistically insignificant result found for wheat's flour (0.809), rice (0.126) and ghee-oil (0.287). The significant result provide strong evidence against the null hypothesis that is the both provinces the household's food expenditure pattern are different.

Table 4.4: Khyber Pakhtunkhwa householo	ds' food expenditure	comparison witl	n other provinces
	as room enpenditure		- ounor provinces

Food Items	Punjab _j		Sindh _j		Balochistanj	
	M.D(ij)_Value	P-value	M.D(ij)_Value	P-value	M.D(_{ij})_Value	P-value
Wheat Flour	745.59478	0.000	787.69475	0.000	-6.40473	0.809
Dairy	8.16991	0.830	616.2692	0.000	1404.05896	0.000
Rice	41.49444	0.000	-309.5730	0.000	22.16188	0.126
Pulses	45.40034	0.000	49.88403	0.000	-86.71827	0.000
Meats	503.08612	0.000	328.37835	0.000	-97.03947	0.021
Ghee/Oil	110.44236	0.000	117.02869	0.000	-12.75664	0.287
Fruits & Veg	561.18578	0.000	592.74551	0.000	392.99116	0.000

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Other foods	948.30933	0.000	342.74269	0.000	520.65114	0.000
Source: Auth	hor's own calculatio	n				

Table 4.5 shows the Punjab households' food expenditure comparison with other provinces. The comparisons of Punjab households with Khyber Pakhtunkhwa for food expenditure the significant result found for all food groups except dairy (0.083). The comparisons of Punjab with Sindh for household food consumption expenditure the result occur insignificant for pulses and ghee-oil (0.394). The Punjab comparison with Baluchistan for household food expenditure the result occurs significant for all food groups except rice (0.146). In the table 4.5 the insignificant result shows that both provinces households are same food expenditure pattern.

Food Items	KP _i		Sindh _i		Balochistan _j	
	M.D(i.j)_Value	P-value	M.D(i.j)_Value	P-value	M.D(i.j)_Value	P-value
Wheat Flour	-745.59748	0.000	42.09996	0.015	-751.99952	0.000
Dairy	-8.16991	.830	608.09926	0.000	1395.88905	0.000
Rice	-41.49444	0.000	-351.06753	0.000	-19.33256	0.146
Pulses	-45.40034	0.000	4.48369	0.136	-132.11862	0.000
Meats	-503.08612	0.000	-174.70778	0.000	-600.12559	0.000
Ghee- Oil	-110.44236	0.000	6.58633	0.394	-123.19899	0.000
Fruits& Veg	-561.18578	0.000	31.55874	0.045	-168.19462	0.000
Other foods	-561.18578	0.000	31.55874	0.000	-427.65819	0.000

Table 4.5: Punjab	households' food	expenditure com	parison with	other provinces

Source: Author's own calculation

Table 4.6 shows the Sindh households' food expenditure comparison with other provinces. The Sindh households' comparisons with Khyber Pakhtunkhwa for households' food consumption expenditure the result found statistically significant for all food items. With Punjab for household food consumption expenditure the result occurs insignificant for pulses (0.136) and ghee-oil (0.394). Interestingly, the Sindh households' comparison with Balochistan for food consumption expenditure the significant result found for all food items.

Table 4.6: Sindh households' food expenditure comparison with other provinces

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Food Items	KPj		Punjal) _j	Balochis	tan _j
	M.D(i.j)_Value	P-value	M.D(i.j)_Value	P-value	M.D(i.j)_Value	P-value
Wheat Flour	-787.69475	0.000	-42.09996	0.015	-794.09948	0.000
Dairy	-616.2692	0.000	-608.09926	0.000	787.78980	0.000
Rice	309.5730	0.000	351.06753	0.000	331.73498	0.000
Pulses	-49.88403	0.000	-4.48369	0.136	-136.60231	0.000
Meats	-328.37835	0.000	174.70778	0.000	-425.41781	0.000
Ghee- Oil	-117.02869	0.000	-6.58633	0.394	-129.78533	0.000
Fruits& Veg	-592.74451	0.000	-31.55874	0.045	-199.75336	0.000
Other foods	-342.74269	0.000	605.55874	0.000	177.90846	0.000
Course on Audio						

Source: Author's own calculation

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Table 4.7 shows the Baluchistan households' food expenditure comparison with other provinces. The food items are wheat flour, dairy, rice, pulses, meats, ghee-oil, fruits-vegetables and other foods. The Baluchistan food consumption expenditure comparison with Khyber Pakhtunkhwa the result occurs statistically insignificant for wheat flour (0.856), rice (0.126) and ghee-oil (0.287). The comparisons with Punjab the result occur significant for all food items except rice (0.146). The Baluchistan comparisons with Sindh for household food consumption expenditure the result occur significant for all food items. In the table 4.7 the significant results show that both provinces households' food consumption expenditure pattern are different and insignificant result indicate that the both provinces households' expenditure for food items are same.

Table 4.7: Baluchistan households' food expenditure comparison with other provinces								
Food Items	KF) j	Pur	ijab _j	Sindh _j			
	M.D(i.j)	P-value	M.D(i.j)	P-value	M.D(i.j)_Value	P-value		
Wheat Flour	6.40473	0.809	751.99952	0.000	794.09948	0.000		
Dairy	-1404.05896	0.000	-1395.88905	0.000	-787.78980	0.000		
Rice	-22.16188	0.126	19.33256	0.146	-331.73498	0.000		
Pulses	86.71827	0.000	132.11862	0.000	136.60231	0.000		
Meats	97.03947	0.021	600.12559	0.000	425.41781	0.000		
Ghee- Oil	12.75664	0.287	123.19899	0.000	129.78533	0.000		
Fruits&	-392.99116	0.000	168.19462	0.000	199.75336	0.000		
Vegetables								
Other foods	-520.65114	0.000	427.65819	0.000	-177.90846	0.000		

Source: Author's own calculation

Conclusions And Policy Recommendation

The comparison study of household food expenditure pattern for 8 food items in Pakistan concludes that Dairy is most preferred food item consumed across the provinces of Pakistan. The household high expenditure found for wheat flour and dairy in all provinces of Pakistan except Baluchistan. The households consumed a high quantity of fruits& vegetables in all provinces. The F- test results found statistically significant for all food items. Further the study shows the households' food consumption expenditure pattern one to one comparison between the provinces of Pakistan with the help of LSD-Test. The Khyber Pakhtunkhwa comparison with Punjab for household food expenditure is significant for all food items except dairy (0.830), similar situation happens in case of Sindh while Baluchistan also have the same results with the exception of wheat flour (0.809), rice (0.126) and ghee-oil (0.287). The Punjab in comparison with Sindh is insignificant for pulses (0.136) and ghee-oil (0.394). In comparison to Baluchistan the relationship is significant for all food items except rice (0.146). Sindh and Baluchistan comparison is also significant for all food items. Looking into the existing dietary diversity in Pakistan the consumption pattern of Wheats, dairy products and fruits-vegetables has increased and the future consumption for these items will be escalating. It is therefore recommended that the production of agriculture and dairy farming must be directed towards increasing the supply of these food items. Government in this regard should ensure self-sufficient production of these product products.

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