DIETARY COMPOSITION OF QATARIS FOR IMPORTED FOOD COMMODITIES

Sadiq,M.S[1]., Singh, I.P[2]., Ahmad, M.M[3]. and Umar, S.M[4].
[1]*Department of Agricultural Economics and Extension, FUD, Dutse, Nigeria*
[2]*Department of Agricultural Economics, SKRAU, Bikaner, India*
[3]*Department of Agricultural Economics, BUK, Kano, Nigeria*
[4]*Department of Agricultural Economics and Extension, FUG, Gashua, Nigeria*
Author's correspondence address: Sadiq, Mohammed Sanusi, Department of Agricultural Economics and Extension, FUD, P.M.B. 7156, Dutse, Nigeria
Email: sadiqsanusi30@gmail.com (+2347037690123)

ABSTRACT
The present research examined the diet composition of Qataris for imported food items. Dated data that spanned for a period of 37 years (1981-2017) sourced from FAO and UNCTAD databanks were used. The data covered twenty eight imported food commodities. Both descriptive and inferential statistics were used to analyze the collected data. The empirical evidence showed dominancy of two commodities *viz.* chicken meat and rice in the average annual expenditure of the consumers, thus indicating poor diversification in the food spending. In addition, the future demand of the chicken meat would increase by almost two-fold, thus indicating the need for domestic investment in the production of poultry chicks in order to meet the increasing demand for chicken meat. Doing so would enhance the GDP of the country as continuous reliance on import could destabilize the country's economy. Furthermore, most of the commodities were normal goods; of the 28 commodities 14 were necessary goods, 9 goods were luxury while the remaining goods were inferior commodities. Thus, it can be inferred that consumers diversified their dietary composition in tandem with an increase in per capita income. The strong influence of the substitution effect due to price change as indicated by the cross-price elasticity showed that global market imperfection-price rise would have allocative inefficiency effect on the economy of the country. There is need for policymakers to strengthen the internal economic system of Qatar thereby insulating it from global food market volatility, nutritional and health threats; and, geopolitical instability. Doing this will enhance the growth and development of the country's GDP.
Keywords: Demand; Diet; Consumers; Imported foods; Qataris

INTRODUCTION
Food consumption is a primary indicator of consumers' wellbeing and a necessity for life sustenance (Liu, 2016). Due to the heterogeneity of consumers, huge disparities exist in food consumption across countries. One of the most robust and famous empirical regularities in economics is Engel's (1857) law, whereby poor countries spend a larger fraction of their income on food than do the rich. But at the same time, due to differences in culture, climate, incomes and prices, there are large disparities in food consumption across countries, especially when we consider detailed food items

In rich countries, consumers are concerned about the nutritional and health aspects of their diets, while poor countries can face food shortages and nutritional inadequacies. To sustain growth in food production, an adequate effective demand for food is required (Ahmed and Shams, 1994). The consumption parameters provide necessary information on linkages from food consumption to incentives for agricultural production, through the marketing sector. For instance, the availability of commodity-wise disaggregated food demand parameters are essential in formulating crop diversification policies and programmes.

In the mist of economist, food demand analysis always remained an important issue of discussion. In developing economies, the food demand analysis is a primary concern because it is related with food security. In terms of quality and quantity, adequate nourishment is necessary to sustain a healthy life.

In the GCC countries as well as the international sphere, consumers' demand analysis has attracted an attention. It is a timely effort for undertaking research on current specific demand elasticities estimates of Qataris. Indeed, price and income elasticities of demand would not only grow our understanding of economic behavior in the country, but can also enhance our vision for policy analysis.

At present, demand function estimation which is especially consistent with the economic theory is an attractive field of research. This advancement offers unique opportunities to researchers in analyzing food demand and related policy issues. How households adjust their consumption in response to changes in income and price is a crucial determinant of the effects of various shocks to market prices and commodity supplies. It is in view of the above that this paper aimed at providing information regarding the demand for imported food commodities in Qatar due to the fact that this country relied on import for food consumption.

RESEARCH METHODOLOGY

The research used time series data that spanned for a period of 37 years (1981-2017); and the data were obtained from FAO and UNCTAD databanks. The data covered import quantities and values of twenty eight food commodities *viz.* cereals, pulses, fruits, vegetables, spices, root and tubers, meats and related products, tea etc. The collected data were analyzed using descriptive statistics and Linear Approximates Almost Ideal Demand System (LA/AIDS) model. The nominal prices of the commodities were deflated with the consumer price index (CPI) to remove the trend.

Figure 1: Map of Qatar

Empirical Model

Following Anwarul-Huq *et al*.(2004); Awal *et al*.(2008) Babar *et al*.(2011), using the budget share form, the LA/AIDS model is given below:

$\omega_i = \alpha_i + \sum_j \gamma_{ij} \ln P_j + \beta_i \ln\left[\frac{X}{P^*}\right] + \varepsilon_i$ .... (1)

$\ln P^* = \sum_j w_j \ln P_j$ …………… (2)

$\omega_i = \alpha_i + \sum_{j=1}^{n=15} \gamma_{ij} \ln P_j + \beta_i \ln\left[\frac{X}{P^*}\right] + \varepsilon_i$…... (3)

The restrictions on the parameters of the AIDS equation (1) are:

$\sum_i \alpha_i = 1, \sum_i \beta_i = 0, \sum_j \gamma_{ij} = 0$, (*Addding – up condition*, *Engel Aggregation* …….. (4)

$\sum_j \gamma_{ij} = 0$ (*homogeneity condition*) …....... (5)

$\gamma_{ij} = \gamma_{ji}$ (*Symmetry condition*) ……….. (6)

Where, ω_i= budget share of the i[th] commodity (i.e. $\omega_i = P_i Q_i / X$); P_j= is the price of the j[th] commodity; X = total household expenditure on all the food items considered for the study; P^*= stone price index; ε_i= stochastic term, and it is assumed to be zero and has constant variance; α_i= intercept; γ_{ij} = price coefficient; and, β_i= expenditure coefficient. Blanciforti and Green (1983); Awal *et al.*(2008) stated that the model that uses Stone's geometric price index is referred to as the "Linear Approximate Almost Ideal Demand System (LA/AIDS)".

The demand elasticities are calculated as the functions of the estimated parameters and they have standard implications.

The expenditure elasticity ($\in_i$) which measures the sensitivity of demand in response to changes in consumption expenditure is specified as follow:

$\in_i = 1 + \left(\frac{\beta_i}{\omega_i}\right)$ ………. (7)

$\in_i = \frac{MBS}{ABS}$ …………. (8)

MBS and ABS means marginal budget share and average budget share, respectively.

Price elasticity is estimated in two ways *viz.* uncompensated (Marshallian) elasticity that contains both price and income effects, and the compensated (Hicksian) elasticity which contain only price effect.

The uncompensated own-price elasticity ($\in_{ii}$) and the cross-price elasticity ($\in_{ij}$) measures how a change in the price one product affects the demand of itself and that of the other products respectively, with the total expenditure and other prices being held constant i.e. *ceteris paribus*. The Marshallian own and cross-price elasticities are shown below (Babar *et al.*, 2011):

$\in_{ii} = \left(\frac{\gamma_{ii}}{\omega_i}\right) - (\beta_i + 1)$ …………….. (9)

$\in_{ij} = \left(\frac{\gamma_{ij}}{\omega_i}\right) - (\beta_i \omega_i / \omega_j)$ ………… (10)

The Hicksian own and cross-price elasticities ($\in_{ii}^*$ *and* $\in_{ij}^*$) which measures the price effects on the demand assuming the real expenditure ($X/_{P^*}$) is constant is given as follows (Babar *et al*. 2011):

$\in_{ii}^* = \left(\frac{\gamma_{ii}}{\omega_i}\right) + (\omega_i - 1)$ …………. (11)

$\in_{ij}^* = \left(\frac{\gamma_{ij}}{\omega_i}\right) + \omega_j$ ………………. (12)

Besides, the compensated price elasticity can be estimated by using $\in_i$, $\in_{ii}$ and $\in_{ij}$, and the permutation is as follow:

$\in_{ij}^* = \in_{ij} + \in_i * \omega_i$ ……………. (13)

Babar *et al*.(2011) reported that the sign of the estimated $\in_{ij}^*$ indicates the substitutability or complementarily between the destinations under consideration. A commodity pair is denoted as a complement or substitute if their compensated cross-price elasticity is negative or positive respectively.

Based on the value of expenditure elasticity, a food item is classified as a necessity/necessary commodity ($0 < \in_i < 1$), a luxury commodity ($\in_i > 1$) or a Giffen / inferior commodity ($\in_i < 0$).

In absolute term, the demand for a particular commodity is price elastic (inelastic) if the elasticity value of its own-price is larger than unity (less than unity).

The Hicksian elasticity indicates the change in demand for a commodity due to a price variation, when the real expenditure change caused by the aforementioned price variation is compensated by an expenditure variation so that satisfaction/utility is kept constant.

When the objective is to use a tax instrument to limit consumption of a certain item by raising its price to consumers, the value of the price elasticity of demand is the key (Clements and Si, 2015). Below is the formula:

$Required\ price\ increase = \frac{Required\ reduction\ in\ consumption}{Price\ elasticity}$ ……. (14)

RESULTS AND DISCUSSION

Budget Shares of Imported Food Commodities

A cursory review of the results showed chicken meat (0.222) to have the largest share in the average annual food budget expenditure then followed by rice with a budget share of 0.178 (Table 1). The budget shares of the remaining food items were marginal with vegetable having the least proportion (0.0013). Therefore, it can be suggested that the consumers in the country expended $0.22 and $0.17 on chicken meat and rice respectively, while marginal amounts were expended on the remaining food items. These indicated that consumers' spend more on these food items. Furthermore, for the average annual quantity consumed, food items with high proportional quantities are rice (72270.30MT), wheat (65557.16 MT), barley (49457.70), chicken meat (37439.43MT), onion (25438.32) and tomatoes (21975.24MT). Thus, it can be inferred that these are the major imported food items consumed in the country possibly because of their importance in the food basket of the consumers. In addition, there is a low diversification in the food spending as two food items *viz.* chicken meat and rice dominated the budgetary expenditure.

For the marginal budget share (Table 1), the results are replicates of the average budget share with chicken meat and rice having marginal budget shares of 39.7% and 18.9% respectively. The implication is that 39.7% and 18.9% of the future budget share on imported commodities would be allocated to chicken meat and rice respectively. Comparing the average budget share with marginal budget share, the marginal budget share indicates that the budget share of chicken meat would increase from 22.2% to 39.7% while that of rice would increase marginally, i.e. from 17.7% to 18.9%. Thus, the increasing budget share on chicken meat is a positive signals for domestic investment in the production of poultry chicks since continue reliance on importation will not augur well for the country's economy and also not a sustainable means of meeting the increasing demand for chicken meat.

Table 1: Average and marginal budget shares

Items	Mean	ABS	MBS	ABS%	MBS%
Barley	49457.7	0.048779	0.080549	4.877894	8.054934
Dry Beans	673.9858	0.002687	0.000403	0.268678	0.040298
Maize	11857.7	0.014088	0.001186	1.408791	0.118611
Beef	2415.946	0.038028	0.046407	3.802833	4.640683
Chicken meat (CM)	37439.43	0.221904	0.396752	22.19042	39.67517
Mutton	6478.865	0.075764	0.104637	7.576427	10.46366
FCM	5480.108	0.028335	-0.01147	2.833546	-1.14695
Potatoes	15589.81	0.017642	0.013645	1.764172	1.364532
Rice	72270.3	0.178219	0.189259	17.82186	18.9259
Spices	1944.135	0.016114	0.014335	1.611427	1.433467
SC	2190.243	0.03012	0.014408	3.012033	1.440833
Tea	1671.622	0.054995	0.055275	5.499547	5.527517
Tomatoes	21975.24	0.02808	0.037664	2.807979	3.766389
Vegetables	159.0896	0.001336	-0.00473	0.133551	-0.47285
Wheat	65557.16	0.075882	-0.01349	7.588165	-1.34853
PV	3813.297	0.018889	-0.00033	1.888911	-0.03334

Onions	25438.32	0.023189	0.011126	2.3189	1.11263
Nuts	244.2973	0.00535	1.16E-05	0.534956	0.001156
Lentils	4340.108	0.011211	0.00842	1.121114	0.842024
Limes & Lemons (LL)	3566.854	0.008733	0.004299	0.873286	0.429946
Fresh Juice (FJ)	7502.973	0.039493	0.04548	3.949252	4.548032
Garlic	2164.011	0.005699	0.007207	0.569947	0.720717
Prepared Fruit (PF)	1789.459	0.015017	0.000227	1.501745	0.022745
Fresh Fruit (FF)	2439.135	0.016033	0.006807	1.603286	0.680676
Dry Fruit (DF)	1721.576	0.012077	-0.0165	1.207743	-1.64953
R&T Flour	126.5676	0.001384	0.000418	0.138382	0.041782
Chick peas (CP)	2184.853	0.005542	0.003623	0.554236	0.362336
Cashew nuts (CN)	308.7624	0.005409	0.004371	0.540913	0.437143
Total	**-**	**1**	**1**	**100**	**100**

Source: Authors' own computation, 2020

Note: FCM, SC, PV, ABS and MBS means Fresh cow milk, Sugar confectionery, Prepared vegetables, Average budget share and Marginal budget share.

LA/AIDS Parameter Estimates of Demand Function

The empirical evidence showed the LA/AIDS model to fit the specified demand equation as it satisfied the economic, statistical and econometric criteria (Table 2). In addition, the diagnostic test statistics *viz.* test for serial correlation, Arch effect and homoscedasticity were outside the plausible region of 10% degree of freedom. The CUSUM test for parameter stability, Chow test for structural break in the data and RESET test for adequacy of the specified equation were outside the acceptable margin of 10% probability level. Furthermore, cases of spurious correlation and spurious regression were absent as evidenced from the coefficient of multiple determination and the Durbin-Watson statistics. To avoid singularity problem some equations were dropped and thereafter estimated using adding-up property. Evidences against the homogeneity and symmetry restrictions imposed by economic theory were not found, thus indicating the consistency of the estimated parameters. With these ample justifications, it can be inferred that the least square estimates are reliable for prediction with certainty and efficiency.

The coefficient of determination ranges from 0.774 to 0.994 with the former and latter being attributed to potatoes and tomatoes respectively. Thus, it implies that price and income factors determined 77.4% and 99.4% of the demand for potatoes and tomatoes respectively. It was observed that of the twenty eight food items considered only five had their intercept parameters been different from zero at 10% probability level. Thus, an indication of the presence of exogenous growth in the demand for five commodities, independent of the movement in prices and income as indicated by their respective intercept coefficients which were different from zero at 10% degree of freedom. The trend growth of chicken meat, spices and tomatoes had a negative sign, thus indicating declined exogenous growth in the demand for these commodities. However, for vegetables and wheat, the trend growth had a positive sign, implying that the exogenous growth in the budget shares of these commodities had increased. The observed decrease and increase in the consumption of these commodities may be attributed to change in taste.

Table 2: LES/AIDS parameter estimates for food items

Items	D_{Barley}	*t-stat*	$D_{Dry\ Beans}$	*t-stat*	D_{Maize}	*t-stat*	D_{Beef}	*t-stat*	D_{ChM}	*t-stat*	D_{Mutton}	*t-stat*	D_{FCM}	*t-stat*
P_{Barley}	0.05275	0.99 NS	-0.00105	0.54 NS	-0.01471	0.73 NS	-0.04415	1.28 NS	0.030675	0.40 NS	-0.03221	0.79 NS	-0.01926	0.31 NS
$P_{Dry\ Beans}$	-0.0683	1.48 NS	-0.001	0.59 NS	-0.00161	0.09 NS	-0.03632	1.22 NS	-0.02029	0.31 NS	-0.0138	0.39 NS	0.060345	1.11 NS
P_{Maize}	0.008511	0.42 NS	-3.8E-05	0.05 NS	-0.00153	0.20 NS	0.023643	1.80*	0.003371	0.12 NS	-0.01856	1.19 NS	0.008198	0.34 NS
P_{Beef}	0.065602	0.96 NS	-0.00073	0.29 NS	0.025943	1.0 NS	0.090548	2.06**	-0.13477	1.39 NS	-0.09876	1.9**	-0.01903	0.24 NS
P_{ChM}	-0.12752	1.36 NS	0.00146	0.42 NS	-0.0458	1.28 NS	0.09793	1.61 NS	0.066299	0.49 NS	0.056104	0.78 NS	0.027447	0.25 NS
P_{Mutton}	0.054023	0.57 NS	0.002602	0.76 NS	-0.00655	0.18 NS	0.00844	0.14 NS	0.218346	1.62 NS	0.012826	0.18 NS	-0.14679	1.32 NS
P_{FCM}	0.086333	1.91**	0.008148	4.92***	0.009279	0.54 NS	-0.03156	1.08 NS	-0.09794	1.52 NS	-0.05084	1.47 NS	-0.04123	0.77 NS
$P_{Potatoes}$	0.023104	0.61 NS	0.001996	1.44 NS	-0.01827	1.27 NS	-0.02386	0.97 NS	0.034403	0.64 NS	-0.0198	0.68 NS	-0.04784	1.07 NS
P_{Rice}	-0.1131	1.28 NS	-0.00471	1.46 NS	-0.00148	0.04 NS	-0.00119	0.02 NS	0.358297	2.84***	0.129706	1.92**	-0.05187	0.5 NS
P_{Spices}	-0.04371	0.60 NS	-0.00203	0.77 NS	-0.02855	1.03 NS	0.034762	0.74 NS	0.110759	1.07 NS	0.022132	0.40 NS	0.029223	0.34 NS
P_{SC}	-0.06208	0.97 NS	-0.00303	1.30 NS	0.012344	0.51 NS	0.037913	0.92 NS	-0.09811	1.08 NS	0.052921	1.08 NS	-0.06268	0.83 NS
P_{Tea}	-0.001	0.02 NS	-0.00057	0.28 NS	0.001609	0.08 NS	-0.07955	2.21**	0.053473	0.67 NS	0.003309	0.08 NS	0.049808	0.76 NS
$P_{Tomatoes}$	0.023412	0.84 NS	0.001742	1.71*	0.001435	0.14 NS	-0.02776	1.54 NS	-0.01358	0.34 NS	-0.014	0.66 NS	0.020567	0.63 NS
$P_{Vegetables}$	0.005658	0.51 NS	0.000373	0.92 NS	0.005234	1.24 NS	-0.00463	0.65 NS	-0.03003	1.9**	-0.01209	1.43 NS	0.018356	1.41 NS
P_{Wheat}	-0.0636	1.01 NS	-0.00252	1.10 NS	-0.00245	0.10 NS	0.028945	0.71 NS	0.026556	0.3 NS	0.002622	0.05 NS	0.127038	1.71*
P_{PV}	0.078342	1.20 NS	-0.00116	0.49 NS	-0.02377	0.95 NS	-0.01589	0.38 NS	0.065794	0.7 NS	0.058372	1.17 NS	-0.09466	1.23 NS
P_{Onions}	-0.03582	0.77 NS	-0.00122	0.71 NS	0.012192	0.69 NS	0.029144	0.97 NS	0.074048	1.11 NS	0.037517	1.05 NS	-0.0227	0.41 NS
P_{Nuts}	0.054379	2.19**	9.16E-05	0.10 NS	0.000964	0.1	0.030857	1.92**	-0.00506	0.14 NS	-0.05155	2.71**	0.083712	2.85**

						0^{NS}						*		*
$P_{Lentils}$	0.156094	2.1**	0.004162	1.53^{NS}	0.024866	0.88^{NS}	-0.08199	1.71*	-0.01551	0.15^{NS}	-0.07546	1.33^{NS}	-0.10057	1.15^{NS}
P_{LL}	0.00055	0.02^{NS}	-0.00247	2.92***	0.005658	0.64^{NS}	0.010233	0.68^{NS}	-0.0855	2.59**	-0.003	0.17^{NS}	0.048482	1.77*
$P_{Fresh\ Juice}$	0.134733	1.49^{NS}	0.000722	0.22^{NS}	0.024974	0.73^{NS}	-0.03575	0.61^{NS}	-0.23903	1.86*	-0.08088	1.17^{NS}	0.017851	0.17^{NS}
P_{Garlic}	0.00813	0.24^{NS}	-0.00401	3.17***	-0.01576	1.20^{NS}	-0.02962	1.32^{NS}	0.015079	0.31^{NS}	-0.03886	1.47^{NS}	0.034395	0.84^{NS}
$P_{Prepared\ Fru}$	-0.04372	0.92^{NS}	-0.00194	1.12^{NS}	-0.02442	1.35^{NS}	-0.0027	0.09^{NS}	0.194799	2.87***	0.056937	1.57^{NS}	-0.01885	0.34^{NS}
$P_{Fresh\ fruit}$	0.003318	0.18^{NS}	-0.0005	0.72^{NS}	-0.00188	0.26^{NS}	0.028313	2.33***	0.023383	0.87^{NS}	0.008083	0.56^{NS}	-0.01186	0.53^{NS}
$P_{Dry\ Fruit}$	0.058176	2.06**	-0.00084	0.82^{NS}	0.005488	0.51^{NS}	-0.00946	0.52^{NS}	-0.0644	1.6^{NS}	-0.02202	1.02^{NS}	0.032784	0.98^{NS}
$P_{R\&T\ flour}$	0.012342	0.72^{NS}	0.000352	0.56^{NS}	0.007715	1.18^{NS}	0.01002	0.91^{NS}	-0.0811	3.32***	0.001807	0.14^{NS}	0.018768	0.93^{NS}
$P_{Chick\ peas}$	-0.06445	1.02^{NS}	0.002026	0.88^{NS}	0.002802	0.12^{NS}	-0.03391	0.83^{NS}	0.063624	0.71^{NS}	0.072139	1.50^{NS}	-0.0974	1.31^{NS}
$P_{Cashew\ nuts}$	0.003589	0.06^{NS}	0.002407	1.14^{NS}	0.026486	1.21^{NS}	0.004711	0.13^{NS}	-0.11089	1.35^{NS}	-0.00087	0.02^{NS}	-0.00146	0.02^{NS}
Expenditure	0.03177	0.80^{NS}	-0.00228	1.56^{NS}	-0.0129	0.85^{NS}	0.008379	0.32^{NS}	0.174848	3.06***	0.028872	0.94^{NS}	-0.03981	0.84^{NS}
Constant	-1.47079	1.37^{NS}	0.032014	0.81^{NS}	0.270386	0.66^{NS}	0.331819	0.48^{NS}	-3.28005	2.13**	0.063672	0.08^{NS}	1.22479	0.96^{NS}
R^2	0.904		0.9798		0.893		0.918		0.936		0.971		0.906	
DW	2.6(0.3)^{NS}		2.8(0.5)^{NS}		2.6(0.4)^{NS}		2.6(0.3)^{NS}		2.3(0.05)**		2.2(0.04)**		2.9(0.8)^{NS}	
Autocorrel.	5.7(0.21)^{NS}		4.7(0.1)^{NS}		6.4(0.1)^{NS}		3.1(0.1)^{NS}		0.5(0.5)^{NS}		0.5(0.5)^{NS}		11.4(0.02)**	
Heterosced.	28.5(0.48)^{NS}		23.1(0.7)^{NS}		19.9(0.8)^{NS}		29.2(0.4)^{NS}		35.8(0.1)^{NS}		35.8(0.2)^{NS}		31.1(0.4)^{NS}	
Arch effect	0.00(0.9)^{NS}		1.2(0.7)^{NS}		0.2(0.5)^{NS}		0.3(0.5)^{NS}		1.3(0.2)^{NS}		1.3(0.2)^{NS}		1.1(0.3)^{NS}	
CUSUM test	2.7(0.3)^{NS}		4.6(0.3)^{NS}		2.3(0.5)^{NS}		2.1(0.7)^{NS}		0.9(0.3)^{NS}		0.9(0.3)^{NS}		0.6(0.6)^{NS}	
Normality	1.73(0.42)		2.2(0.3)^{NS}		0.7(0.6)^{NS}		0.6(0.7)^{NS}		2.4(0.2)^{NS}		2.5(0.3)^{NS}		3.2(0.2)^{NS}	

Source: Authors' own computation, 2020
Note: *** ** * ^{NS} $^{\&}$ ( ) means significant at 1%, 5%, 10%, non-significant and probability value, respectively

Table 2: Continued ……………………………………………….

Items	$D_{Potatoes}$	*t-stat*	D_{Rice}	*t-stat*	D_{Spices}	*t-stat*	D_{SC}	*t-stat*	D_{Tea}	*t-stat*	D_{Tomato}	*t-stat*	D_{Veg}	*t-stat*
P_{Barley}	-0.01737	1.03 ^{NS}	0.09372	1.31 ^{NS}	0.007724	2.15**	-0.00816	0.55 ^{NS}	0.021384	0.83 ^{NS}	0.019802	2.44***	0.000384	0.07 ^{NS}
$P_{Dry\ Beans}$	0.013004	0.89 ^{NS}	0.024192	0.39 ^{NS}	-0.00477	1.53 ^{NS}	0.007285	0.57 ^{NS}	-0.00358	0.16 ^{NS}	-0.03168	4.49***	0.003874	0.86 ^{NS}
P_{Maize}	0.004596	0.72 ^{NS}	-0.00861	0.32 ^{NS}	-0.00492	3.58***	0.014186	2.51***	0.005136	0.52 ^{NS}	-0.00583	1.88*	0.000359	0.18 ^{NS}
P_{Beef}	0.018711	0.87 ^{NS}	0.028904	0.32 ^{NS}	-0.00125	0.27 ^{NS}	0.002672	0.14 ^{NS}	0.03354	1.02 ^{NS}	-0.01935	1.86*	-0.00754	1.14 ^{NS}
P_{ChM}	0.004413	0.15 ^{NS}	-0.25495	2.02**	-0.01088	1.71*	0.028824	1.1 ^{NS}	0.010312	0.23 ^{NS}	-0.04713	3.28***	0.006152	0.67 ^{NS}
P_{Mutton}	0.003559	0.12 ^{NS}	0.063507	0.5 ^{NS}	-0.00038	0.06 ^{NS}	-0.00114	0.04 ^{NS}	0.048695	1.07 ^{NS}	0.001385	0.1 ^{NS}	-0.00676	0.74 ^{NS}
P_{FCM}	0.006048	0.42 ^{NS}	0.091243	1.5 ^{NS}	-0.00189	0.62 ^{NS}	0.001664	0.13 ^{NS}	0.046362	2.12**	-0.01125	1.63 ^{NS}	-0.00121	0.28 ^{NS}
$P_{Potatoes}$	-0.0058	0.49 ^{NS}	0.036155	0.71 ^{NS}	0.004154	1.62 ^{NS}	-0.00029	0.03 ^{NS}	0.035641	1.95**	0.026741	4.62***	-0.00382	1.04 ^{NS}
P_{Rice}	0.008649	0.31 ^{NS}	-0.23337	1.97**	-0.00234	0.39 ^{NS}	0.03717	1.51 ^{NS}	0.03738	0.87 ^{NS}	0.017822	1.32 ^{NS}	0.005471	0.64 ^{NS}
P_{Spices}	0.019027	0.83 ^{NS}	-0.05375	0.55 ^{NS}	-0.03675	7.48***	0.004737	0.23 ^{NS}	0.013185	0.38 ^{NS}	0.00556	0.5 ^{NS}	0.021379	3.03***
P_{SC}	0.017166	0.85 ^{NS}	-0.00247	0.03 ^{NS}	0.020144	4.66***	-0.02312	1.3 ^{NS}	-0.04297	1.39 ^{NS}	0.04859	4.98***	-0.01385	2.23**
P_{Tea}	-0.01315	0.75 ^{NS}	0.130733	1.75*	-0.0021	0.56 ^{NS}	-0.0418	2.7***	-0.06848	2.54***	0.040847	4.79***	0.006592	1.22 ^{NS}
$P_{Tomatoes}$	-0.00993	1.13 ^{NS}	0.025369	0.68 ^{NS}	0.002142	1.14 ^{NS}	-0.00718	0.93 ^{NS}	0.003456	0.26 ^{NS}	-0.01752	4.12***	-0.00198	0.73 ^{NS}
$P_{Vegetables}$	0.000237	0.07 ^{NS}	0.037739	2.55***	-0.00172	2.3**	-0.00733	2.39***	-0.0056	1.05 ^{NS}	-0.00346	2.05**	-7.8E-05	0.07 ^{NS}
P_{Wheat}	-0.00434	0.22 ^{NS}	-0.07828	0.93 ^{NS}	-0.00254	0.6 ^{NS}	-0.02678	1.53 ^{NS}	-0.03449	1.13 ^{NS}	-0.02301	2.39***	-0.00143	0.23 ^{NS}
P_{PV}	-0.0177	0.86 ^{NS}	0.055468	0.63 ^{NS}	0.014576	3.29***	-0.01153	0.63 ^{NS}	-0.00074	0.02 ^{NS}	0.032875	3.29***	-0.00763	1.2 ^{NS}

P_{Onions}	0.009434	0.64^{NS}	-0.02484	0.4^{NS}	-0.00734	2.33**	0.006416	0.5^{NS}	-0.02813	1.25^{NS}	0.009143	1.28^{NS}	-0.00233	0.51^{NS}
P_{Nuts}	-0.00755	0.96^{NS}	-0.08942	2.68***	-0.00263	1.56^{NS}	-0.00893	1.29^{NS}	-0.00492	0.41^{NS}	-0.01542	4.06***	-0.00313	1.29^{NS}
$P_{Lentils}$	-0.01961	0.84^{NS}	0.071409	0.72^{NS}	0.017525	3.49***	-0.01328	0.64^{NS}	0.001639	0.05^{NS}	0.027952	2.46***	-0.01356	1.88**
P_{LL}	-0.00089	0.12^{NS}	0.067108	2.16**	-0.00054	0.35^{NS}	-0.00414	0.64^{NS}	-0.01602	1.43^{NS}	-0.006	1.7*	4.76E-05	0.02^{NS}
$P_{Fresh\ Juice}$	-5.8E-05	0.01^{NS}	0.094109	0.78^{NS}	0.017082	2.8***	-0.00476	0.19^{NS}	-0.00646	0.15^{NS}	0.014916	1.08^{NS}	-0.01389	1.58^{NS}
P_{Garlic}	-0.01158	1.06^{NS}	0.025166	0.54^{NS}	0.002865	1.22^{NS}	-0.01467	1.53^{NS}	-0.00679	0.41^{NS}	-0.00985	1.86**	-0.00062	0.19^{NS}
$P_{Prepared\ Fruit}$	-0.00335	0.22^{NS}	-0.07963	1.25^{NS}	-0.00249	0.77^{NS}	-0.00153	0.12^{NS}	0.002323	0.1^{NS}	0.005346	0.74^{NS}	0.005899	1.28^{NS}
$P_{Fresh\ fruit}$	0.004991	0.84^{NS}	-0.02079	0.83^{NS}	-0.00154	1.22^{NS}	0.007675	1.47^{NS}	0.011374	1.25^{NS}	-0.00667	2.32***	0.001781	0.98^{NS}
$P_{Dry\ Fruit}$	-0.01391	1.56^{NS}	-0.00371	0.1^{NS}	0.002839	1.49^{NS}	-0.01397	1.78*	-0.01903	1.4^{NS}	-0.00596	1.38^{NS}	-0.00121	0.44^{NS}
$P_{R\&T\ flour}$	0.005005	0.93^{NS}	-0.00759	0.33^{NS}	0.002683	2.32***	0.002674	0.56^{NS}	-0.00624	0.75^{NS}	0.001953	0.75^{NS}	-0.00306	1.84**
$P_{Chick\ peas}$	-0.00206	0.10^{NS}	0.079581	0.94^{NS}	0.003494	0.82^{NS}	0.011755	0.67^{NS}	0.01856	0.61^{NS}	0.041376	4.3***	-0.00196	0.32^{NS}
$P_{Cashew\ nuts}$	-0.0024	0.13^{NS}	-0.06163	0.8^{NS}	0.018462	4.73***	0.010901	0.68^{NS}	-0.00695	0.25^{NS}	-0.01241	1.41^{NS}	-0.01221	2.18**
Expenditure	-0.004	0.32^{NS}	0.01104	0.21^{NS}	-0.00178	0.66^{NS}	-0.01571	1.41^{NS}	0.00028	0.01^{NS}	0.009584	1.57^{NS}	-0.00606	1.56^{NS}
Constant	0 .197533	0.58^{NS}	-0.001643	0.0^{NS}	-0.17277	2.37***	0 .40457	1.35^{NS}	-0.31539	0.61^{NS}	-0.54074	3.28***	0.328901	3.14***
R^2	0.774		0.961		0.982		0.952		0.959		0.994		0.915	
DW	2.4(0.1)^{NS}		2.8(0.6)^{NS}		2.3(0.08)*		2.8(0.6)^{NS}		2.4(0.1)^{NS}		2.8(0.5)^{NS}		2.4(0.1)^{NS}	
Autocorrel.	2.0(0.2)^{NS}		9.3(0.2)^{NS}		0.5(0.4)^{NS}		2.2(0.1)^{NS}		3.0(0.1)^{NS}		3.9(0.9)^{NS}		2.0(0.2)^{NS}	
Heterosced.	34.1(0.2)^{NS}		30.3(0.3)^{NS}		24.5(0.6)^{NS}		19.3(0.9)^{NS}		9.9(0.9)^{NS}		21.4(0.8)^{NS}		23.6(0.7)^{NS}	
Arch effect	0.2(0.6)^{NS}		0.04(0.8) NS		1.7(0.1)^{NS}		0.07(0.7)^{NS}		0.05(0.8)^{NS}		0.09(0.7)^{NS}		1.8(0.1)^{NS}	
CUSUM test	2.4(0.5)^{NS}		1.3(0.2)^{NS}		0.2(0.7)^{NS}		2.3(0.5)^{NS}		0.3(0.7)^{NS}		0.8(0.4)^{NS}		0.3(0.7)^{NS}	
Normality	1.6(0.4)^{NS}		3.4(0.1)^{NS}		2.9(0.2)^{NS}		2.4(0.2)^{NS}		0.7(0.6)^{NS}		2.3(0.3)		1.2(0.5)^{NS}	

Source: Authors' own computation, 2020

Note: *** ** * NS & ( ) means significant at 1%, 5%, 10%, non-significant and probability value, respectively

Table 2: Continued ………………………………………………….

Items	D_{Wheat}	*t-stat*	D_{PV}	*t-stat*	D_{Onions}	*t-stat*	D_{Nuts}	*t-stat*	$D_{Lentils}$	*t-stat*	D_{LL}	*t-stat*	D_{FJ}	*t-stat*
P_{Barley}	-0.07353	1.3 NS	0.013277	1.31 NS	0.012836	0.61 NS	-0.0035	0.8 NS	0.001675	0.14 NS	-0.00372	0.36 NS	-0.03474	1.02 NS
$P_{Dry\ Beans}$	0.026886	0.55 NS	-0.01082	1.23 NS	0.001063	0.06 NS	0.002163	0.57 NS	-0.00019	0.02 NS	0.00092	0.1 NS	0.074472	2.52***
P_{Maize}	0.014753	0.68 NS	-0.01585	4.09***	-0.01003	1.24 NS	-0.00096	0.57 NS	0.001055	0.23 NS	-0.00766	1.94**	0.004727	0.36 NS
P_{Beef}	0.022741	0.31 NS	0.014309	1.1 NS	-0.01903	0.7 NS	0.005347	0.95 NS	-0.01421	0.92 NS	-0.01528	1.15 NS	-0.06826	1.57 NS
P_{ChM}	0.148343	1.48 NS	-0.03192	1.78*	-0.02498	0.67 NS	0.004226	0.54 NS	0.001073	0.05 NS	0.006068	0.33 NS	0.086038	1.43 NS
P_{Mutton}	-0.17462	1.74*	-0.04229	2.35***	-0.02416	0.65 NS	-0.00459	0.59 NS	-0.00053	0.02 NS	-0.01151	0.63 NS	0.069696	1.16 NS
P_{FCM}	-0.09332	1.93**	0.007852	0.91 NS	-0.01182	0.66 NS	0.003444	0.92 NS	-0.00313	0.31 NS	-0.02023	2.3**	0.005495	0.19 NS
$P_{Potatoes}$	-0.01448	0.36 NS	0.00329	0.46 NS	-0.00247	0.16 NS	-0.00052	0.17 NS	-0.00031	0.04 NS	-0.0155	2.1**	0.001594	0.07 NS
P_{Rice}	-0.05135	0.54 NS	-0.01757	1.04 NS	-0.0119	0.34 NS	-0.01246	1.7*	0.010604	0.53 NS	-0.01101	0.64 NS	0.032107	0.57 NS
P_{Spices}	0.045889	0.59 NS	-0.031	2.24**	-0.02219	0.77 NS	0.001317	0.22 NS	-0.01304	0.79 NS	-0.02136	1.51 NS	0.003613	0.08 NS
P_{SC}	0.103105	1.51 NS	0.004864	0.4 NS	0.027687	1.09 NS	-0.00504	0.95 NS	0.008477	0.59 NS	0.014486	1.16 NS	-0.05337	1.31 NS
P_{Tea}	-0.01773	0.3 NS	0.021308	2.0 NS	-0.00154	0.07 NS	-0.00146	0.32 NS	0.002378	0.19 NS	-0.0046	0.42 NS	-0.07353	2.06**
$P_{Tomatoes}$	-0.00944	0.32 NS	0.013952	2.62***	0.005541	0.5 NS	0.000198	0.09 NS	0.001287	0.2 NS	-0.00109	0.2 NS	-0.0118	0.66 NS
$P_{Vegetables}$	-0.00481	0.41 NS	-0.00012	0.06 NS	-0.00379	0.86 NS	0.000302	0.33 NS	-0.00176	0.7 NS	4.08E-05	0.02 NS	-0.00228	0.32 NS
P_{Wheat}	0.008889	0.13 NS	0.012755	1.06 NS	-0.00033	0.01 NS	0.008045	1.54 NS	-0.01407	0.99 NS	0.016121	1.32 NS	-0.04054	1.01 NS
P_{PV}	-0.07452	1.07 NS	-0.00548	0.44 NS	0.016937	0.65 NS	-0.0032	0.59 NS	0.004319	0.29 NS	0.008153	0.64 NS	-0.03968	0.95 NS
P_{Onions}	-0.03474	0.7 NS	-0.01115	1.25 NS	-0.00826	0.4	-0.00102	0.26	0.00135	0.1	0.006729	0.74	0.022497	0.76 NS

						5^{NS}		^{NS}		3^{NS}		^{NS}		
P_{Nuts}	-0.01111	0.42^{NS}	0.002606	0.55^{NS}	-0.00852	0.86^{NS}	0.003739	1.82**	-0.00324	0.58^{NS}	0.006098	1.26^{NS}	-0.0079	0.5^{NS}
$P_{Lentils}$	-0.09837	1.24^{NS}	0.025022	1.76*	0.01148	0.39^{NS}	-4.6E-05	0.01^{NS}	0.00067	0.04^{NS}	0.004656	0.32^{NS}	0.034113	0.72^{NS}
P_{LL}	0.005167	0.21^{NS}	0.000387	0.09^{NS}	0.004346	0.47^{NS}	-0.00015	0.08^{NS}	0.002367	0.45^{NS}	-0.00014	0.03^{NS}	-0.02544	1.72*
$P_{Fresh\ Juice}$	0.011499	0.12^{NS}	0.050837	2.95***	0.01506	0.42^{NS}	0.003965	0.53^{NS}	0.005052	0.25^{NS}	0.00411	0.23^{NS}	-0.11405	1.98**
P_{Garlic}	0.027639	0.75^{NS}	0.006256	0.95^{NS}	0.004918	0.36^{NS}	-0.00322	1.13^{NS}	-0.00173	0.22^{NS}	0.003037	0.45^{NS}	-0.00624	0.28^{NS}
$P_{Prepared\ Fruit}$	-0.01739	0.34^{NS}	-0.01589	1.75*	0.001326	0.07^{NS}	-0.00145	0.37^{NS}	0.006171	0.57^{NS}	0.004388	0.47^{NS}	0.039028	1.28^{NS}
$P_{Fresh\ fruit}$	-0.02542	1.27^{NS}	-0.00617	1.72*	-0.00992	1.33^{NS}	0.001066	0.69^{NS}	-0.00216	0.51^{NS}	-0.00355	0.97^{NS}	0.003381	0.28^{NS}
$P_{Dry\ Fruit}$	0.021432	0.71^{NS}	0.000571	0.11^{NS}	0.004732	0.42^{NS}	0.000502	0.22^{NS}	-0.00319	0.5^{NS}	0.008814	1.61^{NS}	0.003274	0.18^{NS}
$P_{R\&T\ flour}$	0.011142	0.61^{NS}	-0.00468	1.43^{NS}	0.005092	0.75^{NS}	-0.00048	0.34^{NS}	0.000414	0.11^{NS}	0.005076	1.52^{NS}	0.024405	2.23**
$P_{Chick\ peas}$	-0.01549	0.23^{NS}	0.011385	0.95^{NS}	0.00416	0.17^{NS}	-0.00906	1.74*	0.007915	0.56^{NS}	-0.01051	0.86^{NS}	0.010286	0.26^{NS}
$P_{Cashew\ nuts}$	-0.0324	0.53^{NS}	0.007942	0.72^{NS}	0.019268	0.84^{NS}	0.003942	0.83^{NS}	0.007099	0.54^{NS}	0.022667	2.02**	0.051842	1.41^{NS}
Expenditure	-0.08937	2.1^{NS}	-0.01922	2.52***	-0.01206	0.76^{NS}	-0.00534	1.61^{NS}	-0.00279	0.31^{NS}	-0.00443	0.57^{NS}	0.005988	0.23^{NS}
Constant	2.74539	2.39***	0.045791	0.22^{NS}	0.225245	0.53^{NS}	0.104589	1.17^{NS}	-0.00311	0.01^{NS}	0.15387	0.73^{NS}	0.070120	0.10^{NS}
R^2	0.903		0.935		0.864		0.985		0.782		0.915		0.964	
DW	2.9(0.7)^{NS}		2.5(0.2)^{NS}		2.9(0.7)^{NS}		2.3(0.07)^{NS}		2.5(0.2)^{NS}		2.3(0.1)^{NS}		2.2(0.04)**	
Autocorrel.	6.3(0.4)^{NS}		3.0(0.1)^{NS}		12.3(0.1)^{NS}		1.9(0.2)^{NS}		5.3(0.5)^{NS}		2.0(0.2)^{NS}		0.5(0.4)^{NS}	
Heterosced.	16.8(0.9)^{NS}		22.5(0.7)^{NS}		23.6(0.7)^{NS}		22.4(0.8)^{NS}		43.8(0.3)^{NS}		15.4(0.9)^{NS}		28.8(0.4)^{NS}	
Arch effect	0.9(0.3)^{NS}		0.7(0.3)^{NS}		0.7(0.4)^{NS}		0.08(0.7)^{NS}		0.0(0.9)^{NS}		0.04(0.8)^{NS}		0.9(0.3)^{NS}	
CUSUM test	1.3(0.2)^{NS}		0.6(0.5)^{NS}		0.7(0.5)^{NS}		0.2(0.7)^{NS}		2.8(0.3)^{NS}		0.4(0.6)^{NS}		1.4(0.1)^{NS}	
Normality	2.0(0.3)^{NS}		11.3(0.00)**		3.3(0.1)^{NS}		5.3(0.06)^{N}		2.4(0.2)^{NS}		1.7(0.4)^{NS}		4.3(0.1)^{NS}	

			*				S							

Source: Authors' own computation, 2020
Note: *** ** * NS & ( ) means significant at 1%, 5%, 10%, non-significant and probability value, respectively

Table 2: Continued ……………………………………………….

Items	D_{Garlic}	t-stat	D_{PF}	t-stat	D_{FF}	t-stat	D_{DF}	t-stat	D_{RTF}	t-stat	D_{CP}	t-stat	D_{CN}	t-stat
P_{Barley}	-0.00339	0.45 NS	0.000988	0.08 NS	0.031905	1.36 NS	-0.03282	0.55 NS	-0.00128	0.48 NS	0.001084	0.13 NS	0.001706	0.27 NS
$P_{Dry\ Beans}$	-0.00322	0.5 NS	-0.0064	0.6 NS	-0.00669	0.33 NS	-0.00226	0.04 NS	-0.00088	0.38 NS	-0.00149	0.20 NS	-0.00088	0.16 NS
P_{Maize}	-0.00494	1.73*	-0.00736	1.58 NS	-0.02007	2.23**	0.023971	1.05 NS	0.001652	1.64*	-0.00319	1.00 NS	-0.00461	1.94**
P_{Beef}	-0.01324	1.38 NS	0.012298	0.79 NS	-0.00355	0.12 NS	0.102392	1.33 NS	0.008512	2.52***	-0.00994	0.93 NS	-0.00658	0.83 NS
P_{ChM}	0.004826	0.37 NS	0.005085	0.24 NS	-0.0351	0.84 NS	0.028472	0.27 NS	-0.00159	0.34 NS	3.74E-05	0.00 NS	-0.00324	0.29 NS
P_{Mutton}	0.001349	0.1 NS	-0.01343	0.62 NS	-0.01705	0.41 NS	-0.0235	0.22 NS	-0.00301	0.64 NS	-0.00356	0.24 NS	-0.00456	0.41 NS
P_{FCM}	-0.01381	2.17***	0.002844	0.27 NS	-0.01637	0.82 NS	0.129625	2.54***	0.005946	2.65***	-0.00525	0.74 NS	-0.00442	0.83 NS
$P_{Potatoes}$	-0.01225	2.3**	0.001923	0.22 NS	-0.01107	0.66 NS	0.015006	0.35 NS	0.000407	0.22 NS	-0.00273	0.46 NS	-0.00541	1.22 NS
P_{Rice}	-0.00061	0.05 NS	-4E-05	0.00 NS	-0.08059	2.06**	-0.02782	0.28 NS	-0.00551	1.26 NS	-0.00065	0.05 NS	-0.00964	0.93 NS
P_{Spices}	-0.01788	1.75*	0.011649	0.70 NS	-0.11225	3.50***	0.102315	1.25 NS	0.00462	1.28 NS	-0.0229	2.01**	-0.02475	2.91***
P_{SC}	0.0169	1.88*	-0.00291	0.20 NS	0.032027	1.13 NS	-0.03984	0.55 NS	-0.00208	0.66 NS	0.008057	0.8 NS	0.006873	0.92 NS
P_{Tea}	-0.0057	0.73 NS	0.007669	0.60 NS	0.006466	0.26 NS	-0.00944	0.15 NS	-0.00061	0.22 NS	-0.00365	0.42 NS	0.000726	0.11 NS
$P_{Tomatoes}$	-0.00189	0.48 NS	0.000638	0.10 NS	0.00914	0.74 NS	0.002724	0.09 NS	-0.00012	0.09 NS	0.00166	0.38 NS	0.003026	0.93 NS
$P_{Vegetables}$	-0.00082	0.53 NS	0.001226	0.48 NS	0.002288	0.47 NS	0.007142	0.57 NS	0.000589	1.07 NS	-0.00066	0.38 NS	-1E-05	0.01 NS
P_{Wheat}	0.007593	0.86 NS	0.008481	0.59 NS	0.037825	1.36 NS	0.004327	0.06 NS	0.003708	1.19 NS	-0.00405	0.41 NS	0.005524	0.75 NS
P_{PV}	0.010013	1.09 NS	-0.02131	1.42 NS	0.035795	1.24 NS	-0.07941	1.08 NS	-0.00428	1.32 NS	0.01064	1.04 NS	0.009694	1.27 NS

P_{Onions}	0.004582	0.7^{NS}	-0.00107	0.10^{NS}	-0.02842	1.38^{NS}	-0.00339	0.06^{NS}	0.000329	0.14^{NS}	-0.00107	0.15^{NS}	-0.00189	0.35^{NS}
P_{Nuts}	0.002108	0.6^{NS}	0.000795	0.14^{NS}	0.021101	1.92**	0.009272	0.33^{NS}	0.002107	1.71*	-0.00044	0.11^{NS}	0.002	0.69^{NS}
$P_{Lentils}$	0.008233	0.79^{NS}	-0.01366	0.80^{NS}	0.068514	2.09**	-0.056	0.67^{NS}	-0.00139	0.38^{NS}	0.013205	1.13^{NS}	0.019901	2.29**
P_{LL}	0.002319	0.71^{NS}	-0.00317	0.60^{NS}	0.009376	0.92^{NS}	-0.01065	0.41^{NS}	0.000298	0.26^{NS}	0.001598	0.44^{NS}	0.000185	0.07^{NS}
$P_{Fresh\ Juice}$	-0.00184	0.14^{NS}	0.009853	0.48^{NS}	0.054001	1.35^{NS}	0.022142	0.22^{NS}	0.003296	0.74^{NS}	0.003994	0.28^{NS}	0.008525	0.81^{NS}
P_{Garlic}	-0.00204	0.42^{NS}	0.001829	0.23^{NS}	0.028456	1.86**	-0.01404	0.36^{NS}	-0.00085	0.50^{NS}	0.000859	0.16^{NS}	0.001259	0.31^{NS}
$P_{Prepared\ Fruit}$	0.006108	0.91^{NS}	-0.01899	1.74*	-0.02221	1.06^{NS}	-0.06429	1.20^{NS}	-0.00206	0.87^{NS}	0.000353	0.05^{NS}	-0.00178	0.32^{NS}
$P_{Fresh\ fruit}$	-0.0021	0.79^{NS}	0.002662	0.62^{NS}	-0.01425	1.72*	0.015437	0.73^{NS}	0.001052	1.13^{NS}	-0.00265	0.90^{NS}	-0.00305	1.39^{NS}
$P_{Dry\ Fruit}$	0.005411	1.37^{NS}	-0.00604	0.94^{NS}	0.036065	2.89***	-0.0267	0.84^{NS}	-8.6E-05	0.06^{NS}	0.004745	1.07^{NS}	0.005696	1.72*
$P_{R\&T\ flour}$	0.003617	1.5^{NS}	-0.00221	0.56^{NS}	0.004417	0.58^{NS}	-0.01563	0.81^{NS}	-0.00077	0.91^{NS}	0.001761	0.66^{NS}	0.002509	1.25^{NS}
$P_{Chick\ peas}$	-0.00614	0.69^{NS}	0.006052	0.42^{NS}	-0.03703	1.33^{NS}	-0.04871	0.69^{NS}	-0.00678	2.17**	0.003205	0.32^{NS}	-0.00485	0.66^{NS}
$P_{Cashew\ nuts}$	0.018759	2.32**	-0.0134	1.02^{NS}	0.080877	3.18***	-0.05022	0.77^{NS}	0.000147	0.05^{NS}	0.012541	1.39^{NS}	0.013207	1.96**
Expenditure	0.001508	0.27^{NS}	-0.01479	1.62^{NS}	-0.00923	0.52^{NS}	-0.02857	0.63^{NS}	-0.00097	0.49^{NS}	-0.00192	0.31^{NS}	-0.00104	0.22^{NS}
Constant	0.016347	0.11^{NS}	0.326307	1.32^{NS}	-0.25760	0.54^{NS}	0.520633	0.43^{NS}	0.003277	0.06^{NS}	0.000621	0.00^{NS}	-0.02377	0.19^{NS}
R^2	0.916		0.927		0.961		0.885		0.961		0.847		0.943	
DW	2.3(0.08)**		2.8(0.6)^{NS}		2.2(0.05)*		2.0(0.01)**		1.9(0.01)**		2.3(0.1)^{NS}		2.1(0.04)**	
Autocorrel.	1.2(0.3)^{NS}		7.5(0.3)^{NS}		0.8(0.3)^{NS}		0.01(0.9)^{NS}		0.0(0.9)^{NS}		1.0(0.3)^{NS}		0.1(0.6)^{NS}	
Heterosced.	25.3(0.6)^{NS}		21.5(0.8)^{NS}		24.3(0.7)^{NS}		28.0(0.5)^{NS}		36.6(0.1)^{NS}		34.0(0.1)^{NS}		25.7(0.5)^{NS}	
Arch effect	1.0(0.2)^{NS}		0.9(0.3)^{NS}		0.2(0.6)^{NS}		0.9(0.3)^{NS}		1.5(0.2)^{NS}		0.6(0.4)^{NS}		0.6(0.4)^{NS}	
CUSUM test	0.9(0.4)^{NS}		1.2(0.2)^{NS}		0.4(0.6)^{NS}		0.5(0.6)^{NS}		1.8(0.1)^{NS}		0.7(0.4)^{NS}		0.08(0.9)^{NS}	

Normality	0.1(0.9) ^{NS}		0.0(0.9) ^{NS}		0.08(0.9) ^{NS}		0.1(0.9) ^{NS}		2.9(0.2) ^{NS}		1.6(0.4) ^{NS}		0.0(0.9) ^{NS}	

Source: Authors' own computation, 2020

Note: *** ** * ^{NS} & ( ) means significant at 1%, 5%, 10%, non-significant and probability value, respectively

Expenditure Elasticity

A perusal of the Table showed that of the twenty eight food commodities considered, twenty three commodities were normal goods while the remaining five commodities were non-normal goods as evidenced by the positive income elasticity for the former and the negative income elasticity for the latter (Table 3). The results showed five commodities *viz.* fresh cow milk, vegetables, wheat, prepared vegetables and dried fruits to be inferior goods as indicated by their expenditure elasticity values which were less than zero (i.e. zero elastic expenditure elasticity). The expenditure elasticity showed fourteen commodities *viz.* dry beans, maize, potatoes, spices, sugar and confectionery, onions, nuts, lentils (*dals*), lemons and limes, prepared fruits, fresh fruits, roots and tubers flour, chick peas and cashew nuts to be necessary goods i.e. necessities because their income elasticity values were less than unity (i.e. inelastic expenditure elasticity). Though, it was observed that the expenditure elasticity of nuts and prepared fruits were close to zero, thus confirming their closeness to a Giffen commodity. Nine commodities *viz.* barley, beef, chicken meat, mutton, rice, tea, tomatoes, fresh juice, garlic were observed to be luxury commodities as evident by their respective expenditure elasticity values which were greater than unity (i.e. elastic expenditure elasticity). It is expected that the luxury food group will experience a rise in the demand when the consumers' per capita income increases in tandem with the overall economic growth of the country's economy. Though, if real income of the consumers' deplete in relative terms, less expenditure will be allocated to this luxury food group. Thus, it can be inferred that as consumers' expenditures increase and consumers' diversify their diet composition, they tends to increase their consumption of non-staple foods rather than staple foods.

For most of the staple foods, their consumption is relatively less affected by income changes and it can be concluded that they have occupied a special position in the country's diets. While for the luxury and inferior foods, the consumption of these food groups are relatively highly affected by changes in the per capita income. The expenditure elasticities of luxury and necessary goods indicated that if consumers' per capita income increased, the demand for these food groups will increased: the proportional change will be more and less for the former and latter. However, for the inferior food group, the expenditure elasticity implied that if consumers' per capita income increases, the demand for this food group would decrease. Given that the supply of lentils (*dals*) is fixed; the upward shift of demand curve would lead to an increase its market equilibrium price. Since the own-price elasticity of this *dals* is inelastic, it is anticipated that the rise in the price due to the shift in the demand curve for lentils would lead to a decrease in demand for this commodity by less than the proportionate change in the price. Given a fixed supply for rice; the upward shift of the demand curve will lead to an increase in the equilibrium market price. Since the own-price elasticity of rice is elastic, it is anticipated that the increase in the price due to the shift in the demand curve of rice would results to a decrease in the demand more than the proportionate rise in the price.

Table 3: Expenditure, uncompensated and compensated own-price elasticities

Items	Expenditure	Uncompensated	Compensated	Income effect	PP(%PR)
Barley	1.651314	-0.049637	-0.130186	0.80549	503.657
Dry Beans	0.149987	-1.36957	-1.36917	0.00403	18.25386
Maize	0.084194	-1.09601	-1.09482	0.01186	22.81007
Beef	1.220323	-1.372678	-1.419085	0.46407	18.2126
CM	1.787941	-0.87608	-0.47932	3.96752	28.53634
Mutton	1.381081	-0.85959	-0.75495	1.04637	29.0837
FCM	-0.40478	-2.41532	-2.42679	0.114695	10.35059
Potatoes	0.773469	-1.3249	-1.31125	0.13645	18.86935
Rice	1.061949	-2.32053	-2.13127	1.89259	10.77342
Spices	0.889564	-3.27878	-3.26445	0.14335	7.624782
SC	0.478359	-1.75189	-1.73748	0.14408	14.27028
Tea	1.005086	-2.24554	-2.19026	0.55275	11.1332
Tomatoes	1.341317	-1.63364	-1.59597	0.37664	15.30327
Vegetables	-3.54057	-1.05212	-1.05684	0.047285	23.76164
Wheat	-0.17771	-0.79349	-0.80697	0.134853	31.50643
PV	-0.01765	-1.27105	-1.27138	0.003334	19.66877
Onions	0.479809	-1.34433	-1.3332	0.11126	18.59668
Nuts	0.002161	-0.29565	-0.29564	0.00012	84.55917
Lentils	0.75106	-0.93741	-0.92899	0.0842	26.66919
L&L	0.492331	-1.01211	-1.00781	0.04299	24.70079
FJ	1.151619	-3.89382	-3.84834	0.4548	6.420438
Garlic	1.264533	-1.35954	-1.35233	0.07207	18.38856
PF	0.015146	-2.25001	-2.24978	0.00227	11.11109
FF	0.424551	-1.87932	-1.87251	0.06807	13.3027
DF	-1.36579	-3.18205	-3.19854	0.164953	7.856581
R&T Flour	0.301933	-1.55575	-1.55534	0.00418	16.06938
CP	0.653758	-0.41981	-0.41618	0.03623	59.55113
CN	0.808158	-1.442652	-1.447024	0.04371	17.3292

Source: Authors' own computation, 2020
Note: PP and PR means Protectionist Policy and Price Rise, respectively.

Own-Price Elasticity

A cursory review of the results showed the own-price elasticity of all the commodities to have negative sloped demand curves as evident from their respect elasticity values which have negative sign, thus conforming to the economic theory on price elasticity. The estimates indicated that the consumers were quite responsive to changes in prices while adjusting their consumption of corresponding commodities. The uncompensated elasticity of demand referred to change in the demand for a particular commodity with respect to a change in the price of the respective product in the absence of any compensation in terms of either price or income change. While compensated price elasticity of demand entails income compensation for a variation in the quantity demand owing to the change in price so as to keep the consumers' utility constant. The uncompensated own-price elasticity consists of price or substitution effect and income effect while compensated own-price elasticity is concerned with only price or substitution effect. The empirical evidence showed a substantial difference between the uncompensated and compensated own-price elasticities, thus indicating the presence of a substantial effect of income (Table 3). The own-price elasticity (uncompensated and compensated) showed seven food items *viz*. dried beans, chicken meats, mutton, wheat, nuts, lentils and chick peas to be price inelastic while the remaining food items (21 commodities) were price elastic.

The estimated uncompensated own-price elasticity of demand for lentils (*dals*) shows that if the price of lentils decreased by 10%, the demand for lentils would increase by 9.37%. Of this total increase in the demand, 9.29% owed purely to price effect as evident by the compensated own-price elasticity. The income effect of the price fall accounts for the remaining 0.084% (i.e. 9.37-9.29) increase in the demand for lentils due to the increase in the per capita real income, if the absolute amount of the nominal income remains unchanged. If an increase in per capita income by 10% is accompanied by a 10% decrease in the price of lentils, the demand for lentils will increased by 7.595% (i.e. 0.084 + 7.51). The increase in the per capita income represents a shift in the demand curve of lentils that normally leads to an increase in the price of lentils.

For chicken meat, the estimated uncompensated own-price elasticity revealed that if the price of chicken meat falls by 10%, thus its demand would increase by 8.76%. Of this increase in the demand, 4.79% owed purely to substitution effect as shown by the compensated own-price elasticity. The income effect due to the decline in the price accounted for the outstanding 3.97% (i.e. 8.76-4.79) increase in chicken meat demand due to the increase in the real per capita income, given a constant nominal per capita income. If the per capita income surged by 10% and subsequently accompanied by a 10% decrease in the price of chicken meat, then the demand for this product would increase by 26.64% (i.e.8.76+17.88).This increase in the per capita income represents a shift in the demand curve for chicken meat which normally leads to an increase in the price of the chicken meat. This is not desireble for the country, where most of the people relied on external food markets, thus draining the country's foreign reserve and making the per capita income vulnerable to external shock. The empirical evidence showed the income effect to be relatively small for lentils demand and large for the chicken meat because the budget share of the former and latter in the average annual budget expenditure is small and large respectively. However, for the estimation of the resulting equilibrium levels for lentils and chicken meat, information on the supply elasticity of these commodities are required.

Furthermore, with the exception of rice, both uncompensated and compensated own-price elasticity estimates showed the income effect of price changes on the remaining food items to be small. This is so given that these food items had small proportions in the consumers' average annual expenditure, hence the reasons why their respective price changes had minimal effect on the real per capita income. For the rice, income effect due to change in price was high owing to its large share in the consumers' annual expenditure. Moreover, since fresh cow milk, vegetables, wheat, prepared vegetables, dried fruits are found to be Giffen goods; the negative income effects offset the total effects of price changes as indicated by the uncompensated elasticities.

It was observed that most of the uncompensated own price elasticities i.e. twenty food items uncompensated own-price elasticity estimates were higher than their respective compensated own-price elasticities while for the remaining eight food items the reverse is the case. For the former, it implies that that price responsiveness of these food items were income-dependent, such that, if income is not constant in the decision process, consumers tend to be less responsive to food prices. While for the latter, it implies that the price responsiveness of these food items were income-independent, such that, when income is held constant, consumers tend to be more responsive to food prices. Generally, it can be inferred that income effect is stronger than substitution effect in influencing food demand in the studied area.

Cross-Price Elasticity

The uncompensated cross-price elasticity reflect the 'gross' cross effect that encompasses both the substitution effect and the income effect while the compensated cross-price elasticity reflect the 'net' effect and include only the substitution effect i.e. the pure price effect. Positive cross-price elasticity implies that the two commodities are complements while negative cross-price elasticity shows that the two commodities are substitutes. A perusal of Table 4 showed evidence of substitutability dominance as indicated by the positive sign of uncompensated cross-price elasticities for 193 commodity pairs out of the 378 commodity pairs. Thus, it reflects that 193 commodity pairs are 'gross' substitutes while the remaining 185 commodity pairs in the matrix are 'gross' complements. For two commodities which are substitutes, it implies that the price of a commodity corresponding to the demand of its counterpart commodity tends to move in the same direction while the reverse is the case for commodity pair found to be complement. However, for the compensated cross-price elasticity, 198 commodity pairs out of 378 commodity pairs are 'net' substitutes while the remaining 180 commodity pairs are 'net' complements.

The cross-price elasticities of root & tuber flours-to-wheat are positive, indicating that the two products moved in the same direction, thus are substitutes. For instance, if the price of root & tuber flours decreases by 10%, consumers' demand for wheat would decrease by 1.49%. The pure price effect of this decline in the price of root & tuber flours would lead to a decline in wheat demand by 1.48%. Since evidence showed wheat to be an inferior commodity, the increase in real per capita income due to the fall in price (the income effect) induces the consumers to decrease their demand for wheat by 0.01% (i.e., 1.49-1.48).

For rice and barley which showed a complementary relationship, a 10% decrease in the price of rice will lead to an increase in the demand for barley by 24.35%. The effect of pure price effect due to the fall in the price of rice would lead to an increase in the demand for barley by 21.41%. The increase in the real per capita income due to the decrease in the price of rice contributed 2.94% to the consumers' demand for barley. The cross-price elasticity reflecting the effect of change in the price of rice on demand for barley shows that a 10% decrease in rice price is associated with a 10% increase in the demand for barley.

It was observed that the cross-price elasticity signs between uncompensated and compensated for some commodity pairs were contrary. For instance, the uncompensated cross-price elasticity shows the relationship of total effect of a change in the price of tea on the demand for barley to be 'gross' complement while the compensated cross-price elasticity indicates them to be 'net' substitutes. Given the relatively high income elasticity of demand for barley, a rise in the per capita real income due to the decline in the price of tea would lead to an increase in the demand for barley. The income effect in this scenario outweighs the price effect, thus an indication that the pure price effect of the fall in the price of tea would lead to a decrease in the demand for barley in the studied area. Generally, the substitution effects of price changes are very strong as evident by the cross-price elasticity estimates. Thus, global price spikes and shortages-shocks could have a repercussion on the economy of the country.

Table 4a: Uncompensated cross-price elasticity

Items	D_{Barley}	$D_{Dry\ Beans}$	D_{Maize}	D_{Beef}	D_{ChM}	D_{Mutton}	D_{FCM}	$D_{Potatoes}$	D_{Rice}	D_{Spices}	D_{SC}	D_{Tea}	D_{Tomato}	D_{Veg}
P_{Barley}	**-0.04964**	-0.35031	-0.99922	-1.17168	0.099801	-0.44379	-0.61126	-0.97362	0.522849	0.484714	-0.24556	0.388588	0.688541	0.509313
$P_{Dry\ Beans}$	-1.402	**-1.36957**	-0.11197	-0.95571	-0.09357	-0.18317	2.133424	0.737742	0.135575	-0.29598	0.243248	-0.06515	-1.12898	2.912878
P_{Maize}	0.165299	-0.00202	**-1.09601**	0.618627	0.004092	-0.25027	0.309124	0.263688	-0.0492	-0.30388	0.478316	0.093316	-0.21243	0.333077
P_{Beef}	1.320115	-0.24079	1.876348	**-1.37268**	-0.63729	-1.31798	-0.61805	1.06922	0.159827	-0.07332	0.108561	0.609682	-0.70225	-5.47182
P_{ChM}	-2.75883	0.731836	-3.04771	2.5263	**-0.87608**	0.655943	1.28036	0.300386	-1.44432	-0.65078	1.072709	0.18638	-1.75432	5.614334
P_{Mutton}	1.058167	1.032733	-0.39561	0.205247	0.924267	**-0.85959**	-5.07414	0.218878	0.351648	-0.01507	0.001723	0.885048	0.023453	-4.7189
P_{FCM}	1.751417	3.056745	0.684607	-0.83622	-0.46369	-0.68178	**-2.41532**	0.349226	0.510215	-0.114	0.070009	0.842873	-0.41035	-0.78103
$P_{Potatoes}$	0.462157	0.758003	-1.28091	-0.63132	0.141134	-0.268	-1.6634	**-1.3249**	0.201773	0.259745	-0.00037	0.647984	0.946297	-2.78052
P_{Rice}	-2.43475	-1.59983	0.058457	-0.07058	1.474221	1.644051	-1.5802	0.530619	**-2.32053**	-0.12568	1.327013	0.678784	0.573866	4.906061
P_{Spices}	-0.9065	-0.74338	-2.01148	0.910568	0.486434	0.285973	1.053945	1.082162	-0.3026	**-3.27878**	0.165665	0.23966	0.192521	16.081
P_{SC}	-1.2922	-1.10244	0.903811	0.990331	-0.46586	0.687012	-2.16961	0.97988	-0.01575	1.253404	**-1.75189**	-0.78153	1.720145	-10.2308
P_{Tea}	-0.05639	-0.16492	0.164591	-2.10411	0.197638	0.022712	1.835068	-0.73299	0.730144	-0.12442	-1.35914	**-2.24554**	1.435902	5.18526
$P_{Tomatoes}$	0.461681	0.672339	0.127562	-0.73627	-0.0833	-0.19554	0.765289	-0.55654	0.140606	0.136039	-0.22366	0.062691	**-1.63364**	-1.35448
$P_{Vegetables}$	0.115127	0.139926	0.372776	-0.12209	-0.13638	-0.16002	0.649693	0.013737	0.211672	-0.10653	-0.24272	-0.10184	-0.12368	**-1.05212**
P_{Wheat}	-1.35332	-0.87469	-0.10467	0.744419	0.059885	0.005692	4.589965	-0.22876	-0.44395	-0.14902	-0.84959	-0.62744	-0.84517	-0.72261
P_{PV}	1.593759	-0.41636	-1.67009	-0.42203	0.281613	0.763243	-3.31423	-0.99901	0.310066	0.906613	-0.37281	-0.01363	1.164309	-5.62738
P_{Onions}	-0.7494	-0.43306	0.886652	0.761254	0.31542	0.48634	-0.76847	0.540025	-0.14084	-0.45295	0.225102	-0.51168	0.317682	-1.6389
P_{Nuts}	1.111315	0.03864	0.073355	0.81024	-0.02703	-0.68249	2.961831	-0.42683	-0.50209	-0.16244	-0.29371	-0.0894	-0.55115	-2.31563

$P_{Lentils}$	3.192717	1.558668	1.775326	-2.15841	-0.07874	-1.00025	-3.53334	-1.10884	0.399986	1.088783	-0.43513	0.029744	0.991608	-10.1054
P_{LL}	0.005577	-0.91219	0.40959	0.267157	-0.39216	-0.04292	1.723265	-0.04825	0.376007	-0.03259	-0.133	-0.2914	-0.21679	0.075294
$P_{Fresh\ Juice}$	2.736394	0.270423	1.808878	-0.9488	-1.10831	-1.08262	0.68547	0.00567	0.525608	1.064397	-0.1373	-0.11773	0.517721	-10.2227
P_{Garlic}	0.162952	-1.48917	-1.1134	-0.78016	0.063461	-0.51512	1.221864	-0.65493	0.140858	0.178397	-0.48401	-0.12342	-0.35267	-0.44031
$P_{Prepared\ Fruit}$	-0.90613	-0.7097	-1.71947	-0.07421	0.866021	0.745778	-0.64406	-0.18649	-0.44772	-0.15283	-0.04307	0.042165	0.185267	4.484986
$P_{Fresh\ fruit}$	0.057575	-0.1709	-0.11875	0.740981	0.092743	0.100579	-0.396	0.286558	-0.11767	-0.09408	0.263175	0.206743	-0.24299	1.406292
$P_{Dry\ Fruit}$	1.184782	-0.30386	0.400629	-0.25131	-0.29971	-0.29522	1.173955	-0.78591	-0.02155	0.177488	-0.45738	-0.34618	-0.21644	-0.85425
$P_{R\&T\ flour}$	0.252122	0.132262	0.548907	0.263191	-0.36655	0.023328	0.66428	0.283999	-0.04266	0.166633	0.089502	-0.11343	0.069079	-2.28212
$P_{Chick\ peas}$	-1.32488	0.75881	0.203991	-0.89292	0.282351	0.950041	-3.42956	-0.11557	0.446192	0.217457	0.393152	0.337452	1.471623	-1.44453
$P_{Cashew\ nuts}$	0.070044	0.90039	1.885012	0.1227	-0.50398	-0.01352	-0.04405	-0.13476	-0.34614	1.146302	0.364743	-0.12638	-0.44397	-9.11873

Source: Authors' own computation, 2020

Note: Own-price elasticities are written in bold letter

Table 4a: Continued……………………..

Items	D_{Wheat}	D_{PV}	D_{Onions}	D_{Nuts}	$D_{Lentils}$	D_{LL}	D_{FJ}	D_{Garlic}	D_{PF}	D_{FF}	D_{DF}	D_{RTF}	D_{CP}	D_{CN}
P_{Barley}	-0.91162	0.752521	0.578908	-0.60639	0.161584	-0.40166	-0.88704	-0.60742	0.113837	2.018014	-2.60247	-0.88818	0.212456	0.324695
$P_{Dry\ Beans}$	0.357477	-0.57027	0.047221	0.406957	-0.01671	0.106713	1.885324	-0.5652	-0.42357	-0.41602	-0.18094	-0.63101	-0.26757	-0.16286
P_{Maize}	0.211018	-0.82471	-0.42526	-0.16577	0.097592	-0.87018	0.117568	-0.87011	-0.47609	-1.24355	2.018138	1.203559	-0.57049	-0.84975
P_{Beef}	0.34448	0.796247	-0.80105	1.037468	-1.25768	-1.73006	-1.73419	-2.33293	0.856366	-0.19963	8.567959	6.17785	-1.78013	-1.20994
P_{ChM}	2.216264	-1.46381	-0.96176	1.011303	0.150967	0.8075	2.144945	0.787992	0.557156	-2.0613	2.882433	-0.99048	0.083581	-0.55651
P_{Mutton}	-2.212	-2.16175	-1.00243	-0.78221	-0.02844	-1.27988	1.753303	0.216717	-0.81938	-1.01973	-1.76668	-2.12326	-0.61579	-0.82795
P_{FCM}	-1.19649	0.444535	-0.49509	0.671972	-0.27177	-2.30212	0.134854	-2.43056	0.217253	-1.00491	10.79984	4.316508	-0.93748	-0.81183
$P_{Potatoes}$	-0.16998	0.192143	-0.09747	-0.07908	-0.0235	-1.76598	0.037675	-2.15452	0.145432	-0.68034	1.284186	0.306717	-0.48556	-0.99711
P_{Rice}	-0.46682	-0.74864	-0.42049	-2.15092	0.990202	-1.17071	0.785963	-0.15445	0.172829	-4.92385	-1.88143	-3.85747	-0.05619	-1.74747
P_{Spices}	0.623726	-1.62496	-0.94862	0.262268	-1.15893	-2.43794	0.089042	-3.14157	0.791588	-6.99179	8.509707	3.350121	-4.12687	-4.57327
P_{SC}	1.394238	0.288144	1.209652	-0.91294	0.763586	1.674117	-1.35596	2.957134	-0.16399	2.01493	-3.22782	-1.48437	1.464052	1.276464
P_{Tea}	-0.16888	1.184044	-0.03765	-0.21797	0.225756	-0.49935	-1.87024	-1.0141	0.564808	0.434956	-0.65158	-0.39895	-0.6388	0.144787
$P_{Tomatoes}$	-0.09134	0.767175	0.253561	0.064994	0.121805	-0.11003	-0.30305	-0.3383	0.070105	0.586238	0.291942	-0.06726	0.309216	0.564738
$P_{Vegetables}$	-0.06182	-0.00489	-0.16287	0.057842	-0.15624	0.00535	-0.05799	-0.14488	0.082954	0.143475	0.59451	0.426638	-0.11833	-0.00163
P_{Wheat}	**-0.79349**	0.752483	0.025039	1.579487	-1.23592	1.884515	-1.03808	1.312227	0.639482	2.402902	0.5378	2.732726	-0.70446	1.035776
P_{PV}	-0.95986	**-1.27105**	0.740215	-0.57868	0.389944	0.943178	-1.00759	1.751816	-1.40062	2.243484	-6.53076	-3.08006	1.926319	1.79578
P_{Onions}	-0.43044	-0.56679	**-1.34433**	-0.1671	0.126206	0.782253	0.566146	0.797783	-0.04849	-1.75895	-0.22599	0.25408	-0.18465	-0.34405
P_{Nuts}	-0.14014	0.143402	-0.3647	**-0.29565**	-0.28776	0.700998	-0.20095	0.368462	0.058214	1.319169	0.780377	1.526114	-0.07685	0.370679

$P_{Lentils}$	-1.28313	1.336103	0.500886	0.002569	**-0.93741**	0.53885	0.862081	1.441573	-0.89884	4.2798	-4.61017	-0.99303	2.386441	3.68134
P_{LL}	0.078376	0.029386	0.191959	-0.01925	0.213259	**-1.01211**	-0.64555	0.404517	-0.20269	0.589806	-0.86087	0.221442	0.291331	0.035895
$P_{Fresh\ Juice}$	0.198044	2.731539	0.670002	0.780534	0.460455	0.490708	**-3.89382**	-0.33242	0.694964	3.390896	1.926726	2.409164	0.734288	1.583598
P_{Garlic}	0.370953	0.337001	0.215027	-0.59668	-0.1529	0.350637	-0.15887	**-1.35954**	0.127378	1.778135	-1.14911	-0.61272	0.156962	0.233811
$P_{Prepared\ Fruit}$	-0.21142	-0.82604	0.065003	-0.25537	0.554182	0.51014	0.985963	1.067759	**-2.25001**	-1.37655	-5.28752	-1.47772	0.068909	-0.32645
$P_{Fresh\ fruit}$	-0.31609	-0.31014	-0.41959	0.21523	-0.18909	-0.39884	0.08318	-0.37182	0.19303	**-1.87932**	1.316074	0.771045	-0.47293	-0.56145
$P_{Dry\ Fruit}$	0.296662	0.042498	0.210345	0.105872	-0.28175	1.015411	0.081076	0.946104	-0.39032	2.256405	**-3.18205**	-0.05335	0.860243	1.055426
$P_{R\&T\ flour}$	0.148468	-0.24641	0.220302	-0.08893	0.037272	0.581932	0.617765	0.634237	-0.14599	0.276274	-1.29047	**-1.55575**	0.31825	0.464148
$P_{Chick\ peas}$	-0.19767	0.608358	0.182291	-1.68713	0.707392	-1.2009	0.259617	-1.07853	0.408423	-2.30649	-4.0201	-4.89742	**-0.41981**	-0.8962
$P_{Cashew\ nuts}$	-0.42058	0.425932	0.833716	0.742356	0.634521	2.598378	1.311894	3.289912	-0.88705	5.047571	-4.14573	0.109931	2.2647	**-1.44265**

Source: Authors' own computation, 2020

Note: Own-price elasticities are written in bold letter

Table 4b: Compensated cross-price elasticity

Items	D_{Barley}	$D_{Dry\ Beans}$	D_{Maize}	D_{Beef}	D_{ChM}	D_{Mutton}	D_{FCM}	$D_{Potatoes}$	D_{Rice}	D_{Spices}	D_{SC}	D_{Tea}	D_{Tomato}	D_{Veg}
P_{Barley}	**-0.13019**	-0.34299	-0.99512	-1.11215	0.187015	-0.37642	-0.63101	-0.93589	0.574649	0.528105	-0.22223	0.437615	0.753969	0.336608
$P_{Dry\ Beans}$	-1.39756	**-1.36917**	-0.11174	-0.95243	-0.08877	-0.17946	2.132336	0.73982	0.138428	-0.29359	0.244533	-0.06245	-1.12538	2.903366
P_{Maize}	0.188563	9.35E-05	**-1.09482**	0.635819	0.02928	-0.23082	0.303421	0.274584	-0.03424	-0.29135	0.485055	0.107476	-0.19354	0.283198
P_{Beef}	1.382912	-0.23509	1.87955	**-1.41909**	-0.5693	-1.26546	-0.63344	1.098634	0.200211	-0.03949	0.126752	0.647904	-0.65125	-5.60646
P_{ChM}	-2.3924	0.765119	-3.02902	2.797095	**-0.47932**	0.96241	1.190539	0.472022	-1.20866	-0.45338	1.178859	0.409412	-1.45667	4.828667
P_{Mutton}	1.183277	1.044097	-0.38923	0.297704	1.059729	**-0.75495**	-5.10481	0.277479	0.432106	0.052332	0.037966	0.961197	0.125077	-4.98715

$\boldsymbol{P_{FCM}}$	1.798208	3.060995	0.686992	-0.80164	-0.41303	-0.64265	**-2.42679**	0.371142	0.540306	-0.08879	0.083564	0.871352	-0.37234	-0.88135
$\boldsymbol{P_{Potatoes}}$	0.491289	0.760649	-1.27943	-0.60979	0.172676	-0.24364	-1.67054	**-1.31125**	0.220508	0.275438	0.00807	0.665715	0.96996	-2.84298
$\boldsymbol{P_{Rice}}$	-2.14046	-1.57309	0.073462	0.146905	1.792866	1.890185	-1.65234	0.668466	**-2.13127**	0.032857	1.412265	0.857909	0.812913	4.275065
$\boldsymbol{P_{Spices}}$	-0.87989	-0.74096	-2.01012	0.930233	0.515245	0.308228	1.047423	1.094626	-0.28549	**-3.26445**	0.173373	0.255856	0.214136	16.02395
$\boldsymbol{P_{SC}}$	-1.24246	-1.09792	0.906347	1.027088	-0.412	0.728611	-2.1818	1.003178	0.016235	1.280198	**-1.73748**	-0.75126	1.760546	-10.3374
$\boldsymbol{P_{Tea}}$	0.034425	-0.15667	0.169221	-2.037	0.295967	0.098665	1.812807	-0.69045	0.788547	-0.0755	-1.33283	**-2.19026**	1.509668	4.990545
$\boldsymbol{P_{Tomatoes}}$	0.508049	0.67655	0.129926	-0.70201	-0.0331	-0.15676	0.753923	-0.53482	0.170426	0.161018	-0.21023	0.090914	**-1.59597**	-1.4539
$\boldsymbol{P_{Vegetables}}$	0.117332	0.140126	0.372888	-0.12046	-0.13399	-0.15817	0.649153	0.01477	0.21309	-0.10535	-0.24208	-0.10049	-0.12189	**-1.05684**
$\boldsymbol{P_{Wheat}}$	-1.22801	-0.86331	-0.09828	0.83702	0.195557	0.11049	4.55925	-0.17006	-0.36337	-0.08152	-0.81329	-0.55118	-0.74339	-0.99127
$\boldsymbol{P_{PV}}$	1.624951	-0.41352	-1.6685	-0.39898	0.315386	0.78933	-3.32188	-0.9844	0.330125	0.923416	-0.36377	0.005359	1.189646	-5.69426
$\boldsymbol{P_{Onions}}$	-0.71111	-0.42958	0.888605	0.789552	0.35688	0.518366	-0.77786	0.557961	-0.11621	-0.43232	0.236195	-0.48837	0.348786	-1.72101
$\boldsymbol{P_{Nuts}}$	1.120148	0.039442	0.073805	0.816768	-0.01746	-0.6751	2.959665	-0.42269	-0.49641	-0.15769	-0.29115	-0.08402	-0.54397	-2.33457
$\boldsymbol{P_{Lentils}}$	3.21123	1.56035	1.77627	-2.14473	-0.0587	-0.98477	-3.53788	-1.10017	0.411891	1.098756	-0.42976	0.041012	1.006646	-10.1451
$\boldsymbol{P_{LL}}$	0.019998	-0.91088	0.410325	0.277814	-0.37655	-0.03086	1.71973	-0.04149	0.38528	-0.02482	-0.12883	-0.28263	-0.20507	0.044375
$\boldsymbol{P_{Fresh\ Juice}}$	2.801609	0.308066	1.812203	-0.9006	-1.0377	-1.02807	0.669484	0.036216	0.567547	1.099528	-0.11841	-0.07804	0.570693	-10.3625
$\boldsymbol{P_{Garlic}}$	0.172364	-1.48832	-1.11292	-0.77321	0.073651	-0.50725	1.219557	-0.65052	0.14691	0.183467	-0.48129	-0.11769	-0.34503	-0.46049
$\boldsymbol{P_{Prepared\ Fruit}}$	-0.88133	-0.70744	-1.71821	-0.05588	0.892871	0.766518	-0.65014	-0.17487	-0.43177	-0.13947	-0.03588	0.057259	0.205411	4.431816
$\boldsymbol{P_{Fresh\ fruit}}$	0.08405	-0.1685	-0.1174	0.760546	0.121409	0.122722	-0.40249	0.298959	-0.10064	-0.07982	0.270844	0.222857	-0.22148	1.349526
$\boldsymbol{P_{Dry\ Fruit}}$	1.204725	-0.30205	0.401645	-0.23657	-0.27812	-0.27854	1.169066	-0.77657	-0.00872	0.188232	-0.45161	-0.33404	-0.20024	-0.89701

$P_{R\&T\ flour}$	0.254407	0.13247	0.549023	0.26488	-0.36408	0.025239	0.66372	0.285069	-0.04119	0.167864	0.090164	-0.11204	0.070936	-2.28702
$P_{Chick\ peas}$	-1.31572	0.759641	0.204458	-0.88616	0.29226	0.957696	-3.43181	-0.11128	0.452078	0.222387	0.395804	0.343023	1.479057	-1.46415
$P_{Cashew\ nuts}$	0.078976	0.901202	1.885467	0.129301	-0.49431	-0.00604	-0.04624	-0.13058	-0.3404	1.151114	0.367331	-0.12094	-0.43672	-9.13788

Source: Authors' own computation, 2020
Note: Own-price elasticities are written in bold letter

Table 4b: Continued ……………………………..

Items	D_{Wheat}	D_{PV}	D_{Onions}	D_{Nuts}	$D_{Lentils}$	D_{LL}	D_{FJ}	D_{Garlic}	D_{PF}	D_{FF}	D_{DF}	D_{RTF}	D_{CP}	D_{CN}
P_{Barley}	-0.92029	0.75166	0.602313	-0.60628	0.19822	-0.37764	-0.83086	-0.54573	0.114576	2.038723	-2.66909	-0.87345	0.244345	0.364116
$P_{Dry\ Beans}$	0.356999	-0.57032	0.04851	0.406963	-0.01469	0.108036	1.888418	-0.5618	-0.42353	-0.41487	-0.18461	-0.6302	-0.26581	-0.16069
P_{Maize}	0.208514	-0.82496	-0.41851	-0.16574	0.108173	-0.86324	0.133792	-0.85229	-0.47588	-1.23757	1.998897	1.207812	-0.56128	-0.83836
P_{Beef}	0.337721	0.795576	-0.7828	1.03755	-1.22912	-1.71134	-1.6904	-2.28484	0.856942	-0.18349	8.516021	6.189332	-1.75527	-1.17921
P_{ChM}	2.176829	-1.46773	-0.85529	1.011783	0.31763	0.916751	2.400494	1.068597	0.560517	-1.96709	2.579358	-0.92348	0.228652	-0.37718
P_{Mutton}	-2.22547	-2.16309	-0.96607	-0.78204	0.028463	-1.24258	1.840554	0.312523	-0.81824	-0.98756	-1.87015	-2.10039	-0.56625	-0.76672
P_{FCM}	-1.20153	0.444035	-0.4815	0.672034	-0.25049	-2.28817	0.167486	-2.39473	0.217682	-0.99288	10.76114	4.325064	-0.91895	-0.78893
$P_{Potatoes}$	-0.17312	0.191832	-0.08901	-0.07904	-0.01025	-1.7573	0.057991	-2.13221	0.145699	-0.67285	1.260091	0.312044	-0.47403	-0.98285
P_{Rice}	-0.49849	-0.75179	-0.33498	-2.15053	1.124055	-1.08297	0.991203	0.07091	0.175528	-4.84819	-2.12484	-3.80366	0.060327	-1.60344
P_{Spices}	0.620863	-1.62525	-0.94089	0.262303	-1.14683	-2.43	0.1076	-3.1212	0.791832	-6.98495	8.487698	3.354987	-4.11633	-4.56024
P_{SC}	1.388885	0.287613	1.224104	-0.91287	0.786208	1.688946	-1.32127	2.995222	-0.16353	2.027718	-3.26896	-1.47528	1.483743	1.300806
P_{Tea}	-0.17866	1.183074	-0.01126	-0.21785	0.267061	-0.47228	-1.80691	-0.94455	0.565641	0.458305	-0.72669	-0.38234	-0.60285	0.189232
$P_{Tomatoes}$	-0.09633	0.76668	0.267034	0.065055	0.142894	-0.09621	-0.27072	-0.30279	0.07053	0.598159	0.253591	-0.05878	0.327573	0.587431

$P_{Vegetables}$	-0.06205	-0.00491	-0.16222	0.057845	-0.15523	0.006008	-0.05645	-0.14319	0.082974	0.144042	0.592686	0.427041	-0.11746	-0.00055
P_{Wheat}	**-0.80697**	0.751144	0.061448	1.579651	-1.17893	1.921874	-0.9507	1.408182	0.640631	2.435117	0.434161	2.755637	-0.65485	1.0971
P_{PV}	-0.96322	**-1.27138**	0.749278	-0.57864	0.404131	0.952478	-0.98584	1.775702	-1.40033	2.251504	-6.55656	-3.07436	1.938667	1.811046
P_{Onions}	-0.43456	-0.5672	**-1.3332**	-0.16705	0.143623	0.79367	0.592851	0.827106	-0.04813	-1.74911	-0.25767	0.261081	-0.16949	-0.32531
P_{Nuts}	-0.14109	0.143307	-0.36213	**-0.29564**	-0.28375	0.703632	-0.19479	0.375226	0.058295	1.32144	0.773071	1.527729	-0.07335	0.375003
$P_{Lentils}$	-1.28512	1.335905	0.506265	0.002594	**-0.92899**	0.54437	0.874992	1.45575	-0.89867	4.284559	-4.62549	-0.98964	2.393771	3.690401
P_{LL}	0.076824	0.029231	0.196149	-0.01923	0.219818	**-1.00781**	-0.63549	0.41556	-0.20256	0.593513	-0.8728	0.224079	0.29704	0.042953
$P_{Fresh\ Juice}$	0.191026	2.730842	0.688951	0.780619	0.490116	0.510152	**-3.84834**	-0.28248	0.695563	3.407662	1.872787	2.421088	0.760106	1.615514
P_{Garlic}	0.36994	0.336901	0.217761	-0.59667	-0.14862	0.353443	-0.15231	**-1.35233**	0.127464	1.780554	-1.1569	-0.611	0.160688	0.238417
$P_{Prepared\ Fruit}$	-0.21409	-0.82631	0.072208	-0.25534	0.565461	0.517533	1.003258	1.086749	**-2.24978**	-1.37018	-5.30803	-1.47318	0.078727	-0.31431
$P_{Fresh\ fruit}$	-0.31894	-0.31043	-0.4119	0.215264	-0.17705	-0.39095	0.101644	-0.35155	0.193273	**-1.87251**	1.294177	0.775886	-0.46245	-0.54849
$P_{Dry\ Fruit}$	0.294516	0.042285	0.21614	0.105898	-0.27268	1.021357	0.094984	0.961377	-0.39014	2.261532	**-3.19854**	-0.04971	0.868139	1.065187
$P_{R\&T\ flour}$	0.148222	-0.24644	0.220966	-0.08892	0.038311	0.582614	0.619359	0.635987	-0.14596	0.276862	-1.29236	**-1.55534**	0.319155	0.465267
$P_{Chick\ peas}$	-0.19865	0.60826	0.184951	-1.68712	0.711555	-1.19818	0.265999	-1.07152	0.408507	-2.30414	-4.02767	-4.89574	**-0.41618**	-0.89172
$P_{Cashew\ nuts}$	-0.42154	0.425836	0.836312	0.742367	0.638583	2.601042	1.318123	3.296752	-0.88697	5.049867	-4.15311	0.111565	2.268236	**-1.44702**

Source: Authors' own computation, 2020

Note: Own-price elasticities are written in bold letter

CONCLUSIONS AND RECOMMENDATIONS

Based on these findings, it can be concluded that there is low diversification in food spending with two commodities *viz*. chicken meat and rice having an overwhelming influence. In addition, the budget share on chicken meat would increase by almost two-fold as evident by the average budget share vis-à-vis marginal budget share. Furthermore, it was observed that most of the commodities were normal goods. Besides, half of the commodities considered (14 goods) were necessary goods; nine food items were classified as luxury while the remaining five food items were classified as inferior good. For the own-price elasticity, income effect dominates in determining the demand for the selected food items while the substitution effect dominates based on cross-price elasticity. Therefore, any rise in price would have consequence on the internal economy *viz.* the GDP and foreign reserve depletion. Thus, the study recommends the need to enhance home grown economy so as to protect the country from global food markets, environmental threats and geopolitical instability.

REFERENCES

Ahmed, A. U. and Shams, Y.(1994).Demand elasticities in Rural Bangladesh: An Application of the AIDS Model. *The Bangladesh Development Studies*, 22(1):1-25.

Anwarul-Huq, A.S.M., Alam, S. and Sabur, S.A.(2004).Estimation of potato demand elasticities in Bangladesh. Bangladesh Journal of Agricultural Economics, XXVII (1):1-13

Awal, M.A., Sabur, S.A. and Mia, M.I.A(2008).Estimation of vegetable demand elasticities in Bangladesh: Application of Almost Ideal Demand System Model. Bangladesh Journal of Agricultural Economics, XXXI(1):35-60

Babar, A., Khalil, M., Zahid, I. and Ijaz, H.(2011).Estimating food demand elasticities in Pakistan: An Application of Almost Ideal Demand System. Forman Journal of Economic Studies, 7:1-24

Blanciforti, L. and Green, R.(1983) An Almost Ideal Demand System incorporating habits: An analysis of expenditure on food and aggregate commodity groups. Review of Economic and Statistics, 511-15

Clement, K.W. and Si, J.(2015).Price elasticities of food demand: compensated vs. uncompensated. Unpublished Manual, Business School, University of Western Australia. Pp. 5

Engel, E.(1857).Die Productions- und Consumptionsverhaltnisse des Konigreichs Sachsen.

Global Agricultural Information Network (GAIN) (2019). 2019 UAE's grain and feed annual report. GAIN Report. Pp

Liu, H.(2016).The income and price sensitivity of diets globally. An unpublished Postgraduate Research submitted to UWA Business School, The University of Western Australia.

Power, L.(2014).Scarcity and Abundance: UAE food and water security. Global Food and Water Crises Research Programme, Australia. Reprinted in Engel's Die Lebenskosten belgischer Atbeiter-Familien. Dresden, 1895.