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ESTIMATED ENGLE FUNCTIONS FOR EGGS AND CHICKEN
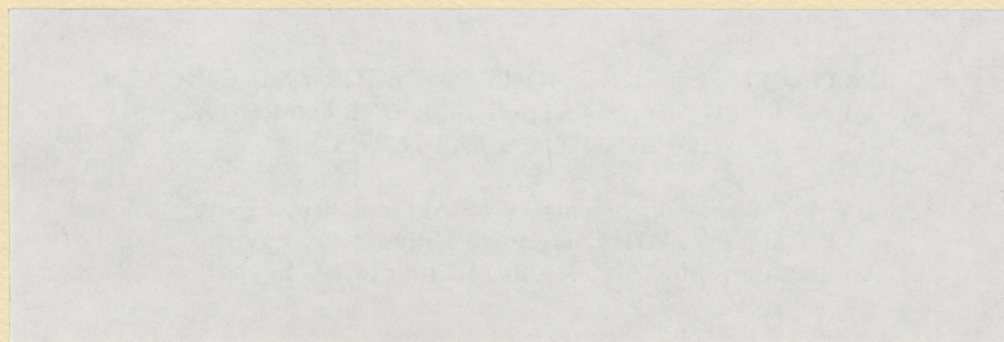MEAT IN EGYPT: TESTING FOR URBAN-RURAL
CONSUMPTION PATTERNS
by
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Introduction :

The expansion of poultry production in Egypt, has been established as a major objective of its food security policy. The output of poultry production "meat and eggs" are of high quality protein food, so essintial for humman nutrition.

Egyption consumption of all high quality protein food items currently average approximatly one - third of the amount protein required for humman nutrition.

Eggs considered as one of the leading and most important protein food, for the Egyptian popultation, as a result of its low prices, and much cheeper for consumers, specially those of low income level.

The purpose of this paper is to estimate consumtion patterns for eggs and chicken meat in urban and rural regions in Egypt.

Separate regressions were run for urbon and rural consumption, then Engle curves were estimated for each of them. The analysis of variance will applied to show if there is any significant difference between both region or not.

This paper discribed the functional forms.

The emperical results are reported next. All of the results are based on data from the familly Budget sample Survey of 1974 - 1975[1].

The Functional forms used in estimation can be expressed as :

a) $Y_i = a + BX_i$ (1)

or $Y_i = b X_i$ (2) Linear

b) $Y_i = a + b \log X_i$ Semi log

c) $\text{Log } Y_i = a + b \log X_i$ Double log

Where as in table (1 , 3)

$E\,Y_i$ = average per capita consumption per unit of eggs within the , 1 th expenditure unit (bracket).

$C\,Y_i$ = average per capita consumption per unit of chicken meat within the 1 th expenditure unit (bracket).

X_i = average per capita total expenditure within the 1 th expend unit (bracket)

While table (2 , 4)

$E\,Y_i$: per capita consumption of eggs for the 1 th houshold.

$C\,Y_i$: per capita consumption of chicken for the 1 th houshold.

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Source : Central Agency of public mobilization and Statistics (CAPMAS), "Family Budget Survey: Survey in Egypt," Cairo, 1974 / 75.

X_i = Per capita total expenditure for the 1 <u>th</u> houshold.

a & b: are paramenter to be estimated. Likelihood ratio procedures can be used to test for the proper functional form.

Empirical Results

The data from the Family Budget sample Survey 1974/ 75, were calssified into sixteen income groups (bracket .) and per capita consumption of eggs and chicken meat (for consumed unit & houshold) associated with each of these income classes were regressed on total per capita expend- iture. The data were expresed in Egyptian pounds and K.g .

<u>First</u>, consider the estimated Engle curves for eggs (table 1 & 2). For both the urban and rural sector and for all functional forms, the estimated $\hat{B}$ indicat as an incre- asing rate, and a positive expendure elasticity, which indicate that the eggs is a superior commodity and is nec- essary in Egypt for various income level, both in rural or urban regions, although rural and urban consumption patte- rns of eggs were found to be quite different.

The estimated expenditure elasticity and Durban - Watson test, was substantially larger for the rural regio than the urban region [1], indicating that rural consumers

Source : 1 - Table (1 & 2)

are much more responsive to change in expenditure with respect to eggs.

The value is about 11.06 & 15.93[1], when estimated the relation between per capita consumption and total expenditure per unit while it is about 9.77 & 17.33[1] when estimating the relation between per capita consumption and total expenditure per houshold, for urban and rural respectively. Both represent highly significant for urban - rural regions.

Second consider the estimated Engle Curves for chicken meat table (3 & 4) . For both urban and rural regions, and for all functional forms. The estimated expenditure elasticity as in table (3) is positive and E 1 , except one i in rural, is less than one / 1. These result indicated that meat chicken is a luxary both in rural and urban areas, but estimated expenditure elasticity as represent in table (4) is / 1 for urban area, indicating that value is highly significant for these parameter($\hat{B}$), The sleap in rural and urbon consumption for eggs and chicken is significant at .05 and .01 significant level.

However, with respect to estimated expenditure elasticities all of the forms produced similar results. The results

Source : 1 - Table (2 & 1)

in tables (1 , 2 , 3 & 4) indicate that eggs and chicken meat in rural and urban areas are a superior goods.

To estimate the consumption patterns of eggs and chicken meat in both urban and rural regions represent an increasing rate by about .39 tons,.02 tons &.07 tons according to the increasment of total expenditure by about L.E 1.00 L.E, and significant was at .01 significant level.[1]

R^2 [2] refers that 90% &95%, for eggs, and 99% & 84% for chicken meat of consumption change is due to the change in total expenditure.

The result is, the relationship represent a semi complementry in urban region while it is complementry in rural area.

The econmic explanation for those results is , in urban , red meat and other alternative protein food like fish, chease,......ect, are available but expensive, while in rural areas, rural flocks make eggs and chicken meat much cheaper than in urban sector.

The linear functional forms were chosen over the semi-log and doube-log forms based on the likelihood ratio test,[3] in table (6) the likelihood ratio procedure rejects all the functional forms in all cases at . . .05 significent level.

Conclusion

The implication draw from the emperical results indicated

(1) Table (3 & 4). (2)Table (3 &4) (3) Table (6).

that there is a significant increasing rate in consuming eggs and chicken meat, with respect to the change in income for both rural - urban sectors.

The absolute values of the estimated expenditure elasticity were higher in rural region than in urban, indicating that rural consumers are much more responsive to change in income (expenditure with respect to eggs and chicken meat).

Estimated expenditure elasticity indicate that eggs and chicken (meat) are a luxarity commodity for both regions in Egypt.

Table (1) : estimated Engle Curves for Eggs
1974 - 75

Model	a	B	R²	ta	tB	E	D.W
Urban							
a. Linear	-2.9928	.3917	.948	-.6127	15.9289	.77718	1.4321
	4.8844	.02450					
b. Semilogy	-331.247	81.3689	.9586	- 15.298	18.0018	1.4781	.4586
	21.6517	4.52005					
c. Double log	-3.20889	1.42834	.8189	-3.7380	7.9555	1.4282	.8189
	.66003	.17954					
Rural							
a. Linear	9.889	.4496	.897	1.9674	11.0628	.8192	1.517
	5.02876	.04064					
b. Semilog	-218.343	61.2926	.9654	-15.6032	19.7558	1.0894	1.3292
	13.9934	3.10260					
c. Double log	-.65564	1.01139	.8876	-1.5114	10.5169	1.01139	1.4121
	.43374	.696168					

Where as :

$E\ Y_i$ = average consumption unit of eggs within the l th expenditure unit (brackets) .

X_i = average per capita total expenditure per unit within the lth expenditure unit.

-Value in parentheus are approximatly consistant standard errors.

Source : Appendix (1) .

(8)

Table (2) : estimated Engle Curves for Eggs
1974 - 75

Model	a	B	R^2	ta	tB	E	D.W
Urban							
a. Linear	1.4613	.393	.956	.4278	17.3316	1.02903	1.5121
	3.41606	.022672					
b. Semi log	-209.680	58.0348	.9323	-11.5165	13.9828	1.3827	.5061
	18.2037	4.07987					
c. Double log	-2.78983	1.37376	.8439	-3.9599	8.7013	1.3738	1.2607
	0.70538	0.15788					
Rural							
a. Linear	4.9942	.4727	.872	.9883	9.7416	1.5956	1.7304
	4.44609	.04838					
b. semilog	-152.431	46.3439	.9432	-11.9557	15.2437	1.150615	.1958
	12.7518	3.04021					
c. Double log	-1.78987	1.25105	.5967	-1.55228	4.55086	1.2511	2.3734
	1.15306	.274404					

Where as

$E Y_i$ = Per capita Consumption of eggs for the ith household.

X_i = Per capita total expenditure for the ith household.

- Value in parentheis are approximately consistant standard errors.

Source : Appendix (1) .

Table (3) : Estimated Engle Curves for chicken (meat)
1974 - 1975

Model	a	B	R^2	ta	tB	E	D.W
Urban							
a.Linear	-1.06905	.03647	.9720	-3.26387	22.0410	1.24672	.6549
	.3275	.001649					
b.Semilog	-30.7529	7.38699	.9411	-12.9964	14.9539	1.712429	1.2769
	2.36626	.493985					
c.Doublelog	-5.60469	1.38794	.8581	-7.75726	9.20182	1.287	.9163
	.722509	.150833					
Rural							
a.Linear	.30659	.040199	.8955	.67521	10.951	.8783	.7682
	.45405	.0036907					
b.Semilog	-20.2815	5.52085	.9775	-20.0984	24.6755	1.23977	1.1862
	1.00911	.223738					
c.Doublelog	-3.95783	1.17164	.9219	-9.6309	12.8590	1.17164	1.3493
	.410949	.091115					

Where as :

$C Y_i$ = average per capita consumption / unit of chicken meat within the lth expenditure unit (bracket).

X_i = average per capita total expenditure / unit within the lth expenditure unit (bracket).

- Value in parentheus are approximatly consistent standard errors.

Source : Appendix (1) .

Table (4):

Model	a	B	R^2	ta	tB	E	D.W
Urban							
a.Linear	1.13671	.0196319	.8373	3.26289	8.48845	.88016	.5410
	.348376	.002313					
b.Semilog	-10.3452	3.09450	.9648	-14.6756	19.5888	.94004	1.2019
	.704954	.157973					
c.Doublelog	-3.01661	.90509	-9.177	-9.33377	12.4970	.90509	.7336
	-323193	.07242					
Rural							
a.Linear	-2.22798	.072613	.9913	-13.3637	40.0271	2.1467	2.5068
	166719	.0018141					
b.Semilog	-24.0703	6.57828	.9155	-10.7474	12.3198	2.0033	.4903
	2.23964	.53396					
c.Doublelog	-6.5677	1.74649	.9440	-13.7710	15.3599	1.7464	1.2300
	.47692	.113704					

Where as :

$C Y_i$ = Per capita consumption of chicken for the lth houshöld.

X_i = Per capita total expenditure for lth houshold.

- Value in parentheus are approximatly consestent standard errors.

Source : Appendix (1).

Table (5) : Analysis of Variance for eggs and chicken meat
1974 - 1975

Model	Eggs		Chicken	
	Table (1)	Table (2)	Table (1)	Table (2)
a. Linear	253.720	300.383	485.806	72.0534
b. Semilog	324.064	195.520	223.618	383.720
c. Doublelog	63.2900	75.7126	84.6734	156.175
Rural				
a. Linear	122.386	95.4844	119.933	160.217
b. Semilog	390.271	232.369	608.882	151.778
c. Doublelog	110.609	20.7103	165.353	235.427

Table (6) : Tests of Functional Forms Based on the
Likelihood Ratio.

Model	Eggs		Chicken meat	
	Table (1)	Table (2)	Table (1)	Table (2)
Urban				
a. Linear	62.6980	57.4117	19.4631	20.8843
b. Semilog	60.8319	60.6580	25.4115	8.63804
c. Doublelog	9.21793	8.62858	6.43019	3.84010
Rural				
a. Linear	60.1428	58.5178	21.6739	5.97228
b. Semilog	51.4500	52.0294	9.3777	24.1996
c. Doublelog	4.13235	13.5773	4.99595	.5478

تقدير منحنيات انجل لاختبار النمط الاستهلاكى الريفى والحضرى
المصرى لكل من البيض ولحــوم الدواجـــن •

دكتـور / ابراهيم صديق على   دكتـوره / وسيمة مصطفى عفيفى

كلية الزراعــه ــ جامعة المنوفيه   كلية الزراعه / جامعة المنوفيه

قسم الاقتصاد الزراعى   قسم الاقتصاد الزراعـى

الموجز

يعتبر التوسـع فى انتاج الدواجن ومنتجاتهـا فى جمهورية مصر العربية احد الاهدا ف
القوميه لتحقيق سياسـة الامن الغذائى باعتبـار لن انتاج اللحوم الداجنه والبيض
اهم السـلع البديــلة اللازمـه لتوفير البروتين الحيوانى فى الغذاء الانسانى •

يقـدر البروتين الحيوانى بحوالى ثلث البروتين اللازم للغذاء الانسانى ومن الملاحظ
ان البيض ولحوم الدواجـن تعتـبر من ارخص البروتينـات الحيوانية وبالاخـص
بعـد الارتفــاع الواضح فى سعر اللحــوم الحمـراء ((الماشيـه)) •

اشتمل هذا البحث دراسة الانماط المختلفه للاستهلاك لكل من البيض ولحـم
الدواجـن فى ريف وحضر جمهوريـة مصر العربيـــه •

اوضحت التقديرات المتحصل عليها من هذه الدراسـه الزيادة الواضحـه فى استهـلاك
كل من البيض ولحوم الدواجـن نتيجـة للزيادة فى انفاق الفرد الريفى والحضـرى
الناتـج عن زيـادة دخلة السـنوى •

كما تبين ان المرونه الانفاقيـة فى الريـف اكبر منهـا فى الحضـر ويوضـح ذلك ان التغيير
فى الدخل الريفى يؤثربصـورة واضحـة على النمـط الاستهلاكى لكل من البيـض
ولحـوم الدواجـــن كما اوضحت تقـديرات المرونه الانفاقيـه ان البيض ولحـوم
الدواجـن تعتـبر سـلع متميزة اذ انهـا من السـلع شبة الكماليـة فى الحضـر
وسـلع كماليـة فى الريـف *