



**AgEcon** SEARCH  
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search  
<http://ageconsearch.umn.edu>  
[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

CA

WP145

**AGRICULTURAL DEVELOPMENT SYSTEMS**  
**EGYPT PROJECT**

**UNIVERSITY OF CALIFORNIA, DAVIS**

UTILIZATION PATTERNS OF THE PRIMARY SUBSIDIZED  
FOOD COMMODITIES IN EGYPT

by

Sobhy Ismail, Dyaa K. Abdou

Zagazig University, Egypt

B. Delworth Gardner

University of California, Davis

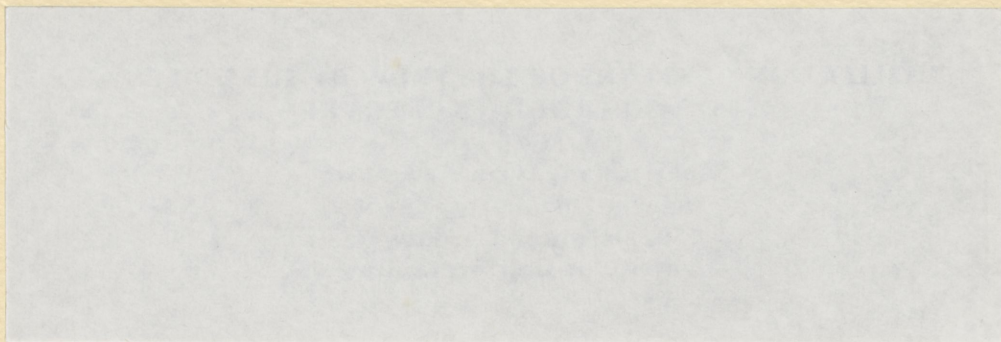
GIANNINI FOUNDATION OF  
AGRICULTURAL ECONOMICS  
LIBRARY

AUG 24 1983

*Econ.*  
**WORKING PAPER**

**US / EGYPT** 





**UTILIZATION PATTERNS OF THE PRIMARY SUBSIDIZED  
FOOD COMMODITIES IN EGYPT**

by

**Sobhy Ismail, Dyaa K. Abdou  
Zagazig University, Egypt  
B. Delworth Gardner  
University of California, Davis**

Assistance from the Agricultural Development Systems Project of the University of California, Egyptian Ministry of Agriculture, and USAID, is gratefully acknowledged, but the author is solely responsible for the views expressed in this paper.

Economics  
Working Paper Series  
No. 145

Note: The Research Reports of the Agricultural Development Systems: Egypt Project, University of California, Davis, are preliminary materials circulated to invite discussion and critical comment. These papers may be freely circulated but to protect their tentative character, they are not to be quoted without the permission of the author(s).

May, 1983

Agricultural Development Systems:  
Egypt Project  
University of California  
Davis, Ca 95616

Utilization Patterns of the Primary  
Subsidized Food Commodities in Egypt

by

Sobhy Ismail, Dyaa K. Abdou, B. Delworth Gardner \*

\* The authors wish to thank Mr. Imam El-Gamasy, Mr. Morad Mousa, and Mr. Ali Farghali from the Ministry of Agriculture, Egypt, for their help in conducting the survey used for this study.

## Introduction

Heavy subsidies to consumers of basic food items is an important feature of Egypt's economy. A subsidy exists when the price to consumers is fixed below the costs of supplying the commodity. Subsidies have become a substantial and growing fraction of the government budget and absorb much of the time and energy of public officials. The subsidy policy is highly controversial since it has significant allocation and equity effects. It severely distorts price signals to consumers since the subsidized prices understate the true opportunity costs of supplying consumers. This causes resource misallocation as consumers increase consumption levels beyond the level where the marginal value of the commodity equals the real marginal supply costs. In addition, because subsidies put such pressure on the government budget, a tendency exists to reduce procurement costs by fixing producer prices at levels far below world market prices. This policy is usually accompanied by government-imposed cropping patterns and mandatory delivery quotas, all of which misallocate resources within the agricultural sector and create a staggering food security problem for the country as the consumption-production gap is filled by imports.

Defenders of the subsidy policy believe it to be necessary to make sure that the population is well-fed at affordable prices. Subsidized commodities tend to be more evenly distributed among income classes in both urban and rural areas<sup>1</sup> than do unsubsidized commodities, and thus it is argued that the subsidies result in a more equalitarian income distribution.

---

<sup>1</sup>See Ismail, Sobhy, B. Delworth Gardner, and Dyaa Abdou, "The Distribution of Food Consumption in Relation to Price and Distribution Policies in the Urban and Rural Areas of Egypt", Working Paper No. \_\_\_\_, ADS California-Egypt Project, Cairo.

A question about which there is much speculation and debate and which is the principal motivation for this paper and underlying study is: do the subsidized commodities get to the intended recipients and is there some degree of "waste" and unintended use? That is to say, does the subsidy policy provide incentives for diverting a significant quantity of food from actual human ingestion. If there is a high degree of waste and unintended use in this sense it would only corroborate the allegations of inefficiency. When we use the term "unintended use" we mean that the use was not a purpose of the government policy. In the minds of the consumer these uses may well have been quite rational given the price distortions caused by the subsidies. Since the question is essentially an empirical one, what is needed to resolve it are some facts about actual utilization patterns.

The study consists of an analysis of a survey taken from rural and urban households in which data were acquired on eight subsidized commodities: wheat, native (balady) flour, fine flour, native (balady) bread, Fino bread, rice, beans, and sugar. The objectives of the study were to analyze sources of supply and utilization patterns of these food items, determine significant economic and social factors affecting these patterns, and draw policy implications.

A random sample of households was drawn from one rural and two urban locations. Eighty families were interviewed from the Hefna village, Belbais district, Sharkia governorate, representing rural areas. Fifty families were randomly selected from Zagazig City, Sharkia governorate, and eighty families from El-Sayeda Zaynab district, Cairo governorate, representing urban areas. Caution must be exercised in interpreting the results. To some extent consumption patterns will vary among rural and among urban regions of the country, principally because tastes, prices, incomes and supply availabilities

differ. The regions sampled cannot represent adequately this whole-country variation. Still, we believe the results are valid as representing the areas studied and in showing rural-urban and income-class differences.

The paper will discuss sources and utilization patterns of each of the commodities in turn, after which conclusions and policy implications will be presented.

Appendix Tables A and B report t-values which were computed on the differences between means to determine if they are significantly different from zero. They shall be discussed as appropriate in the commodity sections.

#### Wheat

As a whole grain, as distinguished from purchased flour and bread, wheat is utilized much more extensively in rural than in urban areas (Table 1). In fact, it is of minor importance to urban families in the sampled areas as it is consumed by only 6 percent of the urban population. On the other hand, it is consumed by virtually all of the rural population sampled and usually it is ground into flour and utilized in making bread. Per capita utilization is about 160 kg. in rural areas, whereas of those consuming wheat at all it is only about 19 kg. per capita in urban areas.

Utilized wheat was largely home-produced (70 percent) by rural families with incomes greater than L.E. 1,000 (high income class). To be self-sufficient in meeting consumption needs from house production is a value highly prized in Egyptian rural society. In contrast most wheat was purchased in the free market (67 percent) by those in the low income class (under L.E. 1,000) (Table 3). It is interesting that the high income class, which produced the bulk of its own wheat, actually consumed less per capita than the low income class which purchased the bulk of its in the free market. This



Table 1: Percent of Consumers Utilizing Commodities and Per Capita Consumption by Income Class in Rural and Urban Areas<sup>1</sup>, A.R.E., 1981

Commodities	Area	Income Group > L.E. 1,000 Family/Year		Income Group < L.E. 1,000 Family/Year		Average	
		Percent of Individuals Consuming	Kg. Per-Capita	Percent of Individuals Consuming	Kg. Per-Capita	Percent of Individual Consuming	Kg. Per-Capita
Wheat	Rural	100.00	154.68	98.96	168.12	99.59	159.96
	Urban	8.43	21.72	3.96	11.04	6.34	18.60
	Average	50.32	142.56	40.81	158.76	46.15	148.92
Balady Flour	Rural	16.90	116.28	36.98	135.72	24.90	127.80
	Urban	15.70	5.28	14.52	11.16	15.15	7.92
	Average	16.25	58.08	23.23	88.08	19.31	73.92
Excellent Flour	Rural	15.86	39.24	10.42	52.20	13.69	43.20
	Urban	25.00	10.80	23.10	10.68	24.11	10.68
	Average	20.82	20.64	18.19	19.92	19.66	20.40
Balady Bread	Rural	62.07	125.04 <sup>1</sup>	60.42	97.68 <sup>1</sup>	61.41	114.24 <sup>1</sup>
	Urban	99.42	863.28 <sup>1</sup>	100.00	1076.4 <sup>1</sup>	99.69	963.48 <sup>1</sup>
	Average	82.33	608.76 <sup>1</sup>	84.65	805.44 <sup>1</sup>	83.35	696.36
Fino Bread	Rural	34.14	46.68 <sup>1</sup>	26.56	69.36 <sup>1</sup>	31.12	54.36 <sup>1</sup>
	Urban	76.74	314.76 <sup>1</sup>	68.98	336.36 <sup>1</sup>	73.11	324.36 <sup>1</sup>
	Average	57.26	241.68	52.53	284.04 <sup>1</sup>	55.19	259.32 <sup>1</sup>
Rice	Rural	95.52	46.32	97.92	38.76	96.47	43.32
	Urban	97.97	32.16	100.00	30.60	98.92	31.44
	Average	96.85	38.52	99.19	33.72	97.87	36.36
Beans	Rural	90.00	17.88	73.44	8.40	83.40	11.88
	Urban	39.83	6.00	33.66	4.44	36.94	5.40
	Average	62.78	11.16	49.09	6.72	56.78	9.48
Sugar	Rural	100.00	25.08	100.00	21.84	100.00	23.76
	Urban	100.00	26.88	100.00	26.88	100.00	26.88
	Average	100.00	26.04	100.00	24.84	100.00	25.56

<sup>1</sup> Measured in number of loaves rather than kilograms.

finding would give support to the view that very active free markets exist in the rural areas where commodities may be traded to accommodate individual family tastes and acquisition constraints.

In urban areas the situation was reversed, the high income class purchased the bulk of its more limited utilization in the free market (65 percent) whereas the low income group produced the bulk of its wheat (64 percent). High income families in urban areas consumed almost twice as much wheat as low income families (Table 1) although consumption was small in both cases. The weighted average of rural and urban consumption, of course, was dominated by rural consumption, and across income classes the average of home-produced and market-purchased wheat was fairly even (53 to 45 percent in Table 3).

The survey required the family to estimate the quantities of wheat going to three uses annually, 1) for human use, and 2) for animal use and otherwise unaccounted for, and 3) for wages paid in kind and offered as gifts (Table 2). The study indicates that in rural area on average among income classes about 7 percent was utilized for poultry and animal feeding and was otherwise unaccounted for (lost to rodents, insects, special, spoiled, etc.) and about 6 percent went to wages-in-kind and gifts. About 87 percent was milled by the rural family and utilized for bread making and other consumption purposes (Table 2). Since there is special interest in the quantities of commodities fed to animals, roughly 73 kg. of wheat are annually fed to poultry and livestock by the typical sampled rural family. There are no significant differences among rural income classes in utilization patterns (Appendix Table 13).

In urban areas, much of the small quantity of wheat consumed goes into making sweets and desserts, since subsidized flour and bread are easily accessible. Some sampling problems are suspected, however, since urban use is

Table 2: Average Annual Per Capita and Per Family Utilization of Wheat  
and Urban Areas by Level of Income, A.R.E., 1981

Area	Income Group $\geq$ L.E. 1,000 Annually					Income Group < L.E. 1,000 Annually					Average				
	Average Consumption (Kg)		Utilization Percent			Average Consumption (Kg)		Utilization Percent			Average Consumption (Kg)		Utilization Percent		
	Family	Individual	Milled for Family Use	For Animal Use	(1) Others	Family	Individual	Milled for Family Use	For Animal Use	(1) Others	Family	Individual	Milled for Family Use	For Animal Use	Others
Rural	1043.04	154.68	85.71	7.03	7.26	863.4	166.44	88.46	7.01	4.53	960.0	159.36	86.85	7.02	6.13
Urban	9.24	1.8	57.14	28.57	14.29	2.16	0.48	54.00	0.00	45.45	5.88	1.20	56.69	23.62	19.69
Average	409.8	71.76	85.31	7.33	7.36	324.0	64.80	88.32	6.98	4.69	369.36	68.64	86.56	7.18	6.26

(1) Wages in Kind and Gifts

Table 3: Wheat-Sources of Acquisition (Percent) by Sampled Families for Two Income Classes in Rural and Urban Areas in A.R.E., 1981

Zone	Income $\geq$ L.E. 1,000 Per Year				Income < L.E. 1,000 Per Year				Average			
	Percent Family Produced	Percent Rationing System	Percent Cooperatives	Percent Free Market	Percent Family Produced	Percent Rationing System	Percent Cooperatives	Percent Free Market	Percent Family Produced	Percent Rationing System	Percent Cooperatives	Percent Free Market
Rural	69.96	-	-	28.04	28.37	-	-	67.41	52.66	-	-	44.41
Urban	35.24	-	-	64.76	63.64	-	-	36.36	40.16	-	-	59.84
Weighted Average	69.47	-	-	28.55	28.51	-	-	67.28	52.53	-	-	44.57



so radically different from rural use for each income class. Of those who consume wheat in urban areas, the families in the low income class appear to utilize most of their wheat for milling and for "other" uses and none for livestock feeding, whereas the high income class utilizes about the same percentage for milling but much more for livestock feeding (29 percent). Of course, even 29 percent of the per family utilization of only 9 kg. per year is only 2.6 kg. per family per year fed to livestock. It must be emphasized that this figure applies only to the 6 percent of urban families who consume wheat as a whole grain.

#### Flour:

The study analyzed all major kinds of flour used in households: wheat and corn flours, balady (high fiber) as well as excellent (low fiber) flours. The previously observed utilization patterns of wheat in rural households in Egypt indicated that use of home-produced wheat and corn flour in baking bread. This recent patterns of market purchases appear to have been the result of the availability of subsidized low-priced flours in the rural markets. However, this is not the dominant pattern. The study shows that only 25 percent of rural households sampled purchased balady flour from the market (Table 1). This percentage is higher for the low income group than the high income group (37 percent against only 17 percent) although the difference is not statistically significant. The percentage of sampled households using fine flours in urban and rural areas is about 24 percent and 14 percent, respectively. However, for those using fine flour, per capita consumption in rural areas is higher than urban areas.

Utilized flours were largely home produced in rural areas and market purchased in urban areas (Table 4). On average, about half of the utilized

Table 4: Flours: Sources of Acquisition (Percent) by Sampled Families for Two Annual Income Classes in Rural and Urban Areas in A.R.E., 1981

Area	Income Group $\geq$ L.E. 1,000				Income Group $<$ L.E. 1,000				Average			
	Purchased		Home-Produced		Purchased		Home-Produced		Purchased		Home-Produced	
	Fine Wheat Flour %	Balady Wheat Flour %	Wheat Flour %	Corn Flour %	Fine Wheat Flour %	Balady Wheat Flour %	Wheat Flour %	Corn Flour %	Fine Wheat Flour %	Balady Wheat Flour %	Wheat Flour %	Corn Flour %
Rural	3.02	9.52	54.06	33.40	2.25	20.75	48.65	28.36	2.68	14.42	51.70	31.20
Urban	67.54	21.05	3.51	7.89	52.65	34.61	4.25	8.49	59.98	27.94	3.88	8.20
Average	4.46	9.78	52.93	32.83	3.74	21.16	47.34	27.77	4.14	14.77	50.48	30.61

flour was from milling home-produced wheat, while home-produced corn flour ranked second in importance (about 31 percent). Purchased balady flour and fine flour represent about 15 percent and 4 percent of total utilized flours, respectively. This pattern exists also for both high and low income groups. However, this pattern differs between urban and rural areas. In rural areas home-produced wheat and corn milled flours represent about 52 percent and 31 percent of total used flours, respectively. In urban areas purchased fine and balady flours are much more important than home-produced flours.

On the average for rural and urban areas the utilization of flours for bread baking dominated that for other uses such as sweets, candies, etc., (about 95 percent to only 5 percent). However, the pattern is significantly different in rural and urban areas. In rural areas, the bulk of the flours consumed goes to bread making, while only 3 percent goes to other uses. The reverse is true in urban areas where over 88 percent is used for purposes other than bread (Table 5). There do not appear to be significant differences between income classes in either rural or urban areas. Of course, it is quite apparent that a great difference exists between the per family and per capita quantities consumed in both rural and urban areas. Generally, it appears that most of the few kilos of flour consumed per head in urban areas are used for making sweets, cakes, candies, etc. These results would suggest an hypothesis: subsidized bread is available to the sampled urban families at lower real costs than bread can be made with subsidized flour. In rural areas this does not appear to be true. Let us now look at the sample results for bread to see if they are consistent with this hypothesis.

Table 5: Average Annual Per Capita and Per Family Utilization of  
Flours in Rural and Urban Areas by Level of Annual Income, A.R.E., 1981

Area	Income Group $\geq$ L.E. 1,000				Income Group < L.E. 1,000				Average			
	Average Consumption (Kg)		Utilization Percent		Average Consumption (Kg)		Utilization Percent		Average Consumption (Kg)		Utilization Percent	
	Family	Individual	Bread	Others	Family	Individual	Bread	Others	Family	Individual	Bread	Others
Rural	1411.08	209.28	97.13	2.87	1239.72	238.92	97.34	2.66	1331.88	221.04	97.22	2.78
Urban	20.28	3.96	12.17	87.83	25.68	5.28	11.32	88.68	22.80	4.56	11.72	88.28
Average	559.08	97.92	95.24	4.76	479.40	95.88	94.46	5.54	521.52	96.96	94.90	5.10



Bread:

Purchased balady bread is used by virtually all sampled urban families (Table 1). For the sampled rural areas, this percentage is about 61 percent, and is growing through time as subsidized bread is increasingly available in rural areas. Given the subsidized price of L.E. 0.01 per loaf, it is cheaper to buy bread from the market either for human use or poultry and livestock feeding than it is to make it at home. Because subsidized bread is not always available in rural areas, however, they continue to depend on mostly imported flour requiring foreign exchange for commercial purchases in international markets.

Fino bread (made with low fiber flour) is used more extensively in urban areas (Table 1). About 73 percent of the families sampled in urban areas use fino bread. Only 31 percent of the families sampled in rural areas consume this type of bread. A greater percentage of the high income group in rural areas uses purchased balady and fino bread but the differences are not statistically significant. In the higher income class in urban areas a greater percentage of families sampled use fino bread, while the quantity of balady bread used is greater for low than high income families (Table 1).

Due to relative price discrepancies between subsidized food and nonsubsidized feed prices, the survey results suggest that some cheap bread is being fed to poultry and livestock (Table 6). Also, due to the very low prices, there is little incentive to prevent waste at eating times or to efficiently store supplies between eating times.

About 94 percent of the utilize balady bread was used for human consumption, while 6 percent was used for poultry and livestock feeding, and otherwise, wasted (Table 6). Generally, about 97 percent of fino bread was

Table 6: Average Annual Per Capita and Per Family Utilization of Balady Bread  
by Levels of Annual Income in Rural and Urban Areas, A.R.E., 1981

Area	Income Group $\geq$ L.E. 1,000				Income Group $<$ L.E. 1,000				Average			
	Average Consumption (Loaves)		Utilization Percent		Average Consumption (Loaves)		Utilization Percent		Average Consumption (Loaves)		Utilization Percent	
	Family	Individual	Human Use	Livestock, Poultry, Other	Family	Individual	Human Use	Livestock, Poultry, Other	Family	Individual	Human Use	Livestock, Poultry, Other
Rural	523.2	77.6	99.15	0.85	306.1	59.0	97.8	2.22	422.9	70.20	98.7	1.31
Urban	4342.1	858.4	90.58	9.42	5260.7	1076.4	96.4	3.6	4780.2	960.48	93.6	6.36
Average	2862.7	501.2	91.19	8.81	3408.9	681.8	96.4	3.5	3120.2	580.3	93.9	6.10

utilized for human use and the rest for these other unintended uses (Table 7). The portion of bread utilized for unintended uses seems to increase slightly as income increases. For balady bread, about 9 percent and 3 percent were directed toward other than direct human consumption uses for high and low income sampled families, respectively. About 5 percent and 0.5 percent from utilized fino bread were directed to unintended uses for high and low income groups, respectively.

The differences in the per capita utilization patterns for the balady and fino bread are statistically significant between urban and rural areas for each income class (Appendix A). Also, utilization patterns for bread are significantly different between high and low income classes in urban areas only.

#### Rice:

The percentages of families surveyed which consume rice vary from about 96 percent for high income rural to all 100 percent for low income urban (Table 1). Major sources of acquisitions for rice are family production, rationing book, government retail cooperative shops, and the free market. Quality and prices of rice acquired from these sources differ greatly. Surprisingly to us, the greatest portion of the utilized rice for all the families sampled (about 39 percent) were purchased in the free market. Rice quantities obtained from rationing books, cooperatives, and family production represents about 23 percent, 22 percent, and 16 percent, respectively of total utilized rice.

Rice obtained through the rationing book represents 43 percent of the rice consumed by families sampled in urban areas. In rural area, however, rationing book rice acquisition represents only 2.6 percent of the utilized rice. Rice purchased in the free market represents over 60 percent of the utilized rice for

Table 7: Average Annual Per Capita and Per Family Utilization of Fino Bread by Level of Annual Income in Rural and Urban Areas, A.R.E., 1981

Area	Income Group $\geq$ L.E. 1,000				Income Group $<$ L.E. 1,000				Average			
	Average Consumption (Loaves)		Utilization Percent		Average Consumption (Loaves)		Utilization Percent		Average Consumption (Loaves)		Utilization Percent	
	Family	Individual	Human Use	Livestock, Poultry, Other	Family	Individual	Human Use	Livestock, Poultry, Other	Family	Individual	Human Use	Livestock, Poultry, Other
Rural	107.4	15.9	100.00	0.00	95.6	18.5	100.00	0.00	102.0	16.9	100.00	0.00
Urban	1222.2	241.6	94.48	5.52	1133.8	231.9	99.49	0.51	1180.1	237.1	96.78	3.22
Average	790.3	138.4	94.77	5.23	745.8	149.2	99.51	0.49	769.3	143.2	96.94	3.06



families sampled in rural areas. These statistically significant differences between the acquisition patterns of rice in rural and urban areas probably are attributable to the government policy terminating the rationing book quota for the rural population-especially in rice producing areas. Per capita acquisition from government retail cooperative shops, however, does not differ significantly between rural and urban areas. Also, the analysis indicated that per capita acquisition of rice from family production differs significantly between rural and urban areas for the high income group only (Appendix B).

The utilization of rice as human use, poultry feeding (before or after cooking), and waste, were about 7 percent for poultry feeding or wasted, and about 93 percent for human consumption (Table 9). The proportion used for all unintended uses is higher in rural than urban areas (about 10 percent compared to only 5 percent). Also, it is interesting that this percentage for unintended uses increases for high income group families. The study indicated that the per capita rice consumption in rural and urban areas may reach as much as about 42 kg. and 31 kg., respectively. Although the differences between per capita utilization of rice for the above mentioned unintended use in rural and urban areas are statistically insignificant (Appendix A), the differences between rural and urban areas for per capita human consumption are statistically significant.

#### Broadbeans:

The survey questions pertain to raw beans rather than cooked beans (foall) or bean-cake which is ready-made (tamia) since it was believed that ready-to-eat bean products would not be so easily diverted to unintended uses. Beans are utilized much more extensively in rural than in urban areas (Table 1). About 83 percent of the families sampled in rural areas acquire and utilize beans

Table 8: Rice: Sources of Acquisition (Percent) by Sampled Families for Two Income Classes in Rural and Urban Areas, A.R.E., 1981

Area	Income Group $\geq$ L.E. 1,000				Income Group < L.E. 1,000				Average			
	Home Produced %	Rationing Book %	Co-op %	Free Market %	Home Produced %	Rationing Book %	Co-op %	Free Market %	Home Produced %	Rationing Book %	Co-op %	Free Market %
Rural	32.09	1.73	15.90	50.28	0.16	4.19	18.34	77.30	20.51	2.62	16.79	60.08
Urban	12.28	40.38	23.89	23.45	9.20	46.63	32.64	11.53	10.86	43.26	27.92	17.96
Average	23.01	19.44	19.56	37.99	5.22	27.93	26.34	40.51	15.69	22.93	22.93	39.02

Table 9: Average Annual Per Capita and Per Family Utilization and Rice By Levels of Annual Income in Rural and Urban Areas, A.R.E., 1981

Area	Income Group $\geq$ L.E. 1,000				Income Group < L.E. 1,000				Average			
	Average Consumption Kg.		Utilization Percent		Average Consumption Kg.		Utilization Percent		Average Consumption Kg.		Utilization Percent	
	Family	Individual	Human Use	Animal Use & Waste	Family	Individual	Human Use	Animal Use & Waste	Family	Individual	Human Use	Animal Use & Waste
Rural	298.32	44.28	94.01	5.99	197.16	38.04	97.20	2.80	251.52	41.76	95.17	4.83
Urban	159.48	31.56	85.74	13.26	149.40	30.60	94.75	5.25	154.68	31.08	90.43	9.57
Average	213.24	37.32	90.68	9.32	167.28	33.48	95.83	4.17	191.64	35.64	92.80	7.20

whereas this percentage is only 37 percent in urban areas. Since low income families tend to acquire beans in ready-to-eat forms, the study indicated that about 63 percent of families sampled in the high income group utilize beans, while only 49 percent of the lower income group families do.

About 57 percent of all beans were purchased in the free market. Family produced beans represented another 29 percent, and (Table 10) beans obtained through the rationing system constitute the lowest percentage (15 percent). However, the acquisition pattern differ greatly between rural and urban areas and the differences in the free market and family production are statistically significant. In rural areas, the major sources are the free market (59 percent), family production (33 percent), and rationing book (8 percent). In urban areas, the free market is also the most important (50 percent) followed by rationing books (42 percent) and family production (7 percent). Statistically, per capita acquisitions from the rationing books do not differ significantly between rural and urban areas, however, (Appendix A).

As to the utilization patterns of beans between human use and animal feeding, the study indicated that only about 76 percent are utilized for human use while the rest are used for animal feeding or otherwise wasted (Table 11). The percentage of beans used for animal feeding in fact was about 28 percent in rural areas but was only 9 percent in urban areas. Also, it is interesting to note that this percentage was far more for higher income group (31 percent) than for the lower income group (7 percent). Generally, the study indicated that the per capita consumption of beans was about 10 kg. and 2 kg. in rural and urban areas, respectively.

The statistical analysis was carried out to test whether the differences among means for various uses in rural and urban areas and for different income classes were statistically significant. The analysis indicated that per capita



Table 10: Broadbeans: Sources of Acquisition (Percent) by Sampled Families  
for Two Income Classes in Rural and Urban Areas, A.R.E., 1981

Area	Income Group $\geq$ L.E. 1,000			Income Group $<$ L.E. 1,000			Average		
	Family Produced %	Rationing Book %	Free Market %	Family Produced %	Rationing Book %	Free Market %	Family Produced %	Rationing Book %	Free Market %
Rural	41.58	5.18	53.30	8.21	15.90	75.90	32.79	7.96	59.24
Urban	9.57	41.74	48.70	3.95	43.42	52.63	7.33	42.41	50.26
Average	36.01	11.50	52.50	7.01	23.62	69.37	27.58	15.02	57.40

Table 11: Average Annual Per Capita and Per Family Utilization of Broadbeans  
by Level of Annual Income in Rural and Urban Areas, A.R.E., 1981

Area	Income Group $\geq$ L.E. 1,000				Income Group $<$ L.E. 1,000				Average			
	Average Consumption (Kg)		Utilization Percent		Average Consumption (Kg)		Utilization Percent		Average Consumption (Kg)		Utilization Percent	
	Family	Individual	Human Use	Animal Use & Waste	Family	Individual	Human Use	Animal Use & Waste	Family	Individual	Human Use	Animal Use & Waste
Rural	83.7	12.4	64.36	35.64	31.9	6.12	93.91	6.09	59.8	9.9	71.61	28.39
Urban	12.1	2.4	91.53	8.47	7.32	1.56	89.18	10.82	9.8	1.9	90.71	9.29
Average	39.8	7.0	69.37	30.63	16.56	3.36	92.62	7.38	28.8	5.4	75.58	24.42

utilization of beans for human use, and animal feedings in rural areas is significantly higher than in urban area at the 0.05 level of significance. However, for the low income group, the difference between rural and urban utilization for animal feeding was statistically insignificant. It seems logical for rural areas to have higher per capita consumption of raw beans since the urban population usually depends on ready-to-eat beans and bean-cake. Actually, the study indicated that the annual per capita expenditure on ready-to-eat beans and bean-cake for families sampled was about L.E. 3.18 and only L.E. 0.24 in urban and rural areas, respectively.

Perhaps the most significant finding is that a larger proportion of beans is diverted to animal use and waste than for any other commodity included in the study especially in rural areas. How much of this can be explained by subsidized prices, by storage problems related to susceptibility to insects and rodents, etc., are questions for future research.

#### Sugar:

Sugar is consumed by all families sampled (Table 1). Like rice, sugar is primarily distributed through the rationing system and each individual is guaranteed a fixed monthly quota. About 67 percent of the per capita sugar consumption was acquired through this channel, while about 23 percent and 10 percent was purchased in free market and government retail cooperative shops, respectively (Table 12).

In the rural areas, about 73 percent of the utilized sugar was obtained from the rationing quota, while this percentage was about 63 percent in urban areas. However, families sampled in rural areas purchased only about 4 percent of their needs from government cooperatives whereas this number was 13 percent in urban areas. As we have seen with other commodities, this difference may be

Table 12: Sugar: Sources of Acquisition (Percent) by Sampled Families  
for Two Annual Income Classes in Rural and Urban Areas, A.R.E., 1981

Area	Income Group $\geq$ L.E. 1,000			Income Group $<$ L.E. 1,000			Average		
	Rationing Book %	Co-op %	Free Market %	Rationing Book %	Co-op %	Free Market %	Rationing Book %	Co-op %	Free Market %
Rural	70.87	4.79	24.34	77.79	2.72	19.48	73.40	4.03	22.57
Urban	62.32	16.90	20.78	64.06	8.86	27.08	63.13	13.14	23.73
Average	66.08	11.57	22.35	68.73	6.77	24.50	67.21	9.52	23.27

the result of fewer government retail cooperatives in the rural than in urban areas. What differences exist between the per capita sugar acquisition through the rationing system in rural and urban areas are not statistically significant.

The study indicated that about 76 percent of sugar utilization overall was for drinks, while about 24 percent was for other uses (Table 13). However, this pattern differs greatly between rural and urban areas as the percentage utilized for drinks was about 86 percent and 70 percent in rural and urban areas, respectively. Also, the patterns differ greatly according to annual income. In rural areas, higher income families use about 17 percent of the sugar acquired for uses other than drinks, while for lower income families this percentage was only 10 percent. In urban areas, however, the difference between the high and low income groups was very small and statistically insignificant. Both seem to use approximately 30 percent of the sugar acquired for other uses than drinks.

There do not appear to be problems of waste and unintended uses in the case of sugar.

#### Conclusions and Policy Implications

This paper has attempted to quantify empirically some unintended consequences of the food subsidy policy that until now have been largely anecdotal and somewhat speculative. These unintended uses included livestock and poultry feeding of foods intended for human consumption, which although unintended, may have at least as much value for livestock as the equivalent nutrients in conventional animal feeds. Economic inefficiency or waste results from this practice, however, because the costs to the nation of supplying these foods are generally higher than the costs of supplying equivalent animal feeds. Alternations made in raw commodities in form (processing, baking, quality

Table 13: Average Annual Per Capita and Per Family Utilization of Sugar by Level of Annual Income in Rural and Urban Areas, A.R.E., 1981

Area	Income Group $\geq$ L.E. 1,000				Income Group $<$ L.E. 1,000				Average			
	Average Consumption (Kg)		Utilization Percent		Average Consumption (Kg)		Utilization Percent		Average Consumption (Kg)		Utilization Percent	
	Family	Individual	Drinks	Others	Family	Individual	Drinks	Others	Family	Individual	Drinks	Others
Rural	169.1	25.1	82.92	17.08	113.2	21.8	90.19	9.81	143.3	23.8	85.58	14.42
Urban	136.3	26.9	70.64	29.36	131.2	26.9	68.30	31.70	133.8	26.9	69.55	30.45
Average	149.0	26.0	76.04	23.96	24.4	24.8	75.74	24.26	137.4	25.6	75.91	24.09

control, etc.) are all obviously quite different and usually are more costly if the commodity supplies are intended for human than for animal consumption. Now that we know the specific quantities that were diverted from human consumption in the sampled areas, the next research task should be to actually measure these inefficiency costs.

Included with animal feeding in the survey was the term "waste". As a concept it is somewhat difficult to deal with in an economic framework. Everyone knows that it has something to do with the difference between quantities acquired for consumption (by either humans and/or animals kept for income or recreation) and quantities actually consumed by them. This difference will be greatly affected by the investment of time and real resources in handling, transporting, storing, refrigerating, and otherwise managing stocks of commodities. There will be a relevant margin for all these activities where a rational person will invest constrained time and real resources to the point where marginal benefits equal the marginal opportunity costs of the resources. The price of the commodity is highly relevant to the choices of these margins. If the price has been reduced through subsidy to the point where it is nearly zero and amounts are not constrained by rationing or supply unavailability, then there are no incentives, except perhaps moral suasion, to invest in avoiding waste. It will be less costly to simply buy more of the commodity than to invest in conservation. Thus, we must conclude that much of what is called "unintended" use or "waste" results from rational decisions of utility-maximizing choosers as they react to relative prices and resource constraints that face them. It is also clear that this phenomenon is an important component of increasing per capita consumption of subsidized commodities.

This reasoning does not weaken the argument at all that from the vantage point of the economy as a whole, the subsidy policy produces misallocation of resources. Given the social costs of supplying subsidized commodities and the implied shadow price that would cover these costs, there is underinvestment in time and real resources to manage and conserve stocks and avoid waste, and this must be considered a demerit of the subsidy policy. We have taken the beginning step toward full measurement of these misallocation costs by estimating the quantities going to unintended uses in the sampled regions but much more needs to be done.

Let us review the percentage divisions of subsidized foodstuffs to unintended uses in the sampled areas:

Wheat	- 7.18 percent
Flour	- 5.10 percent
Balady Bread	- 6.10 percent
Fino Bread	- 3.06 percent
Rice	- 7.20 percent
Beans	- 24.42 percent
Sugar	- no measured unintended use.

It is important to understand clearly the true opportunity costs of unintended use for the economy as a whole. Significant quantities of wheat, flour, and beans are imported and commercial imports cost the Egyptian economy the world price converted to Egyptian pounds at the parallel exchange rate. Thus, if unintended uses of wheat, flour, bread, and beans could be reduced, the saving to the economy must be evaluated in terms of saved foreign exchange. The same rationale applies—reduction of unintended uses must be evaluated in terms of export earnings of foreign exchange foregone and what they would be worth to the Egyptian economy.

As the government of A.R.E. wrestles with the question of how much to subsidize these commodities, it must take into account the costs of these unintended uses. Much attention has been given to the allocative effects of



subsidy on the consumption side-the increase in per capita consumption, the increasing dependence on imports and implications for food security. Added to this list of legitimate concerns is the fact demonstrated by this study-not all benefits claimed for the subsidy policy in terms of human nutrition are valid. Significant allocative losses are also occurring because of rational diversions of subsidized foodstuffs to animals and waste.

This study also contributes to our understanding of the equity of the present subsidy, rationing, and distribution system. We have attempted to identify precisely the acquisition sources of subsidized commodities for high and low income classes in the rural and urban areas sampled. Even at highly subsidized prices, it appears that consumers of beans are not getting their monthly allotment of one kilogram under the rationing system. There appear to be no similar problems with rice and sugar.

From this analysis, we also conclude that there is a great disparity between urban and rural areas in the availability of subsidized commodities from the government retail cooperative shops. Apparently rural citizens do not have access to these stores to the same extent that urban citizens do. Instead, they must rely more on free markets in rural areas where prices are considerably higher. This is a highly perverse income distribution policy since on average rural people are substantially poorer than urban people are. If the primary justification of a subsidy policy is to redistribute income from rich to poor, or even to support poor people with cheap food, then failure to implement fully the policy in rural areas where the poorest people live seems highly inequitable.

The free markets are playing an indispensable role, contributing both efficiency and equity benefits. The reasons are obvious-traders can improve their satisfaction by exchanging their endowments of commodities at mutually

beneficial terms. A more efficient allocation of resources occurs as all traders make themselves better off. Free markets should be encouraged in every possible way.

A free market is not an equitable substitute for a subsidy policy, however. Subsidized commodities, if they are to exist at all, should be made available to all equally. After initial allocation, a "white" market where endowments can be freely exchanged could improve efficiency since consumers have highly diverse preferences and income and wealth constraints.

(Appendix A): T Test Values for Differences Between Per Capita Consumption in Rural and Urban Areas for Each Income Level and all Sampled Families According to Sources and Use

	Wheat			Flour			Balady Bread			Fino Bread			Rice			Broadbeans			Sugar	
	Ave.	≥ 1,000	< 1,000	Ave.	≥ 1,000	< 1,000	Ave.	≥ 1,000	< 1,000	Ave.	≥ 1,000	< 1,000	Ave.	≥ 1,000	< 1,000	Ave.	≥ 1,000	< 1,000	Ave.	≥ 1,000
<u>Sources</u>																				
Family Production	9.8	9.3	4.9										0.7 <sup>a</sup>	1.7	1.3 <sup>a</sup>	1.9	1.61	1.2 <sup>a</sup>		
Rationing Book													10.6	13.8	12.4	0.3 <sup>a</sup>	1.21 <sup>a</sup>	0.6 <sup>a</sup>	1.4 <sup>a</sup>	1.5 <sup>a</sup>
Co-op													1.2 <sup>a</sup>	0.1 <sup>a</sup>	1.3 <sup>a</sup>				2.7	2.6
Free Market Fino	7.9	4.9	6.9	1.4 <sup>a</sup>	1.2 <sup>a</sup>	0.6 <sup>a</sup>							7.9	4.8	6.5	7.4	5.81	4.7	1.4 <sup>a</sup>	0.0 <sup>a</sup>
Free Market Balady				4.2	2.9	3.2														
<u>Uses</u>																				
Human Use				20.1	16.0	13.0	14.3	10.6	10.5	7.9	5.7	5.4	3.8	4.4	0.8 <sup>a</sup>	7.2	5.8	7.4		
Animal Use & Waste	5.3	3.8	3.8	8.8	7.7	5.1	5.7	5.0	3.0	2.3	2.2	0.8 <sup>a</sup>	1.0 <sup>a</sup>	0.8 <sup>a</sup>	0.8 <sup>a</sup>	2.5	2.1	1.6		
Drinks																			0.9 <sup>a</sup>	0.6 <sup>a</sup>
Others	4.4	3.9	2.2	0.4 <sup>a</sup>	1.3 <sup>a</sup>	0.2 <sup>a</sup>													2.9	3.8

<sup>a</sup> Statistically insignificant at 0.05 level of significance

(Appendix B): T Test Values for Differences between Per Capita Consumption in Low and High Income Classes for Rural and Urban Areas and all Sampled Families According to Sources and Use

	Wheat			Flour			Balady Bread			Fino Bread			Rice			Broadbeans			Sugar		
	Ave.	R.(1)	U.(2)	Ave.	R.	U.	Ave.	R.	U.	Ave.	R.	U.	Ave.	R.	U.	Ave.	R.	U.	Ave.	R.	U.
<u>Sources</u>																					
Family Production	2.8*	3.3*	0.7										1.6*	2.3*	0.1	1.0	0.8	1.0			
Rationing Book													0.8	0.8	0.7	1.1	1.5	0.1	0.9	1.9*	0.3
Co-op													1.3	0.1	1.6*				1.2	0.5	1.4
Free Market Fino	2.4*	3.0*	1.1	0.6	0.6	0.2							0.5	0.4	1.1	1.5	1.5	0.5	0.9	1.0	1.3
Free Market Balady				1.4	1.3	0.9															
<u>Uses</u>																					
Human Use				0.4	1.0	0.2	2.7*	0.4	3.8*	0.3	0.8	0.2	0.2	1.6*	1.4	1.6*	1.9*	1.3			
Animal Use & Waste	0.3	0.7	1.1	0.4	0.4	0.0	1.6*	0.6	1.8*	2.4*	0.0	2.4*	1.8*	1.1	1.5	1.2	1.2	0.8			
Drinks																			0.5	0.2	0.4
Others	1.1	1.1	0.2	0.6	0.2	0.9													0.3	3.1	0.6

(1) Rural Area

(2) Urban Area

\*Statistically significant at 0.05 level of significance

