

11 Food Subsidies in Egypt: Benefit Distribution and Nutritional Effects

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On almost any street corner in Cairo one can buy a *tamaya* or *falafel* sandwich for a few cents. This daily fare is a microcosm of the government's involvement in food pricing. The fava beans in the sandwich are subsidized. The oil in which they are fried is subsidized. The bread is subsidized. The tea one might have with the sandwich is subsidized, as is the sugar used to sweeten it. Furthermore, the sandwich will probably be wrapped in a newspaper that is likely to contain a speech or an editorial on the subsidy system.

The Egyptian government and the population at large are not unaware of the costs of the system. Speakers frequently say that the annual outlay for food subsidies—more than 1.6 billion Egyptian pounds (£E 1 = U.S. \$1.22) in 1981/82—exceeds the annual profits from the Suez Canal. The economic costs, as opposed to the fiscal costs, are not as widely known, yet economists and planners are aware of the relation of the overall deficit to inflation and exchange rates. Furthermore, they note with alarm the stagnation of agriculture and the growing dependence on food imports, which can be attributed at least in part to the food pricing system (Scobie, 1983, 1984; von Braun and de Haen, 1983). What, then, are the benefits for which these costs are incurred?

In part, they are political. The commitment to food subsidies represents a social contract, the significance of which goes beyond the value of the goods involved. This study, however, will concentrate on the implicit income transfer embodied in the various commodities handled by the government and the characteristics of the distribution of principal goods. Because many commodities are available at a range of prices depending upon the outlet (Alderman, von Braun, and Sakr, 1982), the benefits of the system will be depicted in terms of the various outlets and marketing channels, which are in effect the instruments for implementing and modifying food policy.

Implicit Income Transfers

Ration System

The formal rationing system is not the largest component of the subsidy bill, but it is the most widespread. Virtually the entire population—about 92 percent of all households—have ration cards that guarantee a monthly quota of sugar, tea, oil, and rice at a low subsidized price and an additional quota of these goods at another higher and generally subsidized price.¹ In addition, card holders can purchase monthly allotments of lentils and beans, although the availability of these is seasonal and less assured. Even families who were not eligible for the lower priced rations in 1982 were entitled to a card that gave access to commodities at the second tier of subsidized prices. Distributed through licensed private grocers, the subsidized goods are regularly available in nearly all villages and urban neighborhoods. The government's supply authority then serves as a wholesaler of principal staple commodities. This reflects an initial goal of the system to provide regular and equitable access to scarce commodities with quantity rather than price mechanisms determining distribution.

In addition to this ration system, consumers can purchase goods from a network of cooperatives and state-owned retail outlets, also called cooperatives. Membership is not required for purchase, nor do official quotas exist on monthly purchases. Furthermore, open-market private trade is permitted.

For most families, the goods available through the ration system are inframarginal; the majority of families make additional purchases at cooperatives or on the open market. For example, whereas less than 2 percent of either the urban or the rural households surveyed reported that they declined some of the sugar ration, 76 percent of the urban and 79 percent of the rural families purchased amounts above the ration. Similarly, 55 percent of urban dwellers and 51 percent of rural households purchased additional amounts of rice, while less than 4 percent of either group declined the ration.

Although the proportion of consumers who purchase additional amounts of goods that are also available in the ration shops is roughly the same in rural and urban regions, the share that comes from the cooperative system is regionally determined. Urban residents obtain most of their additional purchases of sugar, oil, and lentils from the cooperatives, whereas the bulk of their purchases of rice, tea, and beans come from the open market.

Rations, then, can be viewed as augmenting consumption through an income transfer rather than influencing the amount consumed by lowering

1. Except where noted, all household statistics in this chapter are based on a survey of 1,390 rural and 980 urban households undertaken by IFPRI and the Egyptian Institute for National Planning in 1981 and 1982 (Alderman and von Braun, 1984).

the marginal price. The implicit income transfer can be calculated as the difference between a reference opportunity cost, in this study taken as the cost, insurance, freight (c.i.f.) price of the commodity evaluated at the official exchange rate, and the various rationed prices. This difference was multiplied by the respective ration amounts actually received. When income transfer is calculated in this manner, one sees that the average rural resident received a transfer of £E 6.7 in 1982, while an urban resident received £E 8.7. The difference between the two sectors comes mainly from differences in quotas for oil and rice. There is a slight tendency for the absolute value of the transfer to decline with income. The analysis also indicates that larger families had smaller income transfers per person, which was mainly because some commodities are distributed by household rather than by individual quotas. Benefits measured in percentage of total household incomes declined markedly with increased income; the ration transfer for the lowest rural expenditure quartile was 8 percent of their total expenditures, whereas it was only 1 percent for the highest rural expenditure quartile. A similar pattern was observed in the urban sector.

Cross-sectional regressions indicate that increases in ration availability and quotas lead to statistically significant decreases of purchase of the goods from other sources. However, for most goods the reduction was less than the increase resulting from the ration and the accompanying income transfer. This indicates that the ration has a small but measurable effect on consumption that is not predicted by income transfer alone.

Bread and Flour

The commodity group that represents the largest outlay for the government is wheat bread and flour. Consumers may obtain subsidized wheat products as 72 percent or 82 percent extraction flours or as bread made from these flours. The government licenses bakeries and regulates the size, moisture content, and price of the breads. The average urban resident purchases nearly three loaves of bread a day compared to less than a half a loaf daily for rural residents. This apparent disparity is misleading, however, for nearly all rural residents bake at home whereas only a quarter of the urban residents do so. The rural population obtains more than twice as much subsidized flour per capita directly from government channels than the urban population. The annual value of the transfer in bread and flour from licensed outlets that went directly to consumers came to more than £E 600 million in 1981/82. Of this, nearly half went to the rural sector. An additional amount went to consumers through restaurants and sandwich shops.

In addition to bread and flour obtained from government channels, one must consider flour obtained on the open market, which accounted for nearly half of all the flour purchased in the rural area. Much of this flour

was originally imported and sold at subsidized prices at government shops and then resold by individuals at a slight markup. This is a legitimate means by which consumers in villages without flour shops or without the means to purchase a 100-kilogram sack obtain this commodity. In addition, open-market sales consist of flour milled from domestically grown wheat, the bulk of which is traded on the open market. Nevertheless, from evidence obtained from the household survey conducted in 1981/82 by IFPRI and the Institute of National Planning, it appears that a majority of open-market flour sales were at one stage in the marketing network handled by the government and therefore indirectly subsidized. When this is taken into consideration, there does not appear to be any urban bias in the subsidy on wheat and bread. Urban residents obtain an annual transfer of £E 17 per capita from these products, while rural residents obtain more than £E 12 directly from government channels and an additional £E 5 or 6 through the open-market channels.

Although no limits on individual purchases of bread or flour are set by the central government, rural districts can and frequently do limit monthly purchases of flour. This is particularly the case during festival periods, when there is a possibility of demand exceeding local supply. Such temporary limits influence purchases, hence total transfers. Similarly, the distribution of outlets affects purchases. Although rural residents without a flour shop in their own village often purchase flour from government outlets in neighboring villages, they are less likely to make such a purchase than households with a local flour shop. Interestingly, when they do make a flour purchase, it is larger than that of others but not sufficiently so as to offset the smaller frequency. The net effect of such institutional factors is in favor of the southern districts, where the density of flour shops is greatest and in favor of small families, as temporary purchase quotas are frequently per family rather than per individual. On a regional level, the government markets greater quantities of grain in districts where local production is less; hence, it evens out domestic consumption.

Quotas and shortages are both sporadic and local, and therefore the implicit transfer from flour subsidies is determined mainly by the household demand for bread and flour—which is determined largely by income. The absolute value of the transfer can be shown to be significantly and positively related to income in multivariate regressions, but, as with the ration system, the relative share as a proportion of the total expenditures declines with income. However, not every flour product is consumed in greater quantities by upper-income groups. Income elasticity is negative in urban areas for *balady* flour and bread (82 percent extraction) and virtually zero in rural areas for *balady* bread, indicating that *balady* bread and flour are inferior goods. This is not the case for 72-percent-extraction flour or the *fino* and *shamy* breads made from it. Given this pattern of distribu-

tion of benefits, and that refined bread and flours provide less than a quarter of total urban flour consumption and only 10 percent of rural consumption, there appears to be some potential for reducing the fiscal cost of the subsidy bill by reducing the subsidy on the refined products. Although regression results support this view, there is some evidence that appreciable cross-price effects would moderate the effect of an isolated change of refined flour prices.

Cooperatives

In rural areas, cooperatives provide only a small share of any of these goods. Consequently, the transfers obtained by rural residents from cooperatives are only one-tenth of those obtained by urban residents. The average urban resident received a transfer of approximately £E 8 annually through the subsidized cooperative system, about half of which was embodied in purchases of frozen meat, poultry, and fish. Residents of Cairo and Alexandria are not particularly favored by staples from cooperatives but do obtain a significantly greater amount of the frozen goods, as do members of cooperatives established at work places, usually government offices or public sector enterprises.

A principal difference between items available at the cooperatives and those from the ration system is that there are no assured supplies at the cooperatives. Although a family is not limited in the monthly purchase of staple commodities, the cooperatives do have monthly quotas that are frequently less than the quantity that consumers would want to purchase at the fixed price. For this reason, lines form at the outlets—not because distribution is slow but because goods are allocated on a first-come, first-served basis. Those who arrive early gain priority rights to the goods. Late arrivals risk being confronted with empty shelves and the necessity to wait until the next shipment or to pay a higher price for the good on the open market.

Such distribution by willingness to wait might be expected to benefit the poor, who may be assumed to have lower opportunity costs for waiting in line, that is, to value less the alternative use of a unit of time (Barzel, 1974; Nichols, Smolensky, and Tideman, 1971). The available data, however, do not support the hypothesis that the poor can be targeted through their willingness to wait. For example, the ratio of cooperative purchases to open-market purchases is no higher for the poor than for the general population, as would be expected if the poor were more prone to use that outlet. This is also indicated by multivariate regressions that measure the response to waiting time in a manner analogous to price responses. The analysis shows that the longer the waiting time, the less likely an individual was to shop at the cooperative and the more likely to purchase that good on the open market. The poor, however, were as likely to leave the cooperative

market if waiting times increased as was the rest of the population; indeed, in some cases, they were more likely. The explanation for this pattern seems to come from the nature of the distribution; limits are seldom placed on the amounts purchased per visit at cooperatives. Hence, the rich who purchase a larger bundle obtain a greater benefit from standing in line. This greater benefit offsets any possible difference in the opportunity cost for waiting.

The pattern of purchases and the response to waiting times for frozen meat, chicken, and fish are similar to those for staples from the cooperative. In principle, there is a monthly limit on the amount of frozen poultry and meat that a family can obtain, although this is not an assured ration. A strong relation observed between income and frozen chicken purchases, however, indicates that this regulation is frequently not enforced. Unlike chicken, more frozen fish and meat were consumed by the poor than by the higher expenditure quartile, although none of the frozen commodities were widely purchased. Less than a third of the urban population obtains frozen chicken in any given month, with the percentage of families purchasing, as opposed to the quantity bought, declining with income. A similar pattern was observed with frozen fish, whereas less than a quarter of the population obtained frozen meat. Less than 3 percent of the rural population obtained either frozen chicken or meat, but 11 percent were able to procure frozen fish.

Two other forms of direct subsidies contributed to the subsidy bill. The principal one, yellow maize, which added more than £E 150 million to the subsidy bill in 1981/82, however, is actually an input in livestock production. Whereas more than 26 percent of this maize goes to rural households through the cooperatives and is listed for human consumption, virtually all of it is used as chicken feed. The rest of the yellow maize goes to large-scale poultry farms, feed processing, and starch manufacture. The distribution of subsidized yellow maize is the most regressive of all foods. The poorest rural quartile obtained only 14 percent of the maize distributed by the cooperatives, although they purchased 25 percent of the yellow maize sold on the open market. Maize through the latter market channel costs up to twice the subsidized price, although all yellow maize in Egypt is imported and subsidized at some point in the distribution network. Yellow maize is also a major input for prepared cattle feed, much of which is distributed at subsidized prices in the agricultural cooperatives. The poorest quartile obtains only 7 percent of this commodity. Again, this is not because their demand is saturated, as evidenced by the larger share of more expensive open-market sales of feed they purchase.

Another subsidized item using imported wheat flour is pasta, whose subsidy accounts for more than £E 60 million annually. The income elasticity for this commodity is larger than for any other subsidized food com-

modity, with the exception of frozen chicken. This indicates that the subsidy is not targeted to the poor.

Open-Market Purchases

Although consumers benefit from subsidies on foods directly or indirectly handled by the government, a broader picture is obtained when one looks at open-market purchases. The local price of some open-market commodities are below the c.i.f. price for the good, and therefore the consumer receives an implicit subsidy when purchasing the goods. Open-market purchases of flour and cereals fall in this category. For other commodities—notably domestically produced milk and meat products but occasionally sugar, oil, beans, and lentils as well—the open-market price exceeds the import opportunity cost for goods. Consumers are indirectly taxed by import and trade restrictions on these goods. The regional and seasonal pattern of rice supply is such that it occasionally falls in the protected category, although more often the local price is below the potential export price. As upper-income groups purchase more of the protected meat and dairy products, they pay the bulk of the premium attributed to the distorted prices for these goods. The principal beneficiaries of such a price system are the producers of meat and dairy products as well as the producers of clover, the main cattle feed. The government seldom directly captures the implicit tax on locally protected goods, except when the import price falls below the cooperative price. As discussed in chapter 13, this transfer from predominantly urban middle-class meat consumers is distributed throughout the rural sector and partly offsets the implicit taxation on other agricultural commodities, particularly cotton and rice.

Netting all these components—gains and losses from government channels, open-market purchases, and production—one finds that the price system taken as a whole favors the rural community and the urban poor, although some of the components do not (see table 11.1).

One notes, for example, that the rural poor gain nearly £E 19 annually from government channels and an additional £E 6 from open-market purchases of cereals but lose £E 5 on other open-market purchases. In addition, they have a net loss of £E 1 from distorted prices in agriculture. Their average per capita gain from the pricing system, then, comes to £E 19, which is slightly higher than the average gain for the rural sector taken as a whole and exceeds the net gain of £E 13 for the urban sector. This average gain in the cities included a relatively large gain of £E 22 transferred to the poorest quartile and an imputed loss of £E 4 for the richest quartile, whose losses on open-market purchases of animal products exceeded their sizable gains from subsidies and distortions in other market channels.

TABLE 11.1 Income transfer from food subsidies and distorted prices, Egypt, 1981/82 (£E per capita per year)

Source of Transfer	Urban			Rural		
	Lowest Expenditure Quartile	25-75 Percent	Upper Expenditure Quartile	Lowest Expenditure Quartile	25-75 Percent	Upper Expenditure Quartile
Government channels	27.55	29.81	31.22,	18.76	18.21	23.66
Open-market cereals	0.71	2.62	1.34	6.58	11.62	19.30
Other open-market goods	-5.91	-14.85	-36.57	-5.26	-8.65	-17.59
Animal production				4.19	7.67	13.43
Other agriculture				-5.29	-9.64	-20.25
Total	22.34	17.58	-4.01	18.98	19.21	18.47
Total as percent of annual expenditures	12.86	4.66	-0.40	16.89	8.68	3.53

SOURCE: Data from the household survey made by the International Food Policy Research Institute and the Institute of National Planning, Cairo, 1981/82.

Nutritional Concerns

The government's involvement in food distribution, then, contributes a significant portion to the purchasing power of the poor throughout the country. The low prices for major food items undoubtedly contribute to the high food intake in Egypt, intakes that exceed those of virtually every other developing country. The lowest expenditure quartiles in both the urban and rural sectors consume more than 2,300 calories on the average, and the entire population reported an average of more than 2,600 calories consumed in the previous day's meals. Slightly higher results are obtained if average calories are estimated from food purchases. Protein intake is similarly high; even when corrected for amino acid composition in all quartiles, the average intake exceeded the per capita requirement for the average family by at least 25 percent.

Flour and bread are the principal sources of both calories and protein for all income groups. In rural areas, maize, coarse grains, and rice contribute about a quarter of the calories provided by flour and bread in the diet. In urban areas, sugar's contribution to calories exceeds that from rice. It is significant that the ration system contributes an appreciable share of calories to the overall diet, but because these are mainly from sugar and oil, the ration system is not a major source of protein. Nor is the cooperative. This is true despite the role the cooperatives play in distributing frozen imported meat and fish. Current high levels of protein intake would continue even if the contribution to the diet provided by all items from the cooperative were not included in the totals, indicating that there is little justification on nutritional grounds for the subsidy on frozen imported meat and fish.

This point is underscored when protein intakes are adjusted to derive amino acid composition. There is no human biological need for "animal protein" *per se*. Indeed, protein is not absorbed in digestion. What is required are amino acids, which are the building blocks of protein. These can be assembled to form human proteins only if they are present in the relative proportions of the human body. Otherwise, excess amino acids are used as an energy source rather than as a building block. Although the proportion of amino acids in animal products most resembles that in humans, the average diet in Egypt is sufficiently diverse that the amino acids lacking in one food item are likely to be present in another consumed at the same meal. The twenty-four-hour food recall included in the household survey allowed for the calculation of such proportions. The results indicate no protein quality problem in the Egyptian diet.

In calculating the percentage of families that do not obtain sufficient food to meet family requirements, one has to account for both sample variation of recorded intakes and the biological variation of human requirements. As protein requirements are believed to be normally distributed in

a population, with individuals having little latitude for influencing their requirements, it is possible to make a statement about the probability that any observed intake falls below requirements. Accordingly, the requirements used for this study were determined by the average requirement for a given age and sex plus two standard deviations. The actual requirements of 97.5 percent of the population will be below this point. Furthermore, observed intakes were revised downward to adjust for digestibility.

Calorie requirements differ from protein requirements in that an individual can influence calorie requirements by changing his or her activity level. Consequently, one must determine a norm for activity in order to discuss requirements. In this study, moderate activity is assumed, with a 15 percent reduction of calorie needs to accommodate variation of requirements among individuals as well as any costless adjustments of behavior (Beaton, 1983). Using these criteria, one finds that 17.4 percent of the urban and 16.3 percent of the rural households obtained fewer calories than their adjusted requirements. Protein-deficient households comprised only 4.7 percent of the urban sample and 8 percent of the rural sample. It is important to note, however, that virtually no household was found to be protein deficient that was not also calorie deficient. This underscores the view that there is no need for a specific protein policy distinct from other elements of an overall food policy.

A portion of the apparent nutrient deficiencies may reflect measurement error and family differences not related to purchasing power or prices. This view is supported by the appreciable percentage of upper-income groups that appear deficient. If one attributes this level to "background noise" and subtracts it from the calculated level of deficiencies for all quartiles, the urban calorie-deficient population is reduced to 10.4 percent and the rural to 11.4 percent. As expected, the bulk of the calorie-deficient population is in the poorest quartile, representing 24.0 percent of the urban poor and 32.8 percent of the rural poor.

The statistical relation between income and the probability of a calorie or protein deficit was revealed by a probit regression analysis. Income is highly significant in explaining observed family calorie and protein deficits, with rural income increases more likely to decrease the probability of a deficit. An increase of £E 5 in monthly per capita income will reduce the probability of a calorie deficit by 0.01 (mean = 0.17) in urban areas, whereas an increase of £E 1.5 would achieve the same reduction in rural areas. It is unlikely that such a pattern is generated by random variation in requirements; it probably reflects pockets of undernutrition that persist despite high overall food consumption. These pockets are more likely to occur among urban dwellers in Cairo or Alexandria and among rural dwellers in Upper Egypt in the case of calorie deficiency.

At the same per capita income levels, households headed by females are less likely to have low calorie intakes if they live in cities, and families with larger percentages of children are less likely to have a calorie deficit. The family requirements are based on the age distribution in the family; therefore, families with more children have lower overall requirements. There is no way to determine from these data whether the children themselves are more or less likely to consume the required amount of calories.

In cities, ration card holders are more likely to meet their calorie requirements, whereas there is no statistical difference in rural areas. Because the ration system provides only a moderate share of total calories and because families without the card can shop for these goods at the cooperative or on the open market, this is a puzzling observation. It probably reflects both the demographics of families without cards (frequently newlyweds) and market imperfections.

A probit regression was also used to ascertain the relation between having had a child less than five years old die in the previous year and calorie and protein inadequacy. Although 7.5 percent of the rural families surveyed reported such an occurrence—which is alarming when one considers that many families had no children in this age bracket—no statistical relation with either income (negative correlation but not significant) or dietary inadequacy was observed. The pattern of distribution of food among family members and the quality of health care delivery are more important predictors of child mortality than family food consumption. Moderately high levels of stunting and wasting have been observed in Egypt (Egypt, 1978).

The relation of income and calorie deficiencies reported above as well as the moderately high income elasticities for calories in Egypt (about 0.2 overall and nearly 0.4 for the poorest quartile) are evidence that the calorie-deficit population would increase if the current income transfers and price subsidies were removed. Improvements in current high mortality rates or a decrease in the number of children with clinical signs of malnutrition, however, are more likely to be achieved by improvements in health care and sanitation than by any increases in food subsidies or other consumer-oriented food policies.

Summary and Policy Implications

The functioning of the ration system indicates that it is possible for a government serving as an importer and principal wholesaler of basic staples to achieve a uniform and uninterrupted distribution of goods. The use of private traders as the ultimate distributors of rations does not subvert the goal of equitable access to goods, despite fluctuating and occasion-

ally scarce supplies; it may even account for much of the distributional efficiency.

The existence of rations within a multitiered marketing system has only a slight effect on consumption levels, but it has a significant effect on income. This income transfer, or negative tax, is untargeted, but it reduces the relative inequality of income by giving higher proportional shares to the poor. Although such a transfer could also be achieved by a food stamp scheme or a direct income transfer, policing such a system may involve administrative costs similar to or greater than guaranteeing the quotas.

Although the ration system in Egypt does not determine the household marginal purchase of basic commodities and, therefore, probably does not contribute to allocative inefficiencies or deadweight loss, the same cannot be said for other forms of government marketing. Rigid prices lead to local disequilibria, and consumers gain access to goods by their willingness to wait at the cooperative. They allocate a resource—time—but neither the government nor any member of the economy receives this resource as payment. Raising the price of goods sold at cooperatives to the level of the current cash costs plus time allocation should not appreciably change market-clearing quantities, yet it would gain more revenues for the government. The current means of allocation by willingness to wait does not target the poor. It is possible to increase the effectiveness of such targeting by limiting the size of purchase that can be made per visit. This, however, would increase deadweight loss to the economy as well as the real costs to many households.

The tendency to reduce government costs by changing local quotas rather than by raising prices also leads to higher open-market prices in some regions than otherwise would be the case. The effects on distribution differ by commodity but may be different from those intended. This may be particularly true for agricultural inputs, including maize for feed.

Finally, low prices for wheat and flour have an appreciable effect both by increasing real income and by lowering marginal prices. Unlike rations, this probably increases total consumption appreciably. The government can influence consumption somewhat through licensing and placement of outlets, but not much. A policy of price differentials or quotas for items like bread and flour of different qualities will also cause consumption of other goods to change in a manner that may reduce the net fiscal savings from the price change. This stresses the importance of considering substitution in assessing and redesigning existing policies.