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Ibrahim Soliman, in analyzing the nutritional pattern of rural Egyptians, found the average daily per capita intake of protein in 1974-75 to be 73.1 grams of which 63.5 grams were vegetable protein and 9.6 were animal protein (Soliman, table 3).[1] Protein required is estimated to be about 77 grams (Soliman, pp. 4, 5, and 17). At least 9 to 10 percent of the protein should be animal protein. On average, then, the protein gap in rural Egypt appears small and the intake of animal protein more than adequate. Protein, however, according to the Soliman study, does not reach an adequate level until household incomes are 500 L.E. a year (p. 17). He estimates that 74 percent of the rural Egyptian population suffer from protein deficiency; the lower the income level, the greater the deficiency (p. 17). He found, "the inadequacy in intake is most pronounced in the case of animal protein" (p. 17). It, therefore, seemed relevant to ascertain to what extent selected factors related to the consumption by households of adequate levels of animal protein affect that level in the Egyptain case.

Methodology

Data for this analysis were obtained from a 1981-82 survey of 249 rural Egyptian households selected at random from households in 10 villages representative of the five agricultural zones in which they were located. Although the sample was small, it was generally representative of the rural Egyptian population (Mohamed and El-Shennawy).

- The equation utilized was

$$\frac{AP}{P} = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + b_7x_7 + b_8x_8$$

where

AP/P = animal protein as a percentage of total protein in the diet of the household

x_1 = family size

x_2 = household residing in Zone 1

x_3 = household residing in Zone 2

x_4 = household residing in Zone 3

x_5 = household residing in Zone 4

x_6 = age of head of household

x_7 = feddans managed,

and

x_8 = number of cows and buffalos in the village.

Variables used were those found in previous studies to affect quality of diet (Adrian and Daniel). Animal protein was the sum of protein derived from milk, cheese, eggs, poultry, and meat. The food consumption of the household was obtained for one day in each of the four seasons and on different days of the week at each interview. Thus, the data reflect seasonal differences and differing dietary patterns on some days of the week. Family size was the number of persons in the household. Zone 1 was comprised of villages located in the North Delta governorates; Zone 2, the villages located in the Middle Delta governorates; Zone 3, villages located in the southern part of the Delta and the northern part of Middle Egypt (around greater Cairo); and Zone 4, the villages located in Middle Egypt. Zone 5, the zone for Upper Egypt, was omitted. The remainder of the variables are self-explanatory.

The equation was estimated using ordinary least squares. Coefficients, their standard errors, whether they were significant, and whether it was at the .025 percent or 1 percent level are shown in table 1.

Family size, area of residence (except for Zone 4), age of head of household, the number of feddans managed, and the number of cows and buffalos in the village were all found to be statistically significant. The number of feddans managed was significant at the .025 percent level; the others, at the 1 percent level. The most highly significant variable was living in Zone 3 which explained 14 percent of the positive variation in the animal protein to total protein ratio. The villages around Cairo are relatively prosperous villages and the villagers can afford a better diet. By the same token, the villages in Zone 4--Middle Egypt--are relatively less prosperous, and the ratio was not significantly affected by the fact of where the households were located.

Family size affected the ratio negatively. The more mouths to feed, the poorer the diet for the animal protein to total protein ratio is a measure of dietary quality (Soliman, p. 6).[2]

Zones 1 and 2, although not as prosperous as Zone 3, are still relatively prosperous compared to Zones 4 and 5 and living in them makes for higher ratios.

The older the head of household, the higher the ratio--a reflection of the tendency toward greater prosperity as a result of more experience, more knowledge and, for some, more opportunities.

The number of feddans managed, although statistically significant at a high level, was not as significant as six of the other variables. This is a measure of income, and income is significant in explaining quality of diet but other factors are also influential (Ghali and Abou).

TABLE 1

Factors Affecting Rates Between Animal Protein and Total Protein

Variable	Coefficient
Family size	-.0028* (.0009)a/
Zone one	.0515* (.0153)
Zone two	.0690* (.0173)
Zone three	.1398* (.0134)
Zone four	.0189 (.0154)
Age of head of household	.0010* (.0002)
Feddans managed	.0039** (.0016)
Number of cows and buffalos in village	.0312* (.0094)

N = 249.

Mean of animal protein to total protein ratio = .1577

R^2 = .2056.

Durbin-Watson statistic = 1.3442

a/ Figures in parentheses are standard errors. A feddan is 1.03 acres.

* Statistically significant at the 1 percent level.

** Statistically significant at the .025 percent level.

The number of cows and buffalos in the village was highly significant. Milk consumption is highest where villagers own their own cows and buffalos (Goueli and Abdou, p. 20). There are at least two reasons for this. First, the milk is more readily available; and, second, the milk has a known level of safety.

The mean for the ratio, .1577 (almost 16 percent), is higher than required by international standards (Soliman, p. 6), but the distribution of the ratio was not investigated in this study. Goueli and Abdou and Soliman agreed it was the lower rungs of the income distribution that suffered from protein deficiency and an inadequate ratio of animal to total protein (Goueli and Abdou, pp. 24 and 25; Soliman, p. 19).

The conclusions from this analysis are:

1. Increasing income of the lower income rural households will act to increase the animal protein to total protein ratio and, hence, the quality of their diets.

2. Increasing the stock of cows and buffalos is a direct way to increase the ratio through increasing the intake of milk. The answer may be in making credit available so that small farmers can acquire cows and buffalos.

3. Decreasing family size will improve the ratio.

4. Where a villager lives and, hence, the resources he has to work with and the opportunities he has make a difference. Living in a particular area may (1) make it easier to earn a higher income, (2) be associated with greater availability of animal products, (3) be associated with a higher level of knowledge concerning adequate diets, or (4) be a combination of these factors.

Footnotes

[1]The Soliman study relied on data from 4,000 households queried in the Family Budget Survey of 1974-75 conducted by the Central Agency for Public Mobilization and Statistics, Arab Republic of Egypt.

[2]It may be hypothesized that family size (since it may be related to more family members working) may, by its increasing income, affect the ratio positively; but, apparently, its income effect is less than the proclivity of family size to add to consumption. Small children and many older persons add nothing to income but they do consume food. For that matter, children under 14 years of age and women in the Egyptian farm household tend to add less to household cash income or income in kind from crops than the value of their food consumption.

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