Concentrate Feed Mix in Egypt: An Analysis of Government Production and Distribution Policies, and Free Market Price Patterns

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Summary and Conclusions

This paper investigates the production, distribution and policies for feed concentrate mix, a vital source of livestock feed in a country which suffers from chronic feed shortages. Feed concentrate is particularly important during the summer months when fodders are particularly scarce.

The Ministry of Industry manufactures feed concentrate under a formula specified by the Ministry of Agriculture, and designed to take advantage of available local crop by-products, including cottonseed cake, brans, and molasses, while providing a balanced and nutritious livestock diet. The feed mix program also involves decisions of the Ministry of Supply, which imports the yellow maize component, and governorate agencies which are involved in distribution.

The government has had a long standing policy of providing the feed concentrate at fixed prices which are substantially lower than the international value of the components involved. In 1975, for example, the international cost of such feed would have been at least L.E. 97, compared to the L.E. 30 per ton price charged to producers by the government. Thus, in effect the feed concentrate was subsidized by more than L.E. 60 per ton.

At the low price, there is not enough of the feed concentrate available to meet livestock producer demands. The government therefore must allocate the concentrate according to a quota system. As a result, a black market exists for the feed concentrate. The 1976-77 Farm Management Survey showed that the black market price is typically over L.E. 60, or almost twice as high as the controlled distribution price. This indicates that some producers

and middlemen are making money by merely reselling concentrate to producers who have requirements in excess of their quotas.

The government's quota system for distributing the concentrate follows a specific list of priorities which gives first precedence to state farms and specialized producers who have contracts to deliver meat and milk to public sector companies. In this system, the small farmers who hold the majority of Egypt's livestock and who usually specialize in livestock production more than large farmers, have the lowest priority. Small farmers are known to be net purchasers of fodders, and, because of their low quotas, they are probably net purchasers of black market concentrates. Farm Management survey data showed that the black market prices are lower in villages which have specialized feedlot production units and they are also lower in villages nearer to governorate capitals. This indicates that governorate capitals and feedlots are likely sources of black market supply.

Free market prices were found to be much higher in the summer months and lower in villages which have higher than average berseem and barley acreages.

Although these findings indicate that there is a serious misallocation of feed resources in a strictly economic sense, there is not yet enough information available to suggest better alternative policies. It is likely that altering the quota system to give equal treatment to small farmers could make substantial increases in meat and milk production, but it is not clear that local marketing facilities are adequate to translate this production into increased urban supplies, which is the obvious objective of the current quota and price system. Thus, there is a need for continued studies dealing with these and other questions raised in this paper.

I. Introduction

Shortages in feedstuffs are a major concern in Egyptian agriculture, not only because they inhibit the production of sufficient quantities of meat and milk at reasonable prices, but also because forage and fodder production competes with the production of edible crops such as wheat and exportables, such as cotton. Berseem clover, Egypt's main source of forage, is now the country's single largest crop, area-wise, and this conflicts directly with wheat production at a time when the country's dependence on wheat imports is reaching alarming proportions.

The government attempts to provide additional feed matter in the form of concentrate feed mix which is prepared from cotton seed cake, brans, imported maize, molasses and mineral additives. This concentrate is provided at prices which are quite low in comparison to equivalent mix components available on the international market as well as by comparison to other local feeds of comparative nutritive value. The government directs the supplies of the low prices concentrates so as to generate supplies of low priced meats for urban consumers. Nevertheless, since concentrate prices are so low by comparison to alternative feed sources not controlled by government (e.g. berseem and straw) and since concentrate supplies are limited, there is a natural tendency for a "free" or black market to develop in concentrates.

This paper describes the policy and procedures for preparing and distributing concentrate feeds. It describes some of the problems and weaknesses of this system and explains the economic rationale of the black market. Black market prices obtained from the 1976-1977 Egyptian Farm Management Survey are examined in detail. This analysis serves to indicate some important dimensions of the feed scarcity problems, namely, where

(regionally) and when (seasonally) feeds are in shortest supply, as well as to determine some of the underlying factors which influence the market.

Some warnings about the quality of the data are in order. While "free" or black market prices of concentrate were obtained from the Farm Management Survey, there is no indication of the volume of the feed concentrates which is traded in this market, nor is such information yet available from other sources. Measurements for many of the factors which would be expected to affect the market are not available. Nevertheless, some useful conclusions can be drawn from what is available.

II. Methodology

The analytical procedures include: (a) description of feed concentrate production and distribution, (b) discrete analysis (ANOVA and paired Student Tests) in addition to price indices and graph representation, to identify seasonal and regional patterns of concentrate feed mix price, and (c) testing the magnitude and significance of various factors believed to influence the market and price of concentrate feed mix. Factors which are tested for their influence on the free market price are: (1) the region (agronomic zone and village), (2) village distance from the main market (capital of the governorate), (3) existence of feedlot in the village, (4) existence of a local market in the village and (5) seasonal supply of alternative feeds, particularly berseem and barley in winter.

III. Production Policy of Concentrate Feed Mix

The Ministry of Agriculture (MOA) concentrate feed mix composition in February 1977 was 45% cotton seed cake, 26% wheat bran, 17% yellow corn, 7% rice bran, 3% molasses, 1% limestone and 1% salt. An agricultural law

enacted in 1966 (acts No. 110 to No. 116) specifies the general rules that control manufacturing and marketing of concentrate feeds. This law indicates that MOA has the authority to formulate annual policies for the production of feed concentrate mix, with the help of a committee of expert advisors. The annual supplies of cotton seed cake, wheat bran, rice bran, molasses and imported yellow corn are the major determinants of the feed production volume and composition. Accordingly, reductions in the area or yields of cotton, rice, wheat and sugar cane constrain concentrate feed production. In addition to that, the Ministry of Supply (MOS) plays an important role in determining the concentrate feed mix production volume by determining the percentage of wheat extraction and therefore, the quantity of bran left for animal feeding; also MOS imports the yellow corn for either livestock or poultry production.

It should be mentioned that the government, recently, has introduced the imported yellow corn in the composition of the concentrate feed mix, to promote fuller utilization of cotton seed cake and provide a balanced feed mix. This made it possible to increase the total supply of feed mix and all but eliminate the use of crude cotton seed cake by itself. The cottonseed cake by itself is an unbalanced feed with too much protein and energy per unit.

The Organization of Food Industries (OFI), which belongs to the Ministry of Industry (MOI), buys the crude cotton seed produced by MOI in its ginning mills and processes it to produce cotton seed cake and oil. Also OFI receives the specified composition from MOA and processes the concentrate feed mix (Figure 1).

According to MOA, Department of Feed Concentrate Distribution, in 1976-77 the total production of concentrate feed mix was about 900,000 tons. This quantity included about 15,000 tons of unmixed decorticate cotton seed cake for poultry. As Table 1 shows, however, the actual quantity distributed in the same year was about 780,000 tons. Presumably the difference could represent quantities distributed centrally or stored for emergency.

IV. Distribution Policy of Concentrate Feed Mix

There are two main channels for the distribution of this feed mix: (1) central distribution to state farms, public projects and organizations, and (2) distribution to governorates, which is, ultimately, distributed to farmers through the Agricultural Cooperatives (Figure 2). Though MOA provides the rules for pricing and marketing of concentrate feed mix, in general, the major concepts that control the distribution system do not change. However, the distribution rates or quotas for each livestock activity have changed through the years. In the early 70's, the allocation for feedlots and other insured animals was 120 kg. per head per month; the quota for uninsured livestock was 15 kg. per head per month in the summer months. By 1976-77 these figures had increased to 150 kg. and 20 kg., respectively, per head per month. In the latter part of 1980, the rule was changed to permit farmers with any number of livestock to buy insurance, whereas before insurance could only be purchased by farmers with 5 feeder animals or 10 dairy animals. This means that if enough feed is available, now even small farmers can qualify by the larger quotas.

Table 1. Concentrate feed mix distribution shares of livestock activities in 1976-1977

Distribution	Quantity (000) tons	% of total
1. Feedlots	310.000	34.4
2. Dairies	140.000	15.6
3. Traditional holdings	301,180	33,5
4. Department of Veterinary Quarantines	5,000	0.6
5. Livestock on newly reclaimed land in Behera Governorate	5,000	0.6
6. Projects of reclamation (Northwest Coast) in Marrough Governorate	20.000	2.2
7. Poultry feed mix (decorticated) cotton seed came)	15.000	1.7
8. Central distribution and/or storage *	104.000	11.4
Total	900.00	100.0

Source: Collected and calculated from: Ministry of Agriculture, Department of Feed and Cottonseed Cake Distribution, Cairo, Egypt, 1980.

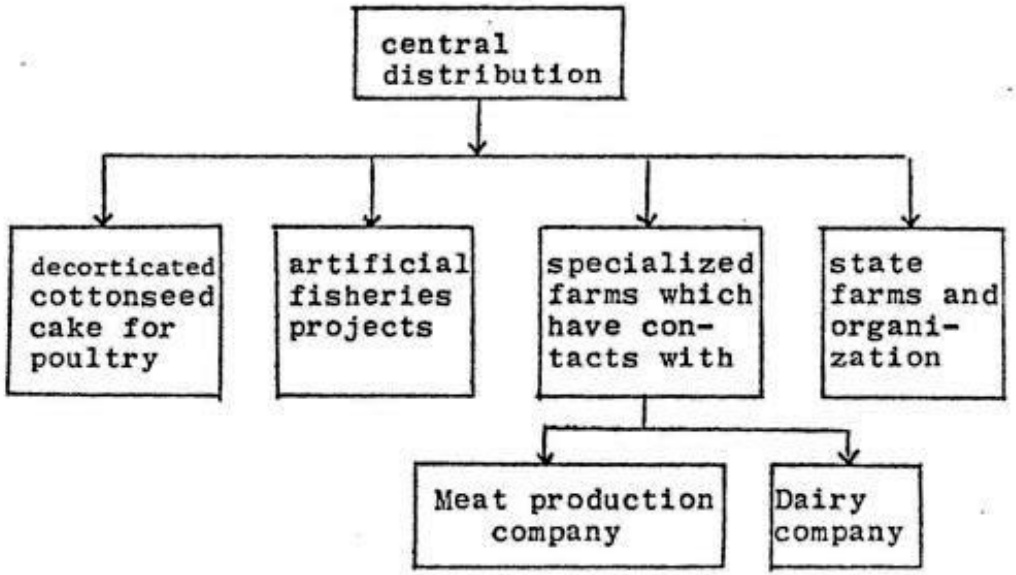
* Calculated as a residual

52 (25% of the total) did not show any seasonal differences. For those villages the price was constant over the year 1976-1977. Therefore, the statistical analysis included only 39 villages for which there was some variation. Two way analysis of variance was used to test the effect of region and season and to get the variance components of concentrate feed mix price. Table 2 shows that both villages (region) and season are statistically significant. The mathematical linear random model was used in which the average concentrate feed mix price in the month j and village i is shown as follows:

$$P_{ijg} = U + R_i + M_j + E_{ijg}$$

In this equation U is the monthly mean price of the whole Egyptian rural areas, and R_i represents the difference between the average price of the i^{th} village and the average price of the population. By including this term, the fact that the concentrate feed mix price varies from village to village is taken into account. R_i is assumed normally distributed with a mean equal to zero and standard deviation O_r. Simlarly, the effect of month j^{th} is M_j which is also assumed to be distributed normally with mean zero and standard deviation O_M. The term E_{ijg} stands for the errors due to data collection. The size of the sample within each village, i.e., number of farms used to get the village average, and the effect of other variables were omitted. E_{ijy} is assumed normally distributed with a zero mean and a standard deviation 6. The hypothesis to be tested is: $R = M = 0$.

Based on the ANOV (Table 2), the concentrate feed mix price variance is due to region (villages) effect (77.38%) and the season effect (7.71%). The



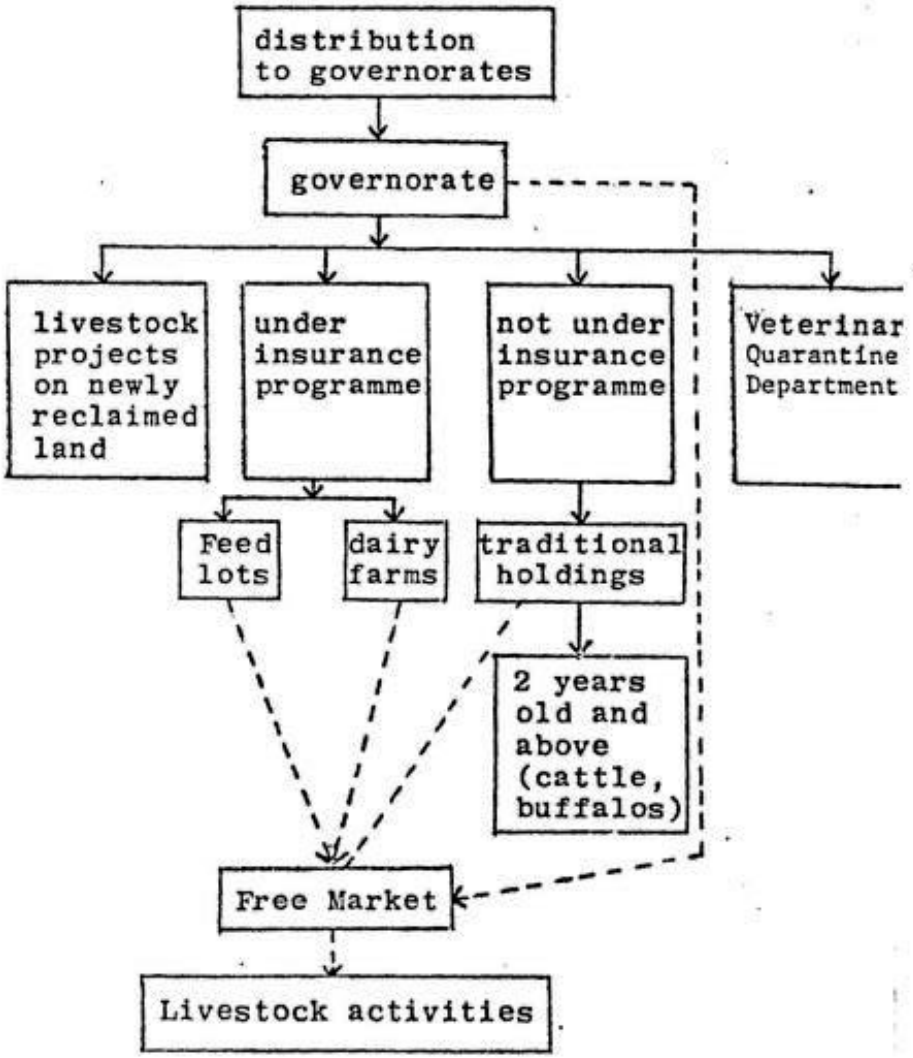


Figure 2. Distribution Channels of Concentrate Feed Mix

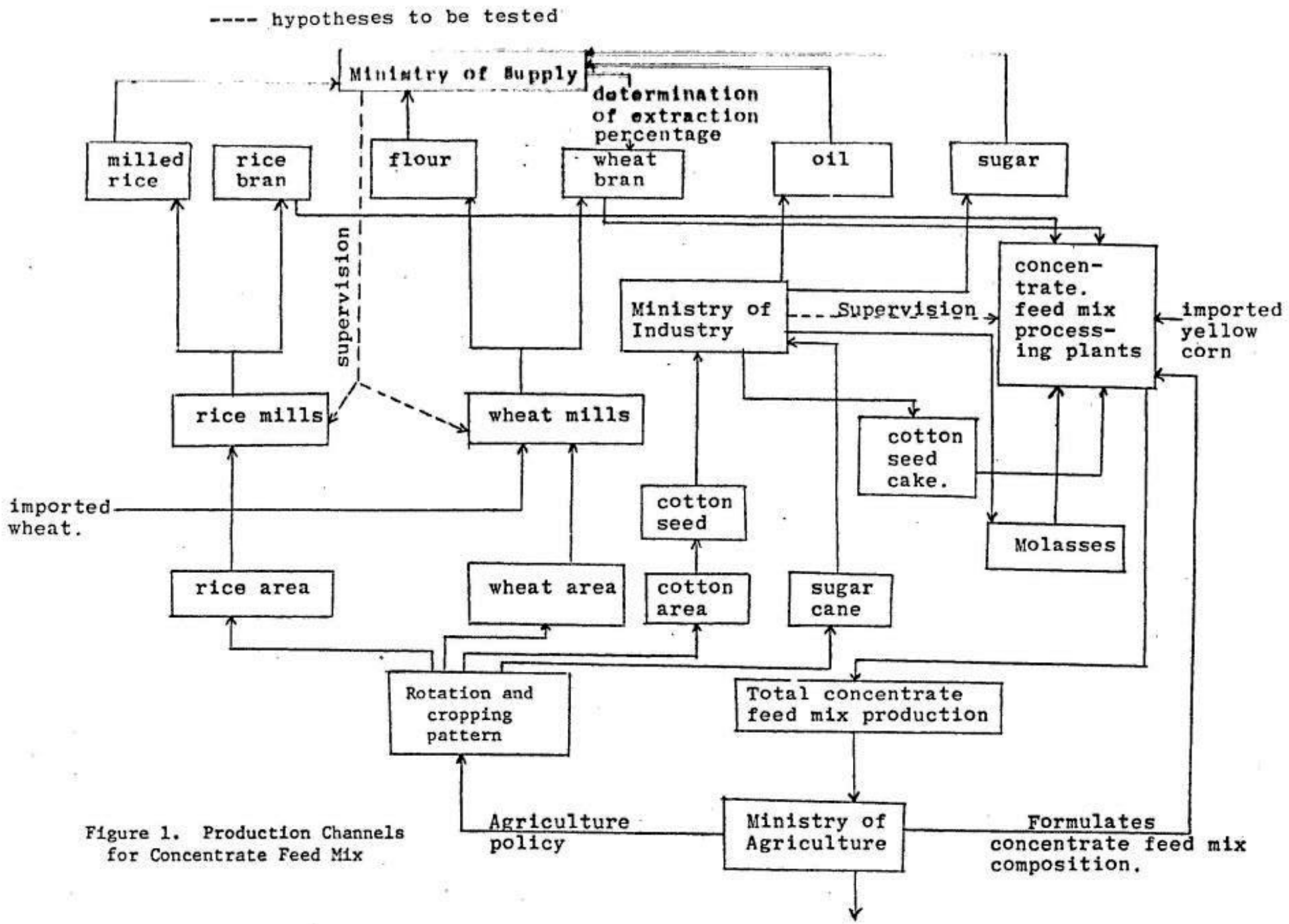


Figure 1. Production Channels for Concentrate Feed Mix

Briefly, the major concepts of the feed concentrate distribution are to give priorities to the major livestock types in Egypt, i.e., cattle and buffalo. The first priority is given to state farms, other public organizations and livestock projects on newly reclaimed lands. Privately owned cattle and buffalo herds under the MOA's insurance system for livestock have the second priority, in general. Within these insured herds, priorities are given to specialized farms that have contracts to supply their products to the Dairy Company of Egypt or the Meat Production Company; these are followed in priority by cooperative societies which have feed lots or dairy animals. Specialized livestock enterprises without contracts with state companies come next.

As noted above, the minimum herd size to qualify for insurance was formerly five head of feeder animals or 10 head of dairy animals. The vast bulk of Egyptian livestock are held on traditional farms in herd sizes of less than 5 head and therefore could not receive the larger distribution quotas which were reserved for insured animals. Although the system has now been altered to permit smaller farmers to qualify for insurance, distribution of concentrate is still dependent upon availability, and priority in distribution still goes to larger farms.

The distributed quantity of concentrate feed mix to traditional farmers amounted to about 300,000 tons in the 1976-77 survey year. This quantity could have been a source of black (free) market concentrate supplies. This possibility arises from the belief that such very small individual traditional holdings may have preferred to resell the quota of

the concentrate feed mix which they received from the cooperative, or even before the quota reaches the cooperative, to middlemen who are able to pay a much higher price to farmers than the subsidized one.

There is an alternative hypothesis concerning the source of "free" or black market supply of concentrate feedmix. This hypothesis, to be tested, is that the specialized livestock enterprises may have received higher quantities of concentrate feed mix than they actually acquired for feeding, either because the quotas were larger or because they provided a record of larger number of heads than they actually had.

The distribution priorities require that those activities with first priority have to provide their meat and milk production to governmental controlled marketing organizations, at fixed low prices. The organizations to receive these meats would include consumer cooperatives, general companies for milk and meat and/or governorate authorities. These organizations are in turn expected to sell meat at low, fixed prices. In other words the feed concentrate distribution policy aims to help insure lower retail prices for meat and milk. However, Soliman (1978) showed that cost of the concentrate feedmix represents not more than 5.8 percent of the weighted retail price index of beef in Egypt, i.e., low price of such feed would not be so effective in lowering the red meat price, in comparison with feeder calf costs, which constitute about one-third of beef retail price index. Calf prices are determined under uncontrolled bargaining market conditions.

V. Regional and Seasonal Patterns of Concentrate Feed Mix Price

Monthly average prices of concentrate feed mix in 13 villages out of

remaining 14.9% were due to residual or other factors. The hypothesis of zero variability are rejected. The results show that village variations play the major role in price differences of concentrate feed mix. The agriculture activities and other socio-economic factors within each village determine the mangitude of the difference between the concentrate feed mix free price in the villages and aggregate average free price of this feed.

However, season variation reflects the affect of variability in both livestock demand and feed supply. The effect of interaction between region and season does exist, but there were no replicates in the data available to estimate such interaction. Using Newman and Keuls method (Q test) to inspect differences between pairs of price, it was possible to analyze the concentrate feed mix price pattern regionally and seasonally.

With respect to seasonal pattern, the aggregate monthly average prices in 1976-77 were as shown in Table 3. Statistically the differences between December, January, February, March and April prices were not significant (at $p < 0.05$). Also, no significant difference was found between July, August and September prices or between the remaining 4 months (October, November, May and June). The minimum average price was found during winter months (from December up to April) and the maximum price was reached during July, August and September, i.e., the summer season.

Villages were ranked according to the mentioned Q test as shown in Table 4. The statistical test shows that it is possible to rank the villages in eight different croups with respect to monthly price average within which significant differences do exist. There is no significant differences between

Table 2

Analysis of variance (between villages and between months) of concentrate feed mix price in Egyptian rural areas in 1976-77.

Source of variation	Degrees of freedom	Sum of squares	Mean sum squares	F ration
Between villages	38	80108.73	2108.12	63.25*
Between months	11	7755.68	705.06	21.15*
Residual	418	13930.88	33.33	
Total	467	101795.29		

* Statistically significant at $p < .01$

the average prices of the villages of each group. This result provides an important evidence for in most cases the villages of each group were from different agronomic zones and different geographic regions. Therefore, village agricultural and economic characteristics are the most important variables that affect the concentrate feed mix free price, and these dominate any general regional effects.

Figure 3 shows the seasonal average free price index on aggregate basis per village in 1976-77 of concentrate feed mix. The U shape indicates the minimum level during winter, and the maximum is reached during summer. The statistical significance of this pattern will be investigated later.

Generally the seasonal pattern reflects changes in the availability of sources during winter (berseem) and food scarcity during the summer. The coefficient of variability between villages for each month is about 25%, which is considerable.

VI. Some factors affecting concentrate feed mix price level and seasonal variability in Egyptian rural areas

As shown earlier, the two major components of variability of monthly average price of concentrate feed mix were the region and the season. Therefore some variables concerning village, location, infrastructure and livestock activities in the village are to be investigated in their relation to the concentrate feed mix price level and their impacts on its seasonal pattern. In addition, the crop pattern of the village will be related to concentrate feed mix price variabilities (particularly its seasonal changes).

A - Effect of the Existence of feedlot farms in the village: -

The existence of feedlot farms in the village may represent additional

Table 3

Monthly average* price of concentrate feed mix in Egyptian rural areas in 1976-77.

Month	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Average of Months
Average price L.E/ton	62.06	59.78	58.05	54.67	53.77	54.58	56.74	58.82	61.38	64.8	65.13	65.70	60.0
Coef-ficient of vari-ability	22.4	22.3	25.3	25.8	25.2	25.7	24.4	22.7	22.3	22.4	24.4	24.6	25.2

* Average of 39 villages only, because 13 villages were ommitted, because they did not show any seasonal variability and 4 other villages were excluded, because there were no concentrate feed mix price in the data available in those villages.

Table 4

Indifference village groups of monthly average price of concentrate-feed mix in Egyptian rural areas in 1976-77.

zone	village	governorate	price LE/ton
15	Tokgharb	Sohag	105
16	Kom-Yaquob.	Quena	78.75
12	El-Mazatli.	Fayoum	74.58
8	El Safi	Kafr El-Sheikh.	74.58
11	Kafr-Taha.	Kalyonbia	72.08
14	El-Haradna.	Sohag	71.67
16	Damhoug	Menoufia	70.00
3	Shembat-Mankla.	Sharkia	70.00
1	Noba-Waldaha-shna.	Sharkia	67.92
1	El-Shaghana.	Sharkia	67.08
3	Kafr-Denohya.	Sharkia	67.08
13	Mazorah	Beni-Suef.	66.67
1	El-Salheya.	Sharkia	65.83
7	Mahalet-Ahmed.	Behera	65.00
8	Ariman	Kafr El-Sheikh.	63.75
8	Kabrit	Kafr El-Sheikh.	63.33
1	Manshat-Radwan.	Sharkia	62.25
1	Kafr El-Noseir.	Sharkia	61.25
2	El Ekhewa	Sharkia	58.08
1	Khatra El Sogaa.	Sharkia	58.00
9	Manshat-Gamal.	Dakahlia	57.5
8	BaneAbeed	Dakahlia	56.92

rank	zone	village	governorate	price LE/ton
	1	Kanteer	Sharkia	55.83
	8	Manakla	Dakahlia	55.75
	9	Gamalia	Dakahlia	55.75
	18	Sabeel	Aswan	55.74
	4	Manshat Kobaa.	Dakahlia	55.00
	9	Sofia	Sharkia	54.17
5	8	Shenou	Kafr El Sheikh.	54.00
	8	Abbaseya	Kafr El Sheikh.	51.67
	7	Kafr-Sharki.	Kafr El Sheikh.	51.67
	4	Beltan	Qualyoibia	49.75
	5	Ezab-Nobar.	Alexandria	48.33
	7	Dalgamon	Gharbia	47.50
6	1	Samaana	Sharkia	47.50
	8	Kafr-Wastani.	Damietta	45.00
7	12	Shawa-shna.	Fayoum	38.75
	13	Asmant	Menia	33.00
8	18	Khorzam	Quena	32.21

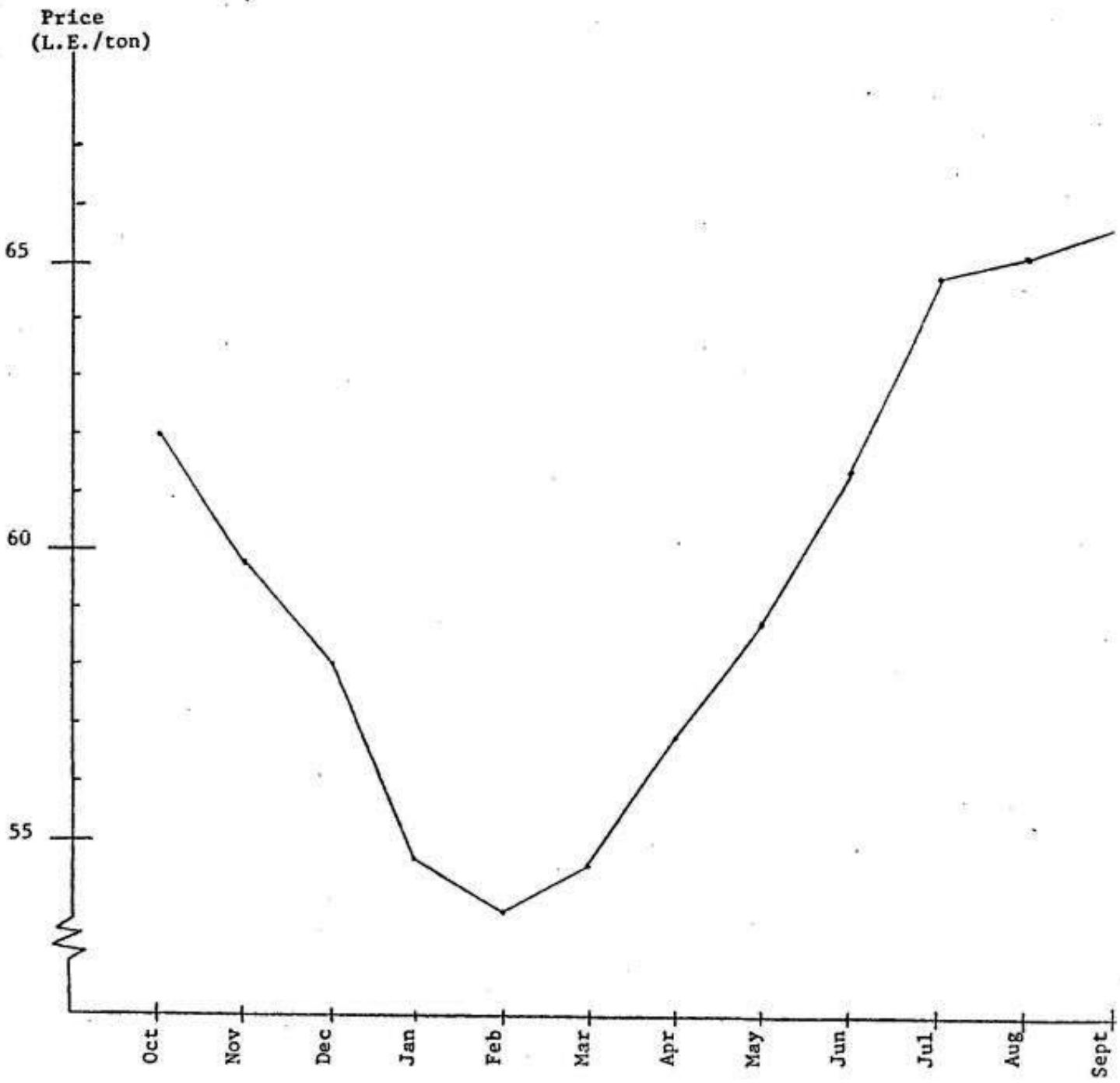


Figure 3. Seasonal Price Pattern of Concentrate Feed Mix, averages of all villages, 1976-77.

pressure on concentrate demand which may raise its monthly average price above the level of those villages without feedlot farms. Alternatively, the feedlots could be a source of free market concentrate supplies, if they sell part of their quotas. The presence of feedlot farms may also change the seasonal price pattern.

The monthly average price of concentrate feed mix in villages with feedlot farms in 1976-77 was L.E. 59.13 per ton, while that of the villages without feedlot farms amounted to L.E. 63.47 per ton (Table 5). A paired "t" test showed that the average monthly price of concentrate in villages without feedlot farms was higher than that of the villages with feedlot farms (at a probability level less than .05). These results suggest that feedlots may be a source of supply to the black market for feed concentrate. This could be either because the quotas they receive exceed their needs or because they misrepresent the number of livestock they actually hold in order to obtain extra quotas.

B - Effect of the distance between the village and the Governorate capital market:

Straight line distance between the village and the governorate capital was taken as an indicator for the village relative location with respect to the main market. Location may affect both the concentrate feed mix price level in the village and its seasonal variation. Villages were classified into three classes according to their distance from the local market: near (less than 20 kms), medium (20-50 kms) and far from the market (above 50 kms.) This classification of the villages showed statistically significant differences in concentrate feed mix prices.

Table 5

Monthly village average price of concentrate feed mix in L.E./ton in Egyptian rural areas* in 1976-77.

Variables affecting monthly average price.	Comparison	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Monthly average in 1976-1977
National average	aggregate air	63.5	62.4	59.8	58.9	60.0	61.0	62.3	64.3	64.3	66.3	66.8	67.5	63.13
Existance of feed-lot-farm in the village.	with feed-lot.	62.4	59.4	58.8	53.8	53.3	52.7	54.3	58.3	59.3	65.4	66.3	66.4	59.13
	without feedlot.	65.2	62.3	61.8	59.3	59.3	60.6	61.8	63.1	65.8	66.6	66.9	68.1	63.47
Village straight-line distance from the govern-orate market.	Near	59.7	57.4	57.8	55.2	54.9	56.3	57.4	60.1	61.4	61.4	62.5	63.4	59.05
	Medium	65.3	61.3	59.7	57.6	57.6	58	59.6	61.4	63.2	68.1	68.1	69	62.5
	Far	77.6	76.0	76.0	66.0	66.0	66.0	68.0	69.0	75.4	76.0	76.0	77.0	72.4

* Data of 52 villages.

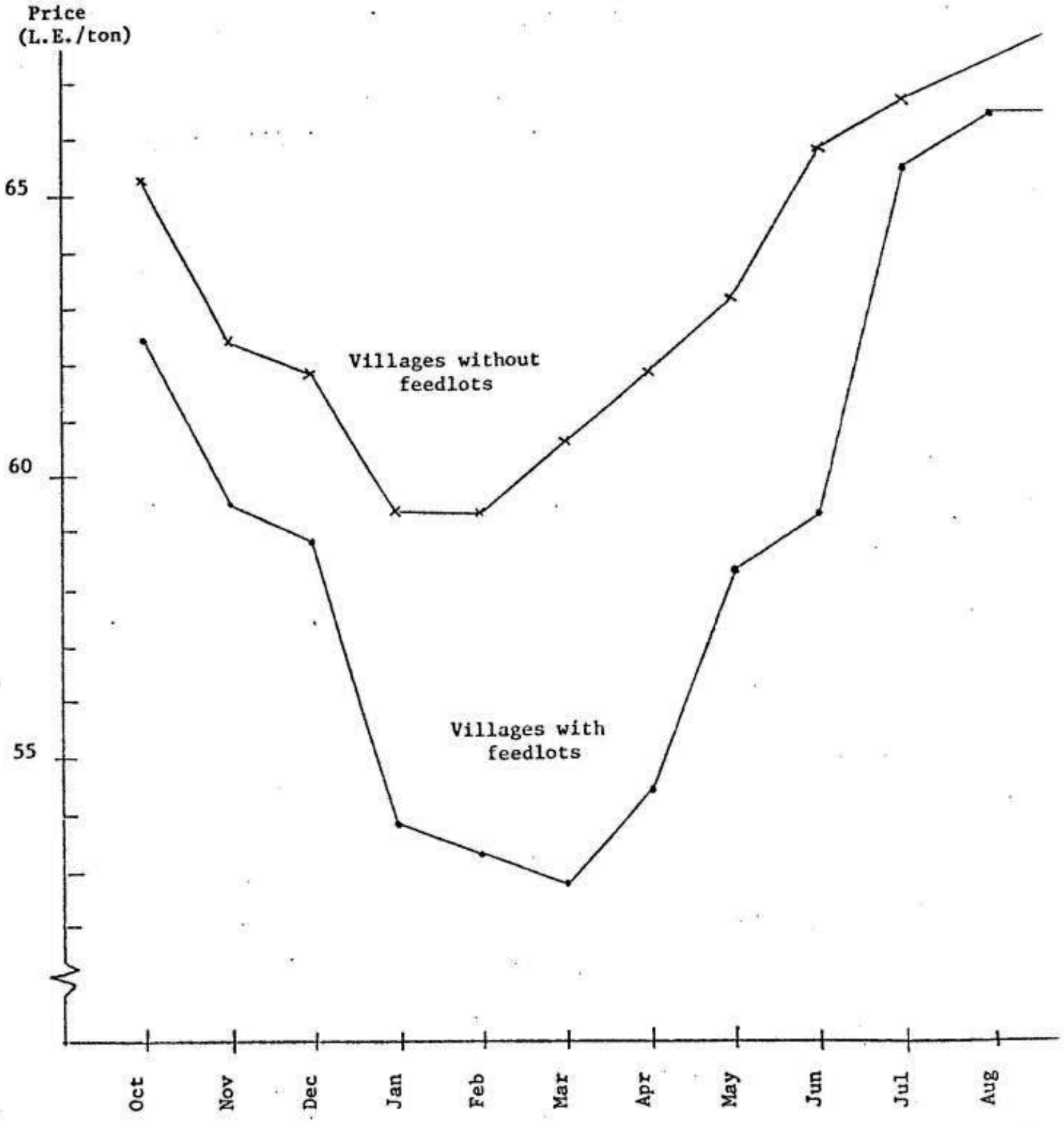


Figure 4. Effect of Feedlot Farms in the Village on Seasonal Price Pattern of Concentrate Price Mix, 1976-77.

The average monthly concentrate feed mix price of the villages increases, the farther the village from the governorate capital market. Analysis of variance between the three groups of villages (Table 6) showed that in the near villages the monthly average price of concentrate feed mix per ton (L.E. 59.05) was significantly ($p < .05$) less than that of medium distance villages (L.E. 62.45 per ton), which in turn was less than the far villages, where prices reached their peak (L.E. 72.39), as shown in Tables 5 and 6. Even when market distance was taken into account there was still a significant seasonal variation in prices between months.

According to economic resources allocation theory, this rank of the concentrate feed mix input prices, according to distance from main markets, is completely consistent. It may reflect the cost of transportation. However, the concentrate feed mix is distributed by the agricultural cooperative societies at the same subsidized price, regardless of location. Thus, these results indicate that central (governorate) markets are important sources of free market supplies.

It appears that middlemen had to pay additional money (e.g. transportation, tips) to move the concentrate from the governorate to the village. These extra costs, are added to the concentrate feed mix price, together with the profit margin of the middlemen. This is how the prices increase as they get farther from the Governorate capitals. On the other hand, the feedlot farm distribution density decreases by increasing the distance from the Governorate capital (20% of near villages, 14% of medium distance villages and less than 7% of the far villages have feedlot farms). To some extent, therefore, the availability of feedlots and the proximity to markets both act together to

reduce free market prices.

It also appears that the scarcity and higher prices last longer in the far villages (June to December) than in the near and medium villages (July, August, September) (Figure 5).

C - Effect of Crops Rotation:

Actually, the cropping pattern and rotation of each village affect the seasonal concentrate feed mix price (not its average). Rotation and cropping pattern provide the feed supply of concentrate feed mix substitutes and complements.

The price pattern of the concentrate (minimum in winter and maximum in summer) reflects the feed supply pattern over the year, as a function of the rotation and cropping pattern. Berseem represents the major source of feed for livestock, during winter, in traditional holdings. Availability of berseem to every small farmer is a common fact. Accordingly, the demand on concentrate feed mix decreases during winter and its prices diminish to the minimum. However, the magnitude of berseem supply (area) differs between villages. Therefore, it is expected that the concentrate feed mix price would vary from village to village according to the (relative) availability of berseem. The average area of berseem in the Egyptian village in 1976-79 was about 16.05% of the total cropped area in the village. The average monthly price of concentrate feed mix in winter for those villages which cultivated less berseem on a percentage of area basis than the national average, was L.E. 56.10 ton. It was significantly higher than the average monthly price of the same feed and the same season in the villages with a relatively larger berseem area than the national average. As Table 7 indicates the

Table 6

Two ways analysis of variance of concentrate feed mix price according to villages classification into 3 distances from the governorate capital and seasonal variations.

Source of variation	Degrees of freedom	Sum of squares	Mean sum of squares	F-ratio
Between months	11	456.61	41.51**	10.57
Between village classes.	2	1166.48	583.24**	148.45
Residual	22	86.44	3.93	
Total	35	1709.53		

* Significant at $p < .01$.

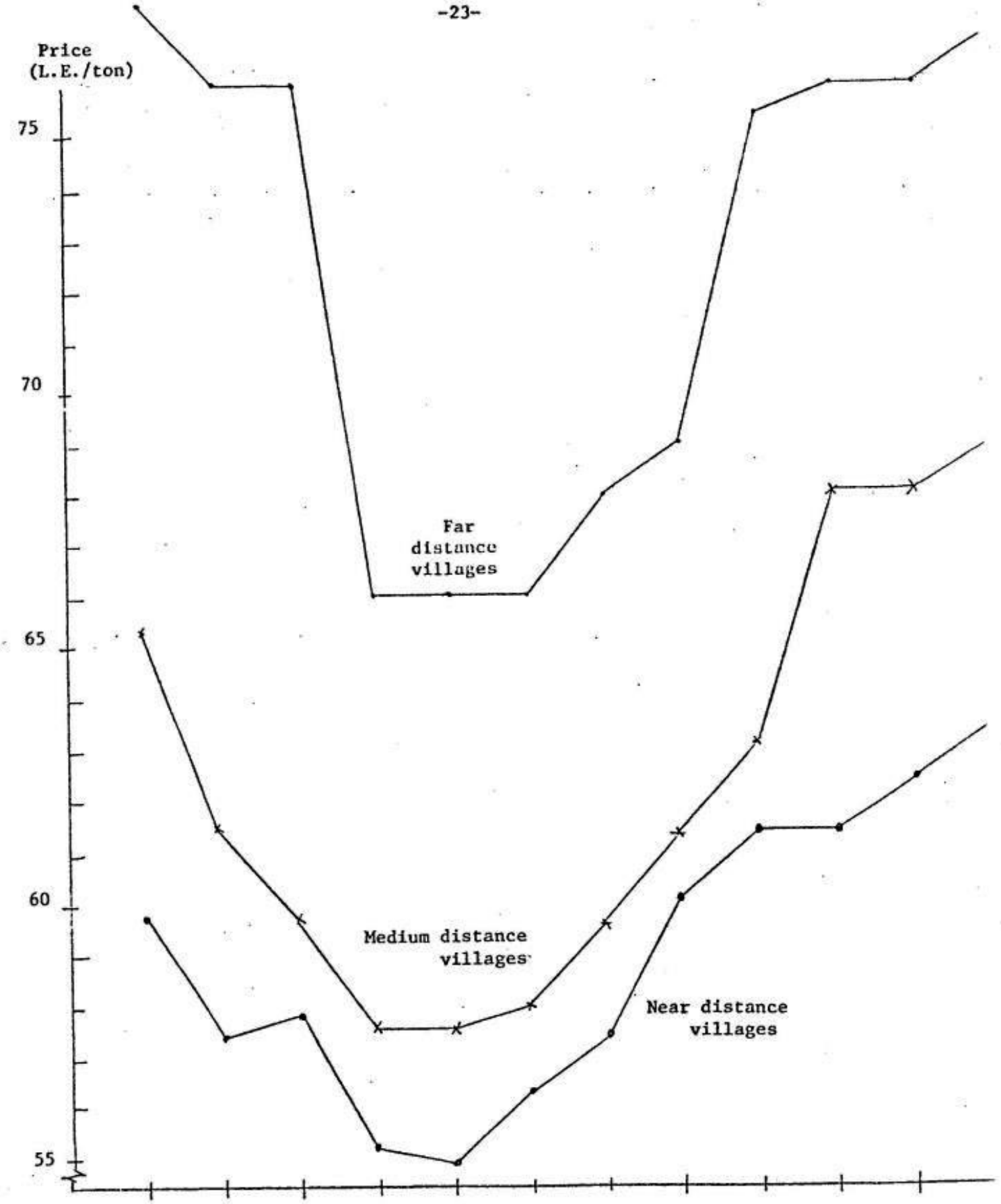


Figure 5: Effect of the Village Distance from the Central Market on Seasonal Price Pattern of Concentrate Feed Mix, 1976-77.

cultivation of barley in a village also has the effect of reducing the free market concentrate price.

The introduction of barley diminishes the affect of shortage in berseem supply. For the villages of greater supply of berseem, the availability of barley in winter cropping pattern had a notable effect on pulling down the concentrate feed mix price. The price averaged L.E. 50.71 per ton in those villages with more than average berseem and with barley. Villages above average in berseem which had no barley within their cropping pattern had an average winter concentrate price of 56, 55 L.E. per ton (Table 7.)

During summer many Egyptian livestock actually cannot obtain their maintenance requirements of feed. Though livestock activities reach their minimum level in summer (cows are dry, no calving operations), there is still a large shortage in feed supply during this season. This shortage has been estimated at not less than 50% of the total requirement. This shortage of fresh fodders would be expected to increase concentrate prices.

On the other hand, the availability of Nili Fodders should diminish the high price of concentrate feed mix during the late summer season. However, the total fodders available in both seasons was 63,000 feddans* in 1976-77, which was not a very large increase over the 51.000 feddans available in 1970.

Evidently, Nili fodder area should be more effective during summer (July, August and September). Straws are to a large extent compementary feeds and

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* Ministry of Agriculture of Egypt: Department of Agriculture Economics and Statistics, 1979. Unpublished records.

Table 7

Effect of fodder availability in winter on concentrate feed mix free price in Egyptian rural areas.

Relative berseem area out of total cultivated area of the village:	Winter months average prices per village per ton in LE.
Above the average of all villages.	54.8
Below the average of all villages.	56.1
Above the average of all villages, and	
*cultivate barley	50.71
*do not cultivate barley	56.55
Below the average of all villages, and	
*cultivate barley	55.1
*do not cultivate barley	57.1

not substitutes for concentrate feed mix, therefore, the wheat and other grains and legumes area on village base did not show any significant effect on its summer prices. Also, maize is usually used for human consumption and for poultry, which is probably why it has no significant effect on concentrate price.

REFERENCES

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