Feed Use Patterns For Livestock On The Egyptian Farm

BY

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Summary

From field data of sample surveys, the study estimated the net feed balance above the livestock requirements per farm. With respect to the conventional diversified output farm, there is excess feed use above the requirements for all farm size classes. The excess has a nutritive value of 1272 Kg of starch equivelant and 520 Kg of digestable protein as a weighted a verage. This feed excess increases as the farm size increases. It is possible to overcome such feed excess by decreasing the berseem arear to reach 981,043 feddans as long season berseem production equivelant. With respect to the Commercial dairy buffalo farms around the urban cities, there is an excess of feed use of about 50% above the requirements. If such excess could be overcome, it would save about 883,000 tons of corn equivelant. To approach this goal several policy instruments are required. These are: to adjust the current livestock input-output price distortions, fix the livestock population number, to establish an effective livestock extention services which guides the farmers towards the best economical feeding systems. It should be mentioned that the current feed use situation leads to the inflation in costs of production due to inefficient use of feed resources.

Introduction

Several previous studies concerned the feed use pattern in Egypt and estimated what called the feed gap, i.e. the

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difference between feed availability and animals requirements. All these studies came to a conclusion that there was an increasing deficit over time and this deficit was the main issue behind the low level of production. The total requirements of livestock and poultry were calculated as 12,730,385 tons TDN and 1,367,258 tons Dp, in 1982 and the nutritive value of the feed resources used in 1982 was about 9,623,736 tons of TDN and 1,916,895 tons of Dp, i.e. there was a feed deficit of about 3,106,6494 TDN and 126,972 tons Dp in 1982 (1). Other studies showed the same trend of feed deficit. (2), (3) and (4). However, these estimates depended upon the puplished secondary data of the feeds used in a given year. They also depended upon hypothetical productivities or output levels presented in the text books about the Egyptian livestock. Even though, these previous research work did not consider the concept of the production function. This concept shows that a given (current) production level should be a direct response of the inputs used (5). Therefore it is not correct to cite that the feed inputs used were less than the feed inputs required for the actual output produced in a given period of time. However, under the production function concept the excess of feed inputs used is permitted. In this case there will be a negative productivity of the feed inputs. Accordingly, it could be said that there is a feed shortage to reach a higher output level than the current one, but the current output is a direct response of all feed used. Also, the feed self-sufficiency is the ratio of production to the consumption, where the later is the sum of domestic production plus import. The country reaches the full self-suffeciency, if the imports are zero.

The present study is an attempt to estimate the present feed use patterns and livestock requirements from field survey data, on the Egyptian farm. The study considered two important livestock farming systems. The conventional diversified output farms which hold more than 90 percent of the Egyptian livestock and the commercial dairy farms around urban cities which produce around one fifth of the milk production in Egypt (6).

Data Base and Methods

The study used field data of a purposive survey, conducted in 1982, for the livestock activities on the conventional diversified production farm in Egypt. It was, partially, supported by the ADS research project of the Ministry of Agriculture (Egypt) and USAID. The survey included 8 villages from four governorates in lower Egypt (Sharkia, Kaliobia, Monoufia and Gharbia). The sampling technique was a stratified clustered random sampling. The sample size was 212 farms. The farms under each farm size class were selected randomly as the following:zero feddan, less than 1 feddan, more than one to three feddans, more than three to five feddans and above five feddans. The collected data included the herd structure and composition, the outputs produced, the inputs used and the inventory changes of the livestock for one agricultural year (1982).

The feeds used data by type, quantity and source were collected in detail. The experience of the authers from the applications of some previous field surveys showed that it is biased to collect the feed use data per individual head on the conventional farm. The Common practice is to survey feeds use on farm as an aggregate for the livestock holding on the farm.

Feed availability was calculated on base of the nutritive values as starch equivelant (SE) and digestive protein (DP), using the standard coefficients published by the animal and poultry research institute of the ministry of agriculture (Egypt). Feed requirements were calculated according to the individual animals holded on the farm. Milk production per head and animal work by type of animal and type of work were available from the survey. Herd structure, by type age, sex and reproductive condition, was among the survey data. Average livewieght per head was estimated as a function of the current age of each animal, the period of holding on the farm and the inventory changes within the concerned year. The net balance were calculatted as the differences between available feeds used and livestock requirements. The net balance shows the deficit or the

surplas of feeds used for the livestock according to the registered output levels on the farms. The sheep unit (SAU) was used in this study as a basic animal unit (7) to relate other livestock on the farm to this index, in order to present the herd structure.

Another survey was conducted in the same year to estimate the sufficiency of the feeds used by the commercial dairy buffalo farms around the big cities. A sample survey of 20 farms of this type were conducted in Giza governorate. The data included (as the first survey in this study) all inputs and outputs of each farm. Therefore, among other purposes of the survey it was possible to estimate feeds used and requirements to get the net balance.

Result and Discussions

Herd Structure and Composition per holding of the Conventional Farm:

From table 1, the average livestock holding per farm is 5.28 SAU. Around one third of the total holding are buffaloes and cattle in milk, whereas two thirds of this category are only buffaloes. Cattle male proportion is much higher than buffalo males, because beef production is still the most important red meat source. More than one-fifth of the SAU are draft animals (donkey and camel). This high proportion of draft animals make a great pressure on limited feed supply. However the current mechanization policy cannot do much in this concern (8), although around 80 percent of the farm's animal work is devoted to transportation by those animals, the current infrastructure of the Egyptian village enforces the farmers to use such animals for transportation. Integrated rural development programmes my solve this problem.

Feed Requirements for Livestock per conventional Farm:

As shown from table 1, buffaloes as a total represents around 37.5 percent of total animal units on the farm, however they require more than one-half of feed requirements of the

farm's livestock holding (table 2). This is because 72 percent of the buffaloes are in milk. On the other hand, while cattle per farm is around 26 percent of the total animal units, they require only one fifth of the total feed requirements (table 2) because only 41 percent of the cattle on the farm are in milk (table 1) and because native cattle milk productivity is much less than buffaloes.

Net Feed Balance Per Conventional Farm:

Actual feed use versus feed requirements per farm were calculated. The net feed balance is the difference between feeds used and feeds requirements for livestock. Table 3, presents the results of such calculations. On the average there is surplus of about 1272 kilograms SE per farm per year and 520 Kg of DP per farm per year. It is the weighted average of all farm size classes. The weights used are devived from the original frequancies of each class in the sample. The agricultural holding records of the concerned villages in the sample which are kept in the agricultural cooperatives were used to get the weight (frequancy) of each farm size class. These calculated aggregate weights are 35%, 45%, 12% and 8% for the farm size classes less than one feddan, 1-3 feddans, 3-5 feddans and above five feddans, respectively. All farm size classes showed surplus increases as the increase in farm size (table 3). This excess in feed use above requirements push the costs of feeding per head much more above the optinum level. This is an indicator of inefficiency which raises the costs of production due to inefficient employment of feeds. It considers, indirectly, as a source of inflation in livestock market. Table 4, shows that the costs of feeding increases as the farm size increases. As table 4 shows, berseem is the main item among the feed cost budget. The smaller the farm size the less is the surplus in feed used, i.e. the smaller farm is more conservative in feed use. This probably because the limited agricultural area available which limits the expantion in berseem area and even legumes and grain crops as sources of concentrates straws. The percentage of off-farm purchased feeds decreases as farm size increases.

Surprisingly, while the smaller farm size is of lower excess feed use they hold the animals of the highest milk yield (9).

From table 4, the source of excess feed costs is mainly due to expantion in berseem feeding. Also, the small farmer, probabley, wants to keep the higher milk yield of his animals at the potential level therefore, he insistes to purchase higher proportion of concentrate feed mix from the black market at three folds its subsidized price. This because his quota is very low because he has no periority in the current distribution system (10). Also, the small farmer purchase more other concentrates (grains, legumes and brans) than the large farmer to improve the feed quality which fitts higher productive animals he holels.

Policy Implication of the Excess feed use on the Conventional Farm:

It is required to avoid the excess feed use per farm above the scientefic requirements, according to the current production levels. This has three policy instruments. First, adjustments of the current agricultural price distortions. Secondly, to establish an effective effecient and active livestock extention service in the villages to guide the farmers towards better effecient use of the available feeds. Thirdly, to cut the berseem area to the optimum level. Obiviously, the first two policies will help to reach the third one. The study shows the berseem area to be decreased as equivelant to the average excess feed used per farm and which can, also, be used to calculate the national average.

Table 5, presents the estimated area of berseem to be decreased in order to overcome the estimated surplus of SE per farm at each farm size class and as a weighted average of all farm size classes. Eventhough, if this area were decreased some surplus in protein would have been left.

On the average a surplus of 1272 Kg of SE per farm is equivelant to around 0.53 feddans of berseem. If this area of berseem was decreased per holding, around 318 Kg of DP per holding would bea surplus (around 164 gm DP per animal unit per day).

The preliminary results of 1982 agricultural census conducted by the Ministry of Agriculture (Central Adimin.for Agricultural Economics and Statistics) showed that there are 1,417,231 agricultural holdings in lower Egypt and with an average area holding of about 2.6 feddans and 1,086,547 feddans in upper Egypt with an average area holding of about 2.0 feddans. The sample survey of the study included only villages from lower Egypt. To apply the estimates for upper Egypt, the following assumption is used. The study showed that the lower the farm size the lower is the excess of the feeds used. Therefore, it is possible roughly, to consider that the expected excess feeds per farm in the upper Egypt is a proportion of that estimate of the lower Egypt in the sample. This proportion is the ratio of the farm size in the upper Egypt to the farm size in the lower Egypt founded by the census. This ratio is about 0.77. Accordingly, it is required to decrease the berseem area by 0.53 feddans in the lower Egypt and by 0.4 feddans in the upper Egypt. The total area are 434,618 feddans in upper Egypt and 751,132 feddans in lower Egypt, i.e. a total of 1,185,750 feddans. In 1984 the total berseem area cultivated in Egypt was around 2.7 million feddans*of which 197,196,7 feddans were long season berseem and 834,971 feddans were short season berseem. As one feddan of the long searess berseem produces 30 tons a year (4 to 5 cuts) and one short season berseem produces 7 tons per years (one to two cuts), the equivelant of total cultivated area of berseem in 1984 was 2,166,793 feddans, i.e. to vanish the estimated excess feed use it is required to keep the berseem area at the level 981,043 feddans a year as equivelant to the production of long season berseem.

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* Ministry of Agriculture (Egypt): Central Administration for Ag. Econ & Stat.

Feed Use Pattern on the Commercial Dairy Buffalo Farms:

The commercial dairy buffalo herds around the urban cities in Egypt use extensive variaties of feeds which include bread and wheat flower (6). From the sample survey of 20 farms conducted in 1982, table 6 shows that surplus of SE and DE per milking head of this type above the requirements recommended by Ghoniem (11) which is calculated according to the actual output of milk and age and weight shown by the servey data. In general there is surplus in feeds used of about 50% above the requirements. This surplus is equivelant to 7.745 Kg SE. and 1.395 Kg DP per milking head per day. This surplus if could be overcome it would lower the costs of production by around 35 piasters per dairy buffalo per day or about 4.3 piasters per 1 Kg of buffalo milk produced per day (1982 prices). At national level this quantity, of feed surplus is equivelant to 88.3,000 tons of corn per year, assuming that the total number of dairy heads under such system are 220,000 *

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* Central Agency for Public Mobilization and Statistics (Egypt): Livestock Statistics in ARE, 1984.

Table 1: Average Herd Structure and Composition per Convintional Diversified Egyptian Farm

	Value
Livestock Holding Size per Farm (A.U):	5.28
Buffaloes:	
In Milk (%)	26.9
Dry:	
Female (%)	7.3
Male (%)	3.3
Cattle:	
In Milk (%)	10.6
Dry:	
Female (%)	7.1
Male (%)	8.3
Sheep:	
Female (%)	4.2
Male (%)	3.4
Goats:	
Female (%)	4.6
Male (%)	2.0
Camels (%)	2.5
Donkeys (%)	19.8

Table 2: Relative Importance of the buffaloes and Cattle feed requirements of the total feed requirements per farm:

	Percentage of total feed requirements	
	Starch equivelant	Digestive protein
Buffaloes: in milk	37.5	39.8
dry	15.6	16.6
total	53.1	56.4
Cattle : in milk	12.0	12.3
dry	10.0	11.6
total	22.0	23.9
Other Types	24.9	19.7

Table 3: Net feed balance per farm by farm size class.

Farm Size class (feddans)	Net feed balance (Kgs/farm) Starch equirelant	Digestive protein
Less one feddan	+ 226	+ 339
1-3 feddans	+ 1216	+ 466
3-5 feddans	+ 3329	+ 992
more than 5 feddans	+ 3085	+ 930
Sample average	+ 1272.5	+ 581

Table 4: Feed Costs per Milking Buffalo per year and percentage of aff-farm purchased feed costs by farm size and by type of feed (1982 Prices).

Feed Item		Less than 1- feddan	More than 1 to 3 feddans	More than 3 to 5 feddans	Above 5 feddans
Berseem	L.E.	82	99	114	124
	% off farm	(50)	(25)	(23)	(27)
Straw	L.E.	35	55	50	70
	% off farm	(76)	(38)	(20)	(23)
Conc.feed Mix(2)	L.E.	34	26	20	20
	% at free price(3)	(65)	(38)	(25)	(30)
Other Conc.(4)	L.E.	21	21	19	15
	% off farm	(100)	(72)	(59)	(31)
Total Costs	L.E.	172	201	203	234
	% off farm	(69)	(40)	(23)	(31)

(1) Calculated at the average fixed prices for all farms.

(2) A processed mix composes of yellow corn, cotton seed cake, bran and mollases. It is distributed by the MOA at subsidized price, according to a quota system.

(3) Some of the Conc. feed mix are illegally available in the free (black) market which is sold at 3 folds the subsidized price.

(4) Includes grains, legumes and brans.

Table 5: Equivelant Area per holding to be taken from under Berseem to vanish the feed use surplus on the conventional farm.

Farm size class	Area of berseem to be decreased per farm which is equivelant to the excess of the feeds used per farm per year
Less than one feddan	2.8 Kirates[1]
1-3 feddans	15.2 Kirates
3-5 feddans	41.6 Kirates
above feddans	38.6 Kirates
weighted Average	12.72 Kirates

(1) One feddan = 24 Kirates

Table 6: Net feed balance per dairy buffalo per day under the commercial production system.

Holding Size No. Animals	Starch Equivelant Kg	% of requirements	Digestive Protein Kg	% of requirements
11-30	7.759	53.88	1.034	49.47
31-50	7.057	51.03	2.105	65.99
51-70	7.428	52.27	1.723	63.58
Sample Avr.	7.745	53.78	1.395	56.71

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أنماط استخدام الاعلاف فى المزرعة المصرية

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ملخـــص

باستخدام بيانات ميدانية من حصر بالعينة قدرت الدراســـة صافى الميزان العلفى فوق احتياجات حيوانات المزرعة . وتبين بالنسبة للمزرعة المصرية التقليدية متعددة المنتجات ان هناك اسرافا فـــى استخدام العلف لكل أحجام المزارع . يزيد هذا الاسراف فـــى قيمته بزيادة حجم المزرعة . وفى المتوسط فان هناك زيادة عـــن احتياجات حيوانات المزرعة بلغت حوالى ١٢٧٢ كيلوجرام معادل نشا وحوالى ٥٢٠ كيلوجرام بروتين مهضوم لكل مزرعة . ويمكن تصحيح هذا الاسراف لو ثبتت مساحة البرسيم فى مصر عند مستوى ٩٨١٠٤٣ فدان مقدره كمعادل لانتاج الفدان من البرسيم المستديم . وبالنسبـــة للمزارع التجارية لانتاج اللبن من الجاموس حول المدن ، فقد تبيـــن ان هناك اسرافا فى استخدام العلف قدر بحوالى ٥٠٪ مـــن احتياجات الرأس الحلابه ، ويمكن توفير حوالى ٨٨٣ الف طـــن معادل ذره لو تمت تغذية هذه الحيوانات وفقا للمقننات العلمية ولتحقيق تلك الاهداف فلابد من تعديل السياسات الزراعيـــة الحالية خاصة بالنسبة للاختلالات السعرية القائمة فى اسعـــار المدخلات والمخرجات الحيوانية ، وتثبيت حجم العشائر الحيوانيـة فى مصر دون زيادة عددية ، وقيام خدمة ارشادية فعالة لتوجيـــه المزارعين نحو أفضل أساليب تغذية حيواناتهم اقتصاديا .

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