



The use of random sampling in studying the problem of feed as one of the factors affecting the production of red meat in fattening farms in Egypt (case study: Qalyubia Governorate)

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Abstract: The topic of research “The use of random sampling in studying the problem of feed as one of the factors affecting red meat in fattening farms in Egypt, Qalyubia governorate as a case study.” The research treated the problem through four main objectives; identifying the problem of fodder locally, identifying the problems of dry feed alternatives and ways to overcome them, studying the functional relationship of the factors affecting the production of red meat in the farms of the research sample, presenting a feasibility study for the manufacture of feed alternatives from agricultural waste in calves fattening farms in the search area. The research used the quantitative and qualitative descriptive approach in the analysis, relying on the primary data of the random sample (for the year 2022), in addition to secondary data related to research in the field of animal nutrition and feed prices, to draw conclusions and make recommendations.

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Introduction

The Egyptian state pays great and noticeable attention to the livestock sector, whether by granting loans at a decreasing interest rate estimated at 5%, compared to 23%, or by developing veterinary services, Serums, and vaccines after the spread of viral diseases. One of the development policies was that the private sector, with its investment and charitable institutions, participated with the official state institutions in the development of livestock. Although the state is supporting large farms as well as activating and reviving the veal project, preventing female slaughter and encouraging calves fattening projects, in order to reduce the red meat gap, (the self-sufficiency rate was estimated at 53.8% in 2020⁽¹⁾), farmers who are breeders are still suffering from a number of problems, including the lack of a stock market for red meat and dairy similar to the stock market for poultry and egg production, in order to ensure the marketing of their products, and they also suffer from a lack of concentrated feed on which fattening projects depend, in addition to its high prices.

The annual needs of livestock of green fodder are estimated at about 40 million tons, 12 million tons of hay, and 16 million tons of concentrated fodder. Egypt, as one of the countries that depends for its food on importing about 45% of its necessary needs, needs to import about (9.4) million tons of yellow corn and about (4.5) million tons of soybeans, whose value

increases annually according to fluctuations in the global market.

Research problem:

The problem is that there is a shortage of concentrated feed that has increased with the coronavirus crisis and then the Russia and Ukraine wars, and this has been reflected in the prices of feed production requirements, including grains such as corn and soybeans as a main component of livestock feed and the production of red meat and dairy.

Although there is a surplus in green fodder estimated at about 19 million tons, there is a deficit in concentrated fodder estimated at about 22 million tons, which made smallholders who own 80% of livestock in Egypt suffer from a deficiency in fodder, which affects the amount of meat produced. Despite the possibility of solving the problem from the agricultural residues, which amount to 37 million tons annually at the level of the Republic.

Research aims:

The research aims mainly to try to find a solution to provide alternative feed in sufficient quantities so that livestock can be increased in Egypt, through:

- 1- Trying to identify the fodder problem locally.
- 2- Identify the problems of dry feed alternatives and ways to overcome them.
- 3- Studying the factors affecting calves fattening farms to produce red meat.

- 4- Conducting a Feasibility study of using feed alternatives from agricultural waste for calves fattening farms.

Research method and data source:

The study relied on the descriptive and quantitative approach in the analysis. and the study also used the random sampling method to select fattening farms. Secondary data obtained from the Economic Affairs Sector and the Central Agency for Public Mobilization and Statistics were used, in addition to unpublished data obtained from the records of the Directorate of Agriculture in Qalyubia Governorate. The primary data obtained through the sampling survey of calves fattening farms in the centers of Qalyubia Governorate were also used.

The results:

1- Feed problem in Egypt:

The problem of fodder in Egypt is an old problem that has been dealt with many researches in order to reach realistic solutions to it, but the problem is expanding and increasing in severity with the inflation of the prices of foodstuffs, agricultural production requirements, and population increase.

This is confirmed by the study of Ramzy⁽²⁾, which indicated that the lack of animal feed is considered one of the chronic problems in Egypt, especially with the increase in demand for red meat due to the steady population increase. This has led to a widening gap between the total and actual capacity of cattle fattening projects in various governorates of Egypt. At the level of breeding and fattening farms, the capacity of cattle fattening has decreased by about 28%.

At the general level, many breeders, especially the young ones, quit investing in the field of livestock at a rate of up to 53% due to the lack of fodder and high its prices, especially since other factors have helped in that, including the lack of free veterinary services, the high prices of medicines and veterinary services, and the increase in the rate of diseases, epidemics and an increase in the mortality rate by up to 5%.

The high prices of green fodder and the wages of the workers, the lack of good insurance for the heads of fattening calves, as well as the lack of agricultural and veterinary guidance, in addition to environmental laws, legislation, and urban sprawl.

Another study by the Desert Research Center (3) obvious that the alternative solution is to use agricultural industrial waste, and believes that date seeds and olive ground exceed barley grain and yellow corn as a component of concentrated animal diet by 70% added to 30% alfalfa dressing.

2- Feed alternatives:

The aim of using feed alternatives to feed animals is to give the highest possible productivity in meat and

milk at the lowest possible cost, and these alternatives must be characterized by the health safety of the animal and be free from any substances that harm the health of the animal so as not to harm human health. Therefore, the Regional Center for Food and Feed⁽⁴⁾ indicates the importance of examining the raw materials used in the feed industry, and that they be tested in a laboratory to ensure their specifications and then allow their circulation and use.

One of the alternative feeding methods is to treat rice straw or hay with 3% urea to raise the protein content to 7%, as every 2 kilograms of rice straw or hay treated with urea equals one kilo of concentrated feed. The (Azolla) plant is also used, which is a plant that floats above the water as green fodder, which is dried and used as dry fodder with other vital additives, or the use of barley, or the expansion of the cultivation of alfalfa, Sudan hashish, and elephant fodder in the reclaimed lands. Maize is also used as one of the fodder alternatives, as its stalks are harvested before the formation of the cobs and converted into (silage) and stored throughout the year. Also, a large part of the municipal alfalfa cultivation is currently being converted to alfalfa, which stays for three years in the agricultural land, and gives higher nutritional values than the municipal alfalfa.

The junkyard of the food industries resulting from the food and juice factories are also used as substitutes for animal feed due to the high percentage of sugars present in them⁽⁵⁾.

Fodder substitutes can also be used from by-products resulting from agricultural production, horticultural and field waste, such as tree pruning waste and vegetable waste such as beans and cowpeas, in addition to dry waste such as hay and cane waste, as they are rehabilitated as feed alternatives used in animal feed. These wastes are characterized by their large size, low nutritional value, unacceptable taste, and their lack of protein and mineral salts, so it can be treated by cutting and crushing them and adding urea and ammonia to them to raise their nutritional value. Dry waste can also be treated with beneficial fungi, adding some vitamins and mineral salts, and adding molasses to improve the taste.

Thus, the animal diet is represented by 70% of the dry fodder, 30% of traditional fodder such as alfalfa, which helps reduce the cost of feeding and contributes to the decrease in meat and dairy prices.

3- Study of the factors affecting calves fattening farms to produce red meat:

The random sampling method was used in selecting calves fattening farms to study the factors affecting calves fattening farms to produce red meat, in Qalyubia Governorate, as follows:

Study population⁽⁶⁾:

Qalyubia Governorate was chosen deliberately as a community for the study as it is the closest distance to Cairo Governorate, where Qalyubia is in the eastern Nile region at the head of the Delta, bordered on the north by Dakahlia and Gharbia governorates, on the south by Cairo and Giza governorates, on the east by Charkia governorate, and on the west by Menoufia governorate.

Which means the importance of the location of Qalyubia Governorate, where it mediates a group of governorates in Egypt, the cultivated area is about 192,952 feddan, or 81% of the total area of the governorate, and by 3% of the total cultivated area in the Arab Republic of Egypt, its most famous agricultural products are cotton, wheat, corn, and beans in addition to vegetables and fruits.

This Governorate is considered a stronghold of industry in Egypt, and the governorate has the elements of agricultural industrial investment, including food security projects, especially in the field of investment in raising and fattening livestock to produce red meat, as well as poultry projects, but it, like the rest of the governorates of the Republic, suffers from an acute shortage of fodder and important concentrated materials. Influencing the development of livestock and poultry⁽⁷⁾.

As for the statistics of Table (2), they refer to the study population for fattening projects only, as it is clear from the table that the governorate has 7 centers,

which are Qalyub Center, Al-Qanater Al-Khairiya Center, Toukh Center, Banha Center, Kafr Shukr Center, Shebin Al-Qanater Center, Al-Khanka Center, with about 206 villages. Despite this, calves fattening projects are established in only about 25.2% of those villages, i.e. in about 52 villages, with a total of only 180 fattening projects in the governorate, and the actual capacity of these projects in production is only about 37.2% of the total capacity that it is assumed that the province will produce 15,808 heads.

Table (1): Breeding and fattening farms for animal production in Qalyubia Governorate for the year 2021

Number of	Livestock farms breeding and
74177	2-1
31307	4-3
92840	9-5
17380	19-10
5870	49-20
4500	99-50
1200	199-100
900	499-200
820	500 or more

Source: Food Security Projects, Agricultural Investment Records, Qalyubia Governorate, 2021 (unpublished data).

Table (2): Distribution of centers, villages, fattening projects and their capacity in Qalyubia Governorate

Administrative center	Number of villages	Number of villages fattening projects	% of projects out of the total number of villages	Number of fattening projects	Totality of total capacity of fattening projects (head)	Actual capacity of fattening projects	% of the actual energy of the total energy	Shortage
Qalyub	19	12	63.2	76	7520	1250	16.6	83.4
Charity arches	18	11	61.1	22	2300	645	28	72
Toukh	51	15	29.4	26	1988	1241	62.4	37.6
Banha	41			21	800	350	43.75	56.25
Kufr Shukr	23	14	60.8	18	775	700	90.3	9.7
Shibin Spans	37			17	2425	1695	69.8	30.2
Khankah and Abu Zaabal	17							
Total county	206	52	25.2	180	15808	5881	37.2	62.8

Table (2) is designed by the researcher. Data source: Directorate of Agriculture, Qalyubia Governorate, reports of the Food Security Projects Administration in Qalyubia 2021.

The Shebin El-Qanater center was the least invested in the number of fattening projects, which amounted to about 17 fattening projects, while it ranked first among the governorate centers in terms of

production, as it has about 1695 heads. As for the Qalyub Center, it ranked first in the number of fattening projects, which amounted to about 76 fattening projects, while it ranked second in production, with about 1250 heads. As for the Toukh center, it ranks second in terms of the number of fattening projects, which amounted to about 26

projects, while it ranked third in terms of production, as it has about 1241 heads.

One of the distinguishing features of breeders in fattening projects in the governorate is that small breeders are mostly concentrated in Qalyub Center, and some of them have left the investment process in such projects due to financial considerations, lack of support, and high costs of breeding and fattening. This also applies to small breeders in the center of Benha, who are mostly investors who are called (the urban investors). Although Benha is surrounded by 41 villages, the urban investor owns the most fattening projects with 21 projects, its actual capacity does not exceed 43.75% of the total capacity. The same applies to the center of Al-Khanka and the west and east of Shubra Al-Khaima.

It is clear from Table No. (2) that the gap between the real capacity of the fattening farms (15808) head and the actual capacity in the sample (5881) head, representing 62.8% due to a group of factors that were field-reported, the most important of which is the problem of inability to "The availability of animal feed" and the high costs of fattening, which is determined in the cost of calves purchased for the purpose of fattening, which amounts to about 8-12 thousand pounds at the age of weaning between 100-150 years, and the cost of feeding from concentrated and filling fodder, which represents 70-85% of the costs of operating the farm, and the high labor wages of workers and reach in the study Field work is about 2000 pounds/month. In addition to the cost of medicines, veterinary care and immunization for the animal during the fattening cycle (5 months) at an average of 1000 pounds per month.

As it is clear from Table No. (2) that there is a gap between the real capacity of fattening farms (15808) head and the actual capacity in the sample (5881) head, representing 62.8%, This is due to a group of factors: the problem of the unavailability of animal feed and the high costs of fattening, resulting from the high prices of purchased calves, which amount to about 8-12 thousand pounds at the age of weaning between 100-150 years, in addition to the cost of feeding from concentrated feed. And the fullness, which represents 70-85% of the operating costs of the farm, and the high wages of the workers from the calvin and reach in the field study about 2000 pounds / month. In addition to the veterinary cost and immunization of the animal during the fattening cycle (5 months), an average of 1000 pounds per month.

The Sample frame:

Through the study population and through the fattening projects included in the names of the breeders in the list (the sampling frame), the calves fattening projects are divided into four basic categories

according to the number of fattening heads of the breeders, namely:

- 1- The first category: 5- Less than 25 heads of fattening calves.
- 2- The second category: 25- less than 35 heads of fattening calves.
- 3- The third category: 35 heads - less than 45 heads of fattening calves.
- 4- The fourth category: 45 heads or more.

Sampling method and random selection:

In this study, the multi-stage stratified sampling method was used, where the sample was selected in stages, and the administrative division was considered the basis for the stratification division, as it was considered that each center within the governorate was a layer (strata), and from each center a number (2) villages were selected from among the villages of the fattening projects. Therefore, these were considered randomly selected villages from within Tabqa (strata) (the center) served as a primary sampling unit, and the randomly selected fattening projects were considered as a secondary sampling unit, and accordingly the fattening farm is considered a sampling unit and represents the number of breeders as well.

Random sample size:

In selecting the random sample, tables of random numbers were used, so that each fattening project in the study population would have an equal chance of random selection, without substitution.

The size of the randomly selected sample was determined as shown in Table No. (3) in terms of its distribution to the centers of the governorate, and it represents 37 fattening farms with the number of breeders, at a rate of 39.8% of the total selected list (93 farms) and at a rate of 45.9% of the actual fattening capacity (958 heads) selected randomly from 2085 head the list, and that, the number of fattening farms in the sample is 37 farms, representing 20.6% of the total number of fattening farms in the study population (180 fattening farms) Table (1).

It was observed that the sample includes the four categories on which the calves fattening projects are divided in the governorate, which means that the randomly selected sample represents the selected community correctly with a number of (37) farms followed by the (T) test, where the greater the degrees of freedom, the less dispersion $((n < 30))^{(8)}$.

The Qalyub Center represents the first category with an average of 15 heads, and the Qanater Al-Khairiya Center represents the second category with an average of 30 heads, while the Toukh Center represents two categories the first with an average of 19 heads and the second category with an average of 27 fattened heads, while the Kafr Shukr Center

represents the third category with an average of 44 fattened heads, and the fourth category with an average 50 fattened calves.

Table (3): The size of the randomly selected sample and its distribution in the centers of Qalyubia Governorate 2022

center (layer)	randomly selected villages	Number of fattening projects (fattening farms)	Number of sample farms (number of breeders)	The number of actual fattening heads	The number of fattening heads in the sample	%of the sample farmers	% of fattening capacity in the sample	Categories' Distribution of sample	Category average (heads)
Qalyub	Mit Halfa	46	8	210	120			first	15
	Qalyub Al-Balad	5	2	68	30			first	15
El Qanater El Khayreya	Al-Baradaa	10	6	422	180			second	30
	sandpis	4	2	83	60			second	30
Toukh	Muchtohur	12	8	528	215			second	27
	Kafr El-Deir	8	6	400	115			first	19
Kafr Shukr	Al-Ashqar	4	3	210	150			Fourth	50
	Isnet	4	2	164	88			third	44
The total		93	37	2085	958	39.8	45.9

The table is designed by the researcher.

Data source: Directorate of Agriculture, Qalyubia Governorate, reports of the Food Security Projects Department (Livestock), unpublished data, 2021

The results of the field research for the sample:

The results of the field research on a sample of fattening farms determined the high operating costs of fattening calves by studying the following factors:

1. The purchase price of calves (100-150 kg, weaning age): 8,000-12,000 pounds. The cycle requires about 4 months of fattening on concentrated diets to reach a selling weight of 500 kg (80-100 thousand pounds selling price). This is reflected in the price of a kilo of red meat to the consumer by about 200-250 pounds/kilo, and the reasons for the high prices are also due to the increase in feeding costs.
2. Feeding costs, which represent in the sample about 70% - 85% of the operating capital of the farm (with an average daily consumption per head: 6.5 kg of concentrated fodder + 2.5 kg of rations + 6 kg of silage) as shown in Table (4).

The problem of concentrated feed faced by fattening farms is determined not only by the lack of supply of them in the local market, but also by the increase in their prices, especially with the global economic recession, after the events of the Corona crisis and the Russian-Ukrainian war, which caused inflation in food commodities to rise by 22% - 32% in global markets, which was reflected in the local market, especially with the rise in the value of the dollar ⁽⁹⁾.

This led to an increase in the price of a ton of concentrated fodder, reaching 14.1 thousand pounds in the local market, as indicated in Table (5) (Statistics 2022).

The average amount of forage used in the sample farms is as follows:

Table No. (4) Sample calves fattening program

Serial No.	weight kg	feed type concentrated dry	Quantity kg/head/day	Coarse fodder, hay, rice straw kg/head/day	silage kg/day
1	up to 100	22% starter	2 – 0.5		
2	150-100	22% starter	3-2		
3	200-150	15% fattening	4-3		2
4	250-200	15% fattening	5-4	1-0.75	4
5	300-250	15% fattening	6-5	1.5-1	5
6	350-300	15% fattening	7-6	2-1.5	6
7	400-350	15% fattening	8-7	2.5-2	7
8	450-400	15% fattening	9-8	3-2.5	8
9	500-450	15% fattening	10-9	3-2.5	10
average			6.5	2.5	6

Source: field research, according to the recommendation of the Animal Research Institute, Agricultural Research Center.

Table (5): shows feed prices (until October 2022) as follows

Table (5): Feed prices in the month of October 2022 in the local market

Concentrated feed type	The price pounds/ton
Super Fattening Starter	14300
Super Fattening Starter	14200
Super Fattening Starter	14100
Super starter / developer	13800
Average price	14100

Source: World Trade - Agricultural Commodities Market (October 2022)

It should be noted that calves fattening usually depends on concentrated dry fodder, which increases the daily growth rate of the animal's weight in addition to the rough, filling diet. It is not permissible to include alfalfa (green) in the fattening process, especially since this raises the feeding costs, especially since one kilo of hay is equivalent to 5 kg of alfalfa.

Dry diets are provided twice a day (morning and evening) according to the aforementioned fattening program. Transformational efficiency is measured on the basis that transformational efficiency = total eaten per day of dry matter kg / daily growth rate kg.

3. It was found from the field research that many of the sample farms use concentrated feed alternatives in a random, indefinite quantity, in the event that the traditional feed components are not available in the local market, so this study proposes rationing the use of feed alternatives in

fattening farms in a scientific manner through a study Economic feasibility to limit the available feed alternatives in the study zone, and to manufacture in form concentrated feed with specific quantity and price.

Factors affecting meat production in fattening farms by sample:

There are several factors influencing the production of meat in the sample farms, which are represented in the type of animal and its age at the beginning of fattening, in addition to the type of feed provided and the duration of this fattening cycle, in addition to the veterinary service and immunization.

The sample also showed that nutrition represents the most influential factor in fattening farms, and there is a gap between the total capacity that can be produced by feed factories in Qalyubia Governorate, and what is actually produced in those factories during the last three available years (Table 6).

It was found that idle capacity represented about 67.7% of the total capacity, and this was reflected in the volume of meat production in the governorate, where it was found that there was a gap in production between the total capacity that could be produced by farms and the actual capacity produced, which amounted to about 62.8% (Table 2).

By studying the most important factors affecting meat production in the sample farms, which were the amount of feed provided to the calves, as well as the number of heads of calves in the farm, and the veterinary service provided, in addition to the size of the labors used to take care of the farms. (Since the type of animal is the same, which is foreign cows, as well as the age of the animal at the beginning of the cycle 100-150 kg) It was found that:

Table (6) The total and actual capacity of fodder production factories in Qalyubia Governorate during the period (2018-2020):

years	Total capacity (ton)	Actual capacity of Folder factories (ton)			Defected Capacity (ton)	% of Defected Capacity
		The total	For milk production	For fattening farms		
2018	1018928	327408	160000	167408	691520	67.87
2019	1020028	328072	160000	167652	691956	67.84
2020	1019028	329452	160000	168402	689576	67.67

Source: Central Agency for Public Mobilization and Statistics - Livestock Bulletin - separate issues.

By the primary data analyses of sample rehearse fattening farms, the following formula is:

$$Y = -2.74 + 0.144 X_1 + 0.067 X_2 + 1.495 X_3 + 2.151 X_4 \quad (4.9) \quad (0.244) \quad (9.01) \quad (1.148) \quad R^2 = 0.97 \quad F = 258.61$$

where:

Y: amount of meat in kilograms per calf.

X1: The amount of feed required for one calf, in kilograms.

X2: the number of heads of calves in the sample farms.

X3: The cost of the veterinary service provided for one calf, in pounds.

X4: The amount of labor used.

The result of the analysis showed that these factors have a statistically significant positive effect at a significant level of 0.01, and that these factors explain about 97% of the increase in the amount of meat produced.

It was found that the feeding provided to the calf has a statistically significant positive effect at a significant level of 0.01, whereby in the case of the stability of the rest of the factors, increasing the amount of diet provided to the calf by about one kg leads to an increase in the amount of meat by about 0.144 kg. The analysis also showed that the number of heads of calves in the farm had no significant effect on the amount of meat produced.

The analysis also showed that the veterinary service had a significant positive effect at a significant level of 0.01 on the production of the amount of meat, as whenever a good veterinary service was provided to fattened calves, this led to a reduction in disease incidence and an improvement in the condition of calves, and thus increased their efficiency in the process of converting food into meat, as it was found to be an increase. And improving this service leads to an increase in the amount of meat by about 1.49 kg.

It was also found that the number of workers used in the farm had no significant effect on the amount of meat produced in the sample farms.

And since the analysis proved the importance of the availability of concentrated feed in fattening calves in the sample, the research tended to try to find alternatives to traditional feed by studying the

feasibility of investing agricultural waste in Qalyubia Governorate to produce feed alternatives, as follows:

4- Feasibility study of using feed alternatives in calves fattening farms:

The feasibility study relied on the investment of agricultural waste in Qalyubia Governorate to show its feasibility in reducing feeding costs, as traditional fodder cannot be dispensed.

Table (7) shows the available amount of agricultural waste in the governorate during the three times of the year 2020/2021:

The statistics of the table show that, the net total agricultural waste available in the governorate is approximately 554 tons, and after transportation and storage, where the process of sorting, cleaning, drying, and organic treatments takes place by 10%, so that the final amount available for the manufacture of alternative feed as raw materials is about 498 tons, divided into two fattening cycles annually (249 tons /session).

The project of producing alternative feed from agricultural waste is considered one of the small projects on which it is relied upon to contribute to the development of the various production sectors, and it can be invested through individuals or one of the state institutions, in the event that individuals are unable to collect agricultural waste from its sources as raw materials and receive it in warehouses and private storages.

Table (7): The available quantity of agricultural waste in Qalyubia Governorate during the three seasons for the year 2020-2021

Amount of agricultural waste (thousand tons) ²	Agro - losses amount (thousand tons) ¹	Type of waste from farms
		Traditional sources
40.15	37	wheat hay
7.89	1.15	Rice straw
135.45	31.7	Corn stover
18.72		Corn buns
0.13	0.001	Cotton firewood
80.10	97.3	Vegetable trellis
45.00	57.99	Fruit leftovers
0.70	0.53	Sugar beet thrones
328.14	225.671	Total

Source: (1) Food Balance: published data (2) crops Research Institute (unpublished data).

In addition to providing other storage warehouses for manufactured alternative feeds, as well as purchasing the necessary equipment for the project, such as the mixer necessary for chopping, cutting, and mixing raw materials, then the need for a spiral belt to transport the final product after addition some organic materials for it such as urea, mineral salts, molasses and limestone to give a suitable taste that the animal accepts.

A pallet scale and packing bags with a capacity of 100 kg/bag are also required. The project requires workers as: (1) agricultural engineer specialized in feeding and fattening animals to produce red meat, in addition to (4) workers for loading, operating, and packing, and (1) car driver to transport raw materials.

To reduce the cost of production, the Directorate of Agriculture in Qalyubia Governorate can invest in the project through its financial and technical capabilities, and the Ministry of Agriculture is interested in replicating the project in the rest of the governorates of Egypt.

- **The feasibility study :**

- **Fixed assets costs** for the project: estimated at 150 thousand pounds, as follows:
 - Number (2) for storage warehouses, one for raw materials and the other for the final product of alternative feed.

It can be granted from the shops available at the Agricultural Bank or affiliated to agricultural cooperative societies in Qalyubia Governorate, and then its cost as a grant becomes equal zero.

- One Mixer with a capacity of 25-50 tons loaded on solid columns attached to it with a spiral belt to transfer the final product after manufacturing to the packaging tank with a pallet scale (the equipment can be manufactured locally at the lowest possible cost of an average of 150 thousand pounds, guided by

previous feasibility studies, taking into account price inflation and a 15% value-added tax for the year 2022), **the cost can be charged to the budget of the Agricultural Extension Department.**

- One (1) semi-transportation vehicle. A vehicle of the Agricultural Extension Department is used in this, so that its cost is not included in the project, except for the consumption of fuel, oils, and spare parts as operating costs.

- **Project operating costs:** during two cycles (300 days) per year: the 150-day cycle is equivalent to a complete fattening cycle, bringing the animal's weight to 500 kg: **a total cost 320,200 pounds, as follows:**

- Raw materials (Inputs) from agricultural waste, as a residuals 498 tons, price 1000 pounds / ton (contribution to support farmers), with a total of 498 thousand pounds.

- Additional organic materials, mineral salts, limestone, and molasses, at a cost of 10,000 pounds.

- Packing bags of 4,980 bags of 100 kg/pack, at a cost of 24,900 pounds.

The cost of electricity to operate the mixer is 30,000 pounds.

- The cost of solar and car oils is 10,000 pounds.

- The value of the depreciation of the project equipment and the car: 10%, at a value of 15 thousand pounds.

- Maintenance value (5%): 7,500 pounds.

- Labor wages (employment is among the workers in the Agricultural Extension Department, then add only remunerations to their basic salary : (6) workers in 10 months of work in the project per year(remunerations with an average of 1,000 pounds monthly , with a total of 60,000 pounds.

- **Value of cost of two operating cycles in the project: 640,400 pounds.**

- value of cost of (1) operating cycle in the project: 320,200 pounds.

- Investment value of the project (Agricultural Extension Department): 470,200 pounds.
- Sales value of the project's production of feed substitutes: 498 tons (price of ton 1760 pounds = 876.480 thousand pounds).
- It is noted that the selling price specified in the feasibility study covers the costs of operating the project for two full cycles (compared to the price of a ton of traditional fodder at about 14.1 thousand

pounds, which is equivalent to 8 times the value in the year 2022):

- Net return: 221,080 pounds (after deducting operating costs and depreciation value).
- % return on investment: 47.00%.

The ratio of benefits to costs: (when the project operated for 10 years at a discount rate of 15% to determine the value of the money during the operating period): (value **to the nearest thousand pounds**):

Table no. (8) The benefit – cost ratio: (value to the nearest thousand pounds):

Years	total cost	Total revenue	%15 of discount rate	The present value of total costs	The present value of total revenue
1	790	876	0.870	677	762
2	640	876	0.756	484	662
3	640	876	0.658	421	576
4	640	876	0.572	366	501
5	640	876	0.497	318	435
6	640	876	0.432	276	378
7	640	876	0.376	241	329
8	640	876	0.327	209	286
9	640	876	0.284	182	248
10	640	876	0.247	158	216
the total				3332	4393

Net present value: + 1061 positive value of more than one million pounds covering the cost of the project.

The ratio of benefits to costs: 1.318. Greater than one as an indicator of the feasibility of the project.

- The previous indicators of the feasibility study were calculated on the basis that the project is service rather than investment. It is managed by the Ministry of Agriculture and Land Reclamation represented by the Agricultural Extension Department. In the case of individual investment, other indicators are added to the feasibility study, such as the recovery period of the invested capital, and the calculation of the Internal Rate of Return for project (IRR) as well as project break-even point and sensitivity tests.

Recommendations

- Generalizing the idea of establishing one or more units to collect and manufacture the waste generated from agricultural production farms at the level of the governorates of Egypt and according to the production capacity in each governorate in order to convert it into fodder that is presented as a complementary and safe alternative to concentrated fodder and less in cost, which contributes to solving the problem of fodder in Egypt in addition to solve The problem of agricultural waste and converting it into a profitable and beneficial project.
- Using the random sampling method in field surveys because it gives realistic and actual results for measuring the efficiency of

production, the problems it is exposed to, and the factors affecting it.

Summary

The fattening farms of calves usually facing a shortage in concentrated feed as a chronic problem for the production of red meat, since after the global Corona virus crisis and then with The start of the Russia-Ukraine war, and the world became suffering from a state of food insecurity, especially in the developing countries, Egypt one of them.

So, the research aims were: trying to now the modern opinions about solving the problem of fodder locally, identify the using of dry feed alternatives and its feasibility from agricultural waste, and also to identify the most important factories to production the red meat. The research relined on the descriptive approach and the random sampling method by using primary date and surveys of agricultural census which selected 37 farms as a sample from 93 caw fattening farms in Qalyubia governorate.

The results of applied research showed raising the purchase price of calves in weaning age at 8 – 12 thousand pounds at 100 k.g reached to 80 – 100 thousand pounds as selling price after fattening recycle

5 months at 500 k.g , this led to raising the pricing of consumer of red meat at 200 – 250 pounds of k.g.

The inflation of prices due to the high cost of feeding at 14.1 thousand pounds in the local market, and some other factories such as high workers' wages and veterinary costs, at a significant level of 1%. The feasibility study showed the possibility of reducing feeding cost at price of ton 1760 pounds as an alternative of feed.

Lately the research recommended: To establish production units for the collection and processing of agricultural waste as one of the alternatives to produce fodder and the development of livestock and generalize that in the governorates of the Republic. And recommended to using the method of random sampling in applied studies to verify realistic and actual results.

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