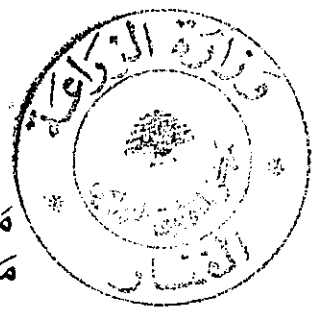

REPORT ON THE ANIMAL FEED INDUSTRY IN LEBANON AND THE PROSPECTS FOR INCREASING MILK AND BEEF PRODUCTION.

By
DR. R. H. KIRBY
and
MR. D. HALLIDAY

of

THE TROPICAL PRODUCTS INSTITUTE
(UNITED KINGDOM MINISTRY OF OVERSEAS DEVELOPMENT).

Republic of Lebanon
Office of the Minister of State for Administrative Reform
Center for Public Sector Projects and Studies
(C.P.S.P.S.)

OCTOBER, 1969.

CONTENTS.

SUMMARY.

The visit arose out of a request from the Lebanon Government to the Ministry of Overseas Development for technical assistance for a survey on the present structure and organization of the animal feed industry and on the possibilities of reducing imports of raw materials used in the industry by the use of raw materials which could be produced locally.

There is a well-established animal feeds industry in Lebanon. Many of the manufacturing firms are efficiently organized and have technical expertise available to them from overseas suppliers of pre-mixes and concentrates, who also provide them with lowest cost ration formulea by means of linear programming analysis. Most of the manufacturers are working well below their full capacity and there is, consequently, sufficient reserve capacity to meet any increased demand for animal feeds likely to arise in Lebanon over the next five to ten years.

The bulk of the feeds are at present sold for poultry purposes. Demand for these purposes seems now to have become fairly stabilized and any increase in demand is likely to come from increased demands for feeds for milk and beef production. Although there are plans to increase milk production in order to reduce the large imports of dried milk, and to increase beef production to reduce the large imports of live cattle and carcase meat, the future development of milk and beef production depends primarily on a sufficient supply of calves with good feed conversion rates and the existence of a plentiful and cheap supply of feed. The price of suitable calves is very high, however, too high for the smaller farmers, and the possibilities of producing sufficient of roughage or forage crops locally are not very promising owing to the fact that in areas where the land is suitable far better returns can be obtained from other crops. It may be possible, however, to use methods of fattening based on rations consisting, largely of concentrates, once a suitable supply of calves becomes available.

As far as milk production is concerned, development is hindered by the lack of demand for liquid milk and the five pasteurizing plants are all working well below capacity. This lack of demand is due considerably to the fact that there are unrestricted imports of dried milk into Lebanon at prices well below the cost of production of liquid milk on the farms. The Animal Production Office has in mind the establishment of better marketing methods in order to increase the price which can be paid to milk producers.

The Lebanese consumer has a preference for mutton over beef. Prospects for mutton production seem more favourable and it would seem that for the foreseeable future efforts towards sheep improvement are likely to produce greater returns than efforts to increase beef production.

PREAMBLE .

This visit arose of a request from the Lebanese Government to the United Kingdom Middle East Development Division for a study to be made of the present position of the animal feeds industry in Lebanon, its future prospects and the possibilities of reducing imports of raw materials used in the industry by the use of materials which could be produced locally. The original terms of reference suggested for the study were as follows:-

TERMS OF REFERENCE.

(1) To analyse the present structure and organization of Lebanon agriculture with particular reference to crops directly or indirectly connected with livestock, on the basis of statistical information made available by the Government of Lebanon and augmented by data and information supplied by other official organizations.

(2) To investigate the research work already carried out in Lebanon on Livestock feedstuffs.

(3) To define an optimum range of feedstuffs based on the nutritive elements available.

(4) To consider the present local market for animal feedstuffs (types and nutritive values of the products, imports, manufacture, distribution, price structure, etc.),

(5) To forecast the potential local supply and demand of animal feedstuffs in the near future and until 1975.

(6) To consider the export possibilities, particularly to Mediterranean countries and West Africa.

(7) To consider the market price per Alimentary unit (proteins, carbohydrates).

(8) To recommend a programme for installing production units, with choise of priority regions and possible capacities.

(9) To investigate the feasibility of the first unit to be installed. The investigation will include the following:-

(a) an estimate of the capacity of the type of factory in the light of the foregoing enquiries;

(b) best location;

(c) type and capacity of machines and installations;

(d) forecast of electric power, steam, water, labour, and auxiliary raw materials required per unit of production.

(e) list of plant, flow-sheets and plans for preliminary installations;

(f) estimates of the cost of the project;

(g) estimates of the probable net cost at various levels of production;

(h) an estimate of the selling and distribution costs;

(i) study of profitability;

(j) comments on the necessary methods, means and organization to ensure the success of the enterprise particularly with regard to supplies of raw materials, production and distribution.

(10) To submit a report in French covering the above points.

It was arranged that Dr. R.H. Kirby and Mr. D. Halliday of the Tropical Products Institute, of the Ministry of Overseas Development, should first of all visit Lebanon to make a preliminary survey of the situation and to decide the lines on which the survey should be carried out and to recommend what further action was needed. Messrs. Kirby and Halliday left London on the 6th October and returned on the 21st October.

It soon became clear, however, that the terms of reference originally proposed were not entirely relevant to the situation in Lebanon and it was decided to modify or omit some items as and where it was considered suitable.

A list of organizations visited and people with whom discussions were held is given in Appendix 'A' to this report.

THE ANIMAL FEEDS INDUSTRY IN LEBANON.

It is understood that there are about fourteen, firms of various sizes already producing animal feeds in Lebanon and visits were made to six of the largest of these firms. Most of the firms are also grain importers and some of them have an interest in poultry and egg production, supplying feeds for their own requirements and also to the market generally. All the firms visited have connections with British, American or French firms from whom they obtain their pre-mixes and concentrates. These overseas firms supply the feed manufacturers with technical expertise and advice when required, provide analytical services

and also compile least cost formulae for them by means of linear programming analysis.

The main market for their products is for poultry feeds, i.e., pre-mixes, layer, broiler, egg concentrates, etc. Owing to the losses caused among poultry by the incidence of Fowl pest over the last two or three years many of the less efficient poultry producers have been forced out of business and the market for feeds has consequently become stabilized and is fairly steady. Whether the market for feeds will expand depends considerably on future developements as regards exports of poultry products. The chief markets are in neighbouring countries and prospects in these countries are dependent on general economic and political factors. The export market, too, is extremely competitive so that it is vitally important that the cost of feeds to the producers should be kept as low as possible since this is by far the most important item of production costs. In this connection it is of interest to note that although there is no Association of Feeding Stuff Manufacturers in Lebanon, as there is, for exemple, in the United Kingdom, about five firms have recently combined together to buy American soya beans in bulk. Buying in bulk instead of in bags is stated to save about U.S.$12.00 per ton. Any action of this sort which can be adopted to help reduce the cost of raw materials and the subsequent cost of feeds to the poultry producers is obviously to be encouraged since the competitiveness of poultry producers in Lebanon on the export markets is bound to depend largely on the cost of feeds.

Owing to the comparatively large number of firms manufacturing animal feeds in Lebanon, the restraints on increasing the export markets to any large extent and the present stabilization of demand for feeds in Lebanon, it is not surprising that all the firms visited were working well below their capacity . Estimates of production ranged from about 50 per cent to 80 per cent of total capacity on a one shift basis and the general opinion seems to be that the industry overall is working at about 50 per cent of its total capaicty. There is, therefore, sufficient unused capacity to take care of any increased demands for poultry feeds which is likely to arise over the next five years if not longer. From the point of view of efficiency and the possibilities of producing feeds at lower prices to the consumer it is probable that two or three mills, or even one large mill, wor-

king at full capacity might have been better had the development of a feed industry been planned properly. As it is, however, the industry seems to have developed haphazardly and some of the firms were originally merely grain importers who, understandably enough, decided to take up the production of animal feeds as an addition to their business activities.

One of the probelms facing the feed manufacturers is that of credit to the farmers and bad debts. The percentage for the latter varies according to the care which is taken by the manufacturer in assessing credit worthiness. In some cases the percentage is stated to be as high as 50 per cent. Obviously, firms take account of the liabilities for bad debts when fixing their prices and it may well be that some users are being charged higher prices for their feeds than they should be because of default by other users. It is suggested that co-operatives of producers might be able to assist here in buying for their members, collecting payments, etc.

As will be seen later, much consideration is being given in Lebanon to the possibilities of developing a dairy and beef cattle industry. Large quantities of milk products (imports in 1968 amounted to over L.L. 41 million), carcase meat (in 1968, total imports amounted to over L.L. 18 million) and sheep, goats and cattle (imports in 1968 amounted to over L.L. 79 million) are imported every year to meet the local demand and any increase in local production would be valuable. Should it be possible to do this there will be an increased demand for dairy and cattle feeds, but in view of the excess capacity available in the present feed factories there seems no reason why any future demands for these purposes could not be taken care of by the present factories. Some of them, however, might need to invest in pelletting plants.

The position is, therefor, that the Animal Feeds industry in Lebanon is efficiently run; has technical expertise available to it from overseas suppliers of premixes and concentrates; and has reserve capacity which can meet any increased demands for feeds which appear likely to arise over the next five years at least. Its main problem is that of raw material supplies and anything which can be done to increase supplies of raw materials locally or to reduce the cost of imported materials, such as by buying where possible in bulk, should be encouraged since in the produc-

tion of poultry, milk or beef cattle the cost of feeds is the most expensive item of total costs.

POSSIBILITIES OF INCREASING LOCAL SUPPLIES OF RAW MATERIALS.

a). Roughage.

From the point of view of raw materials the main difficulty in increasing milk and beef cattle production in Lebanon is the lack of suitable supplies of roughage. Wheat straw, or "tibn", is not produced in sufficient quantities to meet the local demand and in 1968 it was necessary to import over 5 million kilos of wheat straw valued at over half a million L.L. Moreover, the price of tibn has risen enormously over the last few years and now costs about 10 piastres or more per kilo. Owing to the shortage of land in Lebanon, particularly of irrigated land, and the higher returns per hectare which can be obtained by growing other crops, Lebanon only produces about one third of her total annual wheat requirements and no great increase in wheat production, and consequently of wheat straws, can be expected. The position has to be faced, therefore, that if production of milk and beef cattle is to be developed, the increased supplies of roughage which will be required might well have to be obtained by increased imports or diversion of scarce land resources from wheat or vegetable production to forage crops. More will be said about milk and beef production later.

Some comments will now be made regarding the possibilities of producing locally some of the raw materials which are at present being imported for animal feeds.

b.) Oilseed Cakes and Meals.

In 1968, Lebanon imported about 13,189 tons of oil meals, of which about 2,375 tons was soya bean meal and 8,464 tons was cottonseed meal. In addition, approximately 2,459 tons fo cotton seed was imported, presumably for oil extraction. There are only about four to five edible oil mills in Lebanon, all of which are small, and

the largest mill, which was visited, has a daily capacity of 70 tons, uses expellers and last year was only working at about half capacity. Although the mill can sell all the oil it is producing at present the market for oil is not increasing very much mainly because olive oil which is produced locally is preferred for edible purposes. In 1968, about 18,000 tons of oilseed cake or meal were produced in Lebanon of which about 11,000 tons were exported. There seems to be a good export market for the cake and meal. In view of the rather static demand for edible oil, other than olive oil in Lebanon, at present, and the limited capacity of the oil mills the supplies of meal or cake likely to be available from oil extraction in Lebanon are not likely to increase very much in the next few years. Apart from the small quantity of sunflower being produced locally, the oil mills rely mainly on imports of cottonseed, soya beans, groundnuts, etc., for their raw materials. Although any increase in the production of edible oils other than olive oil locally may make available larger quantities of cakes for animal feeding it will not, of course, reduce the overall imports into Lebanon, but will increase them. In any case it is probable that cottonseed and soya beans are a relatively cheaper raw material than any which could be produced locally. The groundnuts produced in Lebanon are of the edible type and no doubt give the farmers a higher return than they would obtain by producing oilseed types. Increased production of sunflower, however, would help to reduce imports of raw materials for the oil mills, and should be encouraged as much as possible particularly since sunflower can be grown in the areas where efforts are being made to stop the growing of hemp for hashish. Apart from sunflower, therefore, there does not seem much which can be done to reduce the imports of oilseed cakes or meals which are or will be required for animal feeding if production of milk or beef cattle is to be increased.

c.) Feather Meal.

One firm, situated in Beirut, is at present producing feather meal on plant designed by the owner of the firm. Output at present is at the rate of 6 to 8 tons per month but could be increased to 12 tons per month if necessary. The firm has an arrangement with one firm in Zahleh from which it buys the wet feathers produced, processes them and sells them back to the same firm. The wet feathers are collected by truck, each truck holding two tons, and one truck represents the feathers obtained during two days killing at

the poultry processing plant. The chief cost of producing the meal is the cost of transporting the feathers from Zahleh. As has been mentioned, at present the capacity of the plant is 12 tons per month but the firm state that with larger autoclaves they could expand production considerably.

It seems a pity that this plant, which could increase its throughput if it more raw material, is not sited neater to the areas where feathers would be more easily available and this suggestion was made to the owner. There must be appreciable quantities of feathers available in the poultry producing areas which are at present wasted and if the processing plant were sited nearer to these areas better use might be made of the feathers for feed purposes.

d.) Animal By-Products.

The abattoir at Tripoli and that at Beirut both nave animal by-product plants. The abattoir at Tripoli, although it has been ready for about two years has not yet started work; the exact reasons why are not known. It is capable of slaughtering 200 sheep or 20 cattle per day and the by-product plant should have an output of about 3 to 4 tons of combined meat and blood meal per working week. The Beirut abattoir, which has equipement for slaughtering 1,000 sheep and 100 cattle per day has a by-product plant which should ba able to produce around 16 to 20 tons of combined meat and blood meal per working week. Although the Beirut abattoir has been ready for operation for some time it has only started operating within the last few weeks owing to difficulties caused by the opposition of the local butchers. It is understood, however, that there is no one on the staff of the abattoir able to run the ry-products plants and the Government has applied for assistance to the United Nations for an expert to run the plant in the early stages and to advice as to whether combined meat and blood meal only should be produced or whether the by-products should be produced and marketed separately in the form of meat meal and dried, blood, etc. In the meantime, any by-products produced will presumably be treated as effluent and dumped into the sea although it is understood that one or two firms have already made tenders to buy the waste products and, in one case, to instal a chemical engineer, run and manage the plant on a contract basis and to market the products if this is required. It is appreciated, of course, that matters

of hygiene, inspection and quality control are of vital importance in meat by-products manufacture and that the plant will need to have someone able to run it on efficient and hygienic lines. Nevertheless, it is felt that it may be difficult to obtain the type of expert required from the United Nations and that it may take several months in any case before such an expert, even if he can be found in any case before such an expert, even if he can be found, will be available. In the meantime, large quantities of blood and meat scrap may be wasted and the abattoir may also be faced with a disposal problem once it starts working on any scale. Unless, therefore, it seems likely that an expert will be obtained in a reasonably short time it is suggested that the offers which have been made by local interests to buy the waste or to operate the plant should be given more serious consideration.

e.) Carobs.

Carobs are quite a useful feed for cattle and pigs. Carob trees grow wild in southern Lebanon near the borders of Israel and production of the beans in 1968 amounted to between about 1,000 to 1,200 tons. One firm at Selaata buys the beans from merchants who buy them from the farmers and processes about 600 to 700 tons per year. Processing consists in removing the seeds and kibbling the beans. After Kibbling the beans are soaked in hot water, where all but about 4 per cent of the sugar is removed and the molasses are then obtaines by evaporating the water in an earthenware vat. the extracted beans are then sold to farmers who collect them from the firm and who use some of them for pig-feeding although most of them are used for fertilizers. The molasses are largely marketed locally but are also exported to France and some other countries. The seeds are exported.

In view of the usefulness of carob beans as animal feed it is suggested that some consideration should be given to the possibilities of increasing carob production in Lebanon. There is a fairly considerable export trade, around 70,000 tons per year, of carobs from Cyprus and it is understood that the crop there gives a higher return per hectare than olive cultivation so that in some areas, olive cultivation is being replaced by carob cultivation. This is due partly to the fact that labour requirements for picking are much less with carobs than with olives. In Cyprus new varieties have been introduced which give higher yields of beans per

tree, the new stock being grafted on to old trees. Grafting takes two years and the first crop is obtained after about five years, but the tree has a very long life, fifty years and sometimes much longer, so that replanting costs are very low. Although the crop is a long-term one there should be a ready market either locally or for export for the crop for some years to come and it may be that carob production may be more profitable than olive growing in some areas. It will be necessary in the first place, however, to obtain some grafting material of the better varieties which are now being grown in Cyprus to see how these grow under Lebanon conditions.

f.) Sugar Beet Pulp.

A visit was made to the Anjar Sugar Beet Factory which is at present producing about 4,000 tons of plain dried sugar beet pulp per season but the production could be raised, it is understood, to 5,000 tons by the use of additional drying plant. At present no molasses are mixed with the dried beet pulp as is customary in beet factories in other countries. The factory has, however, ordered a machine for molassing the pulp and it was hoped that this could have been installed before the season opened this year, but owing to delays by the manufacturers the machine has not yet been delivered. The firm stated that when the machine was installed they proposed mixing 10 per cent by weight of molasses with the dried pulp, but it was pointed out to them that more normal practice is to mix 40 per cent or more of molasses with dried pulp. Assuming that 40 per cent were added the factory would be able to increase its production from 4,000 tons of plain dried pulp to 5,600 tons of dried molassed pulp per season and the molassed pulp would be more palatable to the animals than the plain dried pulp and would provide a feed which could be used in place of barley. The use of the molasses should also enable the factory to increase its revenue and probably at the same time to reduce the cost of the feed.

In 1964 the factory had a surplus of around 3,500 tons and had to ask the Government for permission to export any surplus, but the farmers are now much more appreciative of the value of the pulp and at present the factory is disposing of all the dried pulp it produces. Some farmers collect wet pulp from the factory whereas others buy only dried pulp. The pulp is used both for cattle and for sheep, one farmer, for exemple, feeding 3 kg

per cow per day and another, 1kg of pulp per day per sheep. Some farmers also buy molasses and mix them with their feeds.

It was unfortunate that at the time when the visit was made the owners of the factory had not seen the report made by Mr. H.J. Meadows on his visit to the factory in February this year. Since the report contains comments and suggestions which will be of considerable interest to the manager and owners of the factory it is recommended that a copy of the report should be given to them without delay. Since no one at the factory had seen the report it was, of course, impossible to discuss it with the manager, nor was it possible to find out whether there was any possibility that some of the recommendations in the report were likely to be implemented.

From the point of view of animal feeds the only matter which need be discussed here as regards the Meadows'Report is that the suggestion is made in the Report that the production of the factory should be doubled. If this suggestion is acted upon the factory should be in a position to produce about another 5,600 tons at least of dried molassed pulp or a total of 11,200 tons, This would represent a very useful addition to the quantities of animal feeds available locally and would help to reduce Lebanon's dependence on imports of raw materials.

With the large-sized sugar beet which is at present grown in Lebanon the tops and crowns which are cut off before the beets are taken to the factory weigh about 50 per cent of the total weight of the beet so that at the present rate of production about 45,000 tons of tops and crown are available each season. These, of course, are a very useful animal feed and some farmers who grow sugar beet but who do not have sheep or cattle of their own, lease out the land to owners of flocks so that the sheep can move in and consume the tops, It appears, however, that in the rainy season when many of the herds have been removed to Syria for grazing no charge is made for grazing on the beet land. It may be, therefore, that some of the beet tops are not being used to the maximum advantage and it might be worth while looking into the possibilities of ensiling those tops, if any, which are not at present being utilized to the full.

g.) Alfalfa.

The two main obstacles to any great development in the production of dairy and beef cattle in Lebanon are the lack of supplies of locally available roughage and forage crops. There seems to be more interest now among farmers in the production of forage crops such as alfalfa, but at present the returns to the farmer from alfalfa growing are lower than those which can be obtained from other cash crops such as fruit and vegetables. Another difficulty, too, is that for cultivation of alfalfa irrigated land is necessary and farmers naturally prefer to use such land for crops which give them the maximum returns. The Agricultural Research Institute at Teenayel is carrying out experiments in the cultivation of alfalfa and other forage crops such as perennial rye grass, red clover, and coltsfoot and if these experiments are successful will endeavour to encourage farmers in the area to grow these crops. Some of the larger farmers who have cattle herds are also putting part of their land under alfalfa to provide forage for their own herds. In some areas, too, smaller farmers are putting 150 to 300 dunums (1dunum= 1/10th of a hectare) under alfalfa, but the present yields per hectare will probably have to be doubled if the crop is to become appreciably more attractive in comparison with other crops. Anything which can be done at the Agricultural Research Institute to increase yields by improved cultivation methods or the introduction of better varieties of forage crops will obviously be most valuable.

The suggestion has been made that in some of the dry land areas in Lebanon where wheat in grown mainly as part of the family food requirements but where average yields are extremely low, - i.e., after extraction of seed as low as 300 kilos of grain per hectare, - it might be more profitable to grow forage crops such as grain vetches or grass for hay production. (See F.A.O. Mediterranean Development Project, Lebanon, Country Report", 1959 pp. III, 36/7.) This suggestion seems worth looking at more closely. It might be difficult, however, to persuade farmers to grow forage crops in place of wheat which is required for food for the family, and they would need very firm assurance that they would be able to sell their forage crops to obtain cash to obtain food.

If growing for the market is to be developed on any scale, therefore, the farmers are likely to need some incentive in the early years to grow these new vrops by way of a guaranted price and an assured market since without these incentives it will probably by difficult to persuade them to change their pattern of agriculture. Some form of Government assistance by means of a marketing organization which will buy from the farmers all they are able to produce at a guaranted price may be necessary or these to produce at a guaranted price may be necessary or these facilities might be made available by a producer's co-operative specially established for the purpose provided it were run efficiently. In the case of these forage crops it is essential that they should be cut at the right time if they are to give the maximum feed value, and facilities for getting them to the cattle producers at the right time will need to be available. This is another reason why new growers of the crops will need to have expert guidance and some assistance in marketing in the early stages. Much will depend upon how the situation develops. It may be that cattle producers will be sufficiently anxious to obtain forage crops and will themselves take steps to encourage and aid the farmers without the need for any Government assistance. In planning for an increase in the production of forage crops, however, it is important that the marketing aspects should be borne in mind so that action can be taken when it is required.

MEAT AND MILK PRODUCTION IN LEBANON

a.) POULTRY.

The present modern Lebanon poultry industry has develop over the past fifteen years or so, production and marketing being mainly controlled by a few large businessmen. The bulk of the productive units are located in the Bekaa, but some farms are situated in the Beirut area.

In 1967 about 40 per cent of total egg production and about 5 per cent of broiler production was exported (mainly to other Arab states, e.g., Kuwait), while the remainder satisfied the entire requirements of the home market. There is also a considerable export trade in day old chicks and hatching eggs to the same markets. This export trade has been adversely affected over the past two years by the difficult political conditions in the Middle East arising from the June war of 1967,

a servere outbreak of fowl pest in 1968 and competition from other countries .

The industry is based on the use of the most highly productive breeds of poultry imported originally from Europe and North America, together with modern methods of intensive breeding and rearing. Feeds are compounded on a scientific basis from raw materials which are almost entirely imported. Compounding is carried out both at farm level using grains, oilseed meals and premix concentrates (imported as such), or in the feed factories which may supply either concentrates or complete feed. Efficiency of production is high in the best farms, at one of which 3½b broilers were being produced with feed conversion ratios of 2.2 - 2.3 and a mortality rate of 2-3 per cent.

The 1968 fowl pest epidemic was a serious blow to the poultry industry and drove many of the smaller producers out of business . In and case , however , a shake-out was inevitable especially with regard to broiler production , due to the saturation of the home market and the stagnation of exports . Current prices for eggs and broilers on the home market are considered to be quite good , although fears were expressed that over- production of broilers could again occur in the near future leading once again to thedepression of proces to uneconomic levels .

Future prosperts for the poultry industry appear to be a continuation of the present level of production , geared mainly to the needs of the home marhet ? The prospects for increasing exports do not appear to be good under present conditions .

b.) Gattle .

The bulk of lebanon's beef requirements is satisfied by local slaughter of live cattle imported mainly from SYRIA and to a lesser extent Turkey and Rumania . In 1968 88 , 100 heads of cattle were imported , while the total cattle population of the lebanon was estimated at 86 , 397 during 1968 (45, 132 milk cows , 24, 287 working cattle and 16,960 others) .

Most of the cattle kept are local breeds , but Dutch Friesians and to a lesser extent Danish Red polls constitute the stock of the larger dairy farms . For example one farm has a herd of 160 Friesians including four bulls . Cattle are kept mainly for

milk production or for use as draught animals , and are not at present reared promarily for beef production . Indications are that livestock numbers have decreased considerably in recent years .

The critera for the intensive rearing of cattle for beef production , are a cheap and plentiful supply of calves or stores with good feed conversion rates and the existence of a plentiful and cheap supply of feed . In the latter connection the price of roughages is particularly high due to the shortage of locally produced forage crops. This deficit is made up to some extent by importation from Syria, but prices are still very high, e.G., the price of tibn the most commonly used roughage varies between 10 - 18 PL per KG and it is sometimes more expensive than imported barley . As has already been mentioned , increasing local produvtion of forage crops would necessitate the diversion of scarce land resourees from the growing of other crops which may be more profitable and marketable . There are indications, however , that forage crops can possinly be grown as profitably or more profitably than otder crops , e . g. , wheat , in some areas , but it is extremerly soubtful if fattening of cattle for beef production on rations consisting largely of roughage would be an economic proposition in the foresseeable future . On the other hand the cost of concentrates , which are mainly imported , is comparatively low and it is possible that fattening on rations consisting largely of concentrates might well be profitable provided that there was a cheap supply of calves available.

The most obvious source of calves for beef production is the dairy industry , about which more will be said later . At present the supply from this source is very limited and demand for the small number available has pushed prices to high levels , e. g . , male Friesian calves now sell at around 140 LL each . Until prices of calves are reduced there can be no prospects for intensive beef production .

Taking everything into consideration the prospects for increasing beef production in the lebanon do not appear to be good at present . The key to promoting an increase in beef fattening appears in the first instance to be to increase the supply of suitable calves , and it is likely that this can be best achieved by the stimulation of drairy farming . Even if the supply of calves were right it is unlikely that it would ever be an economic proposition to fatten with ration containing largely roughages . It may be prssible , however , to use methods of fattening on rations consisting largely of concentrates , e . g. , the Rowett method , once a suitable supply of calves become available .

c.) Milk Production (Cows)

Dairy Cattle in the Lebanon are exclusively fed on dry lots, as it is uneconomic to devote scarce land resources to permanent pasture. They are mainly fed on a ration of tibn, beet pulp and concentrates, although some of the modern dairy farms also feed corn silage and alfalfa hay. The high cost of roughage (noted above) mades milk production very expensive even when high yielding Friesian cows are kept, and it is generally considered that producers require a price of around 40 PL per litre for their milk if they are to be able to operate at a reasonable level of profitability.

The unrestricted importation of dried milk, which is available to the consumer at a price of around 25 PL per reconstituted litre has greatly reduced the profitability of dairy farming by depressing fresh milk prices. Nevertheless, many consumers appear to be willing to pay ansubstantial premium for fresh milk.

Another factor limiting fresh milk production is thepoor marketing system, which is not at present aimed towards encouraging the small producer. Milk is marketed at two levels:-

(1) Raw milk sold in the immediate neighbourhood of the producers.

(2) Raw milk is conveyed to large towns, blended with reconstituted powdered milk, pasteurized, packaged and sold through shops.

The main potential for market growth is obviously in the urban areas, but there is at present no overall organization for collecting all the milk surplus to purely local requirements and conveying it to urban areas. There are at pfesent five privately owned pasteurizing plants in the Lebanon, all of which are located in the Beirut area. These obtain their fresh milk supplies from producers on a contract basis. Their suppliers may be the large dairy farms or middlemen who collect from small producers. The price paid by the pasteurizing plants appears to be about 40 PL delivered, while the small producers receive 35-8 PL per litre from the middlemen. The final packaged product retails at about 7P PL per litre.

It was apparent that there was considerable overcapacity in the pasteurising plants which had increased the overheads to the point of unprofitable operation, and it is understood that at present the main source of profit to the plants is from the sale of milk products, not liquid milk. This pressure on profitability encourages the plants operators to use increased proportions of cheaper powdered milk, reducing their demand for fresh milk.

Clearly the need at present is to ensure that greater quantities of fresh milk are used by the pasteurizing plants.This could possibly be achieved by restrictin the permissible percentage of powdered milk in their product by legislation, restricting the importation of powdered milk, or increasing the import duty on it This might however, be considered socially undesirable as under present conditions it would increase the price of milk supplies to the consumer. Certainly it would be very dangerous to introduce such restrictive legislation until substantial additional supplies of fresh milk became available

It is gratifying to note that the Department of Animal Production have already prepared a programme to increase fresh milk supplies by encouraging the smaller producer. The programme includes the following measures:-

(1) The creation of a Government collecting and marketing service for milk.

(2) The provision of more productive breeds of cows on suitable credit terms.

(3) The payment of a reasonable fixed price of around 40 PL per litre (3.5 per cent fat).

The Department does not propose to set up its own pasteurizing and packaging plants and intends to sell to those already in existence. The overcapacity of these plants is a serious problems and it is very important that liquid milk consumption be expanded as rapidly as possible so that overheads may be reduced. This increase in consumption of liquid milk would not be achieved if prices if prices were forced up by restrictions on the use of powdered milk, and it could well be that the interests of the pasteurizing plants are under present conditions irreconcilable with those of the producers. If this is so it may be necessary to effect a reduction in capacity.

d') Milk Production (Sheep)

Sheep's milk is an important product of the Awassi sheep and is much in demand in the Lebanon due to its high fat content. Its is used particularly to make cheese.

Research is in progress at the Turbiol Research Station to increase milk yields from Awassi ewes. With adequate nutrition, milk yields are being increased in two ways:-

(1) Selective in-breeding.

(2) Earlier weaning of lambs.

Spectacular results have already been obtained and it has already been shown that it is possible to raise milk yields from 70 to 400 kg per lactation by a combination of these two approaches. It is considered that an increase in milk supplies from this source would be most valuable.

e))Sheep.

Mutton is the meat most preferred by the Lebanese and is eaten in much greater quantity than beef. For example , at the new Beirut abattoir it was estimated that around ten sheep are slaughtered for each head of cattle. Mutton requirements are largely satisfied by importation of live sheep (mainly from Syria). For example, in 1968 a total of 552,357 sheep was imported while the total sheep population of the Lebanon was estimated at only around 200,000.

Most sheep in the Lebanon belong to the local Awassi fat-tailed breed and are kept mainly by nomadic herdsmen', who normally migrate to Syria in the winter to make use of range pastures. During the summer in the Bekaa the sheep are normally fed on rations consisting of tibn and any other roughages which may be available, e.g., sugar beet tops.

Research is being carried out at the Animal Husbandry Research Station, Turbol in the Bekaa, into methods of increasing local mutton production both by breeding improved stock and improved nutrition. In the former connection a programme is now in progress to increase the lambing rate of the Awassi breed by cross-breeding with rams imported from the Greek island of Kyos.It has been assumed that the Awassi breed is inherentlylow in fertility and twinning rqte, while the Kyos sheep are inherently high giving an average of around 2.83 lambs per owe annually. Doubt has, however, been cast on this assumption of inherent low fecundity in Awassi sheep, and it has been suggested that this is mainly due to poor nutrition. However; the cross-breeding programme is now in full progress although it will be some years before any assessable results are obtained.

It is known that the Awassi breed responds well to improved nutrition and there is considerable scope for increased mutton production from the existing unimproved stock. Improvement in nutrition could be achieved by reseeding the open ranges with improved grasses, or the provision of more and better quality roughages for enclosed dry feeding, e.g., hay or silage from specially cultivated forage crops. Consideration should also be given to the possibility of intensively rearing fat lambs on largely concentrate rations, although it is realised that in this case it may be necessary to import breeds of sheep with higher feed conversion rates when fattened under these conditions. Some lamb fattening is already being carried out in the Bekaa, where lambs are fattened to 12-15 kg live weight on rations containing tibn, beet pulp, oilcake and barley.

In view of the preference of the Lebanese consumer for mutton and the better prospects for increasing mutton production it is apparent that for the foreseeable future efforts towards sheep improvement are likely to produce greater returns than efforts to increase beef production. This has been recognized by the Turbol Research Station which is concentrating all its efforts on sheep rather than cattle.

Conclusions.

In view of the fact that the Animal Feed industry in Lebanon is well-established and organized and since it has sufficient surplus capacity to meet the likely demand for animal feeds over the next five years there is at present no case for the establishment of new factories . The expansion of beef production is likely to be limited by the shortage of forage crops and the problems in supplying them locally, and by the need for a supply of calves with good feed conversion rates able to utilize high concentrate rations efficiently. Milk production will also be limited by shortage of roughage at reasonable price level, and by competition from cheaper imported dried milk.

The Animal Production Office of the Ministry of Agriculture, which has been established fairly recently, is well aware, however, of the problems facing the livestock industries of the Lebanon and has plans for dealing with them. In the circumstances there seems to be no need for any further suveys to be carried out in the field of animal feeds on the lines suggested in the original terms of reference of the team.

THANKS.

Thanks are due to all those private firms and Government organizations who so kindly and courteously supplied the team with information about their activities and about the situation with regard to animal feeds and animal production in Libanon; to Dr.S. Haidar of the Animal Production Office for providing facilities and transport; and special thanks are due to Mr. Mannuelian of the A.P.O. for the very efficient way in which he arranged the programme and generally looked after the team.

APPENDIX 'A'

VISITS DISCUSSIONS ETC.

Beirut

Dr. S. Haidar, Director-General,
Ir. I. Akkaoui,
Dr. A. Saad,
Dr. K. Rida,
Dr. A. W. Morsi,
Mr. Mannuelian
— Animal Production Office, Ministry of Agriculture

Middle East Feed Mill Co., Ltd.

Société pour l'Alimentation et l'Amelioration du Betail, S.A.L.

Société Nationale Industrille Commerciale et Financière, S.A.L.

Mr. E. Wharton; Middle East Area, Manager for Beecham Research International, London.

Nail Oil Company.

Beirut Municipal Abatoir.

Beirut Port Grain Silos

Assayed Agricultural & Chemical Co.

Mr. J. M. Garner Sales Representative, Unilever Ltd; London.

Foremost Pasteurization Plant.
Messrs. Bardeville & Co, Poultry Feather Processors.

Mr. P. Durran, C.B.E.,
Mr. J. B. Wilmshurst.
Mr. C. E. Johnsotn, C.B.E.,
— United Kingdom Middle East Development Division.

Bekaa.

Agricultural Research Institute Teenayel.

Sursock Farm.

Chandour Farm.

Bekaa (continued).

Animal Research Institute, Turbol.

Lipoul Poultry Processing Plant.

Anjar Sugar Beet Factory.

Aziz Wardy & Co., Hatchery and Feed Mill.

Fregco Egg Packing and Marketing Co-operative.

Other Places Outside Beirut.

SLEA Hatchery, Antoura.

Hassan Shuman Broiler Farm, Beit Mary.

S.A.F.A. Fruit Packing Co. , Saida.

Osseiran Dairy Farm.

Carob Processing Co. , Selaata.

Republic of Lebanon
Office of the Minister of State for Administrative Reform
Center for Public Sector Projects and Studies
(C.P.S.P.S.)

الجمهورية اللبنانية
مكتب وزير الدولة لشؤون التنمية الإدارية
مركز مشاريع ودراسات القطاع العام