This work is licensed under a
Creative Commons Attribution-NonCommercial-
NoDerivs 3.0 Licence.

To view a copy of the licence please see:
http://creativecommons.Org/licenses/by-nc-nd/3.0/

(8-32)

INSTITUTE FOR DEVELOPMENT STUDIES

UNIVERSITY COLLEGE, NAIROBI

Discussion Paper No. 70

by

T. J. Aldington

and

Frank A. Wilson

SOME ASPECTS OF THE KENYAN BEEF ECONOMY

September 1968

Any views expressed in this paper are those of the authors. They should not be interpreted as reflecting the views of the Institute for Development Studies or of the University College, Nairobi.

Univ ~~of~~ College Nairobi
Inst for Dev Studies
Discussion paper no 70.

IDS LIBRARY
RESERVE COLLECTION

Some Aspects of the Kenyan Beef Economy

Over the past year we have been engaged in studying various aspects of the Kenyan beef economy. Our results are recorded in a 300 page report which will be lodged with the Institute for Development Studies, the Ministry of Economic Planning and Development and the Ministry of Agriculture. However, we felt that many of the issues which we investigated were of sufficient interest to justify the production of a 'popular' but greatly condensed version of our findings in the hope that it will serve as a useful background for discussion purposes.

For those who may not be aware of the institutional and structural aspects of the beef market in Kenya, this is a good opportunity to briefly describe them. In practice there are three markets which overlap to a greater or lesser degree: the urban market comprising Nairobi, Mombasa, Thika and Nakuru which is dominated by the Kenya Meat Commission (KMC), the other urban and more populous rural areas in which an organised market may be said to exist, and the rural subsistance sector where it does not. We have tended to concentrate on the first of these markets because information on it is more readily available and KMC, as an agent of government policy on the beef industry, plays an important role in the development of the industry and justifies study.

Acknowledgement

We are indebted to many people but in particular we have greatly valued the co-operation of Messrs. Douglas (of the Livestock Marketing Division), Peberdy (Animal Husbandry), Pratt (Range Management) and members of the Kenya Meat Commission, especially Messrs. Shah (Chief Accountant), Thomas (Sales Manager) and Grose of the Accounting Office, Athi River. Several of our colleagues in the Institute for Development Studies and the Department of Economics at University College, Nairobi, have made helpful comments and suggestions.

T. J. Aldington
Frank A. Wilson

Institute for Development Studies
September, 1968.

A Note on Abbreviations used in the Text and Tables

A. Carcass Beef

(1)	H. & F.	-	Hind and Forequarters
(2)	G.A.Q.	-	Good Average Quality grade
(3)	F.A.Q.	-	Fair Average Quality grade
(4)	C.D.W.	-	Cold Dressed weight

B. Commercial organisations and Government Departments

(1)	K.M.C.	-	Kenya Meat Commission
(2)	K.F.A.	-	Kenya Farmers Association (Co-operative) Limited
(3)	Vet. Dept.	-	Veterinary Department
(4)	L.M.D.	-	The Livestock Marketing Division of the Veterinary Department

I. The present and future beef situation in Kenya

I.I. The present situation (1967)

I.I.I. In the absence of a country wide census of the cattle population, a variety of methods were used to provide estimates of the present cattle population and offtake. Our final estimate is that in 1967 the cattle population of Kenya, including grade stock, was 7.331 m.head. The estimated offtake built up from district figures was 13.2% which represents 970,000 head which can be accounted for as follows:

KMC consumption	212,000	(net of Somali imports)
non-KMC consumption	720,000	
on-the-hoof exports	20,000	
	953,000	

The balance of 17,000 head constitutes the error element unavoidable in the estimates of this type.

I.I.2. Our estimate of the average beef carcass weight including edible offal in 1967 is 280.8 lbs which would give a total domestic consumption of 234 m.lbs of beef, bone-in including edible offal, representing a consumption of 24.2 lbs per capita based on a 1967 human population estimate of 9.948 million.

I.I.3. There was more difficulty in estimating sheep and goat populations and offtake rates, but conservatively we estimate that the per capita consumption of sheep and goat meat was 3.6 lbs in 1967.

I.2. Methods used of estimating cattle populations and offtakes

I.2.I. It may be of interest to briefly outline the methods which were used in building up estimates of the cattle population and rates of offtake. The basic data are estimates of district hide sales, rinderpest inoculations and cattle movements obtained from district annual reports of the Vet. Dept. and the Hides and Skins Inspection service. This method of using hide 'consumption' figures as a means of estimating cattle populations has been used before in Kenya, notably by Spinks in the East African Livestock Survey.[1] Our estimates were based on the figures for 1965, 66 and 67. Spinks used 1963 figures alone and it is felt that since that time the standard of collection of hide sales figures in the districts has improved. However, it must be admitted that for the districts of Wajir, Mandera and Garissa, hide sales figures were not available for 1967 at the time of completing the report (in fact such figures from these districts are characteristically very low) and here Spinks' original and heroic estimates of cattle population for these districts were used.

---

1. G.R. Spinks. Marketing of Livestock and Meat in Kenya (East African Livestock Survey.) FAO 1966.

I.2.2. The use of hide sales figures as estimates of beef consumption obviously can lead to errors. The figures are based on returns of district cesses levied on hides when they are moved out of a district. Traders may simply avoid paying the cess by under-recording their sales or they may hold on to stocks in a time of falling prices for hides which is what occurred in 1967; hides may be used domestically and not marketed; carcasses may be flayed but the meat not eaten or, the other way round, the carcasses may not be flayed although the meat is eaten. Some of these errors may be decreased by taking a series of years rather than one only. An allowance was made for the domestic use of hides in certain pastoral districts by adding 10% to the known figures of hide sales. This was the practice adopted by the Vet. Dept. in making earlier estimates of cattle populations.

I.2.3. To the hide consumption figures for each district were added the net movements of cattle into the districts. Figures on these movements were obtained from returns of movement permits issued by the district vet. officers. Therefore for most but not all districts, estimates of the total number of slaughter cattle consumed within the district boundaries andthe net offtake from the district (consumption plus or minus net cattle movements) were available.

I.2.4. Clues on the size of the cattle population from which the offtake of each district was drawn were given by the offtake figures themselves (there is a floor set by the natural death rate, unlikely to be less than 7.5%, and a ceiling of not more than 25% under Kenyan conditions) and rinderpest inoculations. Since the introductions of the CAG inoculant which removes the necessity of inoculating cattle twice, a series of inoculation figures for each district does give an indication ofthe number of immature cattle in the district and hence the cattle population. These figures provide clues of very variable reliability and they were not available for all districts, so for some districts comparisons had to be made between our offtake estimates and previously made estimates of the district cattle populations either by Spinks or the Vet. Dept. The objective was to build up a picture of the existing cattle situation in Kenya piece by piece in the manner of a jigsaw puzzle.

I.2.5. The estimates of the average carcass weights of cattle from different districts were derived from an analysis of the carcass weights of cattle purchased by KMC.

I.3. The future situation (1975)

I.3.I. To make projections on supplies of slaughter cattle, assumptions must be made on the feasible offtake, the cattle population and the average carcass weight. Sophisticated

measurement of supply response is out of the question of course, but our opinion is that the overall cattle population will not increase by 1975 but the offtake rate may be expected to increase from 13.2% in 1967 to 15.5% in 1975. We consider also that the average carcass weight may increase by 5% over the 1967 estimate.

I.3.2. However, in forecasting these increases in offtake and average carcass weight, it is appreciated that even these improvements will require a considerable degree of development in the beef cattle industry. This implies that the preconditions of commercial beef production will have to be satisfied in some areas at present under subsistance pastoral farming.

I.3.3. On the above assumptions, it is estimated that total supplies of beef will be about 326 m.lbs, bone-in including edible offal by 1975.

I.3.4. On the demand side, an estimate of human population growth of 23.3% by 1975[2]. over the 1967 level has been used. We assume conservative increases of 5% for per capita rural incomes and 10% for Nairobi/Mombasa per capita incomes over the period 1967-1975. Also it was assumed that the elasticity of demand with respect to income is 1.0 in rural areas and 1.3 in Nairobi/Mombasa.

I.3.5. On this basis the projected supply of beef would nearly balance the projected domestic demand. If by 1975 is was found profitable to export beef, then a deficit would be created in the internal market which would generate increases in domestic prices.

---

2. This is an early projection by the MEPD based on the 1[illegible] the census in Kenya. As such it is a little higher th[illegible] upper revised projection made in 1967.

2. The KMC in the Kenyan beef market

2.1. The domestic market

2.1.1. In the domestic market KMC has an imperfect control over the urban beef markets of Nairobi, Mombasa, and Nakuru. That is to say the slaughtering of cattle and the movement of beef into these markets from non-KMC sources is restricted to a licenced amount. KMC's control over the Eldoret market was relinquished in May 1968.

2.1.2. KMC's domestic sales amounted to about 30 million lbs CDW in 1967; overseas sales were about 37 million lbs CDW of which over 29 million lbs were in canned corned beef.

2.1.3. The arguments which may be put forward to maintain or strengthen KMC's monopolistic position in these urban markets are firstly that it ensures that regulations on meat hygiene and inspection are properly implemented in these markets and secondly that KMC as a large organisation, requires a large throughput in order to lower unit production costs. If this throughput were to be eroded by competitors in the domestic market who did not have to comply with the same stringent hygiene standards nor compete in overseas markets, unit production costs of KMC would increase, overseas markets may be lost, the health of a large proportion of Kenya's urban population would be jeopardised and the whole beef industry would suffer.

2.1.4. Despite these arguments, we recommend that KMC's monopolistic powers should be reduced and not increased by additional legislation designed to curb competition. The implementation of hygiene regulations on slaughtering premises and meat must be improved by a strengthened inspectorate service: in the case of slaughtering premises, controlled by the municipal public health authorities; and in the case of meat itself, controlled by the Vet. Dept. The objective, in the long run, should be the universal adoption of adequate hygiene standards plus the encouragement of private enterprise in an industry where African entrepreneurs may achieve a foothold fairly easily. Owners of existing premises for slaughtering stock should be encouraged to improve them and the applications for new licences to slaughter stock and market meat should be considered more in terms of the existing processing capacity of the local industry as a whole rather than whether or not KMC can tolerate additional competition.

2.1.5. There is no doubt that KMC, up to the end of 1967 at least, was technically very inefficient. Using three different methods of assessing its technical efficiency, its costs of production were found to be excessive. For example in 1967 the operating costs of KMC (excluding the canning process) came to Shs. 26.95 per 100 lbs CDW and the overhead costs Shs. 13.40

per 100 lbs CDW. As a comparison the slaughtering fees charged by the county councils in the slaughter houses in non-KMC areas and by some private owners of licenced slaughter houses in urban areas controlled by KMC, are of the order of Shs. 12.50 to Shs. 15.00 per head of cattle. This is anything up to an eighth of the costs incurred by KMC to perform essentially the same services, albeit at probably a lower standard. Therefore KMC must reduce its costs of production. It is believed that action has been taken already towards this end.

2.1.6. The charge which KMC levies on retailers buying meat through its Nairobi wholesale depot, at 80 cents per 100 lbs CDW purchased does not seem to be excessive. However, it covers only a part of the service normally provided by meat wholesalers: the actual handling of meat from the processing plant into the retailer's possession, involving transportation from the plant to the depot, a certain amount of storage and administration.

2.1.7. There is a separate charge made if retailers require KMC to transport meat from the wholesale depot to the retailer's premises. This amounts to Shs. 1.70 per 100 lbs CDW. While it is not known whether this is an economically justified rate or not, it is recommended that the transport charge should vary with the actual distance involved and not be an average flat rate.

2.1.8. There is the possibility that whatever improvements are made to the technical efficiency of KMC as a whole, its plants at Athi River and possibly Mombasa, are too large; they may be in fact incurring diseconomies of scale. If economies of scale were being achieved it would be expected that as output increased, the fixed element of production costs per unit of output would decline. This does not appear to be the case with KMC. Comparing 1966 with 1967, output increased from 61.4 m.lbs to 69.3 m.lbs CDW of meat, yet general works expenses increased from Shs. 20.24 to Shs. 22.48 per 100 lbs CDW and total overhead costs increased from Shs. 11.44 to Shs. 13.40 per 100 lbs CDW. What proportion of these increases are accounted for by rising prices of inputs is not known but these examples do raise some questions on what should be the economical optimum size of KMC as an administrative body and of its individual processing plants.

2.1.9. Again there is no doubt that the plant at Athi River is obsolete and incurs high production costs while that at Mombasa is plagued by supply difficulties which also will tend to increase unit production costs.

2.1.10. As a quasi-governmental body the KMC has to operate under difficult conditions because of constraints imposed upon it by the Government. Possibly the worst restriction is the necessity of having to pass any changes in prices to producers or retailers through legislative channels before they may be enforced. Such a time consuming process prevents any rapid adjustments of prices being carried out which are essential if a healthy trading position is to be maintained in a market so prone to fluctuations in prices of saleable products. A major factor contributing to KMC's unhappy trading record in 1967 was the decline in world prices for animal by-products, particularly for hides and beef extract, in the face of which KMC could not respond in time by manipulating the prices it is in a position to control.

2.1.11. Clearly if KMC is to operate on a more efficient basis, such restrictions must be removed. The Government may continue to advise KMC on its marketing policies but the decision to make price changes must rest with KMC and be the responsibility of its management. To this end it may be advisable to reduce the interests of producers on the managing board to prevent the repetition of former uncommercial pricing decisions.

2.1.12. It is appreciated that the Government may wish to control decisions which would have a direct effect on the cost of living and the rate of development of the beef industry. Examples of these would be the prices that KMC charge retailers for different meats and the prices paid to producers for slaughter cattle. However, the Government itself will have to decide on how far KMC will be forced to implement Government policies and what importance should be attached to the desirability of KMC at least avoiding a trading loss if these two objectives conflict.

2.2. The overseas market

2.2.1. While KMC enjoys a degree of monopoly in certain urban markets in Kenya, in the overseas market in which it sells cut and carcass beef, canned corned beef and various by-products, KMC is very much a price taker. Possibly the most important factor here is that on present trends the rising domestic demand for beef is likely to have eroded the present exportable 'surplus' by the middle of the next decade. This will cause KMC to compete more vigourously with domestic buyers in order to achieve its present level of throughput and the resulting increases in prices for slaughter stock may render the export of beef in any form an uneconomic proposition.

2.2.2. It seems that in 1967, contrary to popular opinion, the export of canned corned beef was not a profitable enterprise. Should the world prices of by-products, including beef extract, remain depressed in the face of rising prices for slaughter cattle it

may have to rely on the domestic beef market alone, unless KMC is subsidised by the Government in order to earn foreign exchange.

2.2.3 It has to be faced that it is very unlikely that within the next decade Kenya will be permitted to enter the lucrative cut and carcass beef market of Western Europe. The veterinary and health regulations which are rigourously applied amount to trade restrictions diplomatically disguised. Kenya is hampered too from competing effectively in the beef markets of the Mediterranean, the Arabian Gulf and Indian Ocean countries by high transport costs. The closure of the Suez Canal and the withdrawal of British troops from Aden havebeen recent and additional blows to the higher priced chilled or frozen beef market. The canned corned beef market is attractive because the selling arrangements are relatively simple, the bulk of Kenya's ouput being sold in the U.K. under the Fray Bentos label, and the prices received for a product of relatively low raw material cost appear to be high. Yet if the costs of the purchased inputs, notably the packing materials, the tins and cartons etc. are deducted from the selling price, the net value added by the process is extremely small indeed. In fact the profitability of the canning process is very dependent on the world prices of cattle hidesand other by-products, particularly beef extract. In 1967 when these prices were abnormally low, it seems likely that KMC incurred a trading loss on its canning activities.

2.2.4 An alternative to the canned corned beef trade would be to produce a product in a processed form which would successfully circumnavigate the existing veterinary and health regulations applied on meat products imported into Western Europe, involving possibly less packaging expenses and utilising beef of a medium quality which Kenya can produce relatively cheaply but which European producers do not find attractive to market. Their generally high cost production methods have to be justified by selling in the high price carcass beef retail trade. The concept of a medium quality beef market is mentioned purposely because this would enable the producers at present marketing low quality cattle fit only for the can, to be encouraged by higher prices to produce cattle of improved quality. Under the present and past policy of diverting a large proportion of KMC's total output into the corned beef trade (nearly 50% in 1967) it is not in the commercial interests of KMC to encourage the bulk of producers to improve their stock because to do so would mean that a higher price would have to be paid for a product which, in the can, does not have a proportionally higher market value. We do not consider that it is in the

interests of Kenya's beef cattle industry that this state of affairs should be perpetuated.

2.2.5 Therefore we recommend that KMC should actively investigate the overseas market for other forms of processed beef, particularly cooked beef which is used as an intermediate product for a wide range of manufactured meat products in Europe. There may well be a niche for Kenya here, an interstice in a market dominated by the large producers such as Argentina and Australia.

3. Projections on the demand for KMC beef by 1975

3.I.I. An overall analysis of demand for beef even in urban areas of Kenya is impossible because of insufficient data. However, enough information was available on KMC sales in Nairobi in the period 1955 to 1966 to perform a quantitive analysis of demand for KMC beef in the Nairobi area.

3.I.2. Changes in KMC's selling policy in May 1967 (selling quarters instead of complete sides to retailers) and a strengthening of the legislation designed to increase KMC's monopoly power in the Nairobi market cause a discontinuity in the sales series in 1967. However it is considered that the price and income elasticities derived from the analysis will still be valid for demand projections. The best estimates of these two parameters are

Elasticity of demand with respect to price -0.8
Elasticity of demand with respect to income 1.6

3.1.3. Although these parameters suggest that KMC faces a slightly inelastic demand for its products, KMC would not benefit by raising its prices to retailers. For if KMC do raise their prices by 10% it is estimated that retailers would raise their prices by 12% (implying a retail mark-up of 20%) and this would reduce the quantity purchased by 9.6%. Thus KMC's revenue would barely rise.

3.I.4. With the data available it was not feasible to differentiate between the demands for beef of 'high' and 'low' quality mainly because consumers distinguish more between fore and hind quarter beef than between grades of beef. Therefore these estimates of elasticities of demand refer to total beef.

3.I.5. As the measure of price elasticity is approaching unity, the measure of price flexibility which for the purposes here may be taken to be the reciprocal of price elasticity, will be only a little more than unity. Therefore if KMC did not administer prices to retailers and if supplies of KMC beef were to increase by 10%, the resulting decrease in price to clear the market would be about 11 to 12%.

3.I.6 Looking now at the effect of increases in per capita incomes on the demand for KMC beef, if disposable incomes per adult equivalent (2 children of 15 years or under equal 1 adult equivalent) increase by 10%, then the demand for KMC beef is likely to increase by about 16%. This is high but not unexpectedly so in an area (Nairobi) where incomes are still relatively low by the standards of a developed economy yet where fresh beef is readily and daily available. A contributory factor is that KMC beef may be regarded by many consumers as being a luxury article which they would be more likely to buy as their incomes increased. This would tend to increase the income

elasticity of demand for KMC beef above the level normally associated with total beef.

3.1.7. Ignoring price changes for the time being, if per capita disposable incomes on an adult equivalent basis in the KMC urban arease are assumed to have increased by 10% by 1975 (over the 1967 level) we estimate that the demand for KMC beef in these markets will be about 53 m. lbs CDW. If an allowance is made for exports of say 30 m. lbs which was the 1966/67 level, the total demand is 83 m. lbs CDW, although as has been pointed out above, rising prices for slaughter stock may make the export beef without subsidisation an unprofitable exercise. With an average carcass weight of 326 lbs CDW, an increase of 5% over the 1967 estimated figure, this represents 255,000 head of cattle compared to some 213,000 head 'consumed' by KMC in 1967.

4. Projections on the supply of slaughter cattle to KMC by 1975

4.I.I. The basis for these projections was an analysis of KMC supplies of slaughter cattle over the period of 1953 to 1967. As considerable developments have taken place in the industry during this time, an econometric model was used incorporating a lagged response to price changes, the lag being distributed according to a method proposed by Koyck.[1.] The resulting equation yields both long and short run elasticities of response to price changes. In 1967 the best estimates of point elasticities were 1.7 and 1.0 respectively. Obviously producers are more responsive to price changes in the long run when they can vary their productions plans than in the short run. In this case the short run means a period which was estimated to be 3 years.

4.I.2. As with the preceeding analysis of demand, difficulties are encountered when the regression equation is used as a direct basis for projections to 1975. This is because the data from which the equation is calculated cover a period when a surplus of beef may be said to have existed. That is to say there was no shortage of slaughter cattle likely to cause an upward movement in prices. This situation may not remain to 1975 although as stated above, the potential deficit by that year will not be large if anticipated developments occur in the beef producing industry. Therefore any price increases in slaughter cattle are likely to be caused more by production cost increases than by the demand greatly exceeding the supply.

4.I.3. Apart from one year (1959), since the inception of KMC in 1951 producer prices have steadily increased up to January 1968 when they were reduced, except for 4th grade. If it is accepted that there is a 3 year lag in producers' response to a price change, certainly the 1968 average producer prices are high enough to bring forward the required number of cattle by KMC up to the early 1970's. Subsequently and up to 1975, prices may have to be increased mainly to overcome the effect of increasing production costs which are inevitable and which failing a technological breakthrough in production methods, will not be counteracted by increasing productivity in the industry. Also by this time the projected increase in domestic demand for beef in Kenya as a whole should be pressing on supplies, a hitherto unknown event.

4.I.4. It may be considered that further reductions in producer prices should be made in view of KMC's trading deficit in 1967. However we recommend that such direct cuts should be made only after a very thorough appraisal of the situation. With such a lagged response to price changes, once the cattle supply curve facing KMC begins to unwind downwards, it may prove to be a lengthy and costly business trying to increase supplies to KMC in the future.

In a following section we recommend changes in the grading and pricing policies of KMC which will result in further slight yet indirect reductions to average producer returns. Rather than jeopardise the desirable developments of the industry which psychologically direct reductions in producer returns may entail, we recommend that indirect means of achieving economies should be used.

1. L. M. Koyck. Distributed Lags and Investment Analysis.

5. The Retailing of Beef in KMC areas

5.1.1. The KMC has a theoretical wholesale monopoly in the towns of Nairobi, Mombasa, Nakuru and (until recently) Eldoret. Sales of beef to retailers in 1967 through the wholesale depot in the case of Nairobi and from the KMC controlled slaughter-houses in the case of the other towns were as follows:

Table 1. KMC Wholesales 1967

	CDW '000 lbs		
	BEEF	OTHER MEAT	ALL MEAT
NAIROBI	19,663	1,555	21,218
MOMBASA	7,053	302	7,355
NAKURU	2,424	194	2,619
ELDORET	1,115	32	1,147

5.1.2. It is of interest to note from the table above that KMC sales of Mutton, Lamb and Goat meat taken together were only 7% in quantity terms of total KMC carcass meat distribution at wholesale levels in Nairobi and Nakuru and had an even smaller share in the other centres.

5.1.3. In analysing the retail market against this background it became necessary because of the limited time available to concentrate upon the Nairobi market although retail meat price data was also collected for Nakuru and Eldoret.

5.2. The aims of the retail survey

5.2.1. A major aim of the survey was to analyse the geographical and socio-economic types of market structure to indentify the purchasing patterns of butchers and calculate retail margins for beef.

5.3. Methodology

5.3.1. The KMC wholesale invoices of the 192 retailers were analysed by taking a sample of 6 weeks from the whole of the 1967 calendar year. As it was essential to choose time periods which represented both the peaks and the troughs in the monthly purchase pattern the sample was made more deliberately purposive by the device of grouping the 6 weeks into 3 two-week periods. The intervals between the weeks chosen was decided upon to represent a reasonable spread through the year.[1] Thus the 3 two-week periods analysed were in May/June, September and November. The weekly average quantity of beef of all grades purchased was found to be 367,302 lbs for the sample and 378,135 lbs for the whole year.

---

1. When first drawn the sample consisted of 4 two-week periods the first of which was February 20th - March 4th. This period was discarded for the purposes of analysis as it represented the situation before the change from selling mainly beef sides to selling in quarters and the consequent price adjustment which took effect from 15th May, 1967.

5.3.2. For the purposes of the first stage of the analysis details of wholesale purchases during the sample periods were extracted and placed into distinct geographical and type of market groupings. Butchers purchasing more than 15% of their total KMC carcass beef supplies from Baby Beef/First, GAQ and FAQ hindquarters were considered to belong to the higher income grouping regardless of location.

5.3.3. After grouping the 192 butchers and analysing the purchase records on a group basis the next stage was to attempt as comprehensive a coverage as possible of the main groups to collect retail price information and other data on the retail structure. Out of the 192 butchers for which meat purchase records had been completed 39 (including 20 which in a geographical sense were unplaced) were not considered for enumeration leaving 153 from which to attempt the best possible coverage. The 61% cover (93 out of 153) which was achieved was considered satisfactory bearing in mind that many of the lower grade butchers were found to be somewhat irregular purveyors ofmeat and that as such their premises were found to be closed when initital and sometimes subsequent visits were made to a particular area.

5.3.4. Gross retail margins were calculated for all locational and type of market groups using the mean values for each group as the required wholesale cost and retail price data. The basis of the Gross Margin analysis was to relate the 'cost' of 100 lbs of carcass beef to the return derived from the same quantity of beef via retail sales. The cost per 100 lbs of beef was calculated on the basis of the ruling wholesale prices for different grades (fore and hind) of beef and the proportions of the different grades purchased - hence the practice of using a 100 lb unit so that the proportions purchased expressed in percentage terms multiplied by the ruling grade prices would produce an 'input cost' per 100 lbs.

5.3.5. The calculation of the gross return was based upon average yield[2.] data for different grades of beef from which it was possible to draw up 'return schedules' based upon the grade mix of the average 100 lbs of meat purchased.

5.4. <u>The results of the Analysis</u>

5.4.1. <u>The structure of the retail trade and market requirements.</u> Some of the more relevant findings of the study of the KMC supplied Nairobi retail meat market are presented in the table below.

---

2. The use of yield data derived for different grades of meat makes it possible to make allowance for the variation in gross returns for different grade mixes due to the differing proportions of bone, fat, waste and saleable cuts of meat which are yielded.

Table 2. Purchase Pattern Analysis

PURCHASE PATTERN

CDW lbs purchased expressed as a percentage*

Location or type of Market Group	GAQ H	GAQ F	FAQ H	FAQ F	3rd H	3rd F	4th H	4th F	Mutton + Lamb
High Class Nairobi and Suburbs	32.9	3.2	14.6	1.7	7.8	2.9	11.7	6.5	15.5
Municipal Market	16.1	3.5	13.8	1.8	8.5	6.2	25.6	13.8	8.8
Eastlands	-	49.5	0.2	24.4	10.7	8.7	2.7	1.6	1.4
Eastleigh/ Pangani	-	16.3	0.3	11.5	17.8	13.1	28.8	5.9	2.8
Pumwani/ Shauri Moyo	-	39.2	-	29.9	7.9	11.6	4.2	5.3	0.3
River Road/ Kariokor	0.6	21.7	1.2	15.7	6.6	14.1	11.8	13.6	5.1
Kibera/ Dagoretti Corner	-	3.3	-	46.5	3.6	33.3	10.0	-	-
All Purchasers	9.1	17.4	5.2	12.6	9.5	12.9	15.9	7.7	6.9

* Note that the rows do not - for any of the groups - add up to 100%. The difference is made up of small amounts of Baby Beef and 1st Grade, Goat Meat, Beef Flanks and Veal.

5.4.2. Table 2 shows the main feature of the Nairobi Market; its dualistic structure. There are in effect two markets - a high income market requiring cuts of meat mainly from good quality hindquarters and a low/middle income market which simply requires 'beef', preferably with a fair proportion of fat. The requirements of the latter given the current price structure, are most adequately met by the retailing of meat taken from the forequarter of the animal - hence the distinct purchase pattern shown in Table 2.

5.4.3. It is apparent that there is likely to be a consistent imbalance between fore and hind quarter beef requirements for local consumption. This is illustrated at Table 3 which is based solely on purchase records and thus covers all 192 butchers for which purchase records were collected.

Table 3. Total Weekly Purchases (lbs CDW)
Nairobi Butchers - Average of a 6-week sample

	GAQ^H	GAQ^F	IMBALANCE	FAQ^H	FAQ^F	IMBALANCE
High Class Nairobi and Suburbs	20264	1963	+18301	9350	1027	+ 8323
Municipal Market	12540	4090	+ 8450	10186	1620	+ 8566
All other groups	952	51094	-50142	2075	32761	-30686
Total	33756	57147	-23391	21611	35408	-13797
No. of Butchers buying	41	148	-	45	155	-

5.4.4. The resulting surplus of GAQ and FAQ hindquarters must be sold on the export market in the form of frozen quarters or primal cuts. During the last three months of 1967 and the first six months of 1968 there has been sufficient indication that with the limited export markets facing the KMC a persistent surplus of GAQ and (to a less extent) FAQ hindquarters was being built up. Reference is made elsewhere in this paper to the problems created by this imbalance and to the need for a more flexible pricing policy to accommodate it.

5.4.5. Connected with this is the observed absence of any developed middle-income market. A limited number of the municipal market stalls and retailers in the River Road and Eastleigh groups would appear from the price data collected to be selling cuts of meat, particularly 'steak' at 40 or 50 cents below the price of rump steak in the High Class Nairobi and suburbs group, based upon a predominant purchase of 3rd grade hindquarters. On the whole however, it would appear that the middle income earner buys 'meat' rather than cuts of meat and as such is eating mainly forequarters beef. If the KMC develop their earlier ideas on establishing a retail shop with demonstration prices, we would recommend that they could most usefully play a part in this as yet unexploited sector of the market as a means of encouraging a few of the more progressive 'meat shops' to provide hindquarter cuts of beef for their customers. . . .

5.5. Retail Margins

5.5.1. Table 4 shows the gross revenues, costs and margins for all seven groups. Although the calculation of gross revenue has been explained in the methodology section above, it is important to re-emphasise that considerable care was taken in arriving at acceptable yield measures to apply to different grades of meat. This involved canvassing opinion rather than scientific testing although referance was made to the appropriate literature.
The KMC do not appear to have any consistent yield data based on actual carcass cutting, although some results were available

from high grade hindquarters as part of a test in connection with the preparation of cut beef.

5.5.2. We would strongly recommend that an organisation such as the KMC should have this sort of yield information. We recommend that they should take immediate steps to obtain it - preferably in conjunction with selected butchers so that the realism of market requirements is maintained. Hindand forequarter yields from all grades should be calculated and the test sample should cover the full extent of the possible CDW range for each grade.

Table 4. Gross Retail Margins per 100 lbs of Beef

	Revenue		Cost		Margin as a percentage of Revenue	No. of Butchers
	shs.	cts.	shs.	cts.		
High Class Nairobi and suburbs	186	39	151	62	18.7	16
Municipal Market	163	25	135	07	17.3	10
Eastlands	153	97	112	05	27.2	19
Eastleigh/Pangani	142	85	118	79	16.8	10
Pumwani/Shauri Moyo	141	40	116	83	17.4	19
River Road/Kariokor	141	16	112	01	20.7	10
Kibera/Dagoretti Corner	128	05	109	11	14.8	9

5.5.3. In terms of the average gross retail margins we do not consider the 18.7% for the High Class Nairobi and Suburbs or 17.3% for the Municipal Market to be excessive.[3] Although they have a much higher turnover than for example, the Eastleigh/Pangani or Pumwani/Shauri-Moyo groups they provide a completely different product to their customers. Any comparison between the two markets is for this reason misleading.

5.5.4. Some of the most interesting results are those obtained from the lower and middle income market groups. It is of particular interest to note the relatively large margin range between the low price groups. Thus Eastlands has by far the largest margin which as an expression of the respective gross revenues is almost 10% higher than the Pumwani/Shauri Moyo group. This is an order of difference which was not expected. It can be seen that although the Eastlands group

3. The "Verdon-Smith" report (albeit by a somewhat different approach) found a Gross Margin for the surveyed independent butchers of 22.2% in 1962 in the United Kingdom.
p.p. 103 to 107 "Report of the Committe of Enquiry into Fatstock and Carcass Meat Marketing and Distribution". Cmnd 2282 February 1964.

has both a higher revenue and lower cost figure than Pumwani/Shauri Moyo the difference in margin is determined primarily by the difference in gross revenues. Thus according to the analysis the consumer in Eastlands is, in comparison with the consumer in Pumwani/Shauri Moyo, paying more for beef of (on the average) a slightly inferior quality.

5.5.5. In contrast Kibera/Dagoretti Corner butchers have the smallest margin of all groups but they also pay less for their beef at wholesale than do other groups. Reference to the purchase pattern shows that FAQ and 3rd Grade forequarters rather than GAQ forequarters are purchased and in fact only one member of the group purchased any GAQ fores at all. In further contrast, in Eastleigh/Pangani all members purchased GAQ fores with a group average of 16.3% as opposed to 11.5% and 13.1% for FAQ and 3rd Grade fores respectively.

5.5.6. We do not consider that any of the findings of the retail margin investigation merit intervention into the retail market by KMC. The limit of participation should be the establishment of a retail shop in each of the Eastlands and Eastleigh/Pangani residential areas. For accounting purposes such a demonstration shop should be treated by the KMC as a completely separate and autonomous unit; the meat should be purchased from the KMC wholesale depot and all expenses should be met from gross profits. By means of the demonstration shop butchers may be encouraged to produce basic cuts of meat particularly steaks. We would, however, consider that cooking facilites in most low and middle income homes prohibit anything more than a gradual expansion in consumption of joints of meat. This being so we would not encourage the KMC to go into the cut meat business for local consumption. Joints are not generally required in the low and middle income markets whilst the higher income retailers employ butchers and prefer to cut up the meat themselves.

5.5.7. Based on the results of the retail margin analysis only the Eastlands group could be said to have an excessive margin relative to the services provided. We consider that the implementation of the recommendation made above on the establishment of a demonstration shop would be the most appropriate action particularly from the point of view of encouraging the purchase of higher grade and also hindquarter meat.

6. Government Policy and the KMC: a critique and recommendations

6.1. Grading of slaughter cattle

6.1.1. As shown on the section on the retail market for beef, the absence of a large middle income group of consumers in urban areas means that there is virtually no demand for medium quality beef. The present grading system is not used at all in the lower income market, retailers buying on a lowest price basis. In the overseas market, the canned corned beef trade does not differentiate between grades of beef provided that a certain proportion of fat is maintained, and while the cut/carcass beef trade requires a carcass of good quality, it does not distinguish between say GAQ and FAQ grades. Therefore the wide range of quality standards provided by the present grading system is not justified by the requirements of the beef market: all that is needed is a simple division into 'upper' and 'lower' grades.

6.1.2. We feel that the relatively small market for superior quality beef, (Baby Beef and 1st Grades) could be made more flexible by dropping these two grades and allowing retailers and caterers who wish to buy such quality beef to trade directly with the producers of it. KMC should continue to slaughter, inspect and, if necessary, store the product at agreed charges. Also retailers should be permitted to set their own prices for this quality beef market.

6.1.3. We are convinced that the remaining four grades should be reduced to effectively two or possibly three grades, and the grading system shouldbe placed on a more objective basis than the existing one. Cattle are graded in theory according to the degree of finish of the dressed carcass. However, when we analysed the weight distribution of some 50,000 sides of beef graded at KMC's Athi River factory, we found that in fact cattle virtually were graded on weight with a clear division at a side of 200 lbs CDW. Only 5.4% of GAQ animals and 23.3% of FAQ animals weighed less than 400 lbs CDW, and only 20.6% of 3rd grade and 2.4% of 4th grade weighed morethan 400 lbs CDW. We propose therefore that cattle should be graded mainly on a weight basis, but with two reservations. First, we recommend that a higher price per lb. should be paid for animals of over 400 lbs CDW which are less than 4½ years old, this being the beef demanded by the higher income market. Second, all beef currently downgraded for excessive bruising or on public health grounds should continue to be penalised. The remaining cattle would be paid for on a per lb basis, a higher price being paid for those over 400 lbs CDW. This should encourage producers to market their cattle only when they have attained a reasonable size.

6.1.4. To prevent abuse of the system and the production of overfat cattle, we propose that penalties should be imposed on carcasses weighing more than 600 lbs CDW. This would represent an animal of approximately 1200 lbs liveweight.

6.1.5. Apart from the advantages of rationality and objectivity, the proposed simplified grading system should reduce KMC's administrative costs. The effect on producers' returns of this proposed system, need be marginal only: a narrowing of the range of quality differentials which would tend to reduce the returns accruing to producers of the higher grade cattle, but increase them to producers of lower grade cattle.

6.1.6. A summary of the proposed grading system is

Standard Grade - Carcasses of less than 400 lbs CDW.
Select Grade - Carcasses of more than 400 lbs but less than 600 lbs CDW.
(Select overweight) All carcasses of more than 600 lbs CDW.
Choice Grade - As for Select Grade but carcasses from cattle of less than $4\frac{1}{2}$ years of age.

6.2. KMC's pricing policies

6.2.1. In a preceding section the standard of KMC's technical efficiency was criticised. Here the economic efficiency of the pricing policies adopted by KMC is appraised: whether it results in the efficient allocation of resources in the beef industry and whether it facilitates or hinders the development of that part of the industry which it influences.

6.2.2. The existing policy on prices charged to retailers and paid to producers is very inflexible. Generally but not invariably prices are fixed at the beginning of each year and this makes it difficult for KMC to follow its proclaimed break-even accounting policy. For KMC is faced by fluctuating prices for its final products in overseas markets and, especially important, for its by-products upon which its profitability largely depends. Up to 1963 KMC was allowed a certain accounting margin by paying producers in two stages: an initial payment on the delivery of cattle followed by a bonus when the annual trading profit had been calculated. This policy was abandoned and now KMC is placed in a difficult trading position as it no longer can adjust its producer prices to accommodate changes in the relationships between the supplies of cattle and the demands for KMC products.

6.2.3. In attempting to prescribe a realistic pricing policy for KMC designed to achieve an efficient allocation of resources, we are faced with three important constraints. First, we realise that the Government will wish to retain its policy of fixing wholesale prices for the low income beef market. Second, we feel that with KMC's existing standards of accounting methods, any sophisticated pricing policy based on equating

marginal costs and price is impracticable. Nevertheless KMC should realise that if it has a conventionally shaped marginal cost curve, it cannot expand its production of canned corned beef indefinitely without incurring losses. Thirdly, KMC is not a profit making body but has as its prime objective the supply of the domestic market with beef at the lowest price commensurate with maintaining long term supplies of beef.

6.2.4. Therefore we recommend that prices to producers and for domestic consumers of KMC beef should be based on an opportunity cost principle and reflect the net value of the different forms and grades of beef realised by the various markets. The net value implies that marketing costs including purchased inputs, plus processing costs, have been deducted from the gross sales value to which would be added the appropriate net value of the by-products. The pricing system could be built up from the net value realised for beef in the lowest prices and most price elastic market - canned corned beef. For example, the producer price for Standard grade cattle would be based on the canned corned beef market: the net value of the product plus the value of by-products including beef extract, less processing and administration expenses. The wholesale price on the domestic market for beef of this quality wouldbe geared to the producer price plus processing and marketing costs, less the value of by-products. Thus it would be linked indirectly to the canned corned beef market.

6.2.5. We recommend that such calculations leading to the reassessment of producer and consumer prices should be made as frequently as possible, due attention being paid to the likely supplies of cattle and the expected prices for canned corned beef and by-products on the world market.

6.2.6. It is apparent that in the domestic market, demand patterns are being distorted by the price subsidisation of the market as a whole, although the lower grades are subsidised to a greater extent than the higher grades. In fact we suggest that a major factor contributing to KMC's trading loss in 1967 was the decline in the prices received by KMC for its products (including by-products of course) in the world market which meant that this element of subsidy which we calculated to have been about £K 200,000 in 1967, was fully exposed.

6.2.7. The table below compares the calculated break-even wholesale price for four existing grades in the domestic market with the actual 1968 wholesale prices. These break-even prices are based on fairly crude assumptions and on 1967 cost data but they indicate the amount of subsidisation involved.

Table 1. Break-even prices and subsidisation

Grade	% hinds/fores	1968 combined side price	Break-even price	'subsidy' cts per lb.
		(shs. per 100 lbs)		
GAQ	55/45	158.00	about 158.00	nil
FAQ	54/46	142.40	about 147.40	about 5
3rd	53/47	121.20	about 138.40	about 17
4th	52/48	105.60	about 122.40	about 16-17

The explanation for this is relatively simple. If it is assumed - and it appears to be reasonable to do so - that the costs of transportation, slaughtering, processing and marketing beef on a per lb CDW basis are the same for all grades, and the value of the by-products, also on a per lb CDW basis, similarly is equal for all grades, then the price differentials between grades at the producer level should be maintained down to the wholesale level. Under the present pricing policy these differentials widen, the upper grades attaining wholesale prices which just about break even on these cost assumptions but the lower grades fail to do so.

6.2.8. The differentials between the fore and hindquarter prices at the wholesale level similarly should reflect the current supply and demand relationship. Clearly if there is a deficit of forequarters but a surplus of hindquarters of a particular grade of beef, the relative prices should be adjusted accordingly. The existing policy of having rigid and arbitrary quarterprice differentials is unrealistic. In the low price beef market, quarter price differentials are not necessary.

6.2.9. Seasonal fluctuations in the supplies of cattle to KMC which tend to increase production costs, may be reduced by (a) having a seasonally varying producer price, (b) holding stock on-the-hoof until required or (c) organising contracts with producers. Previous experience with the first method, (a) above, showed that producers tend to over-respond to a seasonal pricing structure if the full seasonal differentials are announced in advance. However, we recommend that further experimentation should be attempted, possibly by announcing seasonal prices in two stages: the first at the beginning of the year, based on previous knowledge of seasonal variations of supplies; andthe second delayed until the current supply/demand position is more accurately known. A result of KMC's present and past rigid pricing policies is that very little is known about how producers and consumers respond to marginal changes in prices.

6.2.10. We realise that the determination of a suitable policy on the prices to be paid to producers of cattle and the prices to face

the consumers of beef is a subject which requires much more study than we have been able to carry out. It is up to the Government to decide what are its priorities concerning the beef industry as a whole and up to the KMC to ensure that the latest cost data is available. Here we have put forward some ideas and tentative findings which we hope will stimulate discussion of this important subject.

6.3. KMC's policy on transport costs of slaughter stock.

6.3.1. The existing policy is that KMC bears the costs of transporting slaughter cattle from the producer to the factory. The cost to KMC of providing this service (usually by rail) in 1967 was about £K 125,000, equivalent to about Shs. 13.00 per head of cattle handled. This excludes the costs incurred by transporting cattle by sea to Mombasa.

6.3.2. The effect of this policy is that some producers who are using more scarce resources in the form of transport facilities, will be subsidised at the expense of those producers who use less.

6.3.3. A uniform policy may encourage an extension of output in more distant areas but this will be achieved at the expense of possibly more intensive output from more favourably situated areas. If it is required to encourage production of beef in the more isolated areas of Kenya which may be the case, then this may be done by means other than a uniform price system which is wasteful of scarce resources and penalises some producers for the benefit of others. Direct subsidisation and/or the provision of improved marketing facilities (for example watering points, stock routes and holding grounds) are the more economically efficient ways of encouraging production in selected marginal areas, not spatially uniform prices.

6.3.4. Therefore we recommend that KMC should devise a scheme whereby producers are remunerated net of livestock transport costs. If producers wish to make their own transport arrangements, they should be permitted to do so.

7. The Extra-KMC Market for Slaughter Stock

7.1. Organised marketing at the point of first sale

7.1.1. The structure of the extra-KMC market is somewhat complex. On the supply side the County Council Auctions (and to a less extent Vet. Dept. sales) are an important source of slaughter stock for local consumption. Additionally, Dalgety Auctioneers are authorised by KMC to organise weekly sales of cattle on a continuing basis. The reasoning behind this authorisation is that there is a local demand for a type of cattle (fat, barren cows) which cannot be met by KMC itself. In addition the Dalgety auctions are a source of supply for centres of urban population which are outside KMC's control.

7.1.2. Dalgety & Co. are permitted to sell approximately 120 head per week at their sales which they hold at semi-permanent auction sites. These auctions have in the main been held in the Rift Valley Province but they have also been held at Konza (Machakos District), Nanyuki (serving Meru and Nyeri Districts) and Naro Moru (Nyeri District). They serve both as a collecting centre for local cattle and also as a convenient source of the type of stock required by butchers. It is an established fact that a major proportion of cattle purchased in Lanet, Naivasha, Gilgil and (to a less extent) Kiganjo and North Kinangop are eventually slaughtered for the Nairobi district market. Thus KMC by continuing to authorise the Dalgety Auctions is in effect tacitly accepting that there is a substantial corner of the retail market wherein it cannot compete as a slaughtering and distributive medium. With this we would agree and, providing that public health checks are not being by-passed, the competition is to be welcomed.

7.1.3. As with the general question of 'illegal' entry of meat over and above the allowed quotas into Nairobi,[1] the matter of diseased meat control is of paramount importance. We consider however that the problem can only be effectively tackled at the point of slaughter. Thus any temptation to restrict the number of "Fat Cow" Auctions as an (attempted) method of reducing the 'import' of illegal meat into Nairobi should be avoided. There would on the other hand, appear to be scope for the expansion of organised slaughter stock auction sales, and in this connection we recommend that the Dalgety 'quota' be increased to 150 head per week in the Rift Valley Province. This increase is not likely to divert cattle previously sold direct to KMC but on the contrary will help to institutionalise and hence control the non-KMC market by the process of selling

1. [illegible] ,350 [illegible] month [illegible] Nairobi [illegible] and [illegible] houses. [illegible] 0,000 [illegible] each [illegible]