THE STRUCTURE AND CONDUCT OF THE ANIMAL FEEDS INDUSTRY IN KENYA: THE CASE OF THE SITUATION IN KIAMBU DISTRICT AND NAIROBI PROVINCE.

BY

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Declaration

This thesis is my original work and has not been presented for a degree in any other University.

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NOTE; The author is responsible for any errors in this thesis.

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ABSTRACT

The animal feeds industry has been characterized by shortages, erratic price fluctuations and low quality animal feeds. In an attempt to examine the cause(s) of these undesirable performance outcomes, this study analysed the structure and conduct of the marketing system for animal feeds using the Structure-Conduct-Performance Model. The structure was assessed using concentration ratio and degree of inequality. The conduct of the manufacturers and traders in setting prices, selling practices and presence or absence of collusive activities was examined. The price levels were assessed at the different channel levels in an attempt to compare the marketing margins and costs. The existence of any distribution and or procurement constraints within the marketing system was examined. Primary data obtained by interviewing animal feeds manufacturers, traders and livestock farmers in Nairobi and Kiambu District were utilized.

The results indicated that the animal feeds industry was characterized by a high degree of concentration and inequality, with one firm, Unga Feeds Limited controlling over 75 percent of the market share. Market penetration, capital requirements were some of the barriers into the industry that existed. Despite these barriers, several firms had emerged the previous five years. Within the distribution, no such inequality and concentration existed. However collusive activities appeared to be rampant.

Unga Feeds Limited acted as the dominant price leader. It used cost-plus basis for pricing the feeds. The ex-factory prices varied from one manufacturer to another due to price

undercutting. The traders' marketing margins were significantly different from their marketing costs at 95% confidence interval. The degree of vertical integration was low, with only one manufacturer distributing pig feeds to the farmers directly. Seventy one percent of the manufacturers indicated that high cost of production was a major problem. Marketing of animal feeds was indicated to be a problem by 50% of the manufacturers. Inadequate foreign exchange allocations and delay in processing of import licences to enable the manufacturers to purchase ingredients had 43% and 29% percent response respectively. Acquisition of raw materials, lack of adequate credit facilities, high transport charges and poor transport infrastructure were also cited.

It is recommended that the nutrients which are imported should be locally produced to avoid the foreign exchange and the import licensing problem. The transport infrastructure and necessary amenities could be improved. This requires repairing the existing road networks. In addition, fuel prices should be reduced so as to reduce the production and transportation costs. The manufacturers could be allowed to buy the amounts of grains that they require without restrictions fromt the National Cereals and Produce Board.

CHAPTER 1

1.0 INTRODUCTION AND BACKGROUND

The overall agricultural policy of Kenya is to achieve internal food self-sufficiency, to maintain adequate levels of strategic reserves, and finally, to generate additional supplies for export (Kenya, 1989). To achieve these goals intensive production methods need to be adopted. This is necessitated by the fact that land suitable for agricultural production is limited; less than 20% of Kenya's land area is suitable for intensive crop and livestock production (Kenya, 1989). In addition, it is necessary to be in a position to feed the increasing human population which is projected to be over 35 million people by the year 2000 (Kenya, 1979). The increasing human population shall reduce the amount of land available for crop and livestock production. Undoubtedly their production methods shall have to change.

Stotz (1979) indicates that dairy production has changed from a system of ley farming on large scale mixed farms to intensive fodder production. This is an indication that the grazing pastures are dwindling. The demand for livestock products shall keep on rising in line with the population growth rates but the supply of land for extensive grazing in the medium and high potential areas will increasingly get scarce. To meet the increasing demand of livestock products, increases in commercial livestock population will be necessary. This is supported by the transformation of the backyard poultry farming to commercial production (Kenya, 1984). It is estimated that by the year 2000, Kenya has to increase the dairy cattle herd to about 5.2 million

cattle, the commercial poultry population to about 6.8 million birds and the pig population to about 100,000 in order to keep abreast with the increased demand for livestock products. This population of livestock shall demand more in terms of grazing land and compounded feeds, at a time when land availability will have contracted by a large extent.

Expansion of livestock production will have to be achieved through use of the marginal areas and or adoption of intensive production methods. However, production in the marginal areas shall contribute minimally to the supply of livestock products. This is because the productivity of these areas is low. Thus the adoption of intensive production methods is expected to play the major role in supplying the livestock products. These methods, which include feedlots for beef production and zero-grazing for dairy production, are intensive feed-based. This implies that the demand for animal feeds will have to increase. Thus, for the structural changes to be effective, the animal feeds industry shall have to expand its production to meet the increased demand for livestock feeds. In addition, it should be able to provide high quality but reasonably priced feeds on a reliable basis.

The performance of the animal feeds industry has not been satisfactory. This is indicated by the frequent shortages and erratic fluctuations of prices of animal feeds. These two observations are interlinked in that if a shortage occurs either as a result of demand outstripping supply or due to some institutional problem(s), then the prices are likely to increase. The price fluctuations could also be due to other factors such as fluctuations in cost of production, government interventions

and the structural organization of the industry.

The theory of the firm holds that firms tend to operate at output levels that maximize their profits. Thus, with this major motive, any industry will supply an output that maximizes the profits for all the individual firms. If this output level does not meet the demand, the prices charged by the various firms tend to be high. This price thus rations the available supply amongst the consumers. If this happens, then the firms in the industry get supernormal profits in the short-run. However, in the long-run, these profits may not persist, unless there are high barriers to entry into the market.

In the long-run, other firms will be induced to enter into the market by the supernormal profits so as to take advantage of these profits. Alternatively, the firms already in existence may expand their operation in which case they will experience economies of scale. Whichever of these two occurs, prices will tend to decrease and the consumers stand to benefit. Moreover, if new firms enter into the industry, competition will occur and this will result in more efficient use of the resources. If economies of scale are experienced, then efficient use of resources will occur and excess capacity will tend to be reduced. However, the benefits which accrue as a result of economies of scale and/or due to new firms entering into the industry may not be transferred to the consumers. Whether these benefits are transferred to the consumers depend on the structure of the industry. If the industry is monopolistic in nature, the benefits are realized by the firms as higher profits. If the economies of scale result in a natural monopoly, then government

intervention through a pricing policy may be necessary. This helps in protecting the consumers from exploitation by the manufacturers.

This study, thus, examined the structure and conduct of the marketing system for animal feeds in Nairobi area and Kiambu District in an attempt to explain the observed performance. The market structure was assessed using concentration ratios, vertical integration and barriers to market entry. The conduct of the manufacturers and traders in setting prices, selling practices and presence or absence of collusive activities were examined. The price levels were assessed at the different channel levels in an attempt to compare the marketing margins and costs. Finally, a descriptive analysis of the industry was done.

The study primarily relied on primary data as well as time series secondary data. The primary data were collected by the author with the help of enumerators by use of questionnaires administered to farmers, traders and manufacturers. The secondary data were extracted from publications and reports of the Ministries of Agriculture, Livestock Development, and Planning & National Development.

1.1 MANUFACTURED FEEDS UTILIZATION IN KENYA.

Table 1.1: Animal Feeds Production (*100 tons) in Kenya: 1980 to 1990.

Year	Cattle Feeds	Poultry Feeds	Pig Feeds	Other Feeds	Total
1980	345	496	89	146	1077
1981	466	639	123	87	1315
1982	379	610	791	57	1126
1983	468	924	723	56	1521
1984	561	695	99	41	1396
1985	466	748	106	49	1369
1986	414	1238	109	21	1782
1987	540	1300	114	21	1975
1988	668	1111	188	57	2045
1989	675	1169	194	72	2111
1990	505	1230	250	81	2034

Source: Central Bureau of Statistics, Statistical Abstract (Various Issues, 1980-1990).

This table indicates that the animal feeds produced are mainly used in the poultry, dairy and pig production with the utilization being 55 percent, 33 percent and 9 percent of the total feeds respectively.Poultry and dairy production are the most important in the consumption of the manufactured feeds.

Table 1.2 shows the breakdown of the poultry population into exotic (layers and broilers) and local birds. The exotic birds are the main consumers of the poultry feeds. Between the

years 1978 and 1990, they constituted approximately 20% of the poultry population. The exotic population was largely responsible for the supply of eggs and poultry meat consumed in urban centres, schools, other institutions and the major tourist hotels.

Table 1.2: Estimated Poultry Population ('000) in Kenya, 1978-90.

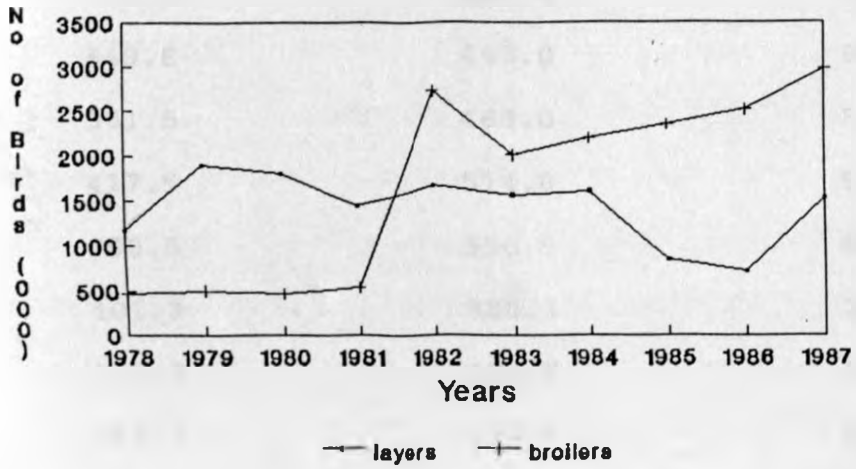
Year	Layers	Broilers	Local	Total
1978	117	46	1,282	1,450
1979	190	50	1,332	1,570
1980	180	47	1,335	1,560
1981	145	53	1,389	1,590
1982	167	273	1,533	1,970
1983	156	200	1,610	1,970
1984	161	219	1,156	1,540
1985	85	235	1,262	1,580
1986	72	251	1,352	1,680
1987	153	298	1,697	2,150
1988	153	298	1,519	2,150
1989	192	350	1,595	2,320
1990	187	578	1,767	2,520

Source: Ministry of Livestock Development, Annual Reports, 1978-1990

Table 1.2 shows that between 1979 and 1990, the layers population decreased while the broilers and local birds generally increased.

Figure 1 shows the population movement of layers and broilers in Kenya for the period 1978 to 1990.

Figure 1: Poultry population trend in Kenya for broilers and layers.



source: Author's survey

The number of eggs produced by the hybrid poultry (Table 1.3) further reflects the decrease in layers population.

Table 1.3: Number of eggs produced (millions) in Kenya, 1978-1990.

Year	No. of Hybrid Eggs	No. of Local Eggs	Total
1978	292.5	480.8	773.3
1979	475.0	444.0	919.0
1980	449.8	445.0	894.7
1981	361.5	463.0	824.5
1982	417.5	514.0	931.5
1983	390.5	536.5	927.0
1984	401.3	385.3	786.6
1985	212.0	420.6	632.6
1986	181.0	450.8	631.8
1987	193.5	482.4	675.9
1988	286.0	560.0	840.0
1989	498.0	412.0	910.0
1990	485.0	456.0	940.0

Source: Ministry of Livestock Development, Annual Reports, 1978-1990.

The decline of layers population may be partly explained by the shortages and increases in feeds prices. This resulted in increased cost of production thereby forcing the commercial poultry producers out of production.

Dairy production, on the other hand, requires concentrate feeds for supplementary purposes. Stotz (1983) indicates that

supplementary feeding become more necessary as increasing numbers of small scale farmers adopt intensive production methods. Moreover, he indicates that if farmers can increase the amount of concentrates fed to their cows by up to about 1.5 to 2.0 kg per cow per day, the yields would increase. Similar results were obtained by Irungu *et al.* (1978).

1.2 PROBLEM STATEMENT

The animal feeds industry has been characterized by frequent shortages, erratic price fluctuations and low quality animal feeds. These observations have been made by several authors amongst them Mbatha (1975), Bartilol *et al* (1988), and Kenya (1991).

Table 1.4 gives the total poultry feeds versus the poultry population and expected feeds consumption between the year 1979 and 1988. The negative signs indicate shortages of feeds and the positive signs, excess supply. Table 1.4 indicates that shortages of feeds are common.Also note that the layers population dropped by more than 50 percent the figure of 1984 during the period between 1985 and 1987 in which excess supply is indicated.

Table 1.4: Total poultry feeds versus poultry population and expected feeds consumption in Kenya.1979-1988.

Year	Amounts of feed in tons (*100)	Expected consumption in tons (*100)	Difference in consumption and amounts of feeds in tons (*10)
1979	652	780	-128
1980	496	738	-122
1981	639	800	-121
1982	610	777	-167
1983	924	705	+219
1984	695	729	-35
1985	748	433	+315
1986	1238	390	+848
1987	1300	417	+883
1988	1111	730	+381
1989	1169	886	+293
1990	1230	1,152	+78

Source: Ministry of Livestock Development, Annual Reports, 1979-1988.

Thus, if it were not for the drop in the layers population, shortages could have been experienced. Even then, a survey carried by Karau *et al.*, (1988), indicated problems of unreliable and scarce feeds supply despite the positive signs which are indicative of excess supply. This suggests the existence of a marketing system which is inefficient.

The output of poultry feeds has often fallen far short of the demand, despite the high provender milling capacity. In 1981 the capacity was 324,000 tonnes (Ekwinorks report, 1981). This has increased with the entry of new firms into the industry since then.

Table 1.5: Projected poultry feed requirements in Kenya up to the year 2,000.

Year	Population in millions of		Feed required in tons (*100) by		Total feed requirement in tons (*100)
	Broilers	Layers	Broilers	Layers	
1981	2.8	1.7	140	1,020	1,160
1985	3.74	2.27	169	1,362	1,531
1990	5.36	3.25	268	1,950	2,218
1995	7.71	4.68	386	2,808	3,194
2000	11.06	6.72	553	4,032	4,585

Source: Ministry of Agriculture (1984).

A look at Tables 1.4 and 1.5 shows clearly that the current production of feeds is well below the projected requirements. This means that the provender milling capacity would require both full utilization and expansion to cater for the demand by the year 2000. Another problem commonly cited is of low quality feeds. Adulteration of chicken feeds by feed millers was reported and a warning issued to the effect that feed millers found mixing fishmeal with sawdust would have their licences

withdrawn (The Standard Daily Newspaper [1], 19th November, 1990). Due to the low quality feeds, farmers complained that the production period for broilers was longer than the recommended one. This made the production costs to be higher than would be the case if the feeds were of high quality. Some farmers even went to the extent of supplementing the feeds with vitamins, premixes and proteins. Consequently the profit margins that they expect from the use of these inputs was lowered.

The aforementioned observations indicate that shortages and erratic price fluctuations of animal feeds experienced were not in the interest of the livestock industry.Furthermore the industry had failed to provide high quality and reasonably priced feeds indicating that the manufacturers were not keeping abreast with the farmers demand. These observations justified a study that would determine the constraints that existed in the industry and offer possible solutions.

1.3 JUSTIFICATION OF THE STUDY

The overall agricultural policy of Kenya is to achieve internal food self-sufficiency, to maintain adequate levels of strategic reserves and finally, to generate additional supplies for export. To achieve these goals, intensive production methods and hence the use of high yielding inputs, require to be adopted. This is even necessitated by the fact that land suitable for agricultural production is limited.

Livestock industry has continued to experience erratic price fluctuations and frequent shortages of animal feeds, which

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[1]Local Daily Newspaper

is one of the major inputs necessary for intensive production of livestock. Stotz (1983) indicates that poultry feeds constitute 60-80% of the production costs of eggs. Shortages and price fluctuations of animal feeds are likely to escalate the production costs of livestock enterprises and consequently reduce the profit margins expected by the farmers. Ultimately, livestock farmers would be forced to either raise the prices of livestock products or stop producing. The small scale producers would be deprived of a source of income as well as worsening the unemployment situation in case they stop producing. The small scale producers of poultry products and to some extent the dairy producers have on average very small land holdings. This means that they may not have any alternative profitable use of their land. In addition, livestock products' consumers would experience unreliable supply, shortages and rising prices. This means that their real income would be adversely affected by the rise in prices. Livestock products would be unaffordable to the majority of their consumers and less of these products which are sources of proteins would be consumed.

Shortages and price fluctuations of animal feeds could be as a result of unavailability and price increases of raw materials and nutrients, failure to obtain the required raw materials due to limited foreign exchange allocation, hoarding and panic buying amongst others. Unavailability of necessary raw materials and nutrients would result directly in shortages and finally, increases in prices of animal feeds. Alternatively, it would escalate the cost of production of animal feeds, which the manufacturers would transfer to buyers of animal feeds as higher

prices. Foreign exchange allocation would determine whether the amounts of the required imported inputs would be obtained. Panic buying and hoarding would create artificial shortages. Hoarding could be as a result of market prices offered being low compared to production costs. The latter are issues of market structure and performance.

The performance of any economy depends on the performance of the individual firms in the economy. If the performance of the business firms is satisfactory, then even that of the economy would be satisfactory. The animal feeds industry is an industry which has arisen due to the livestock industry. The demand for animal feeds is derived from the demand for livestock products as human food. Through this interaction, the unsatisfactory performance of the animal feeds industry would be reflected as poor performance of the livestock industry and, finally, the wider economy.

Breimyer (1975) indicates that livestock production is very sensitive to the availability and prices of animal feeds. He further outlines the reasons why livestock production, which has a direct link with feeds industry, should be made steady. These reasons are:

(a) to give stability to operating margins in feeding and, therefore incomes of livestock and poultry producers. This implies that less volatile feeds prices are in the livestock producers' interest.

(b) to serve the interests of livestock products consumers. These consumers do not like the wavelike flow of meat and poultry products. Wide fluctuations

in availability of these products can have at least two whiplash effects on producers (Breimyer, 1975), which are:-

(i) A prolonged shortage period which can move the demand curve for livestock and poultry products to the left, worsening the price drop when supplies increase.

(ii) Shortages which if they come during inflation,would result in price increases that could create irresistible pressure for price control. This means that the rural and urban poor would be malnourished as they may not afford these foods.

The shortages of livestock and poultry products could be avoided or minimized if there are incentives for their production. Kenya (1980) indicates that to counteract shortages of livestock products, intensive livestock production must be adopted in order to realize higher productivity. However, this can only happen if the inputs required for production are readily available and affordable by the farmers. Moreover, the extent to which agricultural inputs, including animal feeds, are utilized at the farm level depends among other things on the existing marketing system of these inputs that links the agricultural sector with the wider economy. Thus, an effective and efficient agricultural marketing system is pertinent.

The demand for animal feeds is derived from the demand for livestock products as human food, and the general pattern is that the demand for livestock products rises in response to increase in income and human population (Young, 1985). In addition, as the human population influx continues to increase in the urban

areas, where the incomes are higher than in the rural areas,the demand for livestock products will increase. As a result, the demand for animal feeds will undoubtedly increase. The present situation of animal feeds industry does not augur well for increased livestock production. If the situation is allowed to continue, shortages of animal feeds are likely to be more rampant in the future. The existing situation needs to be examined in order to provide information on the cause(s) of this situation and thus the points where intervention can be done.

The role of the animal feeds industry in livestock production cannot be overemphasized. The performance is unsatisfactory and this is a cause of concern. The manufacturers of the animal feeds in Kenya claim that the shortages and price fluctuations observed are due to erratic fluctuations in the availability of raw materials both in quality and quantity (Bartilol, *et al.*, 1988). While this may be true, little is known about the structure and conduct of the animal feeds industry. The erratic price fluctuations of animal feeds may be due to the structure and conduct of the industry. This justifies a study that would identify the constraints that exist in the industry, and account for them. This study thus examined the structure and conduct of the industry with a view to establish the constraints and to account for them. The information generated by this study was then used to suggest appropriate policies for making necessary interventions in the animal feeds industry.

1.5 OBJECTIVES OF THE STUDY

The general objective of the study was to establish if the structure and conduct of the animal feeds industry could be used to explain the observed performance of the industry.

The specific objectives were:

(1) To determine whether the animal feeds industry is characterised by oligopolistic tendencies.

(2) To determine the procurement and distribution channels as well as examining the procurement and distribution constraints.

(3) To determine whether the marketing margins are significantly different from the marketing costs. The marketing margins here define the price spreads between the selling and buying prices of the feeds at the different channel levels.

1.6 HYPOTHESES AND HOW THEY WERE TESTED

The hypotheses tested were closely tied to the objectives above. These were that:

(1) The animal feeds industry is characterized by oligopolistic tendencies.

(2) There is a high degree of vertical integration in the animal feeds industry. This hypothesis was tested by finding the degree to which the participants have control over supply sources and/or sales outlets at each marketing stage and the extent to which some selling and purchasing costs have been reduced.

(3) The marketing margins are significantly different from the marketing costs. The student's t-statistics was used to test this hypothesis.

Ho: $\mu_1 = \mu_2$

H1: $\mu_1 \neq \mu_2$

$$t = \frac{(\bar{X}_1 - \bar{X}_2)}{\hat{S}/\sqrt{(n-1)}}$$

where μ_1 = population mean marketing costs

μ_2 = population mean marketing margins

$\bar{x}_1$ = sample mean of marketing costs

$\bar{x}_2$ = sample mean of marketing margins

n = sample size

$\hat{S}$ = sample standard deviation.

This hypothesis was tested at a 5% level of significance. If the t-value lies beyond $t_{0.025}$ then the null hypothesis is rejected and the alternative cannot be rejected.

CHAPTER 2

LITERATURE REVIEW

Scanty literature is available on marketing of animal feeds in Kenya. Most of the literature available has laid emphasis on the nutritional aspects of animal feeds. Spaeth (1968), Aldington (1970), Mbatha (1976) and Kenya (1980) have cited high prices of animal feeds, besides other constraints such as diseases, fluctuations in the supply of day old chicks and inadequate credit/loan facilities, as the major constraints that have hampered livestock production in Kenya. Stotz (1983) found that the supply of concentrates constrained increased dairy production. High costs and shortages of feeds were cited as contributing to the decline in poultry population (Kenya, 1980). The 1984-1988 Development Plan made similar observations. The prices and unavailability of quality feeds have been causes of complaints from the farmers. This suggests that an efficient animal feeds industry which is an essential precondition for intensified livestock production is lacking.

* Said *et al*, (1985) looked at the animal feeds industry but their emphasis was on the use of local feed resources and they suggested use of alternative raw materials in order to avoid the food-feed competition. They felt that the problems experienced in the industry were largely due to the food-feed competition between the human and livestock population. Bartilol *et al*, (1988), carried out a survey on the animal feeds industry but their emphasis was on raw materials. They suggested production of oil crops to enhance availability of raw materials for animal feeds. Although these two studies viewed the problems experienced

in the animal feeds industry as mainly stemming from the unavailability of raw materials, some of these problems could be due to other factors such as government intervention and the structure of the industry. They did not look at the market structure and conduct of the animal feeds industry as a possible contributor to poor performance.

The Structure-Conduct-Performance Model has been used widely in agricultural marketing studies. Ackello-Ogutu (1976) and Orwa (1979) used it to study the marketing of eggs and poultry meat in Nairobi and Mombasa respectively. Kariungi (1976), Schmidt (1979) and Maritim (1983) used it to study the maize marketing system in Kenya. Mbogoh (1976) used the same method to study the marketing system for Irish potatoes in Kenya. Iyadema (1988) used the market structure analysis to study the distribution of agricultural inputs in Uganda. This study adopted this framework in an attempt to understand the marketing system for the animal feeds in Nairobi and Kiambu.

The only study that has looked at the structure and conduct of the animal feeds industry in Kenya was done by Aldington in 1970. In his study, he found that the structure of the animal feeds industry in Kenya was far from the notions of what may be called an "ideal" structure and felt that there was cause for concern. He further found that the industry could not be termed as inefficient though he contends that it could become more efficient. This is a contradiction since undesirable performance outcomes attests to inefficiency. Moreover, the structure of the market was not conducive to the maintenance of the forces of competition and this was borne out by the market conduct of the

firms (Aldington, 1970). These undesirable performance outcomes continue to be observed twenty years after Aldington's study. This is a cause for alarm as it indicates the possibility of institutional rigidities which may have blocked potential entrants into the industry, thus blocking any competition.

In addition, Aldington did not pay much attention to the distribution aspect of the animal feeds which has been a cause of complaint from the farmers. Muthee (1975) carried out a study on the market for manufactured animal feeds in Kenya. He observed the existence of irregularities in the supply of feeds and prices which were too high for the small scale farmers. He further observed that the distribution points were few and were situated only in large shopping centres. The distributors were mainly Kenya Farmers Association (KFA) stockist and agents who received commissions from the manufacturers. Muthee's study had its emphasis on the role of Agricultural Co-operatives with regard to agricultural inputs.This study was not directed towards examining specific facts about the market structure, price setting and the nature of competition between manufacturers and traders. It fails to explain the performance through the Structure-Conduct relationship. Moreover, since the prices of feeds were controlled, the commission given by the manufacturers may not have been remunerative enough to make many agents stock the feeds closer to the small scale farmers. These studies did not look at the margins accruing to the various middlemen involved in the distribution of feeds and the extent of vertical integration in the industry.

Market structure can be described using a variety of indices

of concentration (Rosenbluth,1955). However only two of the indices are reviewed in this study. The first one describes concentration by looking at the market share controlled by the largest firms while the other one looks at the market share controlled by the smallest firms. The first index describes the market structure using the leading four and eight firm concentration ratios, and the number of firms required to account for 80 percent of the market share. Within this concept,the concentration curve is obtained by plotting the cumulative percentage of firms (ranked from largest to smallest) against the cumulative percentage of market share. These indices are used by Ackello-Ogutu (1976) and Iyadema (1988) respectively. The other concept involves constructing the concentration curve in which the firms are ranked from the smallest to the largest. Within this concept the inequality is obtained by describing the market share held by the smallest 20 and 50 percent of the firms. Inequality defines the degree to which a small percentage of the firms control a large share of the market. However these indices are criticized on the ground that they depend on only one point on the concentration curve, so that there are many changes in the position of the curve that leave the indices unchanged.

Lintner and Butters (1950) have suggested a modified measure of concentration. This measure is the Herfindahl index and consists of the sum of squares of firm sizes, all measured as a percentage of total industry size. To describe inequality, the Gini-coefficient which is a measure of the area between the Lorenz curve and the 45 degree line(line of absolute equality) is estimated. Iyadema (1988) used this concept to indicate the

level of inequality in the distribution of agricultural inputs in Uganda. These modified measures of concentration and inequality are adopted in this study.

The marketing system that exists for any product depends on the nature of the product and the marketing functions that require to be performed before the product ultimately reaches the consumer (Purcell,1979). The number and concentration of the middlemen and the various functions they perform, determines the price levels and thus the marketing margins that prevail at different channel levels. Marketing margins give the price spread between different channel levels. Orwa-Ongiro (1979) used marketing margins to describe the structure of a market by examining how efficiently the market functions are performed through the various market channels that supply Mombasa town with eggs. He observed that both producers and consumers of eggs did not benefit from high marketing margins. Large margins which are not related to marketing costs suggest that middlemen are receiving more profit than is justified thus leading to high consumer and low producer prices (Shepherd and Futrel,1969). The latter observes that efficiency can be achieved by having low marketing margins and marketing costs which result in low consumer and high producer prices simultaneously. It is in this light that the marketing costs and marketing margins are compared in this study.

To analyze marketing costs, Agarwal (1966), and Wollen and Turner (1970) identify and describe the marketing services offered and then evaluates their costs. French (1977) has modelled the spatial components of marketing costs namely,

distribution, delivery and assembly costs. This model cannot be used in this study as it was for a centrally located plant in relation to the market. This study however utilizes his systematic breakdown of distribution costs into small components to estimate marketing costs.

Aldeman (1955) suggests use of the ratios of income and inventory to sales, to determine the level of vertical integration. However, unavailability of data makes these ratios unestimatable besides yielding unreliable and inconsistent results (Barnes, 1955). Thuo (1978) used tying arrangements, affiliations between traders and the extent to which manufacturers are involved in production of raw materials as well as retailing their produce to examine vertical integration in the vegetable oils and fats industry in Kenya. Aneyioboma (1988) has used a similar method to examine the structure of the marketing system for bananas in Uganda. The latter analyses was adopted in this study.

A survey carried out by Karau *et al.*, (1988) indicates that the distribution of animal feeds is not effective. However, they did not attempt to explain why it is not effective. Ineffective distribution could be as a result of lack of competition, cumbersome procurement patterns, geographical barriers and poor market information amongst others.

Iyadema (1988) recognizes three marketing channels that requires to be harmoniously and simultaneously developed so as to provide incentives to a farmer with an intent of making him more productive and integrated in the whole economy.

These marketing channels are:

(i) Channel for his produce;

(ii) Channel for consumer goods and services that he requires but does not produce;

(iii) Channel for farm inputs.

The channel for farm inputs is of critical importance to a farmer. It is through it that he acquires farm inputs in order to realize surplus production which he may dispose of and obtain the deficit consumer goods and services. An efficient agricultural input marketing channel should possess the following characteristics (Iyadema, op. cit.):

(a) It should provide farmers with access to a wide range of agricultural inputs which are appropriate to the level of technology used in their crop/livestock enterprises.

(b) It should make inputs available to the farmers at, or near the site of his or her enterprise.

(c) It should make the inputs available on timely if not continuous basis, commensurate with the nature of the production system.

(d) It should be composed of a sufficient number of suppliers. This would provide a competitive environment for serving the farmer's needs at input prices which reflect the real financial costs to the supplier of commodity in terms of procurement or manufacture, transport, storage and sales.

A marketing system that achieves the above outlined characteristics, provides incentives to farmers and enables them

realize increased productivity. Moreover, the existence of an efficient and flexible agricultural marketing system makes it more readily possible to achieve a smooth transformation of the agricultural sector, which is in line with national development strategies of any developing country (Orwa-Ongiro, 1979). The marketing system of animal feeds thus requires to be examined to see where it is deviating from that of an efficient one. Such a study could provide policy makers with information on how the marketing system could be improved.

* Aldington's study was therefore inadequate, in that it failed to examine the causal relationship that exists between the market structure, conduct and performance. It did not try to examine the structure of the industry using specific structural variables such as concentration ratios. The level of concentration is significant for two reasons (Marion et al., 1979). First, the level of concentration within a market is likely to influence the competitive conduct and strategies of the firms operating in that market. Second, changes in the level of concentration may serve as a proxy for changes in other market structure variables that are difficult to measure, such as barriers to entry facing new entrants. This study attempted to fill the gap existing as well as getting information which could be used by the policy makers to make necessary intervention(s) in the industry. This study concentrated on establishing the structure and conduct of the marketing system for animal feeds in an attempt to explain the performance of the industry.

CHAPTER 3

METHODOLOGY

3.1 Theoretical framework

The Market Structure-Conduct-Performance Theoretical framework of analysis was adopted in this study. This type of analysis provides a model that may be used to assess the influence of the Structure and Conduct on the performance of a marketing system. It involves the analysis of the market structure, market conduct and market performance in an effort to ascertain any "cause-effect" relationship.

The market structure refers to those characteristics of the organization of a market which influence strategically the nature of competition and pricing within the market (Bain, 1967). In this study, the salient features emphasized were:

(i) Market concentration, described as the number and size distribution of sellers and buyers in the market place (Koch, 1974). The market concentration involved the study of the number and size of the market participants (manufacturers, wholesalers and retailers). If the market participants are few in the industry, then they can influence the prices by, say, withholding supplies or through collusion. But if they are many, then it provides for competitive conditions.

(ii) Product differentiation. Chamberlin (1933) reckons that ; " A general class of product is differentiated if any significant basis exists for distinguishing the goods (or services) of one seller from those of

another. Such a basis may be real or fancied, so long as it is of any importance whatever to buyers, and leads to preference for one variety of product over the others". Dahl (1977) contends that product differentiation, like that of animal feeds, may be due to firms emphasizing that their particular feeds have unique characteristics and that "quality" of the product is guaranteed by the brand-name under which they are sold. This aspect may bring about consumer loyalty and consequently reduce competition between the market participants. If this happens, then there is a likelihood of excessive non-price competition, such as unproductive advertising and special services, so that the total cost of doing business would in fact be raised rather than lowered.

(iii) Barriers to entry. Bain (1967) contends that a barrier to entry is simply any advantage held by existing firms over those firms that might potentially produce in a given market. These barriers to entry include managerial know-how, lack of capital, market information, legal barriers and aggressive reaction to newcomers by those already in business.

The elements outlined above are used to determine the particular market structure that exists. Ackello-Ogutu (1976) contends that a high concentration and inequality may indicate oligopoly, though tendencies towards competitiveness are likely if there are no barriers to entry. High barriers to entry into the market lead to oligopoly.

The second element, market conduct, refers to the patterns of behaviour that enterprises follow in adapting or adjusting to the markets in which they sell or buy (Bain, 1967). The buying and selling behaviour of the participants were examined. These behaviours included methods employed by each firm in determining prices and quantities, sales promotion policy, including absence or presence of coercive tactics directed against established rivals or potential entrants, forms of payment and level of activity and actions meant to avoid competition.

The third element, market performance, concerns the economic results that flow from the industry and how well it performs in terms of efficiency and progressiveness, given its technical environment (Bain, 1967).

Market structure and market conduct analysis formed the core of the analytical framework of this study. These two elements were then used to explain the performance of the animal feeds industry. Normally, market structure determines market conduct (Bain, 1967) and it is through this relationship that the degree of market concentration may be positively correlated to forces at work for any given product (Miller, 1955).

3.2 Analytical methods

The main analytical methods used in this study were descriptive analysis and cross-tabulations. Lorenz curves were used to illustrate the business concentration. The concentration ratios and the Gini-coefficients were calculated and used to determine the structure of the industry. If the

concentration ratio and Gini-coefficients are high then oligopolistic tendencies are suggested. High concentration ratios are indicative of an advantage held by the market participants who are in a position to influence the selling prices, thereby being able to exploit the consumers. In this case the consumers are the livestock producers. The Lorenz curve was constructed for the estimation of the Gini- coefficient. The Gini-coefficient is a statistical measure based upon the Lorenz curve (Koch, 1974). If this coefficient is close to 1, it indicates inequality. Inequality refers to the degree to which a small percentage of the market participants control a large percentage of the market.

Herfindahl index, which is a modification of concentration ratio and is a measure of dispersion that can vary between zero and one, is used. Herfindahl index gives the sum of the squares of the relative sizes of the firms in the market; where the relative sizes of the firms are expressed as a percentage of the total size of the market. This index is expressed by the following relation

$$H-\sum_{i-1}^{n} s_i^2$$

Where: H is the Herfindahl index

S_i is the market share of the i^{th} firm

n is the number of firms.

When a large number of firms of equal sizes exist, thus suggesting existence of competition, the Herfindahl index

approaches a value of zero. When only one firm exists, the index assumes a value of one, indicating monopoly in the market.

The student's t- statistic was used to show the significance level between the marketing costs and marketing margins.

3.3 Data sources

The study used primary and secondary data. The primary data were collected using structured questionnaires, designed for the manufacturing firms, traders (wholesalers and retailers) and farmers. Trained enumerators assisted the author in the collection of data. The secondary data were collected from the relevant institutions that dealt with animal feeds and also from the statistical records.

The enumerators were recruited and trained in the month of January 1991. The questionnaires were pretested in the third week of January. During the training of the enumerators, the author discussed the questionnaires thoroughly with them. Data collection was done in the months of February, March and April. During this session, the enumerators presented the data collected and the problems that they had experienced. The author attended a few of the interviews conducted by each enumerator at least twice in a week.

3.4 Types of data

The questionnaires were designed in such a way that different types of data were collected. This was necessitated by the fact that each objective required its own data.

To meet the requirements of the first objective, the following data were collected:

(i) Quantities and values of the feeds produced and sold by each firm for the period 1985 to 1990.

(ii) The major obstacles met in entering and remaining competitive in the animal feeds industry. These included capital requirements, technical know-how and raw materials control.

(iii) Knowledge of other participants' existence and behaviour on prices, output and product differentiation. This information was used to analyze the market structure by use of concentration ratio and inequality.

The second objective was met through use of data on main sources of supply, purchase arrangements, sources of funds and terms of sale. The degree of vertical integration in the market was taken as an indicator of the market structure. This addressed itself to the relationship between the actual market participants and any potential participants. The information on this issue was cross-tabulated and percentages formed the basis of any discussion that regarded any given behaviour.

The third objective was met through use of data on forms of transport used, costs involved and the prices at the different stages of distribution channels. The costs involved were mainly transportation, handling and storage. Animal feeds once manufactured and packaged do not require any further processing and thus, it is only the time and place dimensions which are important in evaluating the marketing costs.

3.5 Sampling frame.

The sampling frame included the animal feeds manufacturers, wholesalers, retailers and farmers who practise zero grazing and/or keep poultry. Due to the dispersion of the animal feeds manufacturers in the country, it would not have been possible to interview all of them within the time and financial budget which was available. In addition, most of the manufacturers are situated within Nairobi Province and they mainly supply feeds to the majority of livestock producers in Nairobi and Kiambu district. Therefore, only those within Nairobi and Kiambu were interviewed. The manufacturers who have processing plant(s) elsewhere in the country were used to give extra information on these other plant(s).

Lists of the wholesalers, retailers and manufacturers were obtained from the Business Licensing Officers in Nairobi at City Hall, Kiambu and Thika towns. Construction of these lists was also enhanced by the lists provided by the Livestock Development Officers in the various divisions of the study area. The manufacturers of animal feeds also helped by providing the lists of their customers. It was found that in the major towns, there were at least three traders and the town with the highest number had eight traders. Due to the small number of traders, "target" sampling was adopted. This sampling technique involves interviewing all the known members of the population. Thus all the known traders in the area of study were interviewed.

In the case of farmers, lists were provided by the Livestock Development and Extension Officers in the Districts. A total of 431 farmers were found who had less than 2,000 birds

and less than 10 dairy animals.

Table 3.1 show the number of farmers interviewed from each sampled division.

Table 3.1: The number of farmers interviewed from each sampled division

Division	Number of farmers	Number sampled
Kikuyu	139	11
Gatundu	93	8
Githunguri	77	8
Thik a	48	5
Juja	41	5
Dagoretti	25	2
Mathare	8	2
Total	431	41

Source: Author's survey.

A random sample of farmers was found wanting as some of the farmers included in it had stopped production. If a farmer was included in the sample and he happened not to be producing, then the next nearest farmer was interviewed. The sample size for farmers interviewed was 41 and the number sampled in each division was proportional to the number of farmers in that division. Five of the questionnaires were spoilt and therefore were not used in the analysis.

3.6 Area of study.

The areas selected for the study were Nairobi and Kiambu District. These two areas were selected because they produce large quantities of livestock products and the demand for these products here was also high. This implies that utilization of animal feeds is also high in these two areas. In addition, Kiambu District is a highly populated district and the effect of structural changes in livestock production methods was likely to be more than in any other area.

3.7 Population of the area.

According to Kenya (1991), the estimates of the human population in Nairobi and Kiambu is shown in Table 3.2.

Table 3.2: Human population distribution in Nairobi and Kiambu,1989-1991.

Area	Human population	Projected population	Area sq. km	Persons per sq. km	
	1989	1991		1989	1991
Nairobi	1,346	1,500	684	1,968	2,190
Kiambu	914	1,098	2,451	372	448

Source: Central Bureau of Statistics, Economic Survey, 1991.

These figures have increased since then. The population in 1991 for Nairobi was estimated at approximately 1.5 million people and that of Kiambu at 1,098,112, assuming a growth rate of 3.7 percent p.a. This population, which is expected to

continue increasing, will undoubtedly create a high demand for livestock products and indirectly, a high demand for livestock feeds.

3.8 Problems experienced during data collection.

The main problem experienced was the delay of the manufacturers in responding to the questionnaires. They needed to be given some time to go through the questionnaires before accepting to fill them. Some of them filled the questionnaires inadequately and this necessitated extra time to have them clarify the unclear answers.

The other problem was concealment of some of the required data. The manufacturers reckoned that some information was private and confidential. The traders and farmers were reluctant to give information as they claimed that they had not benefited from answering other questionnaires directed to them previously.

CHAPTER FOUR

DATA ANALYSIS AND INTERPRETATION

The data are presented and analyzed in two sections. Section 4.1 deals with the structure of the animal feeds industry and section 4.2 looks at the conduct of the animal feeds industry.

4.1 The Structure of the Animal Feeds Industry

4.1.0 Introduction

The production sector dealing with the manufacturing of feeds is first examined. Then the marketing sector which is concerned with the distribution of feeds is examined. These two sectors are examined with a view to establishing how the animal feeds industry is structured using the degree of concentration, market information, product differentiation and barriers to entry. Within this section, the hypothesis that states that the animal feeds industry is characterized by oligopolistic tendencies is tested.

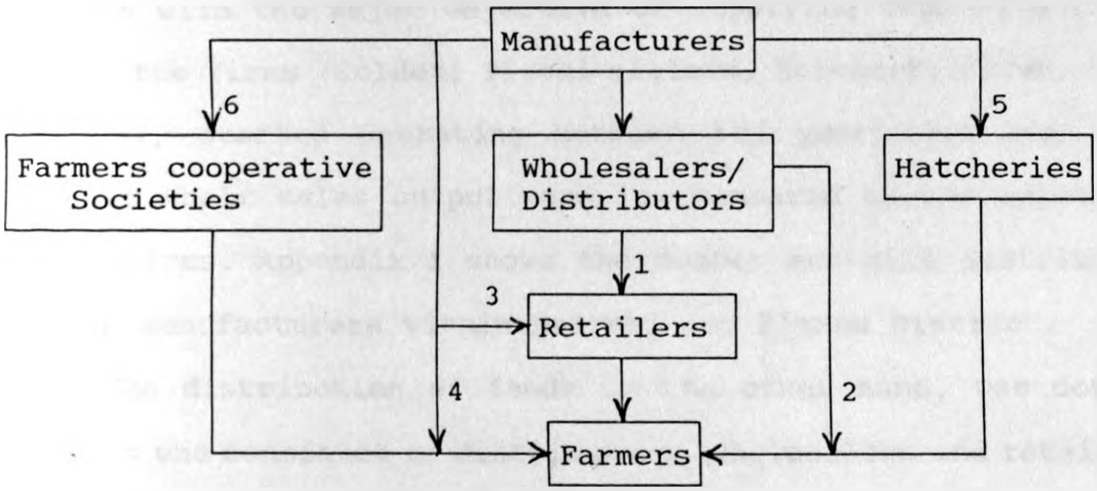
4.1.1 The Marketing System for Animal Feeds in Kenya

The concept of a marketing system includes both the physical distribution of economic inputs and products and the mechanism or process of coordinating production and distribution (Shaffel *et al*, 1985). Thus, a marketing system can be viewed as the totality of product channels, market participants and business activities involved in the physical and economic transfer of goods and services from producers to consumers. The marketing system that develops for any product depends on the nature of the product and the business activities involved (Branson and

Norvell,1983). The channel of distribution that may be involved may be direct as in the case where the producers sell directly to the ultimate consumers, or it may contain one or more institutional middlemen (Donnelly, 1976).

The marketing system for compounded animal feeds in Kenya is shown in Figure 2 which indicates that there are six possible channels of distribution through which the feeds may move from the manufacturers to the farmers .

Figure 2: A Schematic Diagram of the Marketing System for Animal Feeds in Kenya.



Source: Author's investigation.

Channel 1 indicates that farmers obtain their feeds through the manufacturers via the wholesalers and retailers. Channel 2 indicates that the farmers obtain their feeds from the manufacturers via the wholesalers. Channel 3 indicates that the retailers obtain the feeds from the manufacturers and then sell to the farmers. Channel 4 indicates that the farmers obtain their

animal feeds directly from the manufacturers. Channel 5 indicates that farmers get their feeds from the manufacturers through the hatcheries. Channel 6 indicates that farmers cooperative societies supply the farmers with feeds.

Within the area of study (Nairobi and Kiambu District), fourteen animal feeds manufacturers were operating at the time of data collection. Thirteen of these were private companies while the other one was owned by Muranga Farmers Cooperative Society. The latter was concerned with both production and marketing of the feeds while the others were concerned with production alone. This was because the firm was set up by the farmers with the major objective of supplying them with feeds. Six of the firms (Golden, Tigoni millers, Rosemark, Crown, Pica, Rua 307) started operating between the year 1989 and 1990. However their sales output were low compared to the relatively older firms. Appendix I shows the number and size distribution of the manufacturers within Nairobi and Kiambu District.

The distribution of feeds on the other hand, was done by traders who consisted of distributors, wholesalers and retailers. These traders were involved in the transfer of the animal feeds from the factories to the various market centres, which were nearer to the farmers than the factories. The traders were mainly individuals and farmers cooperative societies.

4.1.2 Market Concentration

The concentration of the animal feeds industry was evaluated at two stages. These were the manufacturing and the retail stages. 'Retail' here means all the traders who sell one and more bags of feeds. The traders who sold feeds in smaller quantities of less than one bag were not included. Their exclusion was necessitated by lack of data on the volumes of trade and sales values at the latter stage.

4.1.2.1 Volume and Concentration of the trade

The volume of trade was evaluated in terms of the sales values of all the manufacturers for the period 1986 to 1990. The total sales values fluctuated within this period as shown in Appendix IIa. Unga Feeds Limited, Sigma, Muus and Belfast controlled 77.6 percent, 4.68 percent, 3.92 percent and 3.51 percent of the total volume of sales respectively in 1990. The percentage volume share of sales for Unga Limited decreased between the period 1986 to 1990 while those for Sigma, Muus, Belfast and the other firms generally increased. However Unga Feeds Limited continued to control a large volume of sales. For the traders only the sales values for 1990 were used (Appendix IIb).

The concentration of the manufacturers and traders was evaluated by constructing Lorenz curves using sales values. The cumulative market shares were evaluated and utilized in construction of Lorenz curves. Figures 3 to 7 show the Lorenz curves for the manufacturers for the years 1986 to 1990.

Figure 3: Manufacturers' concetration curve

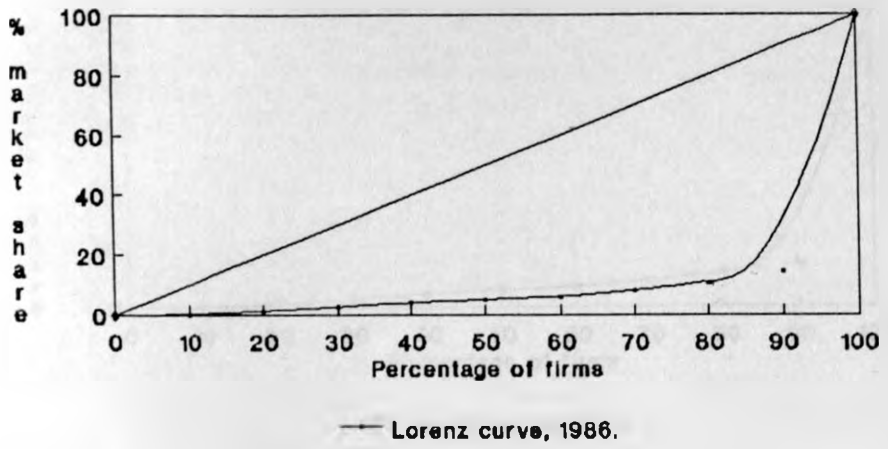


Figure 4: Manufacturers' concetration curve

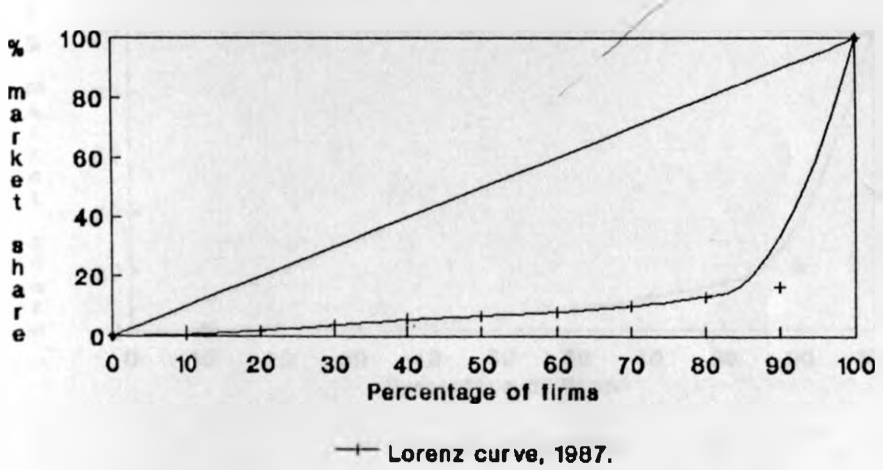


Figure 5: Manufacturers' concetration curve

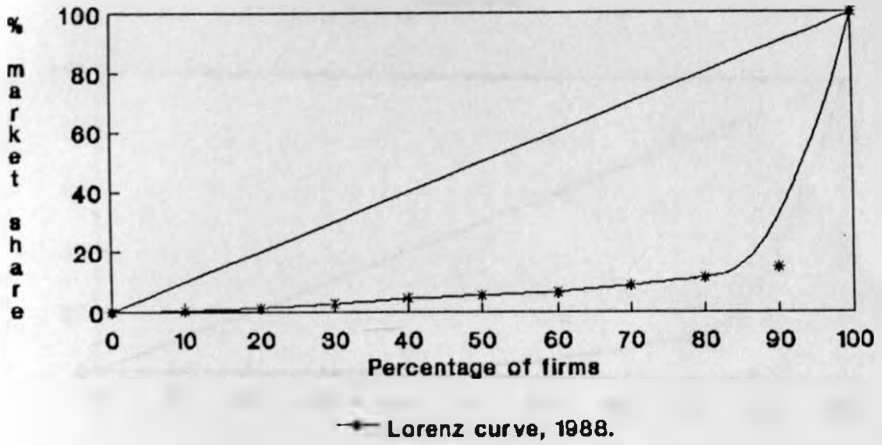
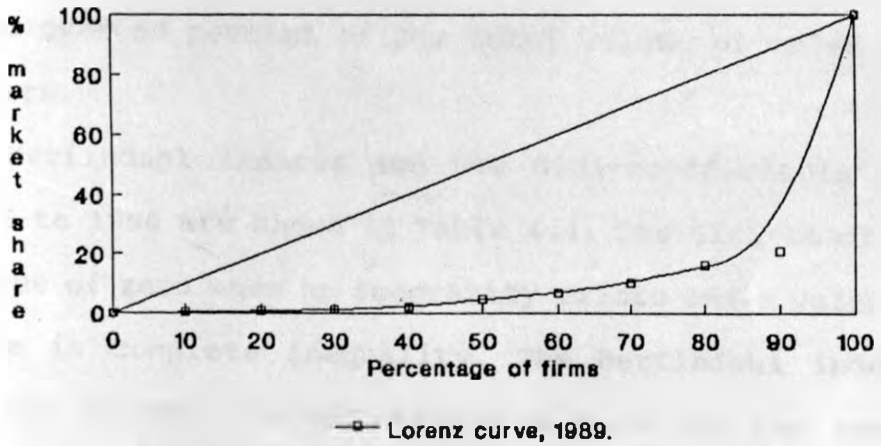
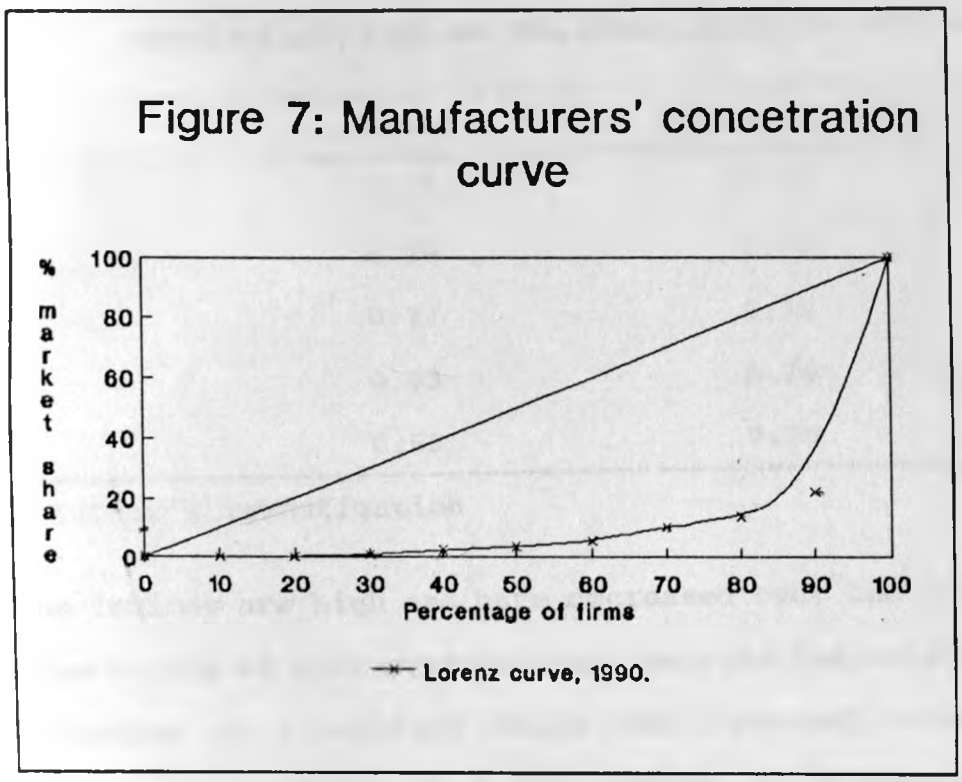


Figure 6: Manufacturers' concetration curve





The figures indicate that 40 percent of the manufacturers interviewed control over 90 percent of the market share while all the other firms control about 10 percent. Unga Feeds Limited controlled over 80 percent of the total volume of sales for the last 5 years.

The Herfindahl indices and the Gini-coefficients for the years 1986 to 1990 are shown in Table 4.1. The Gini-coefficients take a value of zero when no inequality exists and a value of one when there is complete inequality. The Herfindahl index is a modification of the concentration and measures the degree of dispersion. It takes a value of one when there is no dispersion.

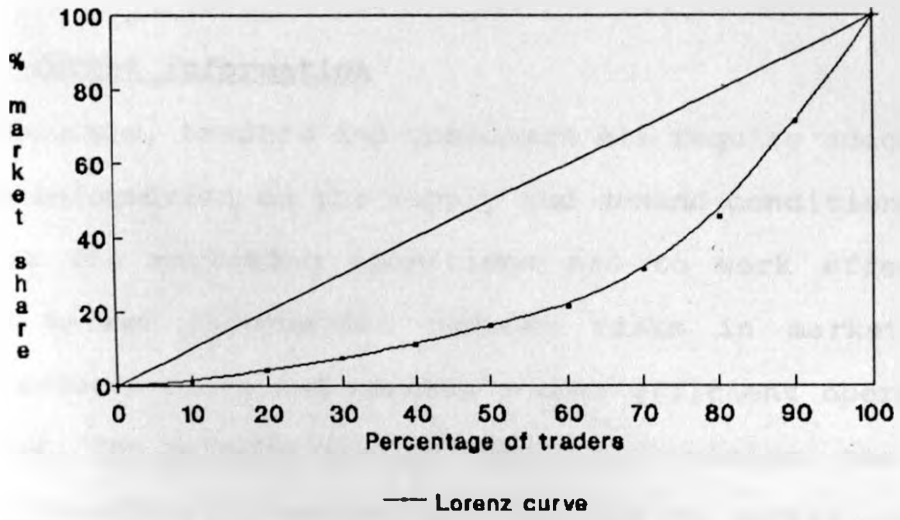
Table 4.1: Herfindahl indices and the Gini-coefficients for the manufacturers of animal feeds in Kenya, 1986-1990.

Year	Index	Gini-coefficient
1986	0.73	0.77
1987	0.70	0.76
1988	0.73	0.75
1989	0.63	0.74
1990	0.65	0.75

Source: Author's investigation

The indices are high and have decreased over the last five years. The values of gini-coefficients indicate the existence of a high degree of inequality while the computed values for Herfindahl indices indicate a low degree of dispersion and therefore a high concentration ratio suggesting lack of competition in the industry. The high inequality and high concentration values computed suggested oligopolistic tendencies at the manufacturing level. The decrease was attributed to the entry of new firms into the industry.

Figure 8: Traders concentration curve



For the traders, the Lorenz curve (Figure 8) was constructed for 1990 only. The Gini-coefficient evaluated was found to be 0.42. This value indicates that the degree of inequality was lower for the traders than for the manufacturers. The Herfindahl index was found to be 0.08. If these two values are rounded off to the nearest integer, it can be inferred that inequality did not exist and that each trader controled relatively a very small proportion of the total sales. This means that there was a high degree of competition in the distribution of feeds. Thus, at this level, no oligopolistic tendencies were exhibited.

From the above discussion the hypothesis that the animal feeds industry is characterised by oligopolistic tendencies was accepted at the manufacturing level and could not be accepted at the wholesale/ retail level.

4.1.3 Market information

Producers, traders and consumers all require adequate and accurate information on the supply and demand conditions of the market if the marketing operations are to work effectively. Improved market information reduces risks in marketing and thereby reduces costs and ensures a more efficient operation of the market. The methods used to obtain information, the flow of information within the marketing system and the market conditions in the animal feeds industry were examined in this section.

Price information was mainly obtained from the posted price lists by the different manufacturers. The manufacturers obtained these price lists from other manufacturers. Direct observation was used by the manufacturers to obtain information on the prices prevailing at the wholesale/retail outlets. The manufacturers indicated that they were constantly communicating with one another for information on raw materials. This was inevitable as some of the manufacturers were also suppliers of raw materials used in production of animal feeds.

The traders mainly used personal communication. The number of traders in each market centre was found to be very small and evidence of collusion was adduced. However the traders found direct observation a necessity in-order to ensure that no cheating on each other occurred.

The farmers seemed to be aware of the different brands of feeds as well as their prices. Sixty one percent of the farmers interviewed indicated that they knew over five different brands while 36 percent indicated that they only knew of less than three brands. These different brands did not seem to pose any choice problem as indicated by 80 percent of the farmers. This was attributed to the fact that the farmers tended to use particular brands. Fifty-five percent of the farmers knew the prices of all the feeds while 45 percent knew the prices of only a few (less than three).

4.1.3.2 Information flow within the marketing system

The manufacturers of feeds indicated that they knew to a limited extent the prices of the feeds in the market place. Sixty eight percent of the manufacturers indicated that they knew the price levels at which they operated, compared to the other manufacturers while 32 percent indicated that they were just within the range of the lowest and highest prices. This could be attributed to the fact that the larger firms, which were older in the business, were interested only in the other older firms. This indicates that at this level, information flow was inadequate.

The traders at the retail and wholesale level indicated that they knew of the prices set by other traders both within the market they were operating in and other nearby markets. This suggests that the intermarket and intramarket flow of information between traders was satisfactory.

4.1.3.3. Market conditions

At the time of data collection, the business activities in the animal feeds industry were relatively low as indicated by all the manufacturers and traders interviewed. Forty six percent of the manufacturers indicated that they knew of the market conditions in advance, while 54 percent did not.The latter group mainly produced feeds whose orders had been placed. This was evidenced by the fact that 13 of the manufacturers interviewed indicated that they had no excess inventories in the factories. This procedure of producing what was ordered for necessitated traders to place orders in advance.

The traders interviewed indicated that they only knew of the market conditions to a limited extent. They could not tell with precision what would be demanded in a particular period. This was evidenced by cases of customers being turned away by traders because of feeds being out of stock. However to maintain good business relationships with the customers, traders preferred buying feeds for them from other traders to turning them away. Cases of feeds being out of stock were common as indicated by 36 percent of the traders interviewed. This was attributed to the lateness in placing orders as well as the lack of transport.

4.1.4. Market entry

Exit and entry of firms into any industry is largely dependent on the perceptions of the profits being earned and/or those to be earned in future in that particular industry. If there are prospects for higher profits, resource transfer into that industry will occur. But this is only possible if no

barriers to entry into that industry have been established. On the other hand, persistent poor performance of an industry could be due to barriers to entry. Barriers to entry into the market thus reduces the threat of potential competitors and hence influences the marketing system. Scherer (1970) outlines several barriers to entry. However the ones which have been examined here are product differentiation, capital requirement, technical knowhow and raw materials control.

4.1.4.1 Capital requirements

Capital requirement was cited as a major constraint that has limited expansion of the animal feeds production. Eight of the manufacturers interviewed indicated that capital requirement was a constraint. The data on amounts of capital invested by the various manufacturers was not available. The manufacturers were found to have taken loans but the amounts involved could not be obtained. High interest rates on these loans were indicated as being prohibitive. Sixty two percent of the traders interviewed had taken loans whereas 38 percent financed their business operations through personal earnings. The amount of capital required by the traders was not prohibitive. This means that capital requirement was not a barrier to entry at the traders' stage. The traders refused to indicate the amounts of loans they had as well as the capital they required to start their business.

4.1.4.2 Technical knowhow and managerial ability

Technical knowledge was found to be a limiting factor at the manufacturing stage. The provending millers require qualified animal nutritionists who are also well versed with computer application. However only the large manufacturers were found to be having them. Two of the smaller firms (Tigoni Mahiu Feeds and Crown Limited) were owned by people who were versed with animal nutrition aspects but the other firms were not. Computer knowledge is necessitated by the fact that animal feeds formulations have to keep on changing according to the prevailing prices of raw materials. The relatively smaller firms only used specific formulations. This means that their profits margins were reduced more than for those who formulated feeds in accordance with the prevailing prices of raw materials.

At the wholesale and retail level, no technical knowledge was required. Similarly, managerial ability was not found wanting as indicated by the traders. Most of the traders interviewed had been in the business for over four years. Therefore, if age is used as a measure of experience and thus managerial ability, then managerial ability was not a limiting factor.

The manufacturers indicated that they had engaged qualified managers and thus managerial ability was not a barrier to entry.

4.1.4.3. Product differentiation

The Kenya Bureau of Standards has specified the minimum standards which animal feeds must meet. The feeds should have a maximum of 12, 6 and 4 percent moisture, crude fibre and acid insoluble ash respectively. The crude protein, crude fibre and available phosporous should not be less than 15, 2 and 0.4 percent for layers and 16, 2 and 0.45 percent for broilers respectively. The manufacturers follow these standards. Only Unga Feeds Limited was found to be carrying out its own research on improvement of animal feeds. This could be attributed to the enormous amount of funds involved in undertaking such research. Advertising, consistency in quality, packaging and trademarks seemed to be differentiating the products. The manufacturers indicated that they were using pre-mixes. The firms were packaging feeds in 70 and 20 kg unit bags. Tigoni millers was found to be using bags of another firm for packaging their feeds and many farmers and traders objected to this as it was misleading. The firms mainly produced the same types of feeds. Broiler and pig feeds were being produced by Unga, Rosemark, Belfast, HighHill, Ideal, Memake, Muus and Muttu firms only.

4.1.4.5 Vertical integration

Vertical integration is the combining of several marketing stages within the same firm (Branson and Norvell,1983). Vertical integration may be forward or backward. Forward integration is the inclusion of marketing stages between any stage and the consumers; and backward integration is the inclusion of additional stages between a given stage and the supply source.

In this study, vertical integration is examined by determining the degree to which the manufacturers and traders have control over supply and/or sales outlets as well as the existence of any tying arrangements.

With regard to sources of raw materials, limited backward integration was observed. The manufacturers indicated that they do not engage in farm production of the raw materials as well as in marketing of their products. The manufacturers indicated that production of some of the raw materials such as maize would not be remunerative since such grains are scheduled crops. Moreover the animal feeds industry largely utilizes by-products such as wheat pollard, maize germ, maize bran and oil seeds cake. Three of the firms interviewed; Unga, Golden and Muus, indicated that their animal feeds factories had been established as by-product lines of production. Unga and Golden have sister firms that produces oilcake, maize bran and wheat pollard; Muus has a sister firm that produces oilcake. These firms meet their requirements first and then sell the surplus. These firms thus, have an unfair control advantage over raw materials.

The other firms interviewed were concerned with production of feeds alone and often complained that they found it difficult to compete with the larger firms because of the control advantage the latter have on raw materials. However this was only a problem when there were shortages. During such periods, the manufacturers compete for raw materials from the processors of products which produce these raw materials. It is at this time that the larger firms have an advantage because they can still afford the raw materials at the higher prices and cushion it with what they

produce. The smaller firms are either forced to close down or produce sub-standard feeds.

The manufacturers had not extended their control to the wholesale/retail outlets and distribution was left to independent traders. This is largely attributed to the fact that due to the shortages of feeds, the traders attempt to ensure they have enough stock for their customers. There were no special agreements and/or arrangements noticed between the traders and manufacturers. The only arrangement noticed was that of traders placing orders and then collecting their feeds later on. However, some traders indicated that they had registered their names with the manufacturers so that in times of shortages they would at least be assured of some supply.

A special type of vertical integration was found to a small extent. This was a contract that involved the Kenchic Limited and its contract farmers. This was a resource-providing contract in which Kenchic supplied the farmers with all the inputs required for production of broilers and the latter in turn, sold the broilers to them. Kenchic Limited does not own a feed provending mill but its feeds are specially formulated by Unga Feeds Limited on a custom basis. Kenchic then transfers these feeds to their farmers at subsidised transportation costs. This indicates some control over the supply source of feeds and those who use them. Rosemark Limited was the only firm that produced and then distributed animal feeds to its contract pig farmers. The farmers in turn sold the pigs to Rosemark Limited. However, this firm was small and was only involved in production of pig feeds only.

Table 4.2: Sources of feeds purchased by farmers

Sources	Number of respondents	Percentage
Retailers	20	60.6
Wholesalers	6	18.2
Manufacturers	4	12.1
Others	3	9.1

Source: Author's investigation

Table 4.2 indicates that the farmers obtain animal feeds from the manufacturers, wholesalers and retailers. Retailers were the major sources of feeds for the farmers as they were close to them.

The traders mainly obtained feeds from the manufacturers. Distributors/wholesalers formed a source of feeds for the retailers. This indicates that there was some degree of channel conflict since farmers could either obtain feeds from the manufacturers or traders. This indicates that the degree of vertical integration was low.

Tying arrangements were observed to be limited to provision of credit and the contracts existing between Kenchic Limited, Rosemark Limited and their farmers. The existence of credit facilities was limited. Traders gave credit to particular farmers only. These observations indicate that the extent of vertical integration was low and thus the hypothesis that the animal feeds industry is vertically integrated is not accepted.

4.2 THE CONDUCT OF THE ANIMAL FEEDS INDUSTRY

The conduct refers to the manner in which firms within an industry adjust prices, output, product quality and promotional efforts in response to competitive pressures (Kohls, 1980). The conduct of the manufacturers and traders as it relates to setting of prices and how they try to minimize competition was examined. The pricing systems practised and the sales promotion efforts undertaken by the manufacturers and traders were considered.

4.2.1 Pricing system

Prior to November 1989, the prices of feeds in Kenya were under price control. However, since then, the prices have been decontrolled and thus left to the market forces of supply and demand. The reason for decontrolling prices is based on the fact that controlled prices limit competition and this can result in producers withholding supply thus causing shortages (Nicholson, 1985). In addition, the quality of feeds is likely to be poor if the prices are controlled at levels where it is not profitable to produce. With the decontrol of prices, the manufacturers are expected to set prices which are reflective of their production costs. The prices at the retail levels on the other hand are supposed to reflect the procurement cost plus the transfer costs. Those who produce at high cost either quits industry or improve their resource utilization. The end result would be efficient use of resources and lower prices.

However lower prices may not be realized if there are many buyers and very few sellers of animal feeds. If there are few sellers they may collude to control prices at levels that do not

reflect the production and procurement costs. If this happens then buyers would be exploited and there would be need of government intervention to check and balance this situation.

Table: 4.3 The ex-factory prices (Ksh) per 70 kg bag of animal feeds in 1991.

	Chick mash	Growers mash	Layers mash	Starter mash	Finisher mash	Diary meal
Unga	315	234	278	433	405	230
MCK	265	215	240	380	375	210
ABC	265	210	240	400	380	210
Belfast	260	215	235	N/A	N/A	190
Tigoni millers	270	245	260	330	310	210
Rua 307	280	232	255	390	350	210
Ideal	280	200	230	N/A	N/A	190
Muus	271	213	246	405	350	185
Muttu	280	240	265	385	380	210

N/A - Not applicable

Source: Author's survey, 1991.

The manufacturers followed the prices set by Unga Feeds Limited. The latter practised cost plus pricing system. Unga Feeds Limited was the dominant firm controlling over 75 percent of the market share. The other manufacturers indicated that they practised price undercutting and their profit margins ranged from 15 to 25 percent. This was the reason for different ex-factory

prices. Price differences between the firms were found to be dependent on type of feed. Table 4.3 shows the various prices of feeds at the ex-factory level. Broiler starter feeds had the largest price difference of Ksh 103 while dairy meal had the lowest, Ksh 45 per bag. The feeds with the highest difference were found to be produced by a few of the manufacturers. Dairy meal feeds had the lowest difference. These price differences indicate existence of price competition between the manufacturers.

Table 4.4. The factors which attract buyers to purchase feeds from particular manufacturers

Factors	Number of respondents	Percentage
Quality	8	57
Price	7	50
Personal relation	3	21
Market situation	3	21
Others	3	21
Credit	2	14

Source: Author's investigation

** Total of percentages is not 100 because of more than one response.

The manufacturers' opinions were that quality attracted buyers most, while prices came second. Farmers were willing to buy 'Unga Feeds' which were relatively more expensive than other feeds. Thus though other factors such as consumer rigidity,

brought about by long standing business relationships could be a reason that made farmers buy from Unga Feeds, the belief that its feeds were consistently of higher quality was outstanding. "Unga Feeds" were the oldest and the farmers attested that they bought these feeds because they had proved to be of good quality.

The traders based their prices on costs of purchase, transport and storage plus a profit margin. The traders had a target margin of profit that they expected and this varied from 8 to 30 percent. Unlike the manufacturers, evidence of collusion within the traders was observed. This tended to make the prices at the wholesale/ retail level to be the same in the various markets.

Table 4.5. Traders' opinion on what attracts particular buyers to purchase their feeds.

Opinion	Number of respondents	Percentages
Business relationship	15	36
Retailing in smaller quantities	13	31
Delivery	7	17
Market situation	3	7
Credit	2	5
Others	3	7
	43	103

Source: Author's investigation.

** Total of percentages is not 100 because of rounding error.

The traders' opinions on what attract particular farmers to them were good business relationship, delivery services and retailing in small quantities. Good business relationship was the most important with a 36 percent response. Sixty three percent of the traders seemed to welcome new entrants while 37 percent indicated that there was no need for new entrants as they could adequately meet the demand. Business relationship factor could be the reason why the traders do not fear competition from new or potential entrants into the business. The traders who were against new entrants feared them because they could easily reduce their profit margins.

The traders set their own prices after considering all the costs involved and then monitoring the prices set by the other traders. Due to the small size of and the low number of traders in each market, there was a possibility of collusion in price setting. This could be the reason why the prices tended to be the same. This is a characteristic of an oligopolistic industry. The traders who preferred customers to whom they delivered the feeds to, were using delivery as a tactic to woo customers. This assured them of a market for their feeds besides maintaining a good business relationship. This could be construed to be a means of creating consumer loyalty.

4.2.2 Testing of the hypothesis that the marketing margins are significantly different from the marketing costs

This hypothesis was examined by evaluating the marketing costs incurred by the traders involved. These marketing costs were storage, transportation, packaging and handling costs. The hypothesis could not be tested at the manufacturers' level due to unavailability of data. The marketing margin was taken to be the price spread between the traders' buying and selling prices. Two levels of price spreads were examined and these were the wholesalers/retailers and the retailers only. Wholesalers/ retailers refer to the traders who sold feeds in whole bag units while retailers refer to those who sold by weighing the feeds in smaller units. Table 4.6 shows the average prices (Ksh) of animal feeds and the price margins for these traders.

Table 4.6: Average prices of feeds (Ksh) and the price margins for traders

1.	Average ex-factory price (90Kg/bag)	= 268.67
	coefficient of variation[2] (%)	= 27.32
2.	Average [3]wholesale/retail price	= 311.69
	coefficient of variation (%)	= 32.24
	Wholesalers' unit margin	= 16.01
3.	Average [4]retailers price	= 388.33
	Coefficient of variation (%)	= 7.82
	Retailers' unit margin	= 24.59

Source: Author's investigation,1991.

Table 4.6 indicates that the retailers' unit margin was higher than the wholesalers' margin. The retailers were found to be taking 64.05 percent of the price spread while the wholesalers were taking 35.95 percent. In addition, the retailer's price was 28.53 percent higher than the wholesale/retail price. This means that the farmers who bought feeds from the former group incur higher expenses per unit than those who bought from the latter group. The marketing margins were found to be statistically

[2]The coefficient of variation is a relative measure of variation which expresses the sample standard deviation as a percentage of the sample mean.

[3]The wholesale/retail price here refers to the average price of traders who sell feeds in one bag units.

[4]This is the average for the traders who sell in less than one bag units.

different from the marketing costs This indicates that traders were getting high profit margins. These high profit margins could be attributed to the collusive tendencies observed in the market. The t-statistic evaluated was 7.74 with 41 degrees of freedom (Appendix III). This value was highly significant at 95% confidence interval and thus the hypothesis was accepted .

4.2.3 Factors that determine the brands of feeds stocked by traders.

It was found that the traders did not stock feeds exclusively from particular processors but from a range of different suppliers. The traders approached the processors for the feeds. However, the relatively new processors had to request the traders to stock their feeds. This was largely due to the products being new in the market and the traders did not want to tie their money in new products. Five of the traders interviewed indicated that the new brands of feeds took as long as two months to sell whereas the other brands sold in a maximum of 2 to 3 weeks.

Farmers' demand was the major factor that determined the brands of feeds stocked by the traders as indicated by 55 percent of the traders. Profitability was only considered by 35 percent of the traders. The terms of sales, and availability of feeds played a minimal role. This indicates that the traders, apart from trying to maximize profits, also took into account what the farmers demanded.

4.2.4 Factors that determine the brands of feeds that farmers use

Table 4.7. Factors that determine the brands of feeds that farmers use

Factor	Number of respondents	Percentage
Quality	26	72.2
Price	17	47.2
Custom	11	30.6
Credit	5	13.9
Availability	3	8.3

Source: Author's investigation.

**Total of percentages is not 100 because of more than one response.

Table 4.7 indicates that 72 percent of the farmers considered quality to be the most important factor when choosing their brands of feeds. Forty seven percent considered prices to be important. These two factors were the most important with the other being availability of feeds, custom and credit. Custom which could be suggestive of consumer rigidity had 31 percent response and these farmers indicated that they had found particular animal feeds that they used to be reliable. Quality and price factors seem to be further supported by the fact that 53 percent of the farmers were found to be mixing different brands of feeds. The reason to this mixing can be attributed to efforts to strike fair quality feeds at a lesser cost.

4.2.5 Sales promotion efforts undertaken to attract customers

Traders can be viewed as middlemen who transfer the animal feeds from the manufacturers to the farmers and thus their role is to facilitate the movement of feeds. The traders displayed their feeds outside their premises during the day. This was an attempt to attract customers. In addition, they had clearly printed signboards indicating the location of their business premises. These were the main promotion efforts undertaken by traders. Other efforts included offering credit to regular customers, delivering the feeds to the farmers, as well as maintaining good customer relationships.

The stage at which aggressive promotion efforts are undertaken is at the manufacturing level. The manufacturers take it that it is only their promotion efforts that can induce farmers to buy their feeds at the wholesale/retail level.

Table 4.8: Promotion efforts undertaken by animal feeds manufacturers

Effort	Number of respondents	Percentages
Quick service	14	100
Regular supply	14	100
Consistent quality	12	86
Price undercutting	10	71
Calendars/pamphlets/posters	8	57
Visiting farmers and attending seminars	7	50
Credit facilities	6	43
Advertising (mass media)	1	7

Source: Author's investigation.

The table above indicates that there was no aggressive mass media advertising undertaken by the manufacturers. The reason for this could be the high costs involved. Only one manufacturer,Unga Feeds Limited, was found to be advertising through the mass media. This firm was also found to be undertaking the other efforts indicated. This is the largest firm and it commands the largest share of the market. This means that it is able to spread the advertisement costs, thereby reducing them per unit of output. This advertising can be seen as a means of forestalling potential entrants as well as an effort to attract customers.

The other promotion efforts which were undertaken by the firms were those which did not tend to raise the average costs and these were maintaining good customer relationships as well as maintaining a regular supply. Maintaining consistent quality was an effort used by 86 percent of the firms interviewed. The firms indicated that maintaining consistent quality was their ultimate goal. Price undercutting was practised by 71 percent of the manufacturers to attract customers. Other efforts undertaken by the manufacturers were offering credit, printing calendars, posters and/or pamphlets, visiting farmers and attending seminars held by the Ministries of Agriculture and Livestock Development.

4.2.6 Methods used by farmers to purchase and transport feeds

Fifty six percent of the farmers interviewed buy feeds in bulk while 44.4 percent buy in small quantities (i.e. less than 3 bags). Eighty six percent of the farmers who bought feeds in bulk indicated that this lowered there transport costs. Fifty six percent indicated that when they bought in bulk the purchase cost per bag was lower. They bought the feeds at a wholesale price which is lower than the retail price. Convinience purpose was also indicated to be important by 53 percent of the farmers. The farmers who buy feeds in bulk do so at lower prices and reduce the unit costs of transportation as compared to when they buy one bag at a time.

Sixty percent of the farmers who bought feeds in small quantities were doing so because of lack of money. Other reasons cited were lack of store, size of enterprise and availability whenever required. Unlike the farmers who buy feeds in bulk,

these ones incur higher procurement costs besides having financial problems. If these farmers are provided with credit, they can reduce their procurement costs by buying feeds in bulk.

4.2.7. Terms of sales

The terms of sales were found to be cash only, cash and credit, and barter exchange to a limited extent.

Twenty eight percent of the farmers paid for their feeds in cash only while 47 percent used both cash and credit. Barter exchange was observed in which 17 of the farmers exchanged their eggs with feeds. The balance which was on top of the eggs after exchanging was then paid to the farmers. This method was used by traders to attract customers. The Kenchic Limited and RoseMark Limited are involved in contracts with some farmers whereby they supply them with animal feeds. In return the farmers sell their livestock and poultry products to them. Kenchic Limited contracts farmers who produce broilers, while Rosemark Limited contracts pig producers. In barter exchange, there is no formal contract signed and the farmers are not under any obligation to exchange their eggs with the feeds.The farmers who were involved in barter exchange were those who were regular customers to the particular traders involved. Thus the traders used this method to lure the farmers to buy feeds from them. This was preferred by some farmers who claimed that the marketing of eggs was a problem.

4.2.8. Mode of transport used by farmers

The "matatu" (public means) and/or hired transport forms the most important mode of transport with a response percentage of 55.6. Thirty one percent used their own transport while 14 percent stated that the supplier provided transport. The Kenchic Ltd delivers feeds to its contract farmers. The farmers interviewed who receive feeds from suppliers (traders) were found to pay between Ksh 5 and Ksh 14 per bag for transport charges. The charges were dependent on the distance covered. The farmers who use "matatu" and or hired transport were found to be paying between Ksh.10 and Ksh.30 per bag. Although the "matatu" and /or hired transport are more expensive, they are commonly used because they are more available than others.

4.2.9. Problems experienced by farmers and their suggestions on how to solve them

Table 4.9 Problems experienced by farmers in procurement feeds

Problems	Number of respondents	Percentages
Marketing of farmers' produce	28	78
Transport	21	58
Quality	19	53
High cost of production	14	39

Source: Author's survey.

Table 4.9 indicates that 78 percent of the farmers experienced problems in marketing their produce. The other problems were transport and quality of feeds.These could be the reasons for the high cost of production complaint. Since animal feeds constitute 60-80 percent of the production costs in livestock enterprises, then these problems can easily result in farmers stopping usage of manufactured animal feeds. This would be detrimental to intensive livestock production.

The farmers pinpointed the suggestions in Table 4.10 which could help them improve their enterprises.

Table 4.10: Farmers' suggestions on how to improve their production

Suggestions	Number of respondents	Percentages
Feeds prices to be lowered	31	86
Organise market for produce	26	72
Transport (roads) to be improved	20	56
Prices to be controlled	11	31
Fuel prices to be lowered	9	25
Water to be availed	6	17

Source: Author's investigation.

Table 4.10 indicates that 86 percent of the farmers expressed the idea that feeds prices should be lowered. Seventy two percent of the farmers suggested that the market for their produce should be organised while 56 percent felt that roads should be improved. Lack of an organised market for eggs made

their production uncertain. High feeds prices made the cost of producing livestock products to be high. Though other problems faced the farmers, high prices of animal feeds seemed to be the major one. This was further supported by the fact that 92 percent of the farmers rated the feeds prices as being high while 8 percent felt the prices were fair. Thirty one percent of the farmers felt that prices of animal feeds should be controlled. Since the prices of of their produce (milk) were controlled while those of animal feeds were not, then a change in the prices of animal feeds could not be matched by a change in the prices of their produce. To remove this discrepancy, the prices of their produce would require to be reviewed more often or to be decontrolled.

4.2.10. Methods used by traders to purchase feeds

The traders' terms of purchase were mainly cash only and cash and credit. The manufacturers offered limited credit facilities of up to one month. The manufacturers claimed that they offered credit to ensure that the traders had their feeds in their premises. Golden Feeds Limited was found to be offering credit without tying it to any period of payment. This firm supplied the willing traders with their feeds and the traders paid back after selling them. This firm was doing this to attract customers as it was relatively very new in the industry. The other firms offered credit only to customers with whom they had long standing business relations. The credit facilities were thus limited in the animal feeds industry and this could be attributed to the low degree of vertical integration.

.2.11. Mode of transport used by traders

ixty one percent of the traders interviewed hired lorries to ransport the feeds from the manufacturers' premises while 22.6 ercent were using suppliers' transport. Sixteen percent were ound to be using their own transport. Own transport was mainly ick-ups and lorries. The hired and suppliers' transport omprised of lorries. Some traders obtained the feeds they sell from Nakuru District and they mainly used hired and/or their own lorries. The traders who do not have lorries hire them from transporters who either ferry goods to Nakuru from other destinations or who come to Nairobi from Nakuru. Traders preferred these transporters because they only paid one way transport charges. This reduced their costs of hiring to and fro transport. However some of the traders complained that it was unreliable.

Pick-ups were mainly used to collect feeds from nearby factories as well as delivering them to customers. Seventy eight percent of the traders indicated that customers collected feeds from their premises while 22 percent indicated that they delivered feeds to the farmers at subsidized transport charges.

4.2.12. Problems experienced by traders

Table 4.11: Problems experienced by traders

Problems	Number of respondents	Percentages
High transportation charges	31	74
High interest rates	17	40
Inadequate storage facility	15	36
Lack of transport	10	24
Long storage period	4	10

Source: Author's investigation.

Table 4.11 indicates that 74 percent of the traders interviewed complained that transport charges were high. Other problems included inadequate storage facilities, lack of transport and high interest rates for servicing loans. The traders suggested reduction of fuel prices to enable them reduce the transportation costs. They further suggested reduction of the interest rates for loans used in the purchase of animal feeds. The high transportation charges and high interest rates incurred by the traders resulted in them raising the prices of animal feeds at the wholesale/retail level.

4.2.13 Problems experienced by manufacturers

Table 4.12 indicates that marketing of animal feeds was a problem faced by fifty percent of the manufacturers. They indicated that due to this problem they could not compete with other manufacturers in the various markets. They indicated that Unga Feeds Limited was their major competitor and they tried to overcome this problem by capturing particular markets. Belfast Limited indicated that its major outlet was in Muranga District while Ideal Feeds Limited had its market in Kiambu District. The new entrants were finding it difficult to market their feeds. High cost of production of animal feeds formed the major problem experienced by manufacturers.

Table 4.12 Problems experienced by manufacturers

Problems	Number of respondents	Percentages
High cost of production	10	71
Marketing of animal feeds	7	50
Raw materials	5	36
Foreign exchange	6	43
Import licence	4	29

Source:Author's investigation.

Acquisition of enough raw materials was a major problem to the smaller firms which do not produce the by-products required for production of animal feeds. This is unlike their counterparts, the Unga Limited and Golden Limited who have

sister firms that produce maize flour and wheat and cooking oil; and Muus whose sister firm produces cooking oil and hence these offer the by-products needed to produce animal feeds. These by-products are used to supplement the cereals used in the production of animal feeds.

The National Cereals and Produce Board (N.C.P.B) is charged with the responsibility of marketing maize and wheat cereals. These cereals are scheduled crops and the N.C.P.B. determines the quantities that should go to the various needs. It determines the quotas that the various firms should get and use in production of animal feeds. The amounts that the firms needed were in excess of the allocated quotas. Therefore the larger firms producing the maize and wheat flour by-products had an advantage over the ones which did not produce them. The firms which did not produce the by-products had to compete for them in the market. Other problems included foreign exchange allocation and import license processing. These problems often made manufacturers produce sub-standard feeds.

CHAPTER 5

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 SUMMARY AND CONCLUSIONS

In the study, the following observations and conclusions were arrived at. By and large, the animal feeds industry was largely found to be in the hands of the private sector. The manufacturers of the animal feeds were basically private companies and individuals. Only one firm, Muttu, was owned by a co-operative society. At the manufacturing level, oligopolistic characteristics were observed. The degree of inequality and concentration were both high indicating lack of adequate competition. Unga Feeds Limited controlled over 75 percent of the market share.

Product differentiation was limited to the feeds having different brand names and prices. Unga feeds Limited was the only firm that carried out research on its animal feeds. The same kind of packaging materials and units as well as other services, such as limited credit and good customer relationship were practised by all the manufacturers. Brand loyalty brought about by long standing business relationships was observed mainly with Unga Feeds.

Some barriers to entry into the industry were identified. These were control of raw materials, inadequate capital, market penetration problem, import licence, foreign exchange allocation and to a lesser extent, high interest rates on loans. Unga Feeds Limited, Golden Limited and Muus Limited had some control over some of the raw materials required in production of animal feeds. Unga Feeds Limited and Golden Feeds Limited have sister firms

which produce cooking oil, maize flour and wheat flour by-products. Muus has a sister firm that produces cooking oil by-products. These are by-products which form the major raw materials required in production of animal feeds. The other animal feeds manufacturers buy these raw materials from these firms and other firms which produce them. The government also controls maize and wheat grains which are also used in production of animal feeds through the National Cereals and Produce Board. Thus the new firms which are also small, find acquisition of raw materials a major obstacle. However the large number of firms which have entered into the industry within the last five years indicates that they have been able to overcome these problems to some extent.

The degree of vertical integration was low. The distribution of animal feeds was mainly done by independent traders who consisted of wholesalers, retailers and farmers' co-operative societies. One manufacturer, RoseMark Limited and one hatchery, Kenchic Limited distributed feeds to their contract farmers. However, the number of farmers served by these were small. Each trader controlled a small share of the market indicating non-existence of inequality and thus existence of some degree of competitiveness in the distribution. The retailers provided further service by selling feeds to the small scale farmers in quantities which they were able to purchase and commensurate with the size of their operations. Over 80 percent of the traders obtained their feeds directly from the manufacturers and sold them mainly to farmers. A few of them sold to other traders. This indicates that the manufacturers did not have restrictions on who

should buy from them. The manufacturers had limited control on the supply sources of raw materials and no control at the sales outlets of their produce. On the other hand, the traders were found to have no control over the supply sources of animal feeds. The extent of tying arrangements was limited to provision of limited credit, the formal contracts between Rosemark Limited, Kenchic Limited and their farmers as well as the informal contract between some traders and farmers. The informal contracts involved barter exchange in which feeds were exchanged for eggs.

The high manufacturers' concentration ratios indicating lack of adequate competition between the manufacturers, could be the reason which has led to shortages and poor quality of feeds. However, this structural organization of the industry cannot be used alone to explain the observed poor performance as indicated by Pickering (1974). Pickering argues that structure alone is of no consequence in explaining performance. Bain (1967) also holds the same view and concurs that conduct which is highly influenced by the structure could be used to explain market performance.

With regard to the market behaviour of the participants, oligopolistic characteristics were observed. The prices of animal feeds were decontrolled and Unga feeds Limited acted as the dominant price leader. Its price system was based on cost plus. The other firms based their prices on the prices of Unga Feeds. Price undercutting was practised by the smaller firms to attract customers. Therefore large price differentials existed for the different brands of feeds. Non-price competition was limited and was mainly being undertaken by the large firms. These firms advertised through the mass media. The other firms did not

advertise because of the cost of doing so. Thus the major forms of competition amongst the manufacturers were price undercutting and advertising.

The low number of traders made it possible for them to have collusive activities. This was mainly in setting prices. The prices set by the traders were found to be more or less the same in the same market and at the adjacent markets. The traders considered the farmers' demand first and then profitability in deciding which brands of feeds to stock. The traders sold feeds to the farmers in quantities commensurate with the size of their enterprises. This means that the distribution system was able to provide the farmers with what they required. However the marketing margins were found to be significantly different from the marketing costs indicating that the traders were enjoying high profits.

The major constraints which were found to be facing the manufacturing firms were unavailability of high quality raw materials, inadequate capital, delay in processing import licence and limited foreign exchange allocation. These have often resulted in production of low quality and shortages of feeds . In addition, poor infrastructure, high transportation charges, impromptu transport and inadequate storage facilities resulted in the ineffective distribution of feeds.

RECOMMENDATIONS

In order to ensure improvements in performance of the animal feeds industry, the following recommendations are made:

i) The nutrients which are imported should be locally produced to avoid the foreign exchange and import licensing problems.

ii) the transport infrastructure could be improved. This requires repairing the existing road networks and providing the amenities necessary. In addition, fuel prices should be reduced so as to reduce the production and transportation costs.

iii) The manufacturers could be allowed to buy the amounts of grains that they require without restrictions from the National Cereals and Produce Board.

iv) The Kenya Bureau of Standards (KBS) should monitor efficiently the quality of animal feeds. It is not enough to stipulate minimum requirememts which are not effected. Thus an efficient quality control system is required to ensure that the stipulations are strictly followed.

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APPENDIX I The number and size distribution of animal feeds manufacturers

Firm	Capacity (TPH)	Location.
*1 Unga	20	Nairobi
2 Muus	4	Thika
3 Muttu	5	Thika
4 Rua	3	Nairobi
5 Ideal	2	Nairobi
6 Memake	2	Nairobi
7 Belfast	5	Nairobi
8 Tigoni Mahiu	4	Limuru
9 Crown	0.6	Kiambu
10 High Hill	1	Limuru
11 Kim Feeds	0.3	Nairobi
12 Sigma	5	Nairobi
13 Golden	6	Nairobi
14 Rosemark	3	Nairobi

*This firm has two plants .

TPH - tonnes per hour.

Source: Author's survey, 1990.

APPENDIX II a: The sales values/percentage shares of the marketed feeds for the period 1986-1990

	1986		1987		1988		1989		1990	
	sale	%	sale	%	sale	%	sale	%	sale	%
1. Golden	-	-	-	-	-	-	-	-	0.28	0.07
2. Sigma	3.60	1.40	5.80	2.17	6.00	1.85	20.28	4.8	19.99	4.68
3. HighHill	4.80	1.87	4.80	1.80	4.80	1.48	5.80	1.37	5.70	1.33
4. MuHu	4.00	1.56	4.50	1.69	6.52	2.01	11.481	2.72	7.99	1.87
5. Tigoni	0.46	0.18	0.53	0.20	0.93	0.29	1.408	0.33	0.64	0.15
6. Tig.Millers	-	-	-	-	-	-	2.29	0.54	2.75	0.64
7. Belfast	7.00	2.73	8.00	3.00	11.80	3.64	17	4.02	15.00	3.51
8. Muus	9.75	3.80	10.00	3.75	8.00	2.47	16.216	3.84	16.77	3.92
9. Rosemark	-	-	-	-	-	-	-	-	N/A	N/A
10. Ideal	2.83	1.10	5.55	2.08	3.13	0.96	3.424	0.81	3.57	0.84
11. Memake	5.00	1.95	5.68	2.13	7.66	2.36	9.037	2.14	8.55	2.00
12. Unga	219.00	85.40	222.07	83.17	275.62	84.95	333.493	78.92	331.69	77.60
13. Crown	-	-	-	-	-	-	2.15	0.51	3.00	0.70
14. Pica	-	-	-	-	-	-	-	-	0.17	0.04
15. Rua 307	-	-	-	-	-	-	-	-	12.00	2.81
Total	256.45	100.00	266.93	100.00	324.46	100.00	422.58	100.00	427.45	100.00

(1) - indicate that the firm had not started operating.

(2) N/A - the data was not available.

Source: Author's study

APPENDIX IIb. The sales values and percentage shares of the traders.

	Quantity(Kshs)	Percentage
1.	15642	0.269
2.	16800	0.289
3.	30111	0.519
4.	34700	0.598
5.	39200	0.675
6.	53200	0.916
7.	53450	0.920
8.	62150	1.070
9.	62980	1.085
10.	67800	1.168
11.	68000	1.171
12.	69980	1.205
13.	72460	1.248
14.	72950	1.256
15.	73700	1.269
16.	73862	1.272
17.	78130	1.345
18.	90000	1.550
19.	94000	1.619
20.	110100	1.896
21.	123170	2.121
22.	217800	3.751
23.	230400	3.968
24.	265500	4.572
25.	266900	4.596
26.	305100	5.254
27.	349900	6.026
28.	366200	6.306
29.	389595	6.709
30.	407000	7.009
31.	425000	7.319
32.	573070	9.869
33.	648000	11.159

Source:Author's survey,1991.

APPENDIX III: The marketing costs and margins for traders in 1991.

No.	Costs	Margins	No.	Costs	Margins
1.	14.10	26.40	22	13.10	44.51
2.	25.79	132.00	23	11.19	32.96
3.	22.34	32.00	24	10.40	30.00
4.	17.60	37.90	25	11.50	37.33
5.	21,60	70.58	26	15.90	28.00
6.	11.50	30.61	27	14.50	26.82
7.	15.10	27.60	28	35.70	92.41
8.	18.00	34.50	29	26.50	59.88
9.	15.14	43.38	30	13.10	22.33
10.	13.53	48.31	31	19.00	23.81
11.	12.00	42.33	32	29.00	78.00
12.	12.60	18.85	33	24.00	52.00
13.	11.80	20.22	34	35.00	90.00
14.	15.00	33.92	35	18.00	50.00
15.	13.90	30.42	36	26.00	90.00
16.	12.70	15.00	37	32.00	65.00
17.	12.10	22.62	38	42.00	120.00
18.	13.05	22.50	39	30.00	67.00
19.	12.30	25.00	40	24.00	59.70
20.	14.60	30.13	41	36.00	105.30
21.	8.75	21.60	42	28.00	122.00

Marketing cost,X1 = 18.445 S = 25.37 t = 7.741
Marketing margin,X2 = 49.115 df = 41
The value of t is highly significant at 95% confidence interval.

APPENDIX IV

UNIVERSITY OF NAIROBI

DEPARTMENT OF AGRICULTURAL ECONOMICS

QUESTIONNAIRE FOR ANIMAL FEEDS MANUFACTURERS.

CONFIDENTIAL

Interview number.....Date.....

Name of firm.....

Address of firm.....

1) When was the firm started?.....

2i) What is the installed capacity?.....

ii) Have there been any changes in the installed capacity? Yes/No.....

iii) If yes, when were the changes and what are they?
.....

.....

iv) Are there plans to increase the plant(s) physical capacity?

Yes/No.....

v) Give reasons to your answer.....
.....

.....

vi) After feed manufacturing, do you use the plant for any other

operation?Yes/No.....

vii) If yes, what is it?.....
.....

viii) If you were to start a new plant what do you think would be the limiting factors and what advantage do you think you have in overcoming these limitations? (Give them in order of importance) [Raw materials, qualified personnel, lack of capital, market information, aggressive reactions by established firms, others]
.....

3i) Does this firm own more than one plant? Yes/No.....

ii) If yes, where is (are) the other plant(s)?.....

.....

iii) On what basis was the present plant location selected?

a) Proximity to raw materials.....

b) Proximity to market for final products.....

c) Availability of space.....

d) Good communication.....

e) Other.....

4. The firm buys raw materials from:

a) National Cereals and Produce Board.....

b) Farmers.....

c) Millers.....

d) Cooperatives.....

e) Private traders.....

f) Others.....

5i) Do you face any competition in procuring raw materials? yes/No.....

ii) If yes, what form does it take and how do you deal with it?

.....

6i) Do you import any raw materials? Yes No.....

If yes, which ones?.....

.....

ii) If you import raw materials, do you do it directly or do you buy from importing agents?.....

.....

iii) From where do the imported raw materials come from?.....

.....

iv) What constraints do you experience in importation of raw materials?

Foreign exchange allocation.....

Time of delivery.....

Clearance.....

Others.....

v) What action is needed to overcome the above constraints (if any) and by whom?

.....

.....

7) Does the firm engage in farm production of any of the raw materials? Give reason(s) to your answer.

.....

8i) Is the labor employed permanent, casual or both.

.....

ii) What was the total labor force last year (1990)?

.....

9) What is the average processing cost per ton or per bag of output of each feed.....

Feed	Average cost of production									
	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Chick mash											
Growers mash											
Layers mash.....											
Broiler starter											
Broiler finisher											
Dairy meal.....											

10) What have been your output for the last 10 years?

Year	Output	Sales value
1980	.....	.....
1981	.....	.....
1982	.....	.....
1983	.....	.....
1984	.....	.....
1985	.....	.....
1986	.....	.....
1987	.....	.....
1988	.....	.....
1989	.....	.....
1990	.....	.....

11a) Have you been producing above what is required to meet the domestic demand? Yes/No.....

b) If yes, what do you do with the excess inventory?
export.....

store.....

12a) Who determines the ex-factory, wholesale and retail prices of the feeds?

Exfactory.....

Wholesale.....

Retail.....

b) On what criteria are price levels determined?.....

.....

c) How do your prices compare with those of other firms?

Same .....

Above .....

Below .....

d) What changes, if any, would you like to see in the price determination system?.....

.....

13a) Do you distribute your products directly to retailers or do you make use of independent middlemen such as distribution agents or wholesalers?

.....

b) How do you transport?

	Rate/km
Own transport	.....
Hired transport	.....
Customers transport	.....

c) Do you have any arrangements with customers? Yes/No.....

If yes, what arrangements do you have?.....

.....

d) Do you choose your distribution agent and or/wholesalers or do you accept any of them who come to purchase your product?

i) Choose.....

ii) Accept .....

e) Which areas of the country do you distribute your feeds and how do you ensure availability of your products to all potential consumers?.....

.....

.....

.....

fi) What are the sales terms?.....
Cash only.....
Credit only.....
Cash and credit.....

ii) If credit, how do you determine whom to give credit?

.....

.....

gi) Do you experience distribution problems? Yes/No.....

ii) If yes, what are they?.....

.....

iii) How do you think these problems can be solved and by whom?

.....

.....

.....

h) Please give the amount of feeds distributed through each of the channels (i.e. Retailers, wholesalers, consumers) for the last 5 years?

.....

.....

14i) Do you face any competition in the market place?

Yes/No.....

ii) If yes, what form does it take and how do you go about it?

.....

15i) How do you know the prices set by other firms?.....

.....

ii) What sales promotion efforts do you undertake to attract customers?.....

.....

16) In your opinion, which attracts the buyers to whom you sell?

a) Market situation.....
b) Large purchases.....
c) Long standing business relations.....
d) Quality of produce.....
e)Credit.....
f) lower prices.....
g)Others.....

17i) How do you determine whether your product meets the consumer's quality requirement?

a) Own research.....

or b) Kenya Bureau of Standards figures.....

ii) Do you consider your product to be differentiated from other manufacturers?Yes/No.....

If yes, what is the basis of differentiation of your product?

.....

.....

18) Is the business
a) a private company?.....
b) a partnership?.....
c) a one-man private business?.....
d) a Kenyan public company?.....

19) Do you obtain any credit for the business? Yes/No
If No, how do you finance the business?

.....

20) What are the other problems, if any, facing your firm with regard to production and distribution of feeds?

.....

APPENDIX V
QUESTIONNAIRE FOR FARMERS

Interview number.....Date.....

Name of farmer.....

Division/District.....

Location.....

1. Type and size of enterprise. Dairy/poultry.....

a) Poultry	Operating capacity	Maximum capacity
i) Layers	.....	.....
ii) Broilers	.....	.....
iii) Indigenous birds	.....	.....
iv) Others	.....	.....

2i) When did you start the enterprise(s)
Layers.....

Broilers.....

Dairy.....

ii) Have you been involved in the enterprise since you started? Yes/No.....

If no, give reason(s).....

.....

iii) What are your other sources of income?.....

.....

3) Size of operation

a) Layers.

i) Size of the flock.....birds

ii) System of production.....

iii) Which others do you know.....

iv) For how long do the birds lay?..... months.

v) How often are replacement pullets raised in a year?.....

b) Broilers

i) Number of broilers per crop.....

ii) Age at slaughter.....

iii) Number of crops per year.....

c) What are the benefits you get from rearing poultry?...

.....

d) Do you have any intention of expanding your operation?

Yes/No.....

Please give reason(s) to your answer (e.g. finance, feeds, marketing)

.....

.....

e) Do you buy feeds in bulk? Yes/No.....

Give reasons to your answer.....

.....

f) How do you store your feeds and for how long usually?

.....

.....

4. Types, sources, amounts and prices of feeds.

Types of feed	No. of 70kg bags used	Source	Prices per bag
Broiler starter	.....	.....	.....
Broiler finisher	.....	.....	.....
Chick mash	.....	.....	.....
Growers mash	.....	.....	.....
Layers mash	.....	.....	.....
Home made	.....	.....	.....
Dairy meal	.....	.....	.....

5. Do you compound your own poultry feeds?

Yes/No.....

If yes, give reason(s) and state the problems you experience and how you think they can be solved?

.....

.....

.....

If no, state the reason(s) for your answer.....

.....

6a)i) Where do you get your poultry feeds and by how much (%)

Manufacturer.....

Wholesalers.....

Retailer.....

ii) How do you transport it.

	Type	Rate Sh/bag	Normal km covered
Own transport	.....	.....	.....
Hired transport	.....	.....	.....
Delivered by suppliers	.....	.....	.....

iii) On average what is the distance to your nearest supplier?

.....km.

iv) How do you purchase your feeds?

.....

.....

b)i How many brands of feeds are you aware of and how many do you use?

Many.....

Few.....

If many, do they pose a choice problem? Yes/No.....

ii) How do you decide which feeds to use? (i.e. from which manufacturer - Credit/ Quality/ Proximity/ Tradition/ Price/ Period of Storage. (Rank them in order of importance)

.....

.....

.....

c) Do you supplement the feeds by use of additives? Yes/No.....

d) Are you aware of all the prices of feeds? Yes/No.....
If yes, how do you get this information?

.....

.....

e) Do you have any advance arrangements with your suppliers? Yes/No.....

If yes, what form of arrangements are they?.....

.....

f) What problems do you experience?

Transport .....

Quality .....

Lack of market for eggs .....

g) How would you rate the prices of feeds

High.....

Fair.....

h) Make any suggestion that would help you improve your enterprise

.....

APPENDIX VI

UNIVERSITY OF NAIROBI

DEPARTMENT OF AGRICULTURAL ECONOMICS

QUESTIONNAIRE FOR TRADERS

CONFIDENTIAL

Interview number.....Date.....

Name of trader.....

Name of location.....

Name of market.....

1(i) Are you a retailer, wholesaler or distribution agent?
.....

(ii) When did you commence business operations in general?

.....

2. Have you handled feeds throughout this period? Yes/No.....

If not, for how long? .....

.....

3. Which brand of feeds do you handle and what are their prices?

Type	Brand	Prices
Chick mash	.....	.....
Growers mash	.....	.....
Layers mash	.....	.....
Broiler finisher	.....	.....
Dairy meal	.....	.....

4. Do you handle feeds exclusively for particular processor(s) or do you buy from a range of different suppliers?

a) Exclusively for particular processor(s).....

b) Range of different suppliers.....

5. If you have more than one supplier, how many are they?

.....

6. Do the manufacturers of feeds request you to handle their products or do you approach them initially?

a) Request me.....

b) Approach them.....

7. What factors do you consider in deciding to handle feeds from any particular supplier?

a)Profitability.....

b) Rate of flow of the product (turnover).....

c) Reliability of supply.....

d) Terms of sale.....

e) Customers Demand.....

f) Others.....

8. What proportion of your total wholesale business (by value) does the trade in feeds constitute?

a) 0-25%.....
b) 25-50%.....
c) 50-75%.....
d) over 75%.....

9a) What is your average monthly turnover (by value) of feeds?
.....

b) Does this vary seasonally?.....Yes/No.....

By how much?.....

10) Are there certain times of the year when you experience shortage of supply of feeds from processors? Yes/No.....

If yes, when? .....

11. How do you distribute feeds to the various customers?

a) Deliver to customers.....

b) Customers collect from my store.....

12. If you deliver the products, do you charge for delivery? Yes/No.....

If yes, what are the charges (Rates).....

13i. How do you obtain the feeds?

a) From manufacturers.....

b) From distribution agents.....

c) Others.....

ii) How do you transport the feeds?

a) Own transport	Capacity	Number
.....	.....	.....

b) Hired transport Rates/bag/car load

....

c) Suppliers transport Rates/bag/car load

....

iii) What is your average transportation cost?.....

iv) Do you have any arrangement with the manufacturers?

Yes/No .....

If yes, what arrangements do you have? (e.g. credit, charged delivery, free delivery, order, quantity discount etc.)

.....

.....

14. Indicate in the table below your transactions for the last three years.

No.	Quantity	Origin	Transport	Cost of transport	Purchase value (Ksh)	Sales value (Ksh)

15. State problems experienced in transport and future plans for improving your transport (e.g. purchase of new vehicles).

a) Lack of transport.....

b) High transportation charges.....

c) Others.....

16a) Who are your main customers?

Less than one bag customers.....
One bag customers.....
More than one bag customers.....

b) Do you do retail of feeds? Yes/No.....

c(i) If yes, what proportion of total feeds turnover does it constitute?

.....

(ii) Which specific areas do you cover?.....

.....

iii) Are you restricted to any area of operation? Give reasons advanced for such action.

.....

17i) Do you have a store for your feeds? Yes/No.....

ii) If yes, what type of storage?

Type	Rent/Month
Permanent	.....
Semi-permanent	.....
Others	.....

iii) What rent per month do you pay? .....

iv) Category of store/business premise.

Category	capacity(m^3)	Rent per month
Own store	.....	.....
Rented store	.....	.....
Other	.....	.....

v) What is the average time of storage before whole stock is sold?.....

vi) What is your estimated storage cost per month?.....

.....

(vii) Who offloads the feeds from the vehicle? .....

.....

(viii) How much do you pay to offload? (indicate where appropriate)

a) Per car load.....

b) Per sack.....

c) Per person.....

ix) State problems experienced in storage, and also your future plans in storage (e.g. new stores and their capacities).

a) Inadequate storage facility.....

b) Long storage periods.....

c) Others.....

18i) Do you prefer customers who come to purchase directly from you or those to whom you deliver the supplies?

.....

ii) Please give a reason for your answer?.....

.....

iii) Do you know other traders who deal in the same business?

.....

iv) If yes, where are they located.....

v) Do you know their sources of supplies? .....

.....

vi) How do your selling and purchasing prices compare?

	Purchasing	Selling
Same	.....	.....
Above	.....	.....
Below	.....	.....

vii) How do you determine your selling price?

.....

viii) What is your feeling towards new entrants into this business?.....

.....

ix) How do you obtain information on your competitors?.....

.....

x) What services, if any, do you provide to customers?

a) Credit.....

b) Delivery.....

c) Advice on pricing, display, storage etc.....

d) Retailing in smaller quantities.....

e) Other.....

xi) What services, if any, do you receive from the manufacturers of feeds?

a) Credit.....

b) Delivery.....

c) Advice on pricing, display, storage.....

d) Other.....

xii) Do you undertake advertisement or product promotion activities? Yes/No.....

If yes, do you do it on manufacturer's request or on your own initiative?.....

19i) What is the average length of storage before whole stock is sold?

.....

ii) What is your estimated storage cost per month?

.....sh/month.

20a) Is the business personal or you share with others?

Specify.....

.....

b) How do you finance your business?

Loan.....

Saving.....

Other.....

c) What are the terms of sales? .....

Cash only.....

Credit/cash.....

e) Do you have any credit or loan facilities? Yes/No.....

If yes, state the source, amount and repayment period.....

.....

If no, give reasons why you do not borrow, and incentives which would make you borrow.....
.....

.....

e) State problems encountered in financing your operations?

.....
.....

.....

21a) What do you consider to be your major problems in this business?

Finance.....

Lack of transport .....

Lack of storage.....

Finance and transport.....

Finance and storage.....

Transport and storage.....

b) In what way(s) do you think these problems can be solved and by whom?

.....