UNIVERSITY OF MANCHESTER

FACULTY OF ECONOMIC AND SOCIAL STUDIES

DEPARTMENT OF AGRICULTURAL ECONOMICS

THE UNITED KINGDOM BROILER INDUSTRY 1960–75

Production, Marketing and Consumption

D. I. SUE RICHARDSON

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AGRICULTURAL ECONOMICS DEPARTMENT

UNIVERSITY OF MANCHESTER

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UNITED KINGDOM BROILER INDUSTRY

1960 to 1975

Production, Marketing and Consumption
Economics of Broiler Production (to 1976)

by

D. I. SUE RICHARDSON

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The Department has developed a special relationship with the poultry industry over the past 25 years. This has culminated with the establishment of the Eastwood Poultry Research Project, thanks to the generous gift by Sir John Eastwood to Manchester University. A good deal of the broiler sector of the project will develop from the basic data provided in this study, at least so far as the United Kingdom is concerned.

This report could not have been written without the helpful advice of poultry organisations, the N.F.U., breeding and feedingstuffs companies, the use of National Food Survey and M.A.F.F. data, and the assistance of A.D.A.S.

Grateful acknowledgement is accorded to all the individuals in these organisations, and particularly to the broiler growers, who gave of their time and advice in assisting the author to complete this study.

CONTENTS

AGRICULTURAL ENTERPRISE STUDIES IN ENGLAND AND WALES

University departments of Agricultural Economics in England and Wales have for many years undertaken economic studies of crop and livestock enterprises. In this work the departments receive financial and technical support from the Ministry of Agriculture, Fisheries and Food.

A recent development is that departments in different regions of the country are now conducting joint studies into those enterprises in which they have a particular interest. This community of interest is being recognised by issuing enterprise reports in a common series entitled "Agricultural Enterprise Studies in England and Wales", although the publications will continue to be prepared and published by individual departments.

Titles of recent publications in this series and the addresses of the University departments are given at the end of this report.

PREFACE

Perhaps because poultry were traditionally the farmyard source of the farmer's wife's pin money and have now, in great contrast, come to be dominated by a relatively few very large-scale, specialist operators, they have excited the interest of very few agricultural economists. Mrs. Richardson, recently appointed the Sir John Eastwood Senior Research Fellow, is now the outstanding university based agricultural economist specialising solely in poultry. For this report she has extracted in great detail material concerning the poultry industry and poultry meat consumption from Ministry of Agriculture publications, the National Food Survey reports, Poultry Journals, Department of Employment Gazette and other sources, adding her interpretative comments. Anyone who wants a handy collection of data relating to poultry meat in the United Kingdom during the last fifteen years should find it in this report.

In addition, the final section of the report deals with the economics of poultry meat production. By drawing together economic and management material over a similarly extended period Mrs. Richardson has given added depth to her own detailed survey carried out in 1972 and 1973, the results of which are presented here in full for the first time.

W. J. Thomas
Professor and Head of Department

INTRODUCTION

The chicken industry is undoubtedly the most dynamic sector of the agricultural industry. Production has increased at a phenomenal post war rate in comparison with the rate of production of other agricultural products. At the same time, the progress of the industry has had a profound effect upon the eating habits of consumers. Chicken is no longer the expensive luxury food product which was mainly consumed by the higher income groups in pre-war days. It is now available as a low priced source of meat, and is consumed regularly by all sectors of the population. As a result of its competitive price position within the meat market, the consumption of poultry meat has increased at a remarkable rate. At the same time the United Kingdom has become virtually self-sufficient in the total supply of poultry meat.

The point of "take-off" occurred in the early 1950's, following the abolition of the rationing of feedingstuffs, and the decontrol of retail prices. The early development of the U.K. industry was stimulated by the impressive results achieved by the broiler industry in the U.S.A. These results gave some indication of the potential prospects for the development and growth of the industry in view of the low food conversion rate and the shorter growing period of broilers, together with technical improvements in the genetic and nutritional field, the industrialisation of production, and changes in processing and marketing methods.

Unlike most other sectors of agriculture, the poultry meat industry has achieved its position without the aid of government subsidies or support measures. It has not favoured any form of government or quasi-government control nor the establishment of a marketing board. On the whole the industry appears to prefer the rigours of the free market system and regards itself as

the epitome of private enterprise. Certainly it is a young industry in the sense that it has not been fettered by traditional attitudes. No doubt the influence of new entrants from outside agriculture has played a significant role in the development of the chicken industry.

The achievements of the industry during the past twenty years have been remarkable. Despite the fact that the cost of feedingstuffs has more than doubled, as well as the effect of inflation on other unit costs, the retail price of chicken in 1974 was no higher than in the early 1950's. It is unlikely that any other industry in the U.K. can match this performance. This has been achieved by the marked improvement in the feed conversion rate from 3.2:1 to 2.2:1 and the reduction in the growing period from 10-12 weeks to 7-8 weeks for the same weight of broiler, together with the economies obtained from scale of production, integration and processing. Sales promotion and advertising have also played an important role in the development of the industry and close marketing links have been developed with the growth of the supermarket chains.

Consumers have benefited considerably from the progress achieved by the industry. As a result, demand has increased, and consumption has risen from 1 million chickens in 1953 to 300 millions in 1975.

Although the industry has progressed, it has been beset with problems from time to time. Even though production has become more rationalised and integrated, it is still rather a volatile industry. The problems have arisen mainly due to imbalances between supply and demand, and as a result production has tended to be cyclical. Joining the E.E.C. has posed further problems for the industry, mainly in connection with the E.E.C. processing and marketing regulations, as well as over the question of New York dressed poultry. So far, the free market within the E.E.C. has not provided any difficulties for the U.K. industry since it is in a favourable competitive position in relation

to the structure of the industry in the other E.E.C. countries. The U.K. industry is virtually self-sufficient, in which imports, so far, have not played a significant role, as in the egg sector of the poultry industry.

During the past three years, the massive increase in the major item in the cost of production, namely feedingstuffs, has caused considerable problems for the industry together with the more favourable treatment received by other competitive livestock products, particularly in the beef sector not only in the U.K. but in the E.E.C. as well. However, provided that the market is kept in balance, future prospects appear favourable in view of the likely further increase in demand and the more favourable competitive price of poultry meat in comparison to the price of other livestock products.

Surprisingly, although the chicken industry is regarded as the innovating sector of agriculture, the provision of market intelligence information still leaves a great deal to be desired and bears little comparison with the type of service provided by the U.S.D.A. and other organisations in the U.S.A. For example, stocks held in public cold stores are available, but the major proportion is held in private stores and this information is not available. There is no weekly (or even monthly) publication covering the situation and outlook for the industry similar to the service provided by the Eggs Authority for the egg industry. No doubt the major organisations within the chicken industry have their own individual market research and intelligence sections. But this could be improved by the provision of an overall service as back-up information to the industry as a whole. Lack of full and complete market intelligence information impedes the marketing process. Perhaps the provision of an adequate early warning system might have assisted in ironing out some of the slumps and booms which have been associated with the industry in the past. It could prove beneficial in the future not only within the U.K. industry but also in particular if competition increases as a result of increased E.E.C. activity.

At present the available statistics and prices are published in a plethora of publications. Certainly the N.F.U. is to be congratulated on its quarterly service to producers. This does tend to concentrate mainly on the production side. The requirement now is surely for an up-to-date bulletin covering the marketing of chicken. At the same time full coverage of the E.E.C. poultry meat industry is required. The U.K. industry may be in a strong competitive position vis-à-vis the E.E.C. poultry industry, but the shape and structure of the industry has changed rapidly in the E.E.C. in recent years. It is in the interests of the U.K. to be kept fully informed of developments in the E.E.C. countries in order to meet the likelihood of increased competition for the home market in the U.K., as well as opportunities to export.

Again, surprisingly, very little work has been done by the Universities on the economics of broiler production and marketing since the reports published by Lowe and James in the late 1950's, apart from some recent publications in connection with the U.K. industry and the E.E.C. The purpose of this report therefore is to examine the development of the broiler industry between 1960 and 1975, following the report written by Dr. Coles in 1960, which covered the period 1945-1959 and to indicate the results obtained in recent surveys of broiler production.

PART I

OUTPUT AND SUPPLY

Previous to the development of the broiler industry, the rearing and fattening of table poultry was a very small specialised industry. Birds were generally killed at about 5 to 6 pounds in weight, at 20 weeks of age. There was also the poussin industry, which involved the rearing of birds to about 2 pounds, at 8-12 weeks, for a specialised market. The bulk of poultry meat supplies consisted mainly of the byproduct of the egg industry in the form of culled layers. Imports covered as much as a quarter of total supplies. The cost of production of specialist table poultry was high, as well as retail prices, so that chicken was an expensive luxury food product. The average consumption of poultry meat covering all types was only about 5 pounds per capita.

Before the development of broiler production in the early 1950's, the table poultry industry had largely been characterised by seasonality of production mainly for the summer market and the Christmas festive season. The basis of broiler production is all year round production, and during the early years was largely farmer/grower based on small units. Originally the source of stock were surplus day old cockerels of the heavier laying strains produced by hatcheries for the egg industry.

Although poultry meat statistics have improved in recent years, information covering output is still not fully comprehensive. The extraction of information for comparative purposes covering broiler production is problematical due to changes in coverage over time. There are also variations in the annual data which may refer to calendar years, June/May years or April/March years.

As Table I indicates, production escalated in the 1950's, and the annual rate of increase reached as much as 83% in 1959. During the 1960's, the growth

TABLE I

ANNUAL OUTPUT OF CHICKEN

Year	Millions	Annual Increase %
1955	25	.
1956	37	+ 48%
1957	45	+ 22%
1958	60	+ 33%
1959	110	+ 83%
1960	120	+ 9%
1961	140	+ 17%
1962	123	- 12%
1963	130	+ 6%
1964	149	+ 15%
1965	156	+ 5%
1966	174	+ 12%
1967	212	+ 22%
1968	232	+ 9%
1969	247	+ 7%
1970	258	+ 5%
1971	280	+ 9%
1972	310	+ 11%
1973	330(p)	+ 7%
1974	305(p)	- 8%
1975	300(p)	- 2%
1976	320(Forecast)	+ 7%

Source: B.P.M.A. (Estimates).

(p) Provisional

TABLE II

U.K. POULTRY MEAT PRODUCTION (a) (b)

June/May Years	Pre-War	1946/47	1953/54	1961/62 (a)	1965/66 (a)	1970/71 (a)	1971/72 (a)	1972/73 (a)	1973/74 (a)	1974/75 (a)
	'000 tons									prov.
MEAT PRODUCED										
FOWLS										
Over 6 months	n.a.	n.a.	n.a.	74.9	69.6	74.0	70.2	61.7	65.6	64.0
Under 6 months	n.a.	n.a.	n.a.	230.9	279.0	426.4	470.9	486.1	487.7	453.1
TOTAL FOWLS	64.5	40.2	70.5	305.9	348.7	500.4	541.1	547.8	553.2	517.1
DUCKS	6.1	6.0	4.6	8.2	9.3	13.0	16.2	16.6	15.9	13.8
GEESE	2.8	3.7	3.1	2.0	1.1	0.8	0.6	0.6	0.7	0.6
TURKEYS	5.9	5.5	7.8	29.9	46.5	70.4	74.4	89.0	96.5	84.9
TOTAL POULTRY MEAT	79.3	55.4	86.0	346.0	405.6	584.6	632.4	653.9	666.4	616.3
NUMBERS SLAUGHTERED	millions									
FOWLS										
Over 6 months	n.a.	n.a.	n.a.	45.4	42.2	48.8	46.6	40.9	43.5	42.5
Under 6 months	n.a.	n.a.	n.a.	172.5	208.6	287.2	317.1	329.6	331.0	307.4
TOTAL FOWLS	42.4	27.2	56.1	217.9	250.8	336.0	363.7	370.6	374.5	349.9
DUCKS	2.8	2.9	2.1	4.5	4.6	6.0	7.5	7.7	7.4	6.4
GEESE	0.6	0.8	0.7	0.4	0.2	0.2	0.1	0.1	0.1	0.1
TURKEYS	1.1	1.0	1.5	6.4	9.3	14.1	14.8	17.9	19.5	17.1
TOTAL POULTRY	46.9	31.9	60.4	229.3	264.9	356.3	386.1	396.3	401.4	373.5

Source: M.A.F.F.
(a) Commercially significant holdings 1965 onwards (prior 1961-Agricultural Holdings)
(b) Basis - Dressed carcase weight. (oven ready).
(c) Due to rounding off, total production statistics may differ from total of individual commodity statistics.

rate tended to slow down, nevertheless production doubled between 1960 and 1970. Already there were signs of problems within the industry due to an imbalance between supply and demand. A cyclical pattern of production developed and there was even a temporary decline in 1962.

The annual average rate of increase tended to slow down in the late 1960's and early 1970's. Nevertheless the rate was still substantial and averaged 8%. However, 1974 turned out to be a disastrous year for chicken producers due to escalating unit costs of production, a halt in the previously marked increase in the price of competitive red meat products, and a substantial build up of poultry meat stocks occurred. As a result, production declined by as much as 8%. However, the earlier cutback in production, which led to a more favourable price of chicken in 1975, together with the likely reduction in beef supplies has encouraged the increased production of chicken in recent months, so that it is likely that the level of production in 1976 will rise above year earlier levels.

It is not possible to provide figures covering table chicken production as a proportion of total poultry meat production for earlier years. No doubt pre-war the percentage was very low. Culled layers provided the main source of supplies. As Table II indicates, the total production of fowls (including table chicken) amounted to 65,000 tons pre-war, and accounted for as much as 81% of total poultry meat production. In 1961/62, fowls over 6 months (culls) accounted for 25% of fowl and chicken production. But by 1974/75, fowls only covered 12% of this market. Although this would indicate a marked fall in the importance of the byproduct of the egg industry as a source of poultry meat, changes in supply, particularly on a seasonal basis can play a significant role within the overall poultry meat market situation.

Broiler production has increased at such a rate that broilers, together with table chicken, now account for as much as 74% of total poultry meat production. (Table II).

TABLE III

U.K. IMPORTS OF POULTRY MEAT (tons)

	1938	1955	1960	1965	1970	1971	1972	1973	1974[b]	1975[b]
FOWLS										
Denmark	10	5400	2800	10606	3786	5899	3455	2915	95	2037
Republic of Ireland	2400			387	270	958	3317	2496	1365	836
Netherlands	1180			30	42	92	81	134	529	2377
Others	5350			92	3	18	19	313	30	17
TOTAL FOWLS	8940	5400	2800	11115	4101	6967	6872	5858	2019	5267
Ducks and Geese	800	1100	600	795	548	527	898	1422	672	551
Turkeys	10990	6100	2200	449	1078	2708	1237	110	141	1381
Cuts	b	b	b	b	b	b	b	b	3763	1157
TOTAL POULTRY MEAT	20730	12600	5600	12359	5727	10202	9007	7390	6595	8356

CANNED POULTRY (tons) (Imports and Home Production)

IMPORTS	200	3000	4400	5890	3728	3539	4456	5099	3422
HOME PRODUCTION	a	a	a	2000	2700	3000	3500	3800	3900

Source: Commonwealth Secretariat and Trade and Navigation Accounts.

(a) less than 1000 tons.
(b) New Series. Poultry Cuts included in whole poultry previous to 1974.

Imports

Pre-war, imports covered a substantial proportion of the total supply of poultry meat in the U.K. Total imports amounted to 20,000 tons (Table III), covered one-fifth of total supplies and therefore played a significant role in the poultry meat market. However, with the growth of home production, imports declined and by 1960 only covered 2% of total supplies. By 1974 imports amounted to 6596 tons and were 68% below the pre-war level. However, there was a marked increase in 1975 above the 1974 level, which was mainly due to increased E.E.C. activity. Imports increased substantially from Denmark and the Netherlands. Previous to joining the E.E.C. only a very low tariff was imposed on imports. The disease control policy discouraged imports from many countries. Exports in proportion to home production are relatively unimportant and only amounted to 2000 tons in 1974, and declined to 1550 tons in 1975, of which exports of whole chicken and chicken pieces accounted for 60%.

Canned Pultry Meat

The production of canned poultry meat amounted to less than 1000 tons in 1960, but by 1974 production had quadrupled to 3900 tons. (Table III). Imports increased markedly above the pre-war level and reached a peak of 6300 tons in 1967. Imports tended to increase during the 1970's, but there was a sharp fall in 1974 due to the depressed state of the market.

Significance of Poultry Meat's Share of Total Meat Market

The importance and significance of the poultry meat industry in relation to the total meat market is illustrated by Table IV.

Poultry meat's share of meat production has increased from 7% pre-war, to 15% in 1960/61, and the forecast indicates that it will be as much as 23% in 1975/76. The massive increase in production cannot be matched by any other sector. Red meat production has increased in total, but the rate of increase

TABLE IV

U.K. MEAT PRODUCTION + SUPPLIES (% Self-Sufficient) and % POULTRY MEAT

	Pre* War	1946* /47	1953* /54	1960* /61	1965* /66	1970 (a) /71	1971 (a) /72	1972 (a) /73	1973 (a) /74	1974 (a) /75	1975/76 (a) Forecast
	'000 tons										
Beef + Veal Production	578	550	645	772	803	987	922	905	915	1147	1148
% Self Sufficient	49%	58%	66%	66%	72%	81%	78%	78%	83%	85%	91%
Mutton + Lamb Production	191	135	172	241	249	223	223	223	241	248	254
% Self Sufficient	36%	24%	35%	39%	45%	42%	41%	44%	54%	60%	55%
Pork Production	209	15	280	441	628	619	647	648	689	657	545
% Self Sufficient	78%	34%	88%	95%	97%	100%	98%	95%	101%	102%	100%
Bacon + Ham Production	159	87	223	193	229	262	284	263	247	231	203
% Self Sufficient	29%	36%	43%	33%	36%	42%	43%	44%	45%	46%	43%
Poultry Meat Production	89	70	101	307	406	579	605	647	655	622	638
% Self Sufficient	80%	72%	86%	98%	98%	99%	99%	99%	100%	100%	99%
TOTAL MEAT PRODUCTION (b)	1226	857	1421	1954	2315	2669	2680	2685	2748	2905	2788
POULTRY MEAT % Share of Total Meat Production	7%	8%	7%	15%	18%	22%	23%	24%	24%	21%	23%
TOTAL MEAT SUPPLIES	2632	1894	2421	3155	3364	3569	3657	3597	3444	3531	3390
TOTAL POULTRY MEAT SUPPLIES	111	97	128	313	415	584	613	655	658	624	646
POULTRY MEAT SUPPLIES as % TOTAL MEAT SUPPLIES	4%	5%	5%	10%	12%	16%	17%	18%	19%	18%	19%

Source: Annual Review and Determination of Guarantees.

* Year June/July (exc. exports) (a) April/March (inc. exports) (b) Due to rounding off, total meat production may differ from total of individual meat production statistics.

TABLE V

VALUE OF OUTPUT OF U.K. AGRICULTURE AND PLACE OF POULTRY MEAT

June/May Years	Pre War	1946/47	1953/54	1960/61	1965/66	1970/71	1971/72	1972/73	1973/74	1974/75	1975/76 Forecast
	£ million										
TOTAL OUTPUT	307	648	1256	1497	1884	2372	2532	2941	3822	4350	5054
LIVESTOCK (Exc.Poultry Meat)	88	120	371	431	580	774	814	1011	1211	1408	1632
POULTRY MEAT	7	18	26	74	93	138	152	167	239	258	308
TOTAL LIVESTOCK	95	138	397	505	673	912	966	1178	1450	1666	1940
POULTRY MEAT % OF TOTAL LIVESTOCK	7%	13%	7%	15%	14%	15%	16%	14%	17%	16%	16%
TOTAL LIVESTOCK AND LIVESTOCK PRODUCTS	213	384	881	1043	1284	1639	1761	2037	2546	2899	3336
%POULTRY MEAT	3%	5%	3%	7%	7%	8%	9%	8%	9%	9%	9%
%POULTRY MEAT & EGGS	18%	18%	18%	23%	22%	21%	20%	18%	22%	19%	18%
POULTRY MEAT AND EGGS % OF TOTAL OUTPUT	13%	11%	12%	16%	15%	14%	14%	12%	15%	12%	12%
POULTRY MEAT % OF TOTAL OUTPUT	2%	3%	2%	5%	5%	6%	6%	6%	6%	6%	6%

Sources: Annual Review and Determination of Guarantees
Output and Utilization of Farm Produce in U.K.

is dwarfed in comparison with the rate for poultry meat. (Since 1973/74, there has of course been a marked increase in beef production).

Except for pork production, which was 102% self-sufficient in 1974/75 (exports in excess of imports) all red meat sectors remain less than self-sufficient in total supplies (beef 85%, mutton and lamb 60%, bacon and ham 46% in 1974/75).

Poultry meat, despite the marked drop in imports, has increased its share of total meat supplies from 4% pre-war to 18% in 1974/75. Beef, on the other hand, has fallen from 45% to 38%, mutton and lamb from 20% to 15%, and bacon and ham from 21% to 14%. Pork's share has increased from 10% to 18%. Perhaps it is significant that the development of pork production is beginning to follow a similar pattern to that of poultry meat, i.e. specialisation, integration and with great emphasis on marketing. The feed conversion rate (pounds of feed to produce one pound of meat) which is lowest for poultry meat, is also much lower for pork production than for beef or mutton and lamb production. Imports have always played an important role in bacon and ham supplies.

Output of U.K. Agriculture and Place of Poultry Meat

A further indication of the importance of the poultry industry within the general framework of U.K. agriculture is illustrated by Table V. The value of the output of poultry products (including the egg industry) accounts for 12% of the total output of agriculture. They are third in order of importance within the livestock and livestock products sector and were valued at £540 m. in 1974/75 and accounted for 19% of the total value of livestock and livestock products (milk and milk products covered 32%, fat cattle and calves 26%, fat pigs 17%, and fat sheep and lambs 6%). Output of poultry products is forecast at £587m. for 1975/76.

Poultry meat's share of livestock and livestock products, and of the total output of agriculture, has trebled since the early 1950's. This achievement is the more remarkable if account is taken of the low comparative level

of the price of poultry meat in relation to the marked increase in the price of other livestock products. Chicken prices, for example, fell by 29% between 1954 and 1972/73, whereas the price of cattle increased by 132% during the same period. Even following the escalation in the price of feedingstuffs and the effect of inflation upon other costs of production, the chicken price index was only 133.9 in 1975 (calendar year) whereas the index for cattle had increased to 307.0. (Base 1954/55 - 1956/57 = 100).

Structure of the Broiler Industry

The structure of the industry has changed considerably from the early stages in the history of its development. At first, production was largely farmer/grower based and units were very small. Production was very profitable in the early 1950's, the price of poultry was still relatively high, and new entrants were soon attracted to the industry.

Clearly with the prospect of increased output and demand there were benefits to be obtained from the economies associated with scale of production. It was further realised that future growth in demand would be stimulated by a change from chicken being associated with luxury food in the minds of consumers to that of a low priced competitive product. This encouraged further economy in the production process.

The growth of the supermarket system of retailing (another innovating industry) required the regular supply of large quantities of broilers of uniform quality in the various weight grades. Other changes in the associated servicing industries also affected the change in the structure of the industry. In particular the establishment of specialist broiler breeding companies, the poultry housing and equipment manufacturing industry, and the feed industry encouraged growth in the scale of production due to the discount system and economies of scale in these sectors of the industry. Changes in packing and processing also required planned production and the regular supply of large quantities of birds.

TABLE VI

STRUCTURE OF BROILER INDUSTRY

NUMBER OF BROILER FLOCKS*IN ENGLAND AND WALES AND PERCENTAGE OF FLOCKS, BY SIZE OF FLOCK

Size of Flock	1960		1965		1970		1971		1972		1973		1974	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
1-999	4507	78.6	1434	51.4	745	39.3	714	39.8	799	42.1	887	44.3	583	36.6
1,000-1,999	245	4.3	108	3.9	92	4.9	84	4.7	92	4.9	104	5.2	81	5.1
2,000-4,999	337	5.9	201	7.2	129	6.8	116	6.5	113	6.0	121	6.1	97	6.1
5,000-9,999	317	5.5	407	14.6	256	13.5	231	12.9	235	12.4	223	11.2	168	10.5
10,000-19,999	203	3.6	339	12.2	276	14.6	249	13.9	220	11.6	205	10.3	217	13.6
20,000-49,999	102	1.8	205	7.3	244	12.9	241	13.4	251	13.3	274	13.7	249	15.6
50,000-99,999	12	0.2	59	2.1	91	4.8	94	5.2	104	5.5	98	4.9	111	7.0
100,000-249,999					39	2.1	42	2.3	59	3.1	59	3.0	66	4.1
250,000-499,999	6	0.1	37	1.3	8	0.4	10	0.6	12	0.6	8	0.4	7	0.4
500,000-999,999					6	0.3	8	0.4	3	0.2	10	0.5	10	0.6
1,000,000 & over					8	0.4	5	0.3	5	0.3	8	0.4	7	0.4
TOTAL FLOCKS	5729	100%	2790	100%	1894	100%	1794	100%	1893	100%	1997	100%	1596	100%

* On Agricultural Holdings.

Source: M.A.F.F. June Census.

TABLE VII

STRUCTURE OF BROILER INDUSTRY

NUMBER OF BROILERS*AND PROPORTION OF NATIONAL FLOCK IN ENGLAND AND WALES, BY SIZE OF FLOCK

Size of Flock	1960		1965		1970		1971		1972		1973		1974	
	Number '000s	%	Number '000s	%	Number '000s	%	Number '000s	%	Number '000s	%	Number '000s	%	Number '000s	%
1-999	530	4.1	169	0.6	130	0.3	124	0.3	133	0.3	147	0.3	98	0.2
1,000-1,999	358	2.8	132	0.5	119	0.3	104	0.3	117	0.3	132	0.3	103	0.2
2,000-4,999	1200	9.3	537	2.1	387	0.9	355	0.9	342	0.8	353	0.7	289	0.6
5,000-9,999	2359	18.2	2528	9.8	1785	4.3	1619	4.0	1673	4.1	1607	3.3	1211	2.5
10,000-19,999	3045	23.5	4152	16.1	3832	9.2	3489	8.6	3119	7.6	2889	6.0	3095	6.5
20,000-49,999	3318	25.6	5912	22.9	7394	17.8	7415	18.1	7699	18.6	8298	17.2	7491	15.7
50,000-99,999	759	5.8	3775	14.6	5936	14.3	6482	15.9	6860	16.6	6700	13.9	7521	16.0
100,000-249,999					5245	12.6	5772	14.1	7947	19.3	7828	16.2	8675	18.2
250,000-499,999	1391	10.7	8630	33.4	3096	7.4	3685	9.0	4788	11.6	2551	5.3	2410	5.1
500,000-999,999					4227	10.1	5506	13.5	2114	5.1	6698	13.9	6942	14.6
1,000,000 & over					9500	22.8	6249	15.3	6492	15.7	11150	22.9	9713	20.4
TOTAL NUMBER BROILERS	12960	100%	25833	100%	41651	100%	40800	100%	41284	100%	48353	100%	47548	100%

*On Agricultural Holdings.

Source: M.A.F.F. June Census.

All these factors gradually changed the structure of the industry from the independent grower, towards large scale production, to horizontal integration as well as the development of the group system and cooperatives. Further concentration took place in the 1960's, along with vertical integration of the whole chain of the production process from breeding, feeding, housing, production, and packing to the processing stage. Eventually this led to the establishment of completely integrated public companies. They could envisage the prospects for further growth, and the application of industrialisation to livestock production. Above all they were innovators, and were naturally attracted to the broiler industry which was a new industry and unfettered by traditional attitudes.

As a result of all these changes, and despite the fact that total production has trebled since 1960, broilers are now produced by fewer units and in the process unit size has of course increased substantially. Tables VI and VII give some indication of the changing structure of the industry. The total number of units amounted to 5729 in 1960. By 1965 numbers had more than halved to 2790, and further declined to about 1800 in the early 1970's. However, there were a signs of an increase between 1971 and 1973. But the difficult marketing situation in 1974 saw a marked drop of 20% in the number of units below 1973.

The contraction has taken place mainly amongst the small and medium scale units below 20,000 birds, whereas large scale units (over 100,000 birds) have increased from 6 in 1960 to 90 (including 7 units of over 1 million birds) in 1974. In 1960, 58% of the total output of broilers was produced by units below 20,000 birds. By 1974 this sector had diminished to 10%, and units of over 100,000 covered 58% of total output. The share of very small scale units has dropped and the number of small scale operators shows a sharp decline, particularly between 1973 and 1974. Although the production of fresh poultry is not concentrated solely on small scale units, nevertheless

they do tend to specialise in this sector of the industry. No doubt many of these operators will have been discouraged by the likely costs of implementing the E.E.C. Health Directive 118/71, which will increase the cost of processing and marketing poultry meat.

Integration and Contract System

The broiler industry is more closely linked in the form of vertical integration, horizontal integration and the contract system of production than any other sector of agriculture. There are several reasons for this development, the major one being the apparent inherent instability and volatile nature of the industry and its inability to match supply with the demand of the market. This indicated the need to control production at all stages of the production process.

At the same time, the growth of supermarkets required the regular volume supply of broilers at low prices. This pressurised the industry into reducing costs and encouraged increased scale of operation. Vertical integration enabled the elimination of several stages of the production process, such as direct sales to the retail industry, thus cutting out the wholesalers, and the establishment of their own feed mills instead of purchasing from compounders. Increased participation in the various production stages and scale of operation required heavy capital investment and the establishment of public companies.

The whole pattern of broiler production covers many stages. The first part is the specialist experimental broiler breeding stage, and the production of grandparent stock. This is followed by the supply farms (multiplying units) which produce hatching eggs for incubation by the hatcheries which supply day old chicks to the broiler production units. The broilers are then slaughtered, plucked, eviscerated, packed and then sold frozen, chilled or fresh according to the various weight and quality grades, either as whole broilers or further processed to the wholesale trade or direct to retailers. The breeders are frequently involved in the export market as well. Associated

TABLE VIII

MAJOR ORGANISATIONS and their MARKET SHARE of U.K. CHICKEN INDUSTRY

1971/72

	Company	Main Brands	Birds (millions)			Market Share
1.	Ross Poultry Ltd.	Buxted Ross	66	24%	36%	
2.	W. & J.B. Eastwood Ltd.	Chubby	33	12%		
3.	Union International Co. Ltd.	Sun Valley Country Produce	31		40%	76%
4.	D.B. Marshall (Newbridge) Ltd.	Chunky	22			
5.	Fitch Lovell Poultry Ltd.	Golden Produce	15			
6.	J.P.Wood Ltd.	Chukie	13			
7.	G.W. Padley Ltd.	Foremost	11			
8.	Moy Park Ltd.	Moy Park	8			
9.	F.M.C.(Meat) Ltd.	Blue Rosette	7			
10.	Thornhills (Packers) Ltd.	Thornhill	6			
	OTHERS		68			24%
	TOTAL		280			100%

1973/74

	Company	Main Brands	Birds (millions)			Market Share
1.	Ross Poultry Ltd.	Buxted	74	22%	33%	
2.	W. & J.B. Eastwood Ltd.	Chubby	37	11%		
3.	D.B.Marshall Ltd.	Chunky	25		40%	73%
4.	Fitch Lovell Poultry Ltd.	Golden Produce	22			
5.	Union International Co.Ltd.	Sun Valley Country Produce	22			
6.	J.P.Wood Ltd.	Chukie	16			
7.	G.W.Padley Ltd.	Foremost	13			
8.	Moy Park Ltd.	Moy Park	10			
9.	Pollastra Packers Ltd.	Suffolk Sovereign	9			
10.	F.M.C(Meat) Ltd.	Blue Rosette	7			
11.	Thornhill Packers Ltd.	Thornhill	6			
	OTHERS		89			27%
	TOTAL		330			100%

Source: B.P.M.A.

with the production process are the feed firms, poultry housing, equipment and processing manufacturers and the veterinary companies as well as other service industries.

Various forms of integration have taken place in the U.K., but unlike in the U.S.A., the feed firms have not generally been the motivating force. During the early stages the processors tended to motivate quasi forms of integration. This system would appear to be preferable, since the processors, as the pivot between supply and demand should be in a position to balance production. However, in practice this did not work out very satisfactorily and the industry became increasingly unstable. Booms and slumps characterised the market situation.

Severe competition for the market encouraged much firmer and extensive control of production from the breeding to the processing stage, the amalgamation of companies, take-overs, and the establishment of brand names of broilers which are now household names due to sales promotion and advertising.

In the early 1960's four packing companies covered 50% of all broiler sales; i.e. Buxted (25%), Fitch Lovell (12½%), F.M.C. (10%) and Ross (9%). The rest of the market consisted of about 100 firms. As Table VIII indicates, other firms have entered the industry and mergers have taken place. Many of the small firms have now disappeared.

Today eleven companies cover 73% of the market, and together with a further 14 smaller companies cover 90% of the market. Each company is different, some are more closely linked than others or may cover more sections of the production chain. The Ross Group which also includes the specialist breeding stage, and Eastwoods which also involves the building of poultry houses, are probably the most extensively integrated. Both companies operate their own feed mills as well. Most companies are specialist poultry meat companies, but may have associations with other firms, some are partly owned by feed firms, or are associated with the production and marketing of other food products e.g. Ross Group - fish, F.M.C. - red meat, or are multi-national

companies such as Union International Ltd.

Contract System

Although the integrated companies are heavily involved in their own-site production of hatching eggs as well as the finished broilers, there is considerable reliance by many companies on production under contract by independent growers. The output from these growers is marketed in conjunction with the output from company owned units under the brand name of the company.

The most recent information (1970/71) indicates that 40% of the total output of broilers was produced by units owned by companies, whilst 50% was produced by independent producers under contract and 10% was disposed on the open market. It is likely that the integrated companies now produce a much higher proportion of total output.

The contract system has grown out of the need for growers to secure a stable and firm outlet for their produce, to reduce risk and uncertainty, to expand their units, to obtain financial and technical assistance, to provide stable prices and improved conditions for long term planning. There have been problems with the contract system in the past where contracts were too open or loosely formed and preference might be given to a company's own production during difficult marketing situations. Some contracts were unfair to producers, where packers tended to gain a greater reward in relation to the risks involved. The main criticisms of contracts today are that they tend to be inflexible, producers being held to the contract price when the market improves unexpectedly. It is also felt that the price should be adjusted according to cost increases during the period of the contract. Producers, contracted to the same organisation, have tended to group together to strengthen their standing when negotiating new contracts.

There are various forms of contract, the most prevelant being the transferred management (in full or in part) type, which covered 73% of all broiler contracts in 1970/71. The contract is usually for a year and covers the whole

of the producer's output. Inputs such as the chicks, feed, catching, medication, vaccination and the insurance of the birds are generally supplied under the contract. The grower provides the housing, labour and covers other costs of production. Supervision and advice are provided by the packer or other organisation with whom the grower is contracted. The packer is responsible for marketing the broilers and the contract price is paid according to the agreement, allowance being made for changes in the price of feed and frequently there is an efficiency payment scheme as well.

There are other more open marketing contracts where the buyer has no control over methods of production, ownership and all costs of production are the responsibility of the grower, and the contract may only cover the price, quality and quantity specifications, weight of birds, and the date of delivery.

In 1970/71, most contracts were made with processors (67%), groups and cooperatives (28%) and wholesalers and others (5%).

The cooperatives have tended to be less important in the broiler sector than in the egg sector of the poultry industry. Nevertheless several important cooperatives operate within the broiler industry. They also make contracts with their grower/members and they are able to arrange advantageous buying contracts for their members with the feed firms, hatcheries, and poultry housing and equipment manufacturers.

Small scale units tend to operate outside the contract system, their units being too small to fit the requirements of the processors. Frequently they tend to concentrate on the fresh market for broilers as well as the heavier type of table bird, which they market either direct to consumers at the farm or to local shops.

Regional Distribution of the Broiler Industry

The number of broilers produced in each area has increased since 1960, but as Table IX indicates there have been shifts in the regional share of total production. During the early years of the development of the industry,

TABLE IX

REGIONAL DISTRIBUTION OF BROILERS (On Agricultural Holdings) ENGLAND & WALES (June Census)*

Region	1960	1965	1970	1971	1972	1973	1974	1975
	.....	.....	.....	'000s	.....	.....	.....	.....
England and Wales	12960	25833	41641	40800	41284	48353	47628	47259
East	3833	7603	10470	9413	8669	11339	11094	
	30%	30%	25%	23%	21%	23%	23%	
South East	3177	4408	6720	7001	6623	6984	6874	
	24%	17%	16%	17%	16%	14%	14%	
East Midlands	1447	4730	5959	5093	5775	5872	5957	
	11%	18%	14%	12%	14%	12%	13%	
West Midlands	1280	2698	4059	4673	5425	6043	5618	
	10%	11%	10%	12%	13%	13%	12%	
South West	1427	2413	4117	4366	4489	4493	4680	
	11%	9%	10%	11%	11%	9%	10%	
North	121	1106	5053	5246	5443	5832	5870	
	1%	4%	12%	13%	13%	12%	12%	
Yorks and Lancs	1380	2329	2898	2953	2835	3179	3265	
	11%	9%	7%	7%	7%	7%	7%	
Wales	296	547	2370	2055	2025	4611	4269	
	2%	2%	6%	5%	5%	10%	9%	
England	12665	25287	39281	38745	39259	43742	43358	
	98%	98%	94%	95%	95%	90%	91%	

DISTRIBUTION OF BROILERS AND OTHER TABLE FOWLS - UNITED KINGDOM

England and Wales	16659	27236	42723	41557	41889	48939	48086	47735
	91%	87%	86%	84%	82%	84%	85%	84%
Scotland	1154	2792	4858	5523	6235	7130	6263	5858
	6%	9%	10%	11%	12%	12%	11%	10%
N.Ireland	464	1185	2202	2650	2809	2297	2352	3115
	3%	4%	4%	5%	6%	4%	4%	6%
United Kingdom	18277	31213	49783	49730	50933	58366	56701	56708p.

Source: M.A.F.F. (% = Regional Share) *Number of Birds.

production tended to be concentrated in the eastern regions. In 1960, the East and South East covered 54% of total output. But by 1974, the share of this area had fallen to 37%. The most marked increase has occurred in the North and in Wales. Their share has increased from 3% to 21%. The regional shifts in production are probably mainly due to the establishment of very large scale units in some areas which has tended to influence the results. Contrary to the general decline in broiler numbers in the United Kingdom as a whole, the number increased markedly in N. Ireland between 1973 and 1975 largely due to expansion by Moy Park Ltd.

PART II

MARKETING

Marked changes in the marketing of poultry have occurred with the development of the broiler industry. Previously, table poultry had been largely sold as fresh New York dressed. With the setting up of large scale processing and packing stations, the practice of selling ready packed oven ready eviscerated poultry began, along with the freezing of poultry which allowed not only a longer shelf life, but also the means of storing an otherwise perishable product.

Integration and the contract system should provide greater control over the production process and in the level of supplies, and in turn should have resulted in an improvement in the apparently inherent unstable nature of the marketing of broilers, i.e. an imbalance between supply and demand, the tendency towards over production, the conflict of interest between the production, processing sectors, and retail sectors of the trade, and swings in the level of prices both on a seasonal and annual basis.

Meat Chick Placements

Chick placements provide a good indication of likely changes in the pattern of production. A cursory examination of the statistics in Table X might give the impression that the industry had settled down to a steady rate of growth. At least the annual statistics for the U.K. show an even rate of 5% per annum between 1970 and 1973. But there was a marked change in 1974, when placements declined by 1%. However, the situation changed again in mid-1975, when the improved competitive position of poultry meat caused a marked increase in chick placements. During the third and fourth quarters, placements increased by 16% and 12% respectively. The annual statistics for England and Wales show a rather more varied course of development.

TABLE X

MEAT CHICK PLACEMENTS (U.K.)

MONTH	1970	1971	1972	1973	1974	1975
	millions					
January*	26.69	26.60	28.02	30.87	34.21	30.08
February	21.45	21.80	23.90	23.65	27.64	25.80
March	21.57	23.38	24.71	26.25	29.85	27.25
1st Quarter	69.71	71.78	76.63	80.77	91.70	83.13
April*	26.90	28.21	29.87	31.71	35.93	31.82
May	21.80	22.33	24.69	25.31	25.41	25.92
June	21.56	24.01	24.87	25.71	23.61	25.80
2nd Quarter	70.26	74.55	79.43	82.73	84.95	83.54
July*	29.08	30.25	30.61	30.67	29.61	33.46
August	23.58	24.21	24.85	26.51	23.51	28.13
September	24.49	25.27	26.05	28.08	24.24	28.24
3rd Quarter	77.15	79.73	81.51	85.26	77.36	89.83
October*	26.67	28.08	27.17	28.65	25.87	31.22
November	21.42	21.49	23.04	24.87	21.90	22.18
December	20.60	22.99	24.81	26.95	23.97	26.63
4th Quarter	68.69	72.56	75.02	80.47	71.74	80.03

* 5 week month

Source: M.A.F.F.

TABLE X(a)

ANNUAL MEAT CHICK PLACEMENTS
England + Wales (only)

Year	millions	%Change	Year	millions	%Change	Year	millions	%Change
1961	106	-	1966	175	+ 12%	1971	245	+ 2%
1962	123	+ 16%	1967	193	+ 10%	1972	254	+ 4%
1963	131	+ 7%	1968	216	+ 12%	1973	267	+ 5%
1964	136	+ 4%	1969	229	+ 6%	1974	268	+ 0%
1965	156	+ 15%	1970	241	+ 5%	1975	275	+ 3%

Source: M.A.F.F.

TABLE X(b)

ANNUAL MEAT CHICK PLACEMENTS (U.K.)

Year	millions	%Change	Year	millions	%Change	Year	millions	%Change
1965*	n.a.	-	1969	267	+ 8%	1973	329	+ 5%
1966	200	-	1970	286	+ 7%	1974	326	- 1%
1967	224	+12%	1971	299	+ 5%	1975	337	+ 3%
1968	248	+11%	1972	313	+ 5%			

*Full U.K. data not available before 1966.

Source: M.A.F.F.

Broiler Throughput

The volatile nature of the broiler market becomes even more apparent from the more realistic picture of marketing, which is provided by packing station throughput, i.e. the actual production of the finished broilers (Table XI) rather than the number of chicks hatched for production purposes.

The actual number produced is mainly dependent upon the number of chicks hatched, but the total produced is influenced by other factors such as the effect of disease and variations in the weight ranges, which is related to the length of the growing period. The lighter the weight of the birds, the shorter the turn round and consequently the greater the number of birds produced in any one time period and vice-versa. There is also a time-lag of 10-12 weeks between the chick placement data and final throughput to allow for the production stage, which also effects the rate of annual change.

Packing station throughput of chickens and capons shows an erratic production pattern. Annual changes show an increase of 4% in 1970, a fall of 2% in 1971, a marked rise of 11% in 1972, a fall of 1% in 1973, followed by a further drop of 3% in 1974, and a more marked contraction of 10% during the first nine months of 1975. Quarterly throughput data show even more substantial swings.

Production and disposal data covering quick frozen poultry (Table XII) indicates even greater swings in the level of production, though this may be somewhat exagerated due to the inclusion of poultry other than broilers.

Marketing Problems

The reasons for the swings in the pattern of production are due not only to the effect of disease (production declined in 1971 due to the outbreak of fowl pest which caused a substantial rise in the mortality rate) and changes within the weight ranges. More fundamental reasons cause fluctuations in supplies. The main reason is the slow response, at first, to changes in the

TABLE XI

PRE-PACKED AND OTHER DRESSED POULTRY
THROUGHPUT OF FOWLS AT PACKING STATIONS IN ENGLAND AND WALES

Year	Quarter	Chickens* & Capons millions	%Change Previous Year %	Boiling Fowls millions	%Change Previous Year %	TOTAL million	%Change Previous Year %
1963	January-March	28.29	a	3.20	a	31.49	a
	April-June	29.87	a	2.78	a	32.65	a
	July-September	31.67	a	2.98	a	34.65	a
	October-December	28.83	a	3.15	a	31.98	a
	Annual	118.66		12.11		130.77	
1970	January-March	57.04	+ 5%	6.19	+11%	63.24	+ 6%
	April-June	57.90	+ 9%	6.28	+24%	64.17	+10%
	July-September	59.27	+ 5%	6.17	+16%	65.45	+ 6%
	October-November	55.81	- 3%	5.89	+29%	61.70	- 1%
	Annual	230.02	+ 4%	24.53	+20%	254.56	+ 5%
1971	January-March	50.17	-12%	6.85	+11%	57.03	-10%
	April-June	53.54	- 8%	4.78	-24%	58.32	- 9%
	July-September	59.33	+ 0%	5.53	-10%	64.86	- 1%
	October-December	62.84	+13%	5.55	- 6%	68.39	+11%
	Annual	225.88	- 2%	22.71	- 7%	248.60	- 2%
1972	January-March	60.88	+21%	6.19	-10%	67.07	+18%
	April-June	64.83	+21%	5.98	+25%	70.81	+21%
	July-September	65.21	+10%	5.39	- 2%	70.60	+ 9%
	October-December	60.66	- 4%	5.56	+ 0%	66.22	- 3%
	Annual	251.57	+11%	23.12	+ 2%	274.69	+11%
1973	January-March	61.72	+ 1%	6.77	+10%	68.49	+ 2%
	April-June	64.68	- 0%	5.00	-16%	69.68	- 2%
	July-September	62.22	- 5%	5.87	+ 9%	68.09	- 4%
	October-December	60.69	+ 0%	6.20	+12%	66.89	+ 1%
	Annual	249.32	- 1%	23.84	+ 3%	273.16	- 1%
1974	January-March	62.22	+ 1%	6.84	+ 1%	69.06	+ 1%
	April-June	64.99	+ 1%	6.78	+36%	71.77	+ 3%
	July-September	59.90	- 4%	5.93	+ 1%	65.83	- 3%
	October-December	53.84	-11%	5.38	-13%	59.22	-12%
	Annual	240.95	- 3%	24.94	+ 5%	265.89	- 3%
1975	January-March	52.83	-15%	6.23	- 9%	59.05	-15%
	April-June	59.61	- 8%	5.47	-19%	65.09	- 9%
	July-September	57.34	- 4%	5.75	- 3%	63.09	- 4%
	October-December	54.72	+ 2%	5.83	+ 8%	60.56	+ 2%
	Annual	224.50	- 7%	23.28	- 7%	247.79	- 7%

Source: M.A.F.F. (Survey 105 firms packing poultry in England and Wales)

*Series changed to Chickens and Capons in 1972. Previously Broilers and other Chickens. These statistics do not represent total poultry output. They do not include poultry marketed directly by producers to wholesale markets and consumers.

(a) 1962 - not available.

Due to rounding, individual items may not add to totals shown.

TABLE XII

U.K. PRODUCTION AND DISPOSAL OF QUICK FROZEN POULTRY AND POULTRY CUTS

HOME PRODUCTION[a]

Year	WHOLE BIRDS				POULTRY CUTS				TOTAL WHOLE AND CUTS			
	Retail Packs	Other	TOTAL	Annual % Change	Retail Packs	Other	TOTAL	Annual % Change	TOTAL	Annual % Change	% Share Whole	% Share Cuts
	'000 tons (net content)											
1969	30.6	19.5	50.1	n.a.	3.0	0.8	3.8	n.a.	53.9	n.a.	93%	7%
1970	37.8	19.1	56.9	+14%	2.6	0.8	3.4	-11%	60.3	+12%	94%	6%
1971	46.6	14.6	61.2	+ 8%	2.4	0.6	3.0	-12%	64.2	+ 6%	95%	5%
1972	55.5	13.6	69.1	+13%	2.5	1.6	4.1	+37%	73.2	+14%	94%	6%
1973	52.3	3.1	55.4	-20%	1.5	0.2	1.7	-59%	57.1	-22%	97%	3%
1974	50.2	1.1	51.3	- 7%	1.7	0.3	2.0	+18%	53.3	- 7%	96%	4%

DISPOSALS[b]

1969	29.7	22.2	51.9	n.a.	3.3	1.0	4.3	n.a.	56.2	n.a.	92%	8%
1970	33.6	19.6	53.2	+ 3%	2.2	1.4	3.6	-16%	56.8	+ 1%	94%	6%
1971	45.9	17.2	63.1	+19%	4.4	1.5	5.9	+64%	69.0	+22%	91%	9%
1972	50.6	18.6	69.2	+10%	3.0	2.5	5.5	- 7%	74.7	+ 8%	93%	7%
1973	48.3	5.7	54.0	-22%	2.5	0.8	3.3	-40%	57.3	-23%	94%	6%
1974	50.3	1.4	51.7	- 4%	2.3	0.7	3.0	- 9%	54.7	- 5%	95%	5%

Source: M.A.F.F. (Series started 1969) n.a. previously. (including Chickens, Hens, Turkeys, Geese, Ducks).

(a) Production Supplies packed for sale in retail & catering packs and supplies frozen in bulk for subsequent repacking.

(b) Disposals Sales by UK producers and distributors of home produced and imported supplies for home trade and exports.

price situation (the birds already being in the pipeline). This is then followed by a rapid reduction in the hatching of chicks which slows the rate of broiler production, by which time the price will have risen again, causing a further increase in supplies.

There is also a conflict of interest between the processing and production sectors. The packing industry requires a high rate of throughput to keep plants operating at full capacity in order to maximise returns (the lower the weight of the birds, the higher the throughput) as well as the need to retain workers. In the production sector, on the other hand, returns are generally maximised by the production of the heavier weight of bird and a longer turn round, particularly during periods of low prices, which results in a reduction in the number of birds produced on an annual basis.

Marketing becomes even more problematical due to the effect of factors outside the control of the industry. This has occurred in particular during the past three years due to the massive rise in the cost of feedingstuffs, the most important item in the cost of production, as well as to the marked rise in the demand for chicken during 1973 as a result of the sharp increase in the price of competitive red meat products. This in turn was followed by a marked increase in carcase meat supplies which consequently depressed the level of poultry meat consumption in 1974. The use of broilers for the operation of "loss-leader" techniques in the supermarket industries also acts as a disrupting measure. There is now closer co-operation than in the earlier years between supermarkets and processors, so that the market is less affected by this system of sales promotion.

The production of quick frozen poultry enables the industry to control the level of supplies, to a certain extent by cold storing, until the market situation improves. But there are limits to this exercise both in terms of the capacity of cold storage facilities and storage costs and particularly

TABLE XIII

U.K. QUARTERLY COLD STORAGE STOCKS 1967-75 POULTRY + RED MEAT

Year	MARCH (c) Chickens	(c) Turkeys	TOTAL POULTRY	(a) Beef +Veal	(a) Red Meat & Offal	JUNE (c) Chickens	(c) Turkeys	TOTAL POULTRY	(a) Beef +Veal	Red Meat & Offal
	'000 tons					'000 tons				
1967	6.5	0.9	8.6	n.a.	n.a.	5.3	1.0	7.3	n.a.	n.a.
1968	7.0	1.2	9.4	n.a.	n.a.	5.5	2.2	8.9	n.a.	n.a.
1969	6.6	4.0	11.9	n.a.	n.a.	5.4	4.0	10.4	n.a.	n.a.
1970	8.4	4.2	13.8	n.a.	n.a.	7.1	5.0	13.4	n.a.	n.a.
1971 (b)	8.2	3.1	12.6	n.a.	n.a.	6.3	2.5	10.1	14.8	73.2
1972	9.8	3.9	15.4	16.6	53.5	8.7	5.0	15.2	14.9	50.2
1973	5.4	3.6	9.8	24.5	60.6	5.5	3.6	10.2	34.6	83.9
1974	10.7	8.0	20.9	34.2	84.0	10.5	10.8	23.9	32.5	87.1
1975	7.1	6.9	15.5	61.3	99.8	5.4	6.0	13.0	59.7	96.7
	SEPTEMBER					DECEMBER				
1967	5.6	4.1	11.1	n.a.	n.a.	8.4	9.2	19.6	n.a.	n.a.
1968	5.7	4.9	11.9	n.a.	n.a.	8.5	11.9	22.1	n.a.	n.a.
1969	5.0	7.8	13.9	n.a.	n.a.	8.4	13.4	23.3	n.a.	n.a.
1970	5.8	7.2	14.7	n.a.	n.a.	7.4	11.8	21.5	n.a.	n.a.
1971	6.9	7.0	15.4	20.9	98.4	8.1	10.1	20.7	19.8	67.7
1972	6.5	6.9	15.0	13.5	34.2	6.5	10.1	18.0	22.7	64.7
1973	6.8	6.2	14.3	34.6	77.3	8.6	9.5	19.9	39.0	86.2
1974	12.9	16.2	32.2	40.4	91.7	9.9	18.4	30.6	50.9	98.1
1975	6.7	7.8	15.8	60.0	108.1	7.7	10.5	20.0	52.1	87.4

Source: M.A.F.F. (Storage stocks for returns nearest to 1st of Month)
(Stocks of Poultry Meat and Imported Red Meat and Offal in Public Cold Stores. Not including private stores, where considerable stocks are held).

(a) n.a. before 1971. (Imported Red Meat and Offal only).
(b) March 26th. n.a. earlier due to postal strike.
(c) Whole and Cuts.

recently with the marked increase in the cost of storing due to the rise in fuel charges. Information is only available covering stocks in public cold stores and not in private stores where the bulk of total stocks are held. The level of stocks is also a good indication of the market situation. As Table XIII shows, during 1973, which was a boom year, stocks declined, but there was a massive increase in 1974. Stocks in September 1974, for example, were nearly double the level of stocks in September 1973. 1974 was a disastrous year for the broiler industry. Cold storage facilities were fully stretched by excessive supplies of other poultry products as well as imported red meat particularly beef. This together with increased home production of beef put further pressure on the market. The contraction of the broiler industry between mid-1974 and early 1975 has had a noticable effect upon the level of storage stocks which have returned to their near normal level of 6-7000 tons. However, recent data indicate an increase in stocks which should act as a warning signal to the industry not to overeact to the more favourable marketing situation in late 1975 and early 1976.

The industry is not affected to the same extent as in the U.S.A., where broilers tend to be "blown in" to the market, where the feed firms largely control integration. The U.K. industry is more centrally organised and therefore should be in a better position to plan and programme supplies according to market demand. It tends to avoid the more violent fluctuations which characterise the American industry. Nevertheless the industry was subjected to considerable strain in 1974. At times it was estimated that losses amounted to between £1 million and £3m. per week. Packers closed factories, many workers were dismissed, and several companies were bankrupted.

It should also be mentioned that the Restrictive Trade Practices Act prevents any collective agreement to control or limit supplies. In addition during 1973/74, the advent of consumer subsidies and preferential treatment for other competitive red meat products have also raised major marketing

TABLE XIV

U.K. MONTHLY COLD STORAGE STOCKS OF POULTRY + RED MEAT AND OFFAL[a] 1971-75

	CHICKEN[d]	TURKEYS[d]	ALL POULTRY AND GAME[b]	BEEF	TOTAL RED MEAT AND OFFAL[a]
			'000 tons		
1971					
J	8.0	2.0	11.7	n.a.	n.a.
F(c)	n.a.	n.a.	n.a.	n.a.	n.a.
M(c)	n.a.	n.a.	n.a.	n.a.	n.a.
A	8.2	3.1	12.6	n.a.	n.a.
M	6.5	2.4	10.2	16.7	72.3
J	6.3	2.5	10.1	15.2	72.8
J	7.0	3.2	11.5	16.1	71.4
A	7.1	3.6	12.1	18.3	81.0
S	6.9	7.0	15.4	20.9	98.4
O	6.9	6.3	14.7	20.9	101.4
N	7.8	8.0	17.3	21.0	90.6
D	8.1	10.1	20.7	19.8	67.7
1972					
J	7.0	2.4	11.6	19.0	60.3
F	9.3	2.8	13.6	17.8	52.3
M	9.8	3.9	15.4	16.6	53.5
A	9.5	3.5	14.4	14.9	53.8
M	9.1	3.9	14.6	16.6	57.1
J	8.7	5.0	15.2	14.9	50.2
J	8.8	5.0	15.4	15.4	48.3
A	6.4	7.1	15.1	14.3	43.0
S	6.5	6.9	15.0	13.5	34.2
O	7.1	7.9	16.3	17.8	50.3
N	7.0	8.0	16.1	20.3	63.6
D	6.5	10.1	18.0	22.7	64.7
1973					
J	5.3	1.8	8.0	22.7	60.0
F	5.8	2.9	9.6	20.8	59.0
M	5.4	3.6	9.8	24.5	60.6
A	5.0	3.9	9.7	27.7	67.6
M	5.3	3.5	9.6	30.0	74.8
J	5.4	3.5	9.8	34.3	82.4
J	6.1	3.7	11.2	34.9	79.7
A	6.6	4.3	11.7	34.2	77.8
S	6.6	4.1	11.7	34.4	77.4
O	7.0	8.0	16.5	34.7	76.2
N	8.0	9.4	19.0	37.4	83.2
D	8.3	9.6	19.8	38.1	84.6

For notes on coverage - see following page.

TABLE XIV (Continued)

MONTHLY COLD STORAGE STOCKS POULTRY + RED MEAT[a] 1974+1975

	CHICKEN[d]	TURKEYS[d]	ALL POULTRY AND GAME[b]	BEEF	TOTAL RED MEAT AND OFFAL[a]
			'000 tons		
			1974		
J	8.7	7.0	18.1	35.6	79.4
F	8.4	3.7	14.0	33.4	80.3
M	10.7	8.0	20.9	34.2	84.0
A	11.3	9.9	24.0	33.4	85.9
M	10.6	10.6	24.0	32.6	87.8
J	10.5	10.8	23.9	32.5	87.1
J	12.0	12.0	27.2	36.7	95.3
A	11.8	16.1	30.9	38.1	94.3
S	12.9	16.2	32.2	40.4	91.7
O	12.5	18.5	33.3	42.1	87.5
N	11.8	17.6	31.6	45.9	87.1
D	9.9	18.4	30.6	50.9	98.1
			1975		
J	9.0	6.9	17.7	54.3	97.1
F	8.3	6.6	16.9	59.4	102.2
M	7.1	6.9	15.5	61.3	99.8
A	5.9	6.7	14.3	59.7	95.3
M	6.0	6.0	13.6	60.9	99.4
J	5.4	6.0	13.0	59.7	96.7
J	5.5	6.6	13.8	59.6	96.5
A	7.0	7.6	16.3	60.2	102.3
S	6.7	7.8	15.8	60.0	108.1
O	6.8	9.0	17.4	56.5	106.8
N	6.6	9.4	17.6	58.1	108.1
D	7.7	10.5	20.0	52.1	87.4

Source: M.A.F.F. (Stocks of Poultry Meat and Imported Red Meat in Public Cold Stores. Not including private cold stores where considerable stocks are held.)
Storage stocks for returns nearest to 1st day of month.

(a) Imported red meat only.

(b) Including other poultry and game (excluding rabbits)

(c) n.a. due to postal strike.

(d) Whole and Cuts.

problems for the industry. The European Commission has added further problems over the possibilities of exporting to other E.E.C. countries by the imposition of processing and marketing regulations.

Seasonal Throughput

The quarterly throughput of prepacked and other dressed poultry indicates that there is still a tendency for throughput to be higher during the summer months when there is increased demand for chicken. Cold storage stocks are normally lower during the summer months than during the winter. A comparison of quarterly throughput on an annual basis reveals considerable variation in total supplies. Disposal of broilers is of course related to the factors already mentioned, but in particular to changes in demand.

Slaughter Weights

Analysis of slaughter weights (Table XV) indicates that the 3 to 3½ pound broiler is the most popular weight of bird, and it accounts for about a third of throughput. The weight range between 2½ to 4 pounds covers about 80% of total throughput. Nevertheless there are quarterly swings between the various weight grades. In 1973, for example there was a substantial increase in the heavier weight of bird over 4 lbs. during the last quarter, and a marked swing towards the smaller weight of birds during the first quarter of 1974. The production of capons reaches a peak during the last quarter to cover the Christmas market.

Further processing of poultry has taken place to encourage demand. An expansion of outlets has occurred with the processing of pre-stuffed birds, as well as the development of specialist chicken restaurants which provide on the spot or take-home meals. However, it is surprising that there has not been an expansion of the "poultry cuts" market. The disposal data (Table XII) indeed show a decline in this market between 1971 and 1974. This is in marked

TABLE XV

PACKING STATION THROUGHPUT BY WEIGHT OF CHICKENS AND CAPONS (Oven Ready Weight)

Year	Quarter	Under 2½ lb %	2½-3 lbs %	3-3½ lbs %	3½-4 lbs %	Over 4 lbs %	Capons %
1972	Jan - March	7.7%	19.3%	33.8%	23.2%	14.6%	1.4%
1973	" "	5.5%	19.5%	35.8%	22.2%	16.1%	0.8%
1974	" "	10.5%	26.6%	32.7%	18.6%	11.2%	0.4%
1975	" "	8.5%	24.8%	32.2%	22.8%	11.2%	0.5%
1972	April - June	7.3%	20.2%	33.9%	23.5%	14.5%	0.6%
1973	" "	8.0%	19.4%	30.2%	25.7%	15.9%	0.8%
1974	" "	7.2%	19.5%	33.6%	23.7%	15.4%	0.6%
1975	" "	7.5%	20.7%	35.4%	23.5%	12.5%	0.4%
1972	July - September	8.5%	24.3%	35.3%	21.3%	9.8%	0.8%
1973	" "	7.6%	20.6%	31.2%	24.2%	15.5%	0.9%
1974	" "	6.0%	20.1%	34.1%	24.2%	14.7%	0.9%
1975	" "	8.0%	21.8%	35.1%	23.6%	10.7%	0.8%
1972	October-December	7.3%	24.4%	35.2%	20.5%	10.7%	1.9%
1973	" "	7.9%	21.9%	30.1%	22.0%	16.8%	1.3%
1974	" "	8.1%	24.2%	33.4%	22.6%	10.4%	1.3%
1975	" "	7.6%	19.8%	33.9%	24.4%	12.5%	1.8%

Source: M.A.F.F.

contrast to the development of the marketing of poultry in other countries such as U.S.A. and Israel.

Fresh Poultry Market

Although the frozen oven ready trade covers the major sector of the market, there is still a considerable trade in fresh clean plucked poultry (uneviscerated). Recent estimates indicate the sale of fresh chicken covered 65,000 tons in 1973 (14% of total output). Production is year round for the lighter weights of chicken whilst there is great emphasis on the Christmas market for the sale of large cockerels and capons.

The specialised production and sale of chilled fresh poultry (eviscerated) has also increased. This has a short shelf life compared to frozen poultry, but clearly there is a demand for this product since one of the major super-market chains concentrates on the sale of poultry of this type.

PART III

CONSUMPTION

The marked increase in the consumption of poultry since the early 1950's is due to the influence of a number of factors which have all favoured the growth of the industry. The relatively slow increase in the size of the population has caused a slight increase in consumption, but this has been a minor influence upon the conspicuous increase in the level of consumption.

The main causes of the substantial increase in consumption per capita have been the effect of the rising affluence of the population since the war, which has resulted in a marked change in the pattern of food consumption, the effect of consumer preference for the more palatable foods, and the relationship between the price of poultry meat and the price of other competitive products, particularly the price of red meat.

At the same time the technical achievements in the production and marketing of poultry have resulted in chicken being available throughout the year at a relatively low price instead of being a high priced luxury seasonal product. The growth of the supermarket industry, changes in retailing methods and shopping habits, as well as changes in the processing of birds into convenience food products have also had a significant effect upon the level of consumption.

Table XVI provides a striking indication not only of the marked increase in the consumption of poultry on a per capita basis, but also of the increased share of the total meat market accruing to poultry. Pre-war only 5 pounds of poultry were consumed per capita and poultry covered only 3.7% of the total meat supplies per capita. By 1960, when the broiler industry had been in operation for only a few years, consumption had more than doubled to 12 pounds

until 1974/75

TABLE XVI

FOOD SUPPLIES PER CAPITA (pounds)

Year	Beef and Veal		Mutton & Lamb	Pork	Offal	TOTAL RED MEAT	Canned Meat(b)	Bacon and Ham	POULTRY MEAT	Rabbits and Game	TOTAL MEAT	% POULTRY
	Bone in	Bone out										
Pre-War	53.2	1.7	25.2	12.3	7.4	99.8	6.8	26.4	5.1	(a)	138.1	3.7%
1955	44.8	1.9	24.4	17.9	8.0	97.0	8.5	24.8	6.4	0.5	137.2	4.6%
1957	51.9	2.2	21.9	17.5	8.8	102.3	9.1	23.6	7.9	0.6	143.5	5.5%
1960	45.1	2.1	24.5	19.2	8.6	99.5	8.5	25.0	11.7	0.6	145.3	8.0%
1961	47.5	1.5	25.4	19.1	9.1	102.6	8.7	25.3	14.2	0.6	151.4	9.4%
1962	48.7	2.3	24.7	21.4	9.5	106.6	8.2	26.1	14.9	0.6	156.4	9.5%
1963	51.1	1.8	23.6	21.5	9.6	107.6	7.7	25.2	14.9	0.5	155.9	9.6%
1964	44.2	3.2	23.7	22.8	9.8	103.7	7.8	25.3	15.8	0.6	153.2	10.3%
1965	39.4	4.9	23.1	25.7	9.7	102.8	6.9	25.9	16.7	0.6	152.9	10.9%
1966	41.4	4.0	23.5	24.5	9.8	103.2	7.1	25.1	17.8	0.7	153.9	11.6%
1967	45.2	2.7	23.8	22.6	10.0	104.3	8.0	24.7	18.9	0.6	156.5	12.1%
1968	42.7	2.6	23.3	23.4	10.1	102.1	7.9	25.3	21.3	0.6	157.2	13.5%
1969	42.7	4.4	21.7	24.6	8.2	101.6	7.0	25.1	22.3	0.6	156.6	14.2%
1970	41.6	5.6	21.2	24.4	7.7	100.5	7.4	25.2	23.6	0.6	157.3	15.0%
1971	40.9	6.7	22.1	26.0	7.8	103.5	7.6	26.2	23.5	0.6	161.4	14.6%
1972	36.4	9.6	20.4	27.2	8.0	101.6	7.8	24.7	26.5	0.6	161.2	16.4%
1973	32.7	10.0	18.2	26.7	7.6	95.2	7.7	22.3	25.9	0.6	151.7	17.1%
1974	43.3	6.0	17.0	26.5	7.5	100.3	6.9	20.9	25.7	0.5	154.3	16.7%
1975	47.0	5.0	18.2	22.7	8.7	101.6	7.0	19.1	25.0	0.4	153.1	16.3%

Source: C.E.C. + M.A.F.F. (Total product weight)
(Not comparable with National Food Survey Statistics)

(a) Rabbits & Game included in Canned Meat - pre-war.
(b) Imported.

per capita and its share had increased to 8.0%. Between 1960 and 1974, consumption more than doubled again to 26 pounds and covered 17% of total meat supplies per capita. However consumption declined in 1975.

During the period 1960-72 the consumption of red meat increased slightly, but later deteriorated to the same level as in 1960 to about 100 pounds per capita. The total consumption of meat therefore increased by approximately the same number of pounds as the increased consumption of poultry meat. In 1973, there was a marked fall in red meat consumption to 95 pounds. But the level of supplies recovered again to 100 pounds in 1974. In contrast, to the normal pattern of increasing annual supplies of poultry meat, there was a slight drop in 1974, and a fall in 1975 caused by increased supplies of beef and mutton and lamb.

It should be noted that the statistics for this table cover total food supplies and are not comparable with household food consumption statistics. Meals consumed outside the home cover a fair proportion of total food expenditure. The rise in consumer expenditure on meals eaten outside the home as a percentage of total household expenditure has increased from 9% in 1953/54 to 15% in 1973.

There have been some interesting changes in the consumption of meat outside the home since 1955.

Household Consumption as % Total Supplies

	1955	1960	1973	1974
Beef	65%	60%	48%	49%
Mutton and Lamb	87%	88%	79%	79%
Pork	42%	34%	37%	39%
Poultry	24%	45%	77%	65%

The above estimates provide only an approximate indication since the basis covering national supplies and household consumption are not strictly comparable.

However they do indicate changed consumer attitudes to the various types of meat. Poultry is no longer associated in the minds of consumers as a luxury food gen -erally consumed at special meals celebrated outside the home. Household consumption as a percentage of total supplies increased from 24% in 1955 to as high as 77% in 1973. Beef, on the other hand, having increased in price, is regarded more as a luxury food, particularly the more expensive cuts and joints and frequently provides the basis for special occasion meals nowadays. As a result, the percentage consumed outside the home has increased. Household consumption of pork has tended to increase in percentage terms in recent years. It is not regarded so much as being a seasonal item. No doubt the increase in the number of households with refrigerators and deep-freezers has contri- buted towards this trend.

Consumer Expenditure

During the period between the early 1950's and 1970's consumer income and expenditure increased substantially. Table XVII indicates the marked increase in total household expenditure. At the same time expenditure on food has increased, but the proportion of total expenditure spent on food has tended to decline at least to 1973, whilst a growing proportion has been spent on items that are characteristic of an affluent society, e.g. refrigerators, T.V. sets, cars, central heating and continental holidays. Expenditure on alcohol has also increased.

Food as a percentage of total expenditure fell from 33.3% in 1953 to 24.4% in 1973. (National Food Survey data generally indicate a rather lower percentage for food in recent years than the family Expenditure Survey, e.g. in 1973 at current prices it was 21.7% in the N.F.S.). There was a noticable slowing down in the rate of fall in 1972 and 1973 which may be attributed to the marked increase in the price of food. However, in real terms, (at 1970 prices), food expenditure as a percentage of total expenditure continued to

TABLE XVII

AVERAGE WEEKLY HOUSEHOLD EXPENDITURE[e]

	1953/54 £	1960 £	1965 £	1970 £	1971 £	1972 £	1973 £	1974 £
Food	3.99	5.09	5.93	7.35	8.02	8.72	9.63	11.29
Beef & Veal	0.16	0.27	0.35	0.45	0.46	0.52	0.57	0.79
Mutton and Lamb	0.10	0.17	0.21	0.22	0.25	0.26	0.30	0.33
Pork	0.04	0.07	0.12	0.15	0.16	0.19	0.23	0.26
Bacon and Ham	0.19	0.17	0.20	0.24	0.24	0.26	0.32	0.36
Ham (Cooked)	0.04	0.06	0.06	0.07	0.08	0.09	0.11	0.13
Poultry	0.05[b]	0.42	0.48	0.63	0.67[c]	0.78[c]	0.91[c]	0.98[c]
Meals Out	0.37	0.51	0.66	1.00	1.11	1.26	1.41	1.63
Alcohol	0.41	0.55	0.83	1.27	1.46	1.65	1.85	2.21
Total Expenditure	12.00	16.40	21.25	28.57	30.99	35.06	39.43	46.13
Food as % Total Exp.	33.3%	31.0%	27.9%	25.7%	25.9%	24.9%	24.4%	24.5%
Income Elasticity of Food Exp. (d)	0.30[a]	0.25	0.23	0.20	0.20	0.23	0.18	0.21

(a) 1955

(b) Including rabbits

(c) Poultry and other undefined meat

(d) National Food Survey

Source: (e) Family Expenditure Survey, Annual Reports Department of Employment.

increase on items such as consumer durables until 1973. But with the marked increase in food prices, food expenditure as a percentage of total expenditure began to rise in 1974 and will likely have increased further in 1975.

Income Elasticity of The Demand for Poultry

The effect of the influence of a rising standard of living and an increase in disposable incomes upon the demand for food and of poultry in particular, is reflected by the income elasticity of the demand for these products.

Between 1956-65, disposable incomes (in real terms) increased by 25%, between 1965-70 by 6%, and between 1970-74 by 17.5%. In money terms incomes increased by 50%, 26% and 70% respectively. The income elasticity of the demand for all food products declined from 0.30 in 1955 to 0.18 in 1973, apart from a slight rise to 0.23 in 1972. The marked rise in incomes in 1973 no doubt resulted in the spending of a higher proportion on other goods and services than on food. However, in 1974, the income elasticity of the demand for food increased to 0.21, and will likely have risen further in 1975.

By comparison the income elasticity of the demand for poultry at 1.70 was much higher than the elasticity of the demand for all food in 1955, i.e. a 1% increase in income per head resulted in an increase of 1.70% in expenditure on poultry (1.61 in quantity), whereas the effect on total expenditure on all food at that time was only 0.30%.

A high income elasticity rate for poultry meat together with the fact that disposable incomes have increased substantially have clearly had a favourable effect upon the level of poultry meat consumption and expenditure. This occurred particularly during the early period of the development of broiler production. The elasticity of demand for poultry has declined over time, as Table XVIII indicates, though it was still high in 1960 at 1.37. Estimates of the rate for broilers indicate a much lower rate for this product of 0.42

by 1965. Annual changes since 1965 generally trended downwards, and levelled out at 0.39 in 1971/72. However in 1973 there was a marked fall to 0.04 (quantity) and 0.10 (expenditure). This indicates that income, on average, had very little effect upon the level of household broiler consumption, and that other factors were responsible for the marked increase in household consumption in 1973. However, in 1974, the income elasticity of the demand for broilers increased to 0.37, which was approximately at the same level as in 1972.

Elasticity of Demand for Red Meat and Chicken

Changes in the income elasticity of the demand for the various red meats and poultry have also influenced the level of poultry consumption, since clearly there are opportunities available to consumers to switch demand according to the level of income. A rising standard of living increases demand for a more varied, interesting and palatable diet as well as a taste for more expensive food.

The relationship between the income elasticity rates for the various meats is shown in Table XVIII. (expenditure and quantity). The rates covering quantity are generally lower than for expenditure because rising incomes tend to cause consumers to demand the more expensive cuts. The income elasticity of demand was much lower for carcase meat, particularly beef, than for poultry during the earlier years. The demand for beef appeared to reach saturation point in 1958 with an income elasticity of -0.02 (quantity). However, with the more rapid rate of growth in incomes in the 1960's, together with reduced supplies, the elasticity rate increased and was much higher than for broilers by 1973. The influence of the elasticities for the various types of meat is reflected at least until 1972, by the per capita consumption levels. The consumption of poultry, pork and beef (bone-out) has increased at the expense of beef (bone-in) and mutton and lamb, i.e. there has been increased consumption of those products earlier associated in consumer minds as the more luxurious

TABLE XVIII

INCOME ELASTICITIES OF DEMAND FOR RED MEAT AND POULTRY

INCOME ELASTICITY OF EXPENDITURE

	1955	1960	1965	1971	1972	1973	1974
Beef and Veal	0.18	0.16	0.21	0.35	0.39	0.42	0.40
Mutton and Lamb	0.48	0.38	0.27	0.07	0.45	0.24	0.23
Pork	0.38	0.46	0.35	0.32	0.39	0.32	0.38
Carcase Meat	0.31	0.27	0.25	0.27	0.41	0.35	0.35
Bacon and Ham	0.32	0.27	0.17	0.16	0.21	0.17	0.22
Poultry	1.70[a]	1.37[a]	0.88[a]	0.62[a] 1.14[c]	0.75[a]	0.96[a]	0.57[a]
BROILERS	n.a.	n.a.	0.42[b]	0.39[b]	0.39[b]	0.10[b]	0.37[b]
ALL FOOD	0.30	0.25	0.23	0.20	0.23	0.18	0.21

INCOME ELASTICITY OF QUANTITY PURCHASED

Beef and Veal	0.08	0.07	0.10	0.30	0.28	0.36	0.32
Mutton and Lamb	0.35	0.29	0.21	0.01	0.39	0.21	0.15
Pork	0.30	0.43	0.31	0.31	0.44	0.29	0.23
Carcase Meat	0.21	0.19	0.18	0.21	0.35	0.29	0.25
Bacon and Ham	0.24	0.22	0.11	0.08	0.11	0.05	0.14
Poultry	1.61[a]	1.34[a]	0.82[a]	0.64[a] 1.06[c]	0.60[a]	0.83[a]	0.46[a]
BROILERS	n.a.	n.a.	0.42[b]	0.37[b]	0.33[b]	0.04[b]	0.31[b]

Source: National Food Survey.

(a) Poultry-uncooked.

(b) Broilers.

(c) Uncooked - Quick Frozen.

meat products. From time to time the pressure of supplies or shortages of particular products has of course influenced the situation e.g. the marked increase in production of broilers in 1972, and the shortage of beef in 1973. The income elasticity of demand for a particular food product generally rises when the price rises relative to the price level of other products, particularly if this occurs in real terms. The income elasticity of the demand for broilers was higher in 1974 than in 1973 in view of the increase in the price of broilers and the pressure of increased supplies of beef.

Household Consumption

Household consumption in terms of the number of ounces purchased per person per week, for the various types of carcase meat and poultry is indicated in Table XIX. This shows the changing pattern of meat eating habits of consumers between 1955 and 1975. The consumption of carcase meat declined from 18.23 ozs in 1955, to 17.32 ozs in 1960, and to 13.68 ozs in 1973. The level increased to 14.65 ozs in 1974 though it was still below 1972. Consumption increased again in 1975. The general decline amounted to 17% between 1955-75.

Meanwhile, in marked contrast, the consumption of poultry meat increased substantially from 0.48 ozs in 1955 to a peak of 6.06 ozs (including cooked chicken) in 1973. Apart from a slight fall which occurred in 1971, due to a reduction in supplies caused by the fowl pest outbreak, consumption increased each year until 1974, when there was a marked decline to 5.14 ozs. However, a substantial recovery occurred in 1975 to 5.69 ozs, though this was still below the high level of 6.06 ozs in 1973.

Within the carcase meat sector, there have been shifts in consumption between the various types of carcase meat. Beef consumption, except for occasional annual increases has generally declined between the 1950's and the early 1970's. However, a marked increase occurred in 1974 and 1975. There has been a substantial downward trend in mutton and lamb consumption until

TABLE XIX

HOUSEHOLD PURCHASES - Ounces/Person/Week

Year	Beef and Veal	Mutton and Lamb	Pork	Total Carcase Meat	Bacon and Ham	TOTAL POULTRY	BROILERS (and poultry)[b]	Cooked Chicken	Other Poultry Uncooked	Other Poultry Uncooked Quick Frozen
1955	9.36	6.55	2.32	18.23	5.35	0.48	0.48[a]	n.a.	n.a.	n.a.
1960	8.72	6.60	2.00	17.32	5.31	1.61	1.52[b]	0.09	n.a.	n.a.
1961	9.08	6.74	1.94	17.76	5.22	2.28	2.18[b]	0.10	n.a.	n.a.
1962	8.98	6.67	2.28	17.93	5.53	2.21	2.12[b]	0.09	n.a.	n.a.
1963	9.40	6.31	2.46	18.17	5.33	2.43	2.34[b]	0.09	n.a.	n.a.
1964	8.49	6.26	2.31	17.06	5.31	2.63	2.52[b]	0.11	n.a.	n.a.
1965	8.04	5.88	2.79	16.71	5.41	3.41	3.28[b]	0.13	n.a.	n.a.
1966	8.08	6.25	2.75	17.08	5.29	3.96	2.64[c]	0.16	0.88	0.28
1967	8.54	6.02	2.28	16.84	5.16	3.95	2.87[c]	0.22	0.54	0.32
1968	7.72	5.67	2.51	15.90	5.13	4.70	3.15[c]	0.20	0.84	0.51
1969	7.68	5.33	2.77	15.78	5.11	4.82	3.30[c]	0.20	0.75	0.57
1970	7.77	5.18	2.81	15.76	5.28	4.97	3.48[c]	0.22	0.62	0.65
1971	7.94	5.39	3.03	16.36	5.11	4.85	3.26[c]	0.21	0.76	0.62
1972	6.87	4.94	3.08	14.89	4.67	5.59	3.65[c]	0.22	1.72	
1973	6.28	4.41	2.99	13.68	4.40	6.06	3.94[c]	0.23	1.89	
1974	7.38	4.09	3.18	14.65	4.18	5.14	3.59[c]	0.19	1.36	
1975	8.27	4.22	2.71	15.20	3.99	5.69	3.75[c]	0.18	1.76	

Source: National Food Survey.

(a) Poultry.

(b) Broilers + poultry excluding cooked chicken 1960-65

(c) Broilers only.

TABLE XX

ANNUAL[(a)] HOUSEHOLD EXPENDITURE P/PERSON/WEEK

Year	Beef and Veal p	Mutton and Lamb p	Pork p	Bacon and Ham p	TOTAL POULTRY p	Poultry Broilers p	Cooked Chicken p	Other Poultry Uncooked p	Other Poultry Uncooked Quick Frozen p
1955	10.05	6.21	2.31	5.96	0.50	0.50[b]	n.a.	n.a.	n.a.
1960	11.34	7.00	2.61	6.59	2.04	1.88[b]	0.16	n.a.	n.a.
1961	11.89	7.00	2.55	6.44	2.66	2.49[b]	0.17	n.a.	n.a.
1962	12.07	7.13	2.95	6.74	2.56	2.43[b]	0.13	n.a.	n.a.
1963	12.71	6.88	3.17	6.75	2.70	2.56[b]	0.14	n.a.	n.a.
1964	12.79	7.43	3.16	7.24	3.15	2.95[b]	0.20	n.a.	n.a.
1965	13.42	7.43	3.86	7.38	3.86	3.63[b]	0.23	n.a.	n.a.
1966	13.94	8.12	4.02	7.66	4.52	2.95[c]	0.29	0.96	0.32
1967	14.77	7.74	3.59	7.79	4.39	3.06[c]	0.40	0.59	0.34
1968	14.76	7.88	4.08	7.86	5.13	3.35[c]	0.37	0.88	0.53
1969	15.68	8.00	4.69	8.30	5.35	3.55[c]	0.38	0.84	0.58
1970	16.45	8.00	5.11	9.10	5.71	3.89[c]	0.42	0.70	0.70
1971	18.96	9.14	5.78	9.32	6.10	3.96[c]	0.42	0.98	0.74
1972	18.46	9.66	6.55	9.70	6.93	4.32[c]	0.51	2.10	
1973	21.92	11.15	8.06	12.35	9.47	6.02[c]	0.58	2.87	
1974	26.62	11.68	9.01	13.82	9.16	6.13[c]	0.65	2.39	
1975	32.51	13.12	9.61	15.58	12.24	7.79[c]	0.75	3.71	
1975[1]	32.98	12.09	8.99	14.43	10.61				
" 2	29.36	13.17	8.89	15.19	12.00				
" 3	32.34	14.27	9.27	15.54	12.49				
4	35.37	12.93	11.28	17.16	13.87				

1975 (1) January-March
(2) April-June
(3) July-September
(4) October-December

Source: National Food Survey. (a) Quarterly-1975
(b) Poultry
(c) Broilers

1975, when there was a slight increase. Pork on the other hand, increased until 1975, when there was a marked fall below the year earlier level. Bacon and ham consumption has dropped by as much as 24% since 1970. It is also notable that the consumption of fish has also declined. Fish also competes with poultry for a share of the housewife's purse.

Household purchases of broilers averaged 3.75 ozs/week and covered 66% of total poultry meat purchases in 1975. Cooked chicken amounted to 0.18 ozs/week and covered 3% of purchases, whilst other poultry (including chicken over 4 pounds) amounted to 1.76 ozs/week and covered 31% of total purchases. Poultry meat is largely purchased in the form of frozen whole birds or parts and covers in the region of four-fifths of total household purchases.

The increased consumption of poultry is also related to the number of households purchasing poultry each week. In 1955, only 3% of households in the National Food Survey, purchased poultry regularly each week, whereas the percentage had increased to 26% in 1973, though there was a slight fall of 2% to 24% in 1974/75.

In earlier years, when the level of consumption was very low, chicken was mainly eaten during the summer months and at Christmas. However, the ready availability of chicken throughout the year, together with the rise in the standard of living, has resulted in the seasonal pattern of consumption becoming more relatively even throughout the year. The level of seasonal consumption is of course affected by the general trend towards increased consumption, as well as by the effect of the relative price of chicken and of red meat.

Seasonal and Quarterly Pattern of Consumption

Table XXI which shows consumption and expenditure of poultry meat indicates that there is a tendency for consumption to be slightly higher during the summer months, and Table XXII covering broiler consumption also reflects

TABLE XXI

SEASONAL POULTRY MEAT CONSUMPTION

Year	CONSUMPTION OF POULTRY MEAT Ozs/Person/Week					EXPENDITURE ON POULTRY MEAT p/Person/Week					% Households Purchasing Poultry	
	Jan-March	April-June	July-Sept	Oct-Dec	ANNUAL	Jan-March	April-June	July-Sept	Oct-Dec	ANNUAL AVERAGE	Poultry	Cooked Poultry
	ozs					pence					%	%
1955[a]	0.47	0.48	0.42	0.54	0.48	0.51	0.54	0.40	0.54	0.50	3%	n.a.
1960[b]	1.58	2.02	1.64	1.83	1.77	1.71	2.43	2.06	1.97	2.04	9%	1%
1961[b]	2.30	2.56	2.49	2.32	2.42	2.66	2.76	2.73	2.50	2.66		2%
1962[b]	2.09	3.09	2.20	2.14	2.38	2.16	3.33	2.43	2.33	2.56	15%	1%
1963[b]	2.33	2.67	2.88	2.50	2.59	2.50	2.76	2.95	2.60	2.70	16%	2%
1964[b]	3.13	2.68	2.68	2.79	2.82	3.23	3.04	3.15	3.18	3.15	18%	2%
1965[b]	3.39	3.58	3.52	3.58	3.51	3.65	4.10	3.92	3.76	3.86	22%	2%
											Broilers	
1966[c]	4.20	4.57	4.02	3.45	4.06	4.54	5.14	4.69	3.70	4.52	20%	3%
1967[c]	3.74	3.67	4.21	4.43	4.01	3.95	4.17	4.71	4.71	4.38	20%	4%
1968[c]	4.79	4.96	5.17	4.28	4.81	5.05	5.33	5.52	4.65	5.13	22%	4%
1969[c]	4.86	5.06	4.85	4.91	4.93	5.07	5.54	5.52	5.31	5.35	23%	4%
1970[c]	5.19	5.09	5.24	4.74	5.06	5.48	5.55	6.09	5.75	5.71	25%	4%
1971[c]	4.29	5.30	4.96	5.11	4.92	4.80	6.81	6.44	6.35	6.10	23%	4%
1972[c]	5.83	5.32	6.09	5.49	5.69	6.85	6.31	7.60	6.95	6.93	24%	4%
1973[c]	6.18	6.66	5.98	5.49	6.09	8.43	9.99	9.66	9.77	9.47	26%	4%
1974[c]	4.69	5.39	5.75	4.88	5.18	8.26	9.47	9.79	9.11	9.16	24%	4%
1975[c]	5.22	5.62	5.68	6.40	5.73	10.61	12.00	12.49	13.87	12.24	24%	4%
1976[c]	5.43					11.93						

Source: National Food Survey.

(a) Poultry Meat.
(b) Poultry meats (including broilers and cooked chicken).
(c) Broilers, other Poultry Uncooked, frozen and Unfrozen, and cooked poultry.

a similar trend. Consumption and expenditure between 1966 and 1975 have both been slightly higher during the summer months (the second or third quarters) than during the first or fourth quarters except in 1973 and 1975.

Generally, the quarterly consumption of poultry meat has continued to increase in comparison with the level of consumption for the same quarter in the previous year, i.e. it has followed the pattern of the annual increase in consumption. A marked fall occurred during 1971, due to the fowl pest outbreak, but the level recovered in 1972. A substantial fall occurred in 1974 in all four quarters, particularly during the first quarter, when consumption was 24% below the same quarter in 1973 and below year earlier levels as far back as 1968. The drop in the level of consumption during 1974 was largely due to the levelling off and the eventual decline of beef prices caused by the mounting pressure of excessive beef supplies, which together with increased lamb consumption, resulted in an increase of 1½ ozs per person per week in carcase meat consumption during the last quarter. There was a slight recovery in poultry meat consumption during the summer months in comparison with the first quarter, partly due to a lowering of prices and the pressure of increased storage stocks. However, the marked increase in carcase meat consumption, encouraged by the issue of beef tokens to pensioners, and a fall of 17% in real terms during 1974 in the price of beef, resulted in a drop of nearly 1 oz per week in poultry meat consumption during the last quarter compared to the third quarter of 1974.

During 1975, poultry meat consumption recovered to an average of 5.73 ozs/week. This was 11% higher than in 1974. Consumption reached a record high level of 6.40 ozs/week in the last quarter of 1975 for any previously recorded level of consumption.

However, the pattern of broiler consumption in 1975 was not so marked. Consumption averaged 3.76 ozs for the year (5% higher than in 1974) but it was 11% below the year earlier level during the first quarter of 1975, and

TABLE XXII

Year	SEASONAL CONSUMPTION OF BROILERS							EXPENDITURE ON BROILERS					
	Jan-March	April-June	July-Sept	Oct-Dec	Average (April-Sept.)	Average (Jan-Mar Oct-Dec.)	ANNUAL AVERAGE	Jan-March	April-June	July-Sept	Oct-Dec.	ANNUAL AVERAGE	%Households Purchasing Broilers during Survey Week
	ozs/person/week							p/person/week					
1966	2.59	2.98	2.65	2.41	2.81	2.50	2.66	2.78	3.33	3.10	2.61	2.95	20%
1967	2.69	2.73	3.06	3.09	2.90	2.89	2.89	2.82	3.00	3.29	3.14	3.06	20%
1968	3.21	3.23	3.29	3.02	3.26	3.11	3.19	3.38	3.44	3.39	3.21	3.35	22%
1969	3.07	3.23	3.49	3.53	3.36	3.30	3.33	3.09	3.50	3.87	3.75	3.55	23%
1970	3.49	3.59	3.73	3.22	3.66	3.35	3.51	3.58	3.91	4.28	3.81	3.89	25%
1971	2.90	3.54	3.42	3.21	3.48	3.04	3.27	3.29	4.47	4.28	3.81	3.96	23%
1972	3.64	3.47	3.96	3.56	3.72	3.60	3.66	4.09	3.99	4.80	4.38	4.32	24%
1973	4.42	3.97	3.72	3.64	3.85	4.03	3.94	5.98	5.85	5.92	6.33	6.02	26%
1974	3.50	3.89	3.90	3.08	3.90	3.29	3.59	5.95	6.45	6.44	5.66	6.13	24%
1975	3.10	4.01	3.81	4.13	3.91	3.62	3.76	6.09	8.39	8.19	8.48	7.79	24%

Source: National Food Survey.

even below the level of the first quarter for any year as far back as 1969 (excluding the exceptional year in 1971).

Social Beef Scheme

The Social Beef Scheme was introduced in December 1974, as part of the E.E.C. measures to deal with the problem of mounting supplies of beef. The aim of the scheme being to encourage beef consumption and in the process to strengthen the beef market. Beef tokens to the value of 20p/week were issued to pensioners and other Social Security beneficiaries for the purchase of beef and veal provided that at least a further 20p/week was spent on these meats. The scheme covered a period of 18 weeks starting from December 2nd, 1974.

Naturally, the effect of the Social Beef Scheme upon the level of beef consumption would have been more marked for pensioners than for other income groups. It is evident that many pensioners saved their tokens to purchase beef at Christmas. These extra purchases would not have been included in the consumption data for the last quarter of 1974, since the field work for the National Food Survey finished on 20th December, 1974, so that it only covered 2½ weeks of the operation of the Scheme in the last quarter of 1974.

The first quarter of 1975, therefore, provides a more reliable indication of the effect of the Scheme upon the level of beef consumption and other carcase meats and particularly upon the level of broiler consumption. The comparative data for the first quarter of 1974 and 1975 show that the Social Beef Scheme substantially affected the level of beef consumption.

Beef consumption increased by 26% for all the households in the N.F.S. and by as much as 67% for pensioner households. Broiler consumption, on the other hand, dropped by 11% and pork consumption fell by 9% (28% for pensioners). During the second quarter of 1975 (the Social Beef Scheme had ended in March) beef consumption declined by 18% below the level of consumption in the first

quarter, whereas broiler consumption increased markedly by 29%.

By the last quarter of 1975, broiler consumption was 34% higher than for the last quarter of 1974, whereas beef consumption was 2% higher, pork 12% higher, but mutton and lamb were 11% lower, so that carcase meat as a whole remained at the same level as in 1974 during the last quarter.*

The Meat and Livestock Commission forecasts that beef production will decline by 17% below the year earlier level in 1976 and will likely decline further in 1977. Sheep meat will fall by 7% and will remain lower in 1977, though it is expected that pork production will likely increase by 14%. Bacon and ham supplies are forecast to remain at the same level. These expectations, therefore indicate that broiler consumption should increase in 1976. Certainly recent broiler chick placement data indicate increased supplies at least during the first half of 1976.

The irregular quarterly pattern of broiler consumption, particularly in recent years, provides some indication of the disequilibrium between demand and supply, the effect of cyclical booms and slumps in production, as well as consumer reaction to the level of broiler prices and the interaction of the supply and price level of other competitive carcase meats. These points will be covered more fully in the section covering the price elasticity of the demand for poultry meat and red meat.

Certainly the broiler industry is still faced with considerable problems in matching supply according to the demand of the market, apart from the problems of increased costs of production. The rather sudden introduction of the Social Beef Scheme, for example, further complicated a difficult enough marketing situation of the industry in late 1974 and early 1975.

Household Consumption According to Income Groups

The classification of households according to income groups is not strictly comparable over time due to difficulties in determining likely income ranges caused by the rise in money incomes. The number of households in

* Recently released data indicates a fall in beef and an increase in poultry, lamb and pork consumption for the first quarter of 1976 compared to the same quarter in 1975.

TABLE XXIII

HOUSEHOLD CONSUMPTION OF POULTRY, POULTRY AS A PERCENTAGE OF CARCASE MEAT AND POULTRY, BY INCOME GROUPS[a]

ozs./person/week

	INCOME GROUPS								
	A			B	C	D			All Households
	A1	A2	ALL A			Excluding O.A.P. With Earners	Excluding O.A.P. Without Earners	O.A.P.[b]	
1955 Poultry	1.57	0.97	1.13	0.40	0.41	.....	...0.40.	.....	0.48
1960 Poultry	4.69	2.64	3.11	1.72	1.32	1.07	1.76	1.08	1.68
" Carcase Meat + Poultry	(27.04)	(20.36)	(21.92)	(19.03)	(18.34)	(16.98)	(21.09)	(19.39)	(19.07)
" Poultry % of Meat+Poultry	17.3%	13.0%	14.2%	9.0%	7.2%	6.3%	8.3%	5.6%	8.8%
1970 Poultry	9.08	4.90	6.10	5.12	4.34	4.31	4.08	3.93	4.84
1971 Poultry	8.07	5.77	6.38	4.82	4.27	3.82	4.86	3.16	4.71
1972 Poultry	7.79	6.62	6.81	5.75	4.92	5.27	4.91	4.08	5.46
" Carcase Meat + Poultry	(28.91)	(24.34)	(25.21)	(20.66)	(18.52)	(18.03)	(20.33)	(21.25)	(20.42)
" Poultry % of Meat+Poultry	26.9%	27.2%	27.0%	27.8%	26.6%	29.2%	24.2%	19.2%	26.7%
1973 Poultry	7.92	6.55	7.03	5.66	5.59	3.34	6.55	5.21	5.86
" Carcase Meat + Poultry	(25.99)	(20.54)	(22.36)	(19.44)	(18.12)	(15.92)	(20.13)	(21.23)	(19.61)
" Poultry % of Meat+Poultry	30.5%	31.8%	31.4%	29.1%	30.8%	21.0%	32.5%	24.5%	29.9%
1974 Poultry	6.09	6.16	6.16	5.01	4.90	4.93[c]	5.62[d]	4.01	4.99
" Carcase Meat + Poultry	(26.97)	(21.78)	(23.06)	(19.35)	(18.69)	(18.07)	(21.08)	(21.84)	(19.71)
" Poultry % of Meat+Poultry	22.6%	28.3%	26.7%	25.9%	26.2%	27.3%	26.7%	18.4%	25.3%

Source: National Food Survey (Poultry uncooked).

(a) Income Groups - see following page.

(b) O.A.P. - Old Age Pensioners.

(c) Group D_1 (1974)

(d) Group D_2 (1974)

TABLE XXIII(a)

HOUSEHOLD EXPENDITURE ON POULTRY AND CARCASE MEAT p/person/week by INCOME GROUPS[a]

		INCOME GROUPS								
		A			B	C	D			All Households
		A1	A2	ALL A			Excluding O.A.P. With Earners	Excluding O.A.P. Without Earners	O.A.P.[b]	
1960	Poultry	5.23	2.98	3.51	1.97	1.44	1.26	1.91	1.18	1.88
"	Carcase Meat + Poultry	(36.16)	(25.42)	(27.95)	(22.87)	(21.73)	(19.52)	(23.95)	(21.87)	(22.83)
"	Poultry % of Meat+Poultry	14.5%	11.7%	12.6%	8.6%	6.6%	6.5%	8.0%	5.4%	8.2%
1970	Poultry	10.39	5.45	6.90	5.58	4.61	4.89	4.21	4.48	5.29
1971	Poultry	10.40	7.14	8.01	5.78	5.04	4.44	5.45	3.91	5.68
1972	Poultry	10.45	8.25	8.67	6.74	5.60	5.97	5.49	4.85	6.42
"	Carcase Meat + Poultry	(62.66)	(49.52)	(52.15)	(41.49)	(37.32)	(35.47)	(39.81)	(43.02)	(41.09)
"	Poultry % of Meat+Poultry	16.7%	16.7%	16.7%	16.3%	15.0%	16.8%	13.8%	11.3%	15.6%
1973	Poultry	13.37	10.06	11.17	8.56	8.23	4.88	9.77	7.72	8.89
"	Carcase Meat + Poultry	(72.97)	(52.38)	(59.11)	(49.32)	(45.73)	(41.57)	(48.86)	(52.62)	(50.02)
"	Poultry % of Meat+Poultry	18.3%	19.2%	18.9%	17.4%	18.0%	11.7%	20.0%	14.7%	17.8%
1974	Poultry	11.74	10.91	11.14	8.51	8.11	8.66[c]	9.81[d]	7.10	8.52
"	Carcase Meat + Poultry	(77.06)	(63.90)	(67.13)	(55.12)	(52.11)	(50.15)	(58.29)	(61.47)	(55.84)
"	Poultry % of Meat+Poultry	15.2%	17.1%	16.6%	15.4%	15.6%	17.3%	16.8%	11.6%	15.3%

Source: National Food Survey (Poultry uncooked).

(a) Income Groups - see following page.

(b) Old Aged Pensioners.

(c) Group D_1 (1974).

(d) Group D_2 (1974).

TABLE XXIII (Continued)

GROSS WEEKLY INCOME GROUPS (HEAD OF HOUSEHOLD) AND % OF HOUSEHOLDS

INCOME GROUP	1955 Income	% (a)	1960 Income	% (a)	1970 Income	% (a)	1971 Income	% (a)
A1	over £24	2.5%	over £34	2.4%	over £60	2.8%	over £69	3.0%
A2	£15-24	7.6%	£20-34	7.6%	£40-60	6.6%	£45-69	8.0%
B	£9-15	37.1%	£12-20	38.5%	£23-40	34.2%	£27-45	31.9%
C	£6-9	27.4%	£8-12	32.4%	£12½-23	36.3%	£14-27	35.4%
D	Under £6	25.4%	Under £8	19.2%	Under £12½	20.2%	Under £14	21.8%

INCOME GROUP	1972 Income	% (a)	1973 Income	% (a)	1974 Income	% (a)
A1	over £80	2.2%	over £85	3.6%	over £100	1.6%
A2	£53-80	7.8%	£60-85	7.2%	£70-100	4.8%
B	£30-53	42.3%	£34-60	39.9%	£41-70	34.3%
C	£17-30	41.6%	£19½-34	26.2%	£23-41	31.4%
D	Under £17	6.0%	Under £19.5	23.0%		
D_1					Under £23	4.9%
D_3 (b)					Over £23	2.8%
D_2 (b)					Under £23	6.3%
(c) Pensioners					n.a.	14.0%

(a) Number of households in each group as % Total number of households.

(b) Households without an Earner.

(c) Pensioners - at least 75% of income derived from N.I. retirement or similar pensions, or supplementary pensions or allowances.

Group D of the National Food Survey, for example, was much higher in 1974 than in 1972. However the results in Tables XXIII and XXIII(a) provide some indication of changes in consumer habits between the various income groups.

In earlier years, when poultry meat was expensive, there was a wide range in consumption between the high and low income groups. Even so in 1955 the average level of consumption for Group A.1. was quite low at 1.57 ozs per week, but it was much higher than the negligible amount of 0.40 ozs for the low income groups, as it was for the bulk of households (65%) in Groups B and C.

However there has been a marked increase in consumption in all income groups, particularly in groups B, C and D, so that income differences in the level of consumption have narrowed as the market has extended to the lower income groups and pensioners. Until 1974 all groups offset the general decline in the consumption of carcase meat, by increased consumption of poultry. However the rise in carcase meat consumption during 1974 led to a decline in poultry consumption, which in turn reverted to a rise in 1975.

High income households tend to purchase the higher priced expensive food products. Poultry consumption by the A.1. group, increased to 9.08 ozs per week in 1970. There was a decline in 1971 and 1972, indicating that saturation point appeared to have been reached. Consumption increased slightly in 1973, but not as much as might have been expected in view of the drop in carcase meat consumption in 1973. Poultry meat consumption covered 31% of total carcase and poultry meat consumption in 1973 compared to 17% in 1960. But in 1974, there was a marked fall in poultry meat consumption to 6.09 ozs/ week (23% below 1973), which only covered 23% of total carcase meat and poultry consumption. Nevertheless this was higher than in 1960. However, due to the relatively low price of poultry meat, expenditure, as a percentage of carcase and poultry meat expenditure, has not exhibited the same increase (14.5% in 1960, 18% in 1973 and 15% in 1974).

Pensioners tend to be more conservative in their dietary habits. Lamb consumption has not declined to the same extent for this group, and was even higher than for all other groups (except D.3) in 1974. Nevertheless the low price of chicken and the growth of the portion trade have proved attractive to these households (14% of the sample), so that they have at least changed their food habits and attitudes in relation to chicken consumption. However, pensioners in the over 75 age group tend to consume less poultry meat than pensioners in the 60-74 age group, as indeed they consume less meat as a whole.

Consumption by pensioners has increased nearly five times since 1960 to 5.21 ozs in 1973. There was a marked response to the price situation in 1973 by this group, when consumption increased by 28% over 1972, and covered 25% of the total consumption of carcase and poultry meat. In 1960, expenditure on poultry only covered 5% of carcase and poultry meat expenditure. By 1973, this had increased to 15%. This percentage may appear rather low in comparison with the percentage for the higher income groups, but this is accounted for by the lower price of carcase meat purchased by pensioners. Expenditure on carcase meat amounted to 44.90p for pensioners and 59.60p in the A.1 group. It is also noteworthy that pensioners seldom take meals away from home, and therefore a higher proportion of their total food expenditure is expended on household food expenditure than by the higher income groups, Pensioners, for example, only average 1.40 meals taken outside the home per week, compared to 4.53 in the A.1 group. The pattern of consumption changed markedly for pensioners in 1974, when poultry meat consumption declined by 23% below the year earlier level. Carcase meat consumption increased by 11%. It seems likely that the position will have reversed again after March 1975 following the ending of the Social Beef Scheme and the rise in the price of beef.

Within the rest of Group D, the response to the price situation was very different in 1973 (possibly due to the change in the stratification of the sample). There was a marked fall in poultry consumption by Group D (with

earners) and a substantial increase to 6.55 ozs in Group D (without earners). This group spent the highest amount in percentage terms on poultry of all groups at 20% of total carcase and poultry meat expenditure. In 1974, Group D (with earners) also responded differently to the price situation, when consumption increased substantially for this group. Expenditure on poultry meat as a percentage of total meat expenditure was higher than for any other group in 1974.

Within the bulk of households, i.e. Groups B and C, the pattern of consumption has naturally followed in line with the average for the country;

Clearly, the greatest potential for further growth in consumption will still be found in the lower income groups. No doubt this occurred when the price of carcase meat relative to the price of poultry meat began to rise again in 1975. The average per capita consumption rate for the U.K. is still below that of France and Italy in the E.E.C., and well below the level for Canada, U.S.A. and Israel. However as has already been noted competition for the market between the carcase meat sector and poultry meat is liable to artificial distortion. In 1974, for example, the issue of beef tokens to pensioners (a form of consumer subsidy) distorted the normal pattern of consumption in favour of beef consumption to the detriment of poultry and pork consumption.

Composition of Households and Poultry Consumption

Expenditure on food per person varies according to the size and composition of households partly because of economic factors but more because the physiological needs of children are different from adults. Income per head, average energy requirements and average consumption usually decline as size of family increase because the additional members are usually children. In 1974, average weekly food expenditure by families with 3 or more children was only £2.29 per head compared to £3.81 for households with 2 adults with no children. Large families spend a much higher proportion of their incomes on

TABLE XXIV

HOUSEHOLD COMPOSITION AND CONSUMPTION + EXPENDITURE (ozs. and p./person/week) OF POULTRY MEAT

Households with one man and one woman and:-	1960 ozs.	p.	1970 ozs.	p.
No other (one or both + 55 years)	2.46	(2.90)	6.05	(7.00)
No other (both under 55)	3.19	(3.91)	7.37	(8.55)
1 child	1.63	(1.80)	5.14	(5.46)
2 children	0.97	(1.17)	4.11	(4.34)
3 children	0.83	(0.89)	3.82	(4.10)
+ 4 children	0.55	(0.62)	3.22	(3.22)
Adolescents only	2.72	(2.55)	4.85	(5.03)
Adolescents and Children	0.92	(1.07)	4.85	(5.05)
Other Households with:				
Adults only	2.45	(2.68)	5.65	(6.31)
Adolescents and No children	2.08	(2.24)	5.03	(4.93)
1 or more children and no Adolescents	1.27	(1.43)	3.66	(3.81)

Source: N.F.S., M.A.F.F.

Households with 1 Adult with:-		1972 ozs.	p.	1973 ozs.	p.	1974 ozs.	p.
No children		4.36	(5.52)	5.09	(8.17)	4.39	(8.34)
1 or more children		5.28	(5.82)	5.38	(8.50)	5.12	(9.26)
Households with 2 Adults							
Age Housewife	Children						
Under 35	None	7.87	(9.28)	8.67	(12.71)	6.61	(11.40)
35 - 54	None	8.47	(10.01)	7.35	(11.38)		
55 +	None	5.78	(7.14)	6.70	(10.07)		
Age Housewife	Children						
Under 25	1 - 2	5.14	(5.66)	5.25	(7.32)	4.89	(8.20)
25 - 34	1 - 2	5.09	(5.81)	5.55	(8.48)		
35 +	1 - 2	5.97	(7.05)	5.83	(8.71)		
Age Housewife	Children						
Under 35	3	4.01	(4.44)	4.55	(6.33)	4.09	(6.55)
+ 35	3	3.63	(4.46)	5.06	(7.82)		
Age Housewife	Children						
Under 35	4+	3.41	(3.62)	4.54	(6.00)	4.07	(6.59)
+ 35	4+	3.67	(3.94)	4.00	(5.33)		
Households with 3 Adults							
No children		6.48	(7.75)	5.75	(9.56)	5.31	(9.41)
Households with +4 Adults							
No children		5.80	(6.96)	6.91	(10.70)	5.29	(10.06)
Households with +3 Adults							
+1 or 2 children		5.07	(5.78)	5.90	(8.82)	4.88	(8.13)
+3 children		3.67	(4.20)	3.68	(5.51)	2.88	(4.57)

food and are dependent on cheaper sources of energy such as bread.

Table XXIV indicates the level of poultry consumption according to the size of households and family groups. The consumption of poultry has increased substantially for all groups since 1960, though more rapidly for the larger family groups. Although there is not as wide a range between the various size groups as in 1960, the divergence is still fairly considerable both in the level of consumption and expenditure on poultry meat and wider than it is for households divided according to income groups.

The consumption of poultry by the various groups has also been affected by changes in the pattern of carcase meat consumption. All groups indicate a downward trend in carcase meat consumption, particularly in 1973, except for households with four adults where the consumption of beef actually increased. In 1974, nearly all the groups showed a marked increase in the consumption of carcase meat and a decline in poultry consumption.

In 1974, the highest level of poultry meat consumption was found in the household group of 2 adults (without children) which averaged 6.61 ozs/ per head/week (11.40p expenditure). The lowest level is found in the group containing 3 adults and 3 or more children, which averaged 2.88 ozs (4.57p expenditure). Both these groups manifested a similar pattern in the level of carcase meat consumption, with the former group averaging the highest level of 20.25 ozs (65.80p) and the latter group only 8.93 ozs (25.72p). The range in expenditure is wider than for consumption due to the purchase of higher priced meat products by the adult only group.

The effect of the increased price of beef in relation to the price of poultry since the 1960's, is reflected by the more marked response of increased poultry consumption by families with higher numbers of children.

Regional Characteristics of Poultry Consumption

Dietary patterns of food consumption and expenditure vary according to

TABLE XXV

HOUSEHOLD CONSUMPTION OF POULTRY (and Carcase Meat) ACCORDING TO REGION and TYPE OF AREA

Region	1955		1960	1970		1973			1974			Weekly Total Food Expend.	
	Total Poultry	Carcase Meat	Total Poultry	Broilers	Total Poultry	Broilers	Total Poultry	Carcase Meat	Broilers	Total Poultry	Carcase Meat	1973 £	1974 £
	ozs/per person/per week												
Wales	(0.25)	16.91	(1.49)	2.76	(5.08)	3.34	(6.28)	13.34	3.48	(5.19)	15.25	2.74	3.04
Scotland	(0.33)	14.45	(1.30)	2.96	(3.77)	3.07	(4.34)	11.94	3.23	(4.43)	13.68	2.72	3.17
North Yorks+Humberside	(0.24)[a]	17.10	(0.87)	3.22	(4.77)	3.08	(4.64)	12.47	3.12	(4.58)	13.59	2.70	3.17
North West	(0.68)[b]	18.17	(1.41) (1.95)[c]	3.05	(4.92)	2.94	(5.11)	13.24	2.59	(4.22)	15.15	2.67	3.18
E. Midlands	(0.37)[c]	18.32	(1.79)	3.02	(4.75)	3.79	(5.86)	13.57	3.34	(4.92)	14.39	2.71	3.09
W. Midlands	(0.61)	19.54	(1.47)	3.30	(5.13)	3.23	(4.93)	12.55	3.56	(5.01)	12.72	2.63	2.90
S. West	(0.92)[d]	18.48	(2.09)[d]	3.70	(4.94)	4.05	(6.79)	15.21	3.48	(5.17)	14.99	2.72	3.06
S.E./E.Anglia	(0.57)	18.07	(1.66)	3.03	(5.01)	4.53	(6.62)	13.58	3.96	(5.46)	14.49	2.59	3.05
				4.20	(5.76)	4.63	(6.89)	14.74	4.11	(5.92)	15.40	2.81	3.15
Type of Area													
Conurbations													
London	(0.48)	21.76	(2.81)	4.83	(6.32)	5.01	(7.80)	16.30	4.75	(6.40)	17.96	2.96	3.39
Provincial	n.a.	n.a.	(1.70)	3.26	(4.89)	3.89	(6.50)	13.91	3.69	(4.97)	15.56	2.75	3.18
Other Urban Areas													
Large Towns	n.a.	n.a.	(1.51)	3.37	(4.90)	4.02	(5.76)	13.29	3.53	(5.23)	14.00	2.72	3.11
Smaller Towns	n.a.	n.a.	(1.48)	3.33	(4.64)	3.90	(5.40)	12.93	3.26	(5.02)	13.30	2.65	2.99
Semi-Rural Areas	n.a.	n.a.	(1.28)	3.29	(5.25)	3.42	(5.77)	13.09	3.17	(4.83)	14.18	2.73	2.93
Rural Areas	n.a.	n.a.	(2.34)	2.73	(3.81)	2.33	(4.63)	14.11	2.85	(3.45)	12.65	2.54	2.75
ALL HOUSEHOLDS	(0.48)	18.23	(1.77)	3.51	(5.06)	3.94	(6.09)	13.75	3.59	(5.18)	14.72	2.74	3.10

Source: M.A.F.F. National Food Survey.

(a) North, E. + W. Ridings (b) N.Midlands + East (c) Midlands (d) S.E. + South

region as well as type of area. In 1974, the average expenditure on food for all households was £3.10* per person per week, and at £3.18 was highest in the Yorkshire and Humberside region, followed by Scotland and the North. The lowest level was found in Wales at £3.04. There have always been greater variations according to type of area. Expenditure in the London connurbation was £3.39 compared to £2.75 in the rural areas. The price of food tends to be higher in Scotland, as well as in London, but households in London tend to purchase the more expensive foods. The "price of energy" index is probably the best comparative measure of the effect of variations in the level of food expenditure. In 1974, the average cost per calorie of diet in London was 11.5% higher than the average for all households, though the index of food prices was only 2.7% higher.

The consumption of poultry meat has increased markedly for all areas, so that there is greater uniformity in the level of consumption, though more particularly on a regional basis than on a type of area basis as Table XXV indicates. Consumption in London was 58% above the average in 1960, and although consumption is still highest for London at 6.40 ozs, the marked increase in other areas has raised the average level, so that London is now only 24% higher for poultry meat as a whole and 27% higher for broilers. Consumption in Scotland and in the North has always tended to be lower than for other regions. In 1974 consumption in the Yorkshire and Humberside region was 19% below the national average (28% lower for broilers) and in Scotland was 15% below the average (10% for broilers). There has been a marked increase in consumption in Wales from 30% below the average in 1955 to just above the national average in 1974, though broiler consumption was 3% below the average. The South and East Anglia, which includes the London area, on a regional basis, averaged the highest regional rate which was 14% higher and 15% higher for broilers than average. Consumption still tends to be much higher in the North

* Recently published information indicates this increased to £3.77/week in 1975.

West than in Yorkshire.

The higher level of consumption in the London connurbations reflects changes in retailing and marketing methods. The earlier establishment of supermarkets in London and the South East has undoubtedly influenced the level of consumption in these areas. Town dwellers are probably more adventurous and more liable to change their food habits than rural dwellers. However there has been a notable switch in the pattern of rural consumption, though this is likely to have occurred due to the higher availability of "free supplies" in earlier years. By 1974 the level for rural areas was 33% below the average for poultry meat (21% for broilers) whereas in 1960 it was 32% higher. Until 1974 carcase meat consumption tended to be higher in the rural areas than in all other areas except the London conurbation and S.E. Anglia. However there was a marked decline of 10% in carcase meat consumption in the rural areas between 1973 and 1974.

Poultry meat consumption has tended to be associated with a high level of carcase meat consumption, e.g. S.E./East Anglia and the London conurbation. However, there does appear to be some variation in the relationship in recent years, particularly between 1973 and 1974. Also contrary to the national average fall in broiler consumption between 1973 and 1974, consumption increased in Wales, Scotland, the North, East Midlands and in the Rural Areas. Also contrary to the national pattern, carcase meat consumption declined in the West Midlands and in the Rural Areas.

Consumption of Poultry Meat and the Ownership of Deep Freezers and Refrigerators

In recent years increasing number of households own deep-freezers and refrigerators. By 1974, households owning deep-freezers covered 15% and refrigerator owners covered 84% of all households in the National Food Survey. Deep-freezer ownership tends to be related to households with a higher number of persons per household, and with the higher income groups and the rural areas.

Deep-freezer ownership households tend to consume more poultry meat than average, and in 1974 consumed 5.30 ozs of poultry meat/person/week, which was 6% higher than the average for all households and 63% higher than for households without deep-freezers or refrigerators.

In 1972 and 1973, deep-freezer households consumed more carcase meat than average, as might be expected. But surprisingly the pattern of the consumption of both poultry meat and carcase meat was different from the average in 1974, since poultry meat increased and carcase meat consumption declined for the deep-freezer group. It is particularly surprising that beef consumption declined for this group between 1973 and 1974.

Patterns of the consumption of the various meat cuts also vary between freezer owners and other households, e.g. in 1973, freezer owners purchased seven times as much beef on the bone as other households. Freezer owners can take advantage of weekly or monthly changes in the relative price of the various meats by purchasing at the more attractive price levels and storing the meat for future consumption. They probably purchase larger quantities of pre-packed frozen poultry portions than other households and are able to take advantage of the lower prices available for bulk purchases of meat. Certainly their consumption of frozen convenience meats and meat products is considerably higher than the average for all households. In 1974 their consumption of these products was 36% higher than the average, and 83% higher than for households without freezers or refrigerators.

Households with refrigerators follow the average pattern of consumption, since they cover 84% of all households. Their consumption of poultry meat was slightly lower than for freezer owners in 1974, but their consumption of carcase meat was much higher at 15.17 ozs compared to 13.96 ozs for freezer-owners, and 19% higher than for households without refrigerators or deep-freezers. The consumption of poultry meat by refrigerator owners averaged 5.27 ozs in 1974 compared to only 3.25 ozs for households without refrigerators.

Energy Value and Nutrient Content of Poultry and Carcase Meat

The average energy value of food consumed in households has fallen slightly in recent years. Table XXVI indicates that this amounted to 2321 Kcal. per person per day in 1974 compared to 2628 Kcal. in 1960. The decline is partly due to a higher proportion of the population being engaged in sedentary occupations as well as to the increased consumption of meals away from home which amount to 10% of total food consumption. It should be noted that the data for 1974 is not directly comparable with earlier years, because the data for this year includes the first comprehensive analysis of meat and meat products to be made for many years.

Energy derived from carcase meat has tended to decline. However, poultry meat has increased its share of the energy value of carcase meat and poultry from 3.8% in 1960 to as much as 14.3% in 1973 (12.5% in 1974).

The protein nutrient content of diets tended to decline slightly over time to 1973. The carcase meat content dropped from 10.1g. to 7.6g. per person per day between 1960 and 1973, though this increased to 9.2 in 1974. But a reverse pattern is indicated for poultry. This shows a marked increase from 0.9g in 1960 to 3.3g in 1973, though this declined to 2.8g in 1974 due to the fall in the consumption of poultry. It has increased its share of carcase meat and poultry from 8.2% in 1960 to 30.3% in 1973. But in 1974, there was a marked fall below year earlier levels to 23.3%. No doubt with increased consumption of poultry in 1975 and 1976 this pattern will reverse upwards once more.

The fat content of poultry is much lower than for other carcase meat, so that poultry meat's share of the fat content of carcase meat and poultry is much lower than its share of protein. This is one of the reasons for the popularity of poultry meat in slimming diets.

Poultry meat is low in its content value of saturated fatty acids. Carcase meat accounts for 11% of the total intake of saturated fatty acids in

TABLE XXVI

POULTRY AND CARCASE MEAT

Energy Value and Nutritional Content of Domestic Food Consumption (Per Person/per day)

	ENERGY (Kcal)					ENERGY (% Total Food)				
	1960	1970	1972	1973	1974	1960	1970	1972	1973	1974
Beef and Veal	81	75	66	60	61	3.1%	2.9%	2.7%	2.5%	2.7%
Mutton and Lamb	68	56	53	48	45	2.6%	2.2%	2.2%	2.0%	2.0%
Pork	27	40	43	42	34	1.0%	1.5%	1.8%	1.8%	1.5%
Carcase Meat	176	171	162	150	140	6.7%	6.6%	6.7%	6.3%	6.2%
POULTRY	7	20	23	25	20	0.3%	0.8%	0.9%	1.0%	0.9%
Poultry + Carcase Meat	183	191	185	175	160	7.0%	7.4%	7.6%	7.3%	7.1%
Poultry as % Carcase + Poultry Meat	3.8%	10.5%	12.4%	14.3%	12.5%					
TOTAL MEAT	390	429	406	391	361	14.8%	16.5%	16.7%	16.3%	15.6%
Poultry % Meat	1.8%	4.7%	5.7%	6.4%	5.5%					
ALL FOOD	2628	2600	2430	2400	2321					

	PROTEIN (grams)					PROTEIN (% Total Protein)				
	1960	1970	1972	1973	1974	1960	1970	1972	1973	1974
Beef and Veal	5.8	4.9	4.3	4.0	5.3	7.7%	6.5%	6.0%	5.6%	7.5%
Mutton and Lamb	3.4	2.7	2.6	2.3	2.1	4.6%	3.6%	3.5%	3.2%	2.9%
Pork	0.9	1.2	1.3	1.3	1.8	1.2%	1.6%	1.8%	1.8%	2.6%
Carcase Meat	10.1	8.8	8.2	7.6	9.2	13.5%	11.7%	11.3%	10.6%	13.0%
POULTRY	0.9	2.8	3.1	3.3	2.8	1.2%	3.7%	4.3%	4.7%	3.9%
Poultry + Carcase Meat	11.0	11.6	11.3	10.9	12.0	14.7%	15.4%	15.6%	15.3%	16.9%
Poultry as % Carcase + Poultry Meat	8.2%	24.1%	27.4%	30.3%	23.3%					
TOTAL MEAT	18.7	21.1	20.1	19.5	20.2	25.0%	28.1%	27.7%	27.3%	28.5%
Poultry % Meat	4.8%	13.3%	15.4%	16.9%	13.9%					
ALL FOOD	74.7	74.9	72.5	71.4	70.9					

	FAT (grams)					FAT (% Total Fat)				
	1960	1970	1972	1973	1974	1960	1970	1972	1973	1974
Beef and Veal	6.5	6.1	5.4	5.0	4.4	5.7%	5.1%	4.8%	4.4%	4.2%
Mutton and Lamb	6.1	5.0	4.8	4.2	4.1	5.3%	4.2%	4.2%	3.8%	3.9%
Pork	2.6	3.9	4.3	4.1	3.0	2.2%	3.2%	3.8%	3.7%	2.8%
Carcase Meat	15.2	15.0	14.5	13.3	11.5	13.2%	12.5%	12.8%	11.9%	10.9%
POULTRY	0.3	0.9	1.1	1.2	1.0	0.3%	0.8%	1.0%	1.1%	1.0%
Poultry + Carcase Meat	15.5	15.9	15.6	14.5	12.5	13.5%	13.3%	13.8%	13.0%	11.9%
Poultry as % Carcase + Poultry Meat	2.0%	5.7%	7.6%	8.3%	8.0%					
TOTAL MEAT	33.6	35.8	33.8	32.4	29.0	29.2%	29.7%	30.0%	29.0%	27.4%
Poultry % Meat	0.9%	2.5%	3.3%	3.7%	3.5%					
ALL FOOD	114.8	121	112	111	106					

Source: National Food Suryey.

household diets. In comparison poultry only accounts for 0.6%. The percentages for mono-saturated fatty acids are 12.3% and 1.0%, and for polyunsaturated fatty acids 5.0% and 2.4% respectively.

PART IV

PRICES and MARKETING MARGINS

Price of Poultry, Red Meat and Fish

Increased affluence and other factors already mentioned have clearly affected and encouraged poultry meat consumption. But the main reasons for the marked increase in consumption have been the fall in the price of poultry meat in real terms since the early 1950's, and the relationship between the price of poultry and carcase meat. This has caused shifts in demand and substitution in the purchase of the various types of red meat and poultry.

The supply situation also affects the level of consumption, reflected partly through its influence on price, partly through changes in availability, for example, by the general fall in the consumption of mutton and lamb. Poultry meat, on the other hand, has been readily available. In the short term the effect of the pressure of shortages or surpluses in supplies upon consumer reaction may be masked by the pricing policy of the poultry trade to the supply situation. Retailers generally attempt to level out price fluctuations according to the level of the supply of the various types of carcase meat. But in the long term, retailers of course, are unable to prevent a rise in prices due to a shortage of supplies, e.g. the price of beef in 1973.

The average retail price of poultry meat and the more important competitive products between 1955 and 1975 are indicated in Table XXVII. This shows the marked increase in money terms of the price of beef, mutton and lamb, fish as well as the increased price of pork. The price of poultry meat, on the other hand, had declined markedly by the early 1960's and steadily downwards to 1968/69. The price increased in 1971, due to a shortage of supplies caused by the sudden outbreak of fowl pest. Even in 1972, when the average price was slightly higher than in the 1960's, it was still lower than in the 1950's.

In real terms, after deflation by the Index of Retail Prices, the real price of beef has increased, and substantially so in 1973 as well as the price of lamb. The real price of pork has remained fairly stable until 1972. In marked contrast there has been a decline in the real price of poultry meat.

TABLE XXVII

RETAIL PRICE OF RED MEAT, FISH AND CHICKEN (pence per pound)

Year	Beef and Veal p.	Mutton and Lamb p.	Pork p.	Bacon and Ham p.	Broiler Chicken p.	Fish, White Filleted p.	Fish, White Frozen[b] p.
1955	17.24	15.25	16.06	17.91	22.93[a]	11.23	n.a.
1960	20.83	16.96	20.75	19.83	19.75[a]	15.25	20.29
1961	20.96	16.63	21.04	19.71	18.33[a]	16.17	20.75
1962	21.50	17.08	20.67	19.50	18.29[a]	16.54	21.25
1963	21.63	17.42	20.54	20.21	17.46[a]	16.67	21.67
1964	24.00	18.96	21.83	21.79	18.67[a]	18.17	22.33
1965	26.67	20.17	22.13	21.83	17.71[a]	18.79	23.54
1966	27.58	20.79	23.42	23.17	17.92	19.42	26.13
1967	27.67	20.58	25.17	24.13	17.08	19.92	26.54
1968	30.58	22.25	26.00	24.50	17.04	20.67	26.08
1969	32.62	23.97	27.05	26.01	17.18	21.74	26.97
1970	33.83	24.72	28.98	27.56	17.80	23.86	28.18
1971	38.21	27.12	30.44	29.10	19.51	27.08	33.87
1972	42.86	31.14	33.89	33.10	18.89	32.17	36.11
1973	55.80	40.27	43.06	44.72	24.33	40.68	43.65
1974	57.81	45.90	45.32	52.72	27.29	49.87	57.23
1975	62.75	49.67	56.50	62.37	33.17	.	.

Source: National Food Survey.

(a) Poultry 1955-65. Broilers under 4 lbs. 1966-75.

(b) Excluding fish fingers, fish sticks, fish bites.

TABLE XXVIII

PRICE ELASTICITY OF DEMAND*

	1958[1]	1958[a]	1959[b]	1960[c]	1961[d]	1963[e]	1966[f]	1969[g]	1972[h]	1973[i]	1974[j]
Beef and Veal	-1.32	-1.42	-1.54	-1.53	-1.45	-1.29	-1.06	-1.24	-1.06	-1.57	-0.81
Mutton and Lamb	-1.29	-1.22	-0.92	-0.86	-0.80	-0.57	-0.13	-0.47	-0.91	-0.91	-0.12
Pork	-2.30	-1.25	-2.13	-1.64	-0.90	-1.36	-1.03	-1.12	-1.19	-1.06	-1.21
Carcase Meat	-1.19	.....	.....	-0.90	.....	.....	-0.82	-0.82	-0.67	-0.70	-0.62	-0.68
Poultry											
Poultry	-1.59	-0.68	-1.15	-1.13	-0.90	-1.15[j]	-0.41	n.a.	n.a.	n.a.	n.a.
Broilers	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	-0.69	-0.88	-0.97
Cooked Chicken	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	-1.92	-2.04	-1.44	-1.08	-1.36

Source: M.A.F.F. National Food Survey.

* Derived from time series analyses of following periods:-

(a) 1954 - June 1959 (b) 1955 - 1959 (c) 1955 - 1960 (d) 1956 - 1961

(e) 1956 - 1963 (f) 1960 - 1966 (g) 1964 - 1969 (h) 1966 - 1972

(i) 1968 - 1973 (j) 1969 - 1974 (k) 1964.Poultry -0.90 (l) 1954 - 1958 (June 1958)

Even though the price rose markedly in 1973 in money terms, due largely to the increased cost of production caused by the massive increase in the price of feedingstuffs, it was still below earlier levels in the 1950's and 1960's. Poultry meat therefore, in both money terms and real terms is much cheaper in relation to the price of other carcase meat as well as fish. Therefore from a position, where poultry meat was considerably more expensive, per pound, than carcase meat in 1955, it had reached a level of rough equivalence in 1960. Despite the subsequent increase in broiler prices in recent years, the price was one third of the price of sirloin by the end of 1975 and was very favourable in relation to other carcase meats.

Relative Price of Poultry and Carcase Meats and the Effect on Demand

Estimates of the price elasticity of the demand for carcase meat indicate that this was negative and near to unity at -0.90 for the period 1956-1965 i.e. for a 1% increase in price the quantity purchased would decline by 0.90% (or vice versa if the price fell by 1%).

Within the carcase meat sector, changes in the own-price elasticity of demand have occurred between the red meats and these are indicated in Table XXVIII. Beef was more price elastic in 1958, than subsequently, except in 1973, and the elasticity declined during the 1960's. The elasticities for mutton and lamb have also declined, whilst those for pork have fluctuated. The price elasticity of demand increased markedly for beef in 1973, due to the rise in the price of beef, but subsequently declined in 1974.

Since the price elasticity of the demand for poultry was relatively high in the 1950's, and in the early 1960's, the marked fall in the price of poultry meat in money terms, (as well as in real terms) which previously had been higher than for all the carcase meats as well as bacon and fish, together with the increase in the price of these products in money terms (as well as in real terms for beef) particularly during the early 1960's, naturally acted as a spur towards the increased consumption of poultry meat.

TABLE XXIX

ESTIMATES OF PRICE ELASTICITIES OF DEMAND[(a)] FOR CARCASE MEAT AND POULTRY 1956-1966

Elasticity with respect to price of:-

	Beef and Veal		Mutton and Lamb		Pork		Poultry	
Beef and Veal	-1.30	(0.18)	+0.04	(0.10)	-0.04	(0.08)	+0.12	(0.07)
Mutton and Lamb	+0.07	(0.18)	-0.52	(0.19)	+0.19	(0.11)	-0.10	(0.10)
Pork	-0.18	(0.35)	+0.46	(0.27)	-1.24	(0.33)	+0.20	(0.18)
Poultry	+0.68	(0.39)	-0.31	(0.10)	+0.26	(0.24)	-1.26	(0.36)

(a) Figures in brackets are estimates of standard errors.

Source: N.F.S., M.A.F.F.

CHANGES IN DEFLATED PRICES[a] AND AVERAGE PURCHASES[b] OF CARCASE MEAT AND POULTRY AND IMPLIED INDICES OF DEMAND (geometric average 1956-66 = 100) at Constant Prices

	1956	1958	1960	1962	1964	1966
Beef and Veal						
Prices(a)	41.2	42.3	45.2	43.2	46.2	48.7
Purchases(b)	9.93	9.50	8.66	8.99	8.42	8.13
Demand (c)	96	97	99	99	101	106
Mutton and Lamb						
Prices (a)	36.4	37.4	36.7	34.3	36.2	36.6
Purchases (b)	7.12	6.01	6.59	6.64	6.25	6.08
Demand (c)	116	98	103	100	96	93
Pork						
Prices (a)	43.0	41.5	45.1	41.6	41.8	41.4
Purchases (b)	1.84	2.08	1.97	2.27	2.30	2.63
Demand (c)	79	88	97	106	108	126
Poultry						
Prices (a)	59.5	50.4	42.7	37.0	35.6	31.4
Purchases (b)	0.49	0.79	1.51	2.03	2.50	3.66
Demand (c)	53	69	100	116	133	161

(a) Pence/lb., deflated to allow for changes in general level of retail prices since 1956.
(b) Ozs/person/week
(c) Including changes in demand attributable to changes in real personal disposable incomes.

Source: N.F.S., M.A.F.F.

At the same time greater choice within the poultry meat sector, the ready availability of broilers throughout the year, sales promotion, loss leader techniques and changes in retail selling, all contributed towards the increased underlying demand for poultry meat.

Although the own-price elasticities of the demand for red meat and poultry provide an indication of the changed patterns in demand, they do not take account of the extent to which the demand for poultry may, or may not have been affected by changes in the demand for carcase meat.

Estimates of the cross-elasticities as well as own-price elasticities in Table XXIX provide some indication of trends in demand between 1956-1966.

During this period the real price of beef increased by 18%, lamb remained fairly stable, and pork declined slightly. In contrast the real price of poultry fell by as much as 47%. The own price elasticity of beef seems rather high at -1.30 (-1.06 for 1966) as well as the level for poultry at -1.26, though the price elasticity for poultry was extremely high during the earlier years of the decade. The cross-elasticities fail to attain statistical significance except for poultry with respect to lamb. Purchases of beef generally declined from 1963, but there appeared to be a strengthening in underlying demand for beef. Purchases and the demand for mutton and lamb trended downwards, whereas there was a rising trend for pork, and there was a marked increase in the demand for poultry meat. Clearly a shift occurred in the demand for carcase meat in favour of poultry meat. The consumption of poultry increased from 0.49 ozs in 1956 to 3.66 ozs in 1966. The dominating factor in the carcase meat sector tended to be the price of beef and the situation in relation to the supply of beef. The effect of higher prices in the late 1960's however was masked by the increase in disposable incomes.

During the decade there was a marked widening in the market for poultry meat. The percentage of households purchasing poultry during the recorded week increased from 4% in 1956 to 20% in 1966. Purchases of carcase meat, although

TABLE XXX

ESTIMATES OF PRICE ELASTICITIES AND GROSS PRICE ELASTICITIES OF DEMAND 1964-1971

	Elasticity with respect to price of:							
	Beef and Veal		Mutton and Lamb		Pork		Broilers	
Beef and Veal	-1.03	(.25)	0.06	(.13)	0.21	(.09)	0.08	(.09)
Mutton and Lamb	0.11	(.25)	-0.77	(.24)	0.05	(.13)	0.25	(.13)
Pork	0.75	(.33)	0.09	(.24)	-1.52	(.27)	0.09	(.20)
Broilers	0.39	(.45)	0.63	(.33)	0.12	(.27)	-1.06	(.38)

CHANGES IN DEFLATED PRICES, AVERAGE PURCHASES, AND IMPLIED INDICES OF DEMAND

(geometric mean 1964-1971 = 100)

	1964	1965	1966	1967	1968	1969	1970	1971
Beef and Veal								
Prices (a)	94	99	99	97	102	103	101	104
Purchases (b)	106	101	102	106	96	95	97	98
Demand (c)	98	100	101	103	98	99	99	104
Demand (d)	99	101	101	103	98	99	98	102
Mutton and Lamb								
Prices (a)	100	101	101	97	100	102	100	99
Purchases (b)	111	104	108	104	98	94	89	94
Demand (c)	105	103	106	102	99	98	92	96
Demand (d)	106	103	107	102	99	98	91	95
Pork								
Prices (a)	100	97	99	104	102	100	101	97
Purchases (b)	88	106	101	87	94	106	106	115
Demand (c)	91	101	99	94	96	105	108	108
Demand (d)	92	102	100	94	95	105	107	107
Poultry								
Prices (a)	123	111	108	100	95	91	89	88
Purchases (b)	67	86	92	102	111	119	122	115
Demand (c)	86	95	100	105	104	104	106	101
Demand (d)	87	96	100	105	104	104	105	99

(a) Deflated to allow for changes in the General Index of Retail Prices since 1964.
(b) Per person.
(c) Per person. Including changes in demand attributable to changes in real personal disposable income.
(d) Per person. After removal of effects attributable to changes in real personal disposable income.

Source: N.F.S., M.A.F.F.

more frequent, declined from 81% to 77% for beef, and from 61% to 59% for lamb. Purchases of pork however increased from 24% to 30% indicating a widening of this market as well as for poultry. Although poultry purchases were less frequent, it is likely that the purchases were higher in quantity terms.

Analysis of the price elasticities and cross-price elasticities for the next five years to 1971 (Table XXX) reveals that the own-price elasticity of the demand for poultry began to decline slightly for this period, which is not unexpected in view of the marked surge in consumption during the past decade. However, the rate for broilers increased slightly between 1969 and 1971 from -0.75 to -1.06. The own price elasticity of demand had declined slightly for beef and lamb, but it increased for pork. The real price of beef increased towards the end of the 1960's, partly due to the shortage of supplies caused by the outbreak of foot and mouth disease in 1968. The underlying demand for beef began to decline, but increased momentarily in 1971 due to the effect of fowl pest which reduced broiler supplies. The demand for mutton and lamb continued to trend downwards, and there was a marked fall in purchases of 20% between 1964-1970, of which 8% was caused by the fall in the real price of broilers. The real price of pork remained fairly stable, depending upon the supply situation due to the cyclical nature of production. The underlying demand for pork was clearly rising and purchases increased.

The marked rise in broiler consumption for the previous decade continued during this period, but at a rather slower rate. Nevertheless in contrast to the overall decline in carcase meat, broiler consumption increased by 82% between 1964 and 1970, while the real price continued to fall, the money price fluctuated slightly depending upon the supply situation. Estimates indicate that about one tenth of increased purchases was due to changes in the price of carcase meat (mainly beef) and the effect of income elasticity of demand, whilst three fifths was caused by the fall in the real price of broilers, and one third was due to the widening of the market and the strengthening of the

underlying demand for broilers.

There was a slight shift in demand for broilers to beef, lamb and pork in 1971, due to a reduction in the supply and an increase in the price of broilers caused by the fowl pest outbreak. This was a temporary reversal of the customary annual fall in the real price of broilers. There was also an improvement in carcase meat supplies at this time.

The market for broilers widened again between 1966-1970. The percentage of households purchasing broilers increased from 20% to 25% but there was a fall of 2% in 1971. The slide continued for beef, which fell from 77% to 75% and more so for lamb from 59% to 51%. Pork continued its upward trend registering an increase from 30% to 36%.

The 1970's have been characterised by sharper changes in the level of prices, shortages and surpluses, disequilibrium of the market, together with marked swings in the level of consumption of meat as well as switches between products, than for any period since the war. The price situation was further complicated by the marked increase in the cost of production caused by the substantial rise in the price of feedingstuffs together with the effect of inflation on both producer and consumer reaction.

The marked rise in money prices, as well as in real prices, caused demand to become more elastic for all the products including poultry meat. The changes in the price levels between the different meats similarly caused the cross-price elasticities to become more significant (Table XXXI).

During 1972, there was a complete reversal in the supply situation from 1971, caused by a growing shortage of beef, and a marked increase in the price. Beef consumption declined as well as lamb. Clearly these meats were being substituted by the purchase of broilers. The price of broilers had fallen during the first half of 1972 due to increased supplies caused by producer reaction to the improved price situation in 1971. The consumption of beef fell from 7.94 ozs in 1971 to 6.90 ozs in 1972, whereas poultry meat increased from

TABLE XXXI

ESTIMATES OF PRICE AND CROSS-PRICE ELASTICITIES OF DEMAND[a] (1966-1973) FOR CARCASE MEAT and BROILERS

Elasticity with respect to price of:-

	Beef and Veal		Mutton and Lamb		Pork		Broiler Chicken	
Beef and Veal	-1.56	(.22)	0.32	(.11)	0.26	(.09)	0.07	(.09)
Mutton and Lamb	0.62	(.21)	-1.19	(.20)	0.16	(.13)	0.32	(.13)
Pork	0.85	(.30)	0.26	(.21)	-1.29	(.25)	-0.08	(.18)
Broilers	0.29	(.39)	0.71	(.29)	-0.11	(.24)	-1.21	(.34)

(a) Calculated from monthly data 1966-73. Figures in brackets are estimates of standard errors.

ANNUAL INDICES OF AVERAGE DEFLATED PRICES, PURCHASES AND DEMAND taking into account effect of CROSS-PRICE ELASTICITIES FOR RELATED COMMODITIES

Average for period = 100.

	1966	1967	1968	1969	1970	1971	1972	1973
Beef and Veal								
Prices (a)	94	92	97	98	96	99	104	123
Purchases (b)	108	112	101	101	102	103	92	84
Demand (c)	99	100	98	98	98	105	98	104
Demand (d)	101	102	99	99	98	105	96	101
Mutton and Lamb								
Prices (a)	97	94	97	99	96	95	103	122
Purchases (b)	115	112	105	101	95	100	93	83
Demand (c)	111	106	102	102	95	98	98	90
Demand (d)	112	107	103	102	95	98	97	88
Pork								
Prices (a)	97	101	99	98	98	95	99	115
Purchases (b)	96	82	90	101	102	110	114	110
Demand (c)	99	91	92	100	103	104	106	105
Demand (d)	100	93	93	101	104	104	104	102
Broilers								
Prices (a)	116	108	102	98	95	95	86	102
Purchases (b)	80	89	96	103	105	100	113	121
Demand (c)	99	104	102	101	103	97	92	103
Demand (d)	100	105	103	102	103	97	90	100

(a) Deflated to allow for changes in General Index of Retail Prices.
(b) Per Person.
(c) Per Person. Including changes in demand attributable to changes in real personal disposable income.
(d) Per person. After removal of the effects attributable to changes in real personal disposable income.

Source: M.A.F.F. N.F.S.

TABLE XXXI(a)

ESTIMATES OF PRICE and CROSS-PRICE ELASTICITIES OF DEMAND[(a)] 1967-74

Elasticity with respect to price of:-

	Beef and Veal		Mutton and Lamb		Pork		Broilers	
Beef and Veal	-1.07	(.18)	0.22	(.10)	0.15	(.07)	0.05	(.07)
Mutton and Lamb	0.44	(.21)	-1.43	(.21)	0.12	(.11)	0.25	(.12)
Pork	0.48	(.23)	0.18	(.17)	-1.35	(.18)	-0.12	(.13)
Broilers	0.20	(.31)	0.53	(.27)	-0.16	(.18)	-1.30	(.30)

(a) Calculated from monthly data 1967-74. Figures in brackets are estimates of standard errors.

ANNUAL INDICES OF AVERAGE DEFLATED PRICES, PURCHASES and DEMAND, taking into account effect of CROSS-PRICE ELASTICITIES FOR RELATED COMMODITIES 1967 - 1974

Average for period = 100.

	1967	1968	1969	1970	1971	1972	1973	1974
Beef and Veal								
Prices (a)	91	95	96	94	97	102	120	107
Purchases (b)	113	103	102	103	104	93	85	99
Demand (c)	104	99	99	99	104	96	98	103
Demand (d)	106	101	101	100	104	94	95	100
Mutton and Lamb								
Prices (a)	91	94	96	94	93	100	119	116
Purchases (b)	117	111	106	100	106	98	87	81
Demand (c)	105	103	102	95	98	101	100	96
Demand (d)	109	106	105	96	98	99	97	92
Pork								
Prices (a)	100	98	97	97	94	98	114	104
Purchases (b)	81	88	99	99	107	111	107	113
Demand (c)	87	89	97	99	101	105	113	112
Demand (d)	90	92	100	101	101	103	108	107
Broiler Chicken								
Prices (a)	110	104	100	97	97	88	104	101
Purchases (b)	85	92	98	101	96	108	115	108
Demand (c)	103	101	100	101	95	91	109	101
Demand (d)	105	103	102	102	95	90	106	97

(a) Deflated to allow for changes in General Index of Retail Prices.
(b) Per person.
(c) Per person. Including changes in demand attributable to changes in real personal disposable income.
(d) Per person. After removal of effects attributable to changes in real personal disposable income.

Source: National Food Survey.

4.85 ozs to 5.69 ozs. The underlying demand for pork increased. Pork and poultry therefore tended to substitute for the marked decline in beef and continued fall in lamb consumption. The underlying trend towards the increased demand for beef hesitated significantly due to the exceptionately high price of beef.

In 1973, during the first quarter, there was a further marked rise in beef prices, causing a 17% increase in real terms above the level for the last quarter of 1972. Consumer resistance resulted in a fall of 13% in consumption. Broiler consumption, in contrast, reached its highest ever level for any quarter, and was 24% above the level for the last quarter of 1972, despite a rise of 8% in real prices. Supplies of beef remained low, but in the autumn the trend changed with a marked increase in supplies. This caused a fall in the price of beef and 24% rise in the level of consumption in the last quarter of 1973.

The increased cost of broiler production markedly affected the price of broilers, which by the last quarter were 28% above the real price in the last quarter of 1972. (The long downward annual trend in the real price of broilers was reversed during the second half of 1972). Together with the effect of the substantial rise in the supply of beef, the consumption of broilers declined, no doubt partly due to the marked increase in the price as well as substitution towards beef. Lamb consumption declined in 1973, and the underlying demand for pork decreased - the price of pork having increased by 16%.

Although the year closed to the general disadvantage of the broiler industry, the earlier shortage of carcase meat resulted in a fall of 8% in carcase meat consumption over the whole year. Meanwhile broiler consumption had increased by 8% and reached the highest ever recorded annual level of consumption for poultry meat as a whole of 6.09 ozs (31% of carcase and poultry meat in total).

The percentage of households purchasing beef during the recording week

declined from 74% in 1971 to 65% in 1973, from 51% to 44% for lamb, and pork declined from a peak of 37% in 1971 to 35%. Poultry however increased from 23% to 26%. This again is a reflection of consumer reaction to the changing price levels between the various carcase meats and poultry.

The changed situation in the level of supplies, already apparent during the last quarter of 1973 continued in 1974 with increased beef supplies. By mid-1974, the price of beef in money terms began to fall. Supplies further increased in the autumn. By the last quarter, increased pressure of supplies caused the real price to be 14% below the level in the last quarter of 1973, and in money terms was also lower than in 1973. The higher own-price elasticity of demand for beef caused a substantial increase in consumption to 8.30 ozs for this quarter - the highest level since 1971, and 13% above the level for the last quarter of 1973. Beef tokens were issued to pensioners during this quarter, which no doubt encouraged higher beef consumption.

The price of lamb had also decreased in real terms, but the underlying trend towards a decline in consumption continued during the first half. However consumption increased during the second half in response to the higher elasticity of the demand for lamb in the 1970's. The price of pork was 9% higher during the last quarter of 1974. Consumption had waivered during the year and declined during the last quarter. Pork production was similarly affected as broiler production by the marked increased cost of production caused by the substantial increase in the price of feedingstuffs.

Meanwhile the poultry meat situation reflected a marked fall in consumption for each quarter of 1974 compared to the previous year. The level increased slightly in the summer due to the slight fall in the price of broilers, but it was still well below 1973. During the first quarter consumption fell by as much as 24%, but by the last quarter the percentage fall had reduced to 13%. Supplies of poultry meat contracted by the end of the year due to the marked cutback in chick placements, the effect of the higher level of cold

storage stocks as well as reaction to the continued serious loss situation in the production sector.

The total increase in carcase meat consumption amounted to 0.97 ozs per person/week for 1974, reflecting the 9% fall in the real price of carcase meat. Beef consumption had increased by as much as 1.10 ozs, whilst poultry meat had fallen by 0.91 ozs for the year. In the last quarter the switch was even more apparent. Beef and lamb consumption were 1.59 ozs higher than in 1973, whilst poultry declined by 0.61 ozs and pork by 0.09 ozs, poultry consumption having dropped by a further 13% below the level for the third quarter of 1974.

During 1975, the level of the demand, consumption and the price of carcase meat was complicated by the effect of the subsidy on the price of beef due to the operation of the Social Beef Scheme during the first quarter of the year. Beef supplies continued to increase, and beef consumption reached the highest recorded level for the first quarter at 9.11 ozs/per person/week. The price of beef was slightly higher, but in real terms was lower, and much lower for the sector of the population which was entitled to beef tokens. Mutton and lamb consumption also increased because prices were below 1974 due to a rise in supplies. Clearly there was substitution in the consumption of broilers and pork in favour of beef and lamb. Broiler consumption declined from 3.50 ozs for the first quarter of 1974 to 3.10 ozs for the same quarter in 1975.

However, there was a marked fall in carcase meat consumption from 16.1 ozs in the first quarter to 14.1 ozs in the second quarter. Over one-third of the decline was due to the rundown in the beef token scheme. Broiler consumption increased from 3.10 ozs to 4.01 ozs.

As the year progressed, beef supplies began to decline, so that the price increased and by the end of the year the price of sirloin, at 100p/lb was 27% higher than in December 1974, whereas the price of broilers at 30p/lb was only 11% higher.

TABLE XXXII

RETAIL PRICE BROILERS (FROZEN), BEEF, PORK, LAMB p/lb.

	Broilers	Beef	Pork	Lamb	Chuck
			1971		
	.....	.....	pence per pound	.....	.....
January	17½	47	30	19	33
February	17	48	29	19	34
March	17½	49	29	20	35
April	18	51	29	20	37
May	19	52	29	20	37
June	19	53	30	20	37
July	19	53	30	20	37
August	19	53	30	20	37
September	18½	53	30	19	37
October	18	53	31	19	37
November	18	53	31	19	37
December	18	54	32	20	37
			1972		
January	17½	54	31	21	38
February	16½	55	31	21	39
March	17	56	31	21	39
April	17	56	32	21	40
May	17	56	32	21	40
June	17	63	33	26	43
July	17½	62	33	26	43
August	18	63	33	26	43
September	18½	63	34	26	43
October	18½	63	35	26	43
November	18½	63	36	26	44
December	18½	67	40	27	47
			1973		
January	19	75	40	29	54
February	20½	74	40	29	55
March	21½	74	40	30	55
April	22	74	40	30	54
May	22	75	41	31	54
June	22	75	41	30	55
July	22½	77	42	32	55
August	23½	78	42	34	55
September	25½	78	43	36	55
October	27	78	48	38	56
November	27	78	50	38	56
December	26½	79	51	39	57

contd....

TABLE XXXII (Contd.)

RETAIL PRICE BROILERS (FROZEN), BEEF, PORK, LAMB p/lb.

	Broilers	Beef	Pork	Lamb	Chuck
			1974		
	.....	.....	pence per pound	.....	.....
January	26	80	50	40	57
February	25½	79	47	38	56
March	25	79	46	38	56
April	25	79	46	36	56
May	25	80	45	35	55
June	24	80	44	34	55
July	24	80	44	33	53
August	24	80	44	32	53
September	25	80	46	33	52
October	26	79	49	33	52
November	26	78	51	33	51
December	27	79	53	34	53
			1975		
January	28	83	53	36	54
February	28	83	52	35	55
March	29	91	53	37	60
April	29	96	55	38	63
May	31	97	57	38	64
June	31	99	58	39	64
July	31	98	57	39	61
August	31	97	57	39	60
September	32	98	59	38	61
October	31	96	62	39	62
November	30	97	64	39	64
December	30	100	66	40	66

Source: Department of Employment Gazette and M.A.F.F. Food Facts.

Broilers (Frozen 3 lbs).

Beef (Sirloin, without bone home-killed).

Pork (Leg. home-killed).

Lamb (Shoulder - imported).

Chuck (Home-killed).

By the end of the year broiler consumption had increased substantially, so that it reached the highest level ever recorded for the last quarter at 4.13 ozs which was 34% higher than for the same quarter of 1974.

Over the year as a whole beef supplies were higher than in 1974, which together with the fall in the price of beef during the autumn and early winter and the growing underlying demand for beef during the past three years, resulted in an increase in beef consumption from 7.41 ozs in 1974 to 8.32 ozs in 1975. Mutton and lamb began to decline again during the second half of 1975 indicating the general fall in the underlying demand for lamb as well as the rise in the price, which at 40p/lb at the end of the year was 6p above the price in December 1974. Pork consumption had declined from 3.20 ozs in 1974 to 2.73 ozs in 1975. The increase in the underlying demand for broilers in 1975 however resulted in an overall increase in broilers from 3.59 ozs in 1974 to 3.76 ozs in 1975, which no doubt would have been higher but for the effect of the Social Beef Scheme. Some of the increase in broiler consumption would have been made at the expense of pork consumption and no doubt of lamb consumption during the latter half of the year.

By the end of the year sirloin beef was over three times the price of broilers, pork was over twice the price and lamb was 33% higher.

The marked seasonal price changes which have occurred between 1971 and 1975 are well illustrated by the monthly retail price data for the various meats in Table XXXII.

Annual Broiler Producer, Wholesale and Retail Price and Marketing Margins 1960-75

The decline in the share of food sales accruing to producers is of major concern to the agricultural industry, i.e. marketing margins (producer - retail price spreads) tend to increase at a faster rate than producer prices. An indication of the situation in the broiler industry is illustrated in Table XXXIV. This covers the producer, wholesale and retail price of broilers and marketing margins on an annual basis between 1960 and 1975.

TABLE XXXIII

ANNUAL AVERAGE PRODUCER PRICE OF BROILERS
LIVEWEIGHT pence/pound

Year	p/lb	Index 1960 = 100
1960	8.8	100.0
1961	7.7	87.5
1962	7.8	88.6
1963	7.5	85.2
1964	7.7	87.5
1965	7.5	85.2
1966	7.6	86.4
1967	7.4	84.1
1968	7.3	83.0
1969	7.2	81.8
1970	7.4	84.1
1971	8.4	95.5
1972	7.9	89.8
1973	10.5	119.3
1974	13.1	148.9
1975	13.7	155.7

Sources: P.F. + P. 1960-61, B.O.C.M./COBB 1962-69,
F.M.C. 1970-72, A.C.M.S. 1973-74, N.F.U. 1975.

Any comparison of prices in the producer, wholesale and retail sectors is complicated by the changing characteristics of each sector as well as by the changing structure of the industry. The production sector is closely integrated with the processing sector. Nearly three quarters of the total production of broilers is controlled by 11 producer/processor companies. However the output of these companies includes the production under contract by independent growers. Table XXXIV therefore has been designed to cover the prices received by these producers. Normally producers are paid on the basis of the live-weight of the birds. This price has been converted to the equivalent oven-ready weight in the producer price series. (A comparison of prices and marketing margins for producer/processors and the retail sector is included at the end of this chapter).

Variation in the annual prices during the 1960's reflected the supply/demand situation. At the same time the technical achievement of the industry resulted in a downward trend in the cost of production, though towards the end of the 1960's it became increasingly difficult to withstand increased unit costs of production. The producer price, as indeed the wholesale and retail price, tended to fall at least until the late 1960's. However, the cost of production was sharply affected by increased unit costs, particularly the price of feedingstuffs from 1972 onwards, as well as the effect of inflationary pressure on other costs in the 1970's. A marked increase in producer prices occurred between 1972 and 1974.

Within the processing sector, costs likely declined during the 1960's due to greater concentration and increased scale of operation, as well as a reduction in distribution costs. But this sector was similarly affected by the pressure of inflation in the form of spiralling wage rates, increased costs of packaging material, fuel prices and advertising charges.

The growth of the supermarket industry caused marked changes in the retailing sector and resulted in a reduction in retail marketing costs, particularly by means of bulk purchasing, quick throughput and reduced labour costs.

TABLE XXXIV

ANNUAL BROILER PRODUCER, WHOLESALE AND RETAIL PRICES (Oven Ready p/lb) AND MARKETING MARGINS

Year	Producer Price p/lb	Annual Change	Gross Margin Prod. W'sale Price p/lb	Gross Margin as % Prod. Price	Prod. Price as % W'sale Price	W'sale Price p/lb	Annual Change	Gross Margin Retail/ W'sale Price p/lb	Gross Margin as % W'sale Price	W'sale Price as % Retail Price	Retail Price p/lb	Annual Change	Gross Margin Prod./ Retail Price	Producer Price as % Retail Price
	p.	%	p.	%	%	p.	%	p.	%	%	p.	%	p.	%
1960	11.7	.	2.9	25%	80%	14.6	.	5.2	36%	74%	19.8	.	8.1	59%
1961	10.3	-12%	2.6	25%	80%	12.9	-12%	5.4	42%	71%	18.3	-8%	8.0	56%
1962	10.4	+ 1%	2.5	24%	81%	12.9	± 0%	5.4	42%	71%	18.3	± 0%	7.9	57%
1963	10.0	- 4%	2.4	24%	81%	12.4	- 4%	5.1	41%	71%	17.5	-4%	7.5	57%
1964	10.3	+ 3%	3.7	36%	74%	14.0	+13%	4.7	34%	75%	18.7	+7%	8.4	55%
1965	10.0	- 3%	3.0	30%	77%	13.0	- 7%	4.7	36%	74%	17.7	-5%	7.7	57%
1966	10.1	+ 1%	3.1	31%	77%	13.2	+ 2%	4.7	36%	74%	17.9	+1%	7.8	56%
1967	9.9	- 2%	2.1	21%	83%	12.0	- 9%	5.1	43%	70%	17.1	-5%	7.2	58%
1968	9.7	- 2%	2.1	22%	82%	11.8	- 2%	5.2	44%	69%	17.0	-1%	7.3	57%
1969	9.6	- 1%	2.4	25%	80%	12.0	+ 2%	5.2	43%	70%	17.2	+1%	7.6	56%
1970	9.9	+ 3%	2.6	26%	79%	12.5	+ 3%	5.3	43%	70%	17.8	+4%	7.9	56%
1971	11.2	+13%	2.7	24%	81%	13.9	+11%	5.6	40%	71%	19.5	+10%	8.3	57%
1972	10.5	- 6%	2.9	28%	78%	13.4	- 4%	5.5	41%	71%	18.9	- 3%	8.4	56%
1973	14.0	+33%	5.0	36%	74%	19.0	+42%	5.3	28%	78%	24.3	+29%	10.3	58%
1974	17.4	+24%	2.5	14%	87%	19.9	+ 5%	7.4	37%	73%	27.3	+12%	9.9	64%
1975	18.3	+ 5%	5.8	32%	76%	24.1	+21%	9.1	38%	73%	33,2	+22%	14.9	55%

Source: Producer Price (conversion. Oven Ready = 75% L.W.). See Producer Price Table for Sources.
Wholesale Price B.P.M.A.
Retail Price 1960-65 Poultry. 1966-75 Broiler Chicken uncooked, including frozen under 4 lbs. N.F.S.

Large multiple stores (including the co-operatives) now account for 43% of chicken retail sales, whilst butchers cover 24%, other grocers 7%, fishmongers/ poulterers 6% and all other outlets 20%. However, as in the other sectors of the marketing chain, costs have increased substantially in recent years. All sectors recognise the need to maintain advertising and sales promotion compaigns in order to stimulate demand.

Although the prices listed in Table XXXIV are not strictly comparable, e.g. the retail price covered the price of poultry in 1960-65 and the price of broilers (including both frozen and fresh birds) from 1966 onwards, nevertheless patterns and trends over time are discernable. Generally, producer, wholesale and retail prices move in a similar direction, but wholesale prices tend to increase or decrease more, in percentage terms, from one year to another than either producer or retail prices (except for producer prices in 1971, 1972 and 1974 and retail prices in 1974 and 1975). The last two years have been exceptional in many respects for broiler production and marketing, particularly in relation to the price of carcase meat, the effect of the Social Beef Scheme as well as the effect of inflation.

The wholesale price probably reflects the demand/supply situation more extremely than the retail price mainly because wholesalers are the pivot between the producer and the consumer sectors. The retail trade in any case tends to smooth out prices (particularly on a weekly or monthly basis) in order not to upset consumers by sudden sharp price changes, particularly if the processor's selling price moves markedly upwards. The producer price does not fully reflect the immediate supply/demand situation since producer prices, particularly for producers under contract, are often previously agreed prices with the processors and are often linked to the price of feedingstuffs. Producer prices tend to lag behind changes in the other sectors.

Contrary to the general picture of the agricultural industry as a whole, the percentage share of the retail price accruing to producers in the broiler

industry has tended to remain fairly stable - though fluctuating between 56% and 59% during the 1960's and early 1970's. However there was a marked rise to 64% in 1974, (caused by the decline in broiler consumption which depressed the level of retail prices), followed by a sharp fall to 55% in 1975 when retail prices improved again.

Although the prices in the table indicate a fairly stable trend of the share of the retail price accruing to producers, an examination of the producer share of the wholesale price reveals a rather different picture. This indicates that the share declined from 80% to 77% between 1960 and 1966. The share increased to 83% in 1967 and then trended downward to 74% in 1973, i.e. the margin between the producer and the wholesale price has tended to increase and particularly during the latter period in money terms from 2.1p in 1967 to 5.0p in 1973. There was a sharp fall to 2.5p in 1974. However the margin more than doubled to 5.8p in 1975. Meanwhile the gross margin between the wholesale and the retail price increased from 5.1p in 1967 to 9.1p in 1975.

The gross margin between the wholesale and the retail price is always much wider than the margin between the producer and the wholesale price, despite the extra costs involved in processing and distributing the birds from the producing/processing sector to the wholesale sector. The broiler becomes a standardised packaged product once it leaves the processing station and requires no alteration on the part of the wholesale or retail trade, i.e. it becomes an ordinary grocery line.

The wider margin between the wholesale and retail price than the margin between the producer and the wholesale price, tends to cancel out the effect of the declining producer share of the wholesale price over time. As a result the producer's share of the retail price, in percentage terms, has tended to remain fairly stable over time, at least until the last three years.

During the latter half of 1973, a marked increase occurred in the producer price due to increased costs of production (particularly the price of feeding-stuffs), pressure on the part of producers for better prices and increased

consumer demand for broilers caused by the sharp rise in the price of beef. The buoyant market encouraged a marked increase in production.

However, 1974 turned out to be a disastrous year for producers and processors, which resulted in a very sharp drop in the margin between the producer and the wholesale price. On average there was a minimal increase in the wholesale price, as wholesalers and processors had to deal with excessive supplies, extreme pressure of very high storage stocks, as well as attempting to compensate producers for their higher costs of production. The situation was further complicated in 1974, by a reversal of the situation in the red meat sector. Wholesalers therefore attempted to hold prices down. The margin between the wholesale and the retail price nevertheless increased substantially which was partly caused by spiralling retail costs of marketing.

In percentage terms the gross margin between the wholesale and the retail price, as a percentage of the retail price, amounted to 27%, whereas the margin between the producer and the wholesale price was only 13% of the wholesale price in 1974.

The situation changed again during 1975, so that the price of broilers became much more competitive to the increased price of carcase meat and the demand for chicken increased. The wholesale and the retail price increased substantially, whereas the producer price only increased on average by 5%. As a result the gross margins became more in balance. The margin between the producer and the wholesale price being 24% of the wholesale price, and the margin between the wholesale and the retail price being 27% of the retail price. It should be noted that the price of broilers in this table covers frozen and fresh broilers.

Monthly Producer, Wholesale and Retail Price of Broilers and Marketing Margins 1971-75

Although there are evident trends on an annual basis, the price situation and the extent of the marketing margins are more related to cyclical surplus or shortage situations. In recent years these have of course been further

TABLE XXXV (a)

MONTHLY RETAIL, WHOLESALE AND PRODUCER PRICE OF BROILERS (Oven Ready p/lb) and MARKETING MARGINS

Year	Retail Price p/lb	Monthly change	Gross Margin W'sale Retail Price	W'sale Price as % Retail Price	W'sale Price p/lb	Monthly change	Gross Margin Prod. W'sale Price	Prod. Price as % W'sale Price	Prod. Price p/lb	Monthly change	Prod. Price % Retail Price	Average Weekly Chick Placements	Cold Storage Stocks Chicken	Chicken & Capon Throughput Quarterly
	p.	%	p.	%	p.	%	p.	%	p.	%	%	millions	1000 tons	millions
1971														
J	17.5		4.5	74%	13.0		2.1	85%	11.1		63%	5.32	8.0	
F	17.3	-1.1%	4.3	75%	13.0	±0.0%	1.8	86%	11.2	+0.9%	65%	5.45	n.a.	50.17
M	17.6	+1.7%	3.8	78%	13.8	+6.2%	2.6	81%	11.2	±0.0%	64%	5.85	n.a.	
A	18.2	+3.4%	3.6	80%	14.6	+5.8%	3.4	77%	11.2	±0.0%	62%	5.64	8.2	
M	18.9	+3.8%	3.5	81%	15.4	+5.5%	4.1	73%	11.3	+0.9%	60%	5.58	6.5	53.54
J	19.2	+1.6%	4.1	79%	15.1	-1.9%	3.8	75%	11.3	±0.0%	59%	6.00	6.3	
J	19.1	-0.5%	4.6	76%	14.5	-4.0%	3.2	78%	11.3	±0.0%	59%	6.05	7.0	
A	18.8	-1.6%	4.6	76%	14.2	-2.1%	3.0	79%	11.2	-0.9%	60%	6.05	7.1	59.33
S	18.5	-1.6%	5.0	73%	13.5	-4.9%	2.3	83%	11.2	±0.0%	61%	6.32	6.9	
O	18.1	-2.2%	4.7	74%	13.4	-0.7%	2.3	83%	11.1	-0.9%	61%	5.61	6.9	
N	17.7	-2.2%	4.6	74%	13.1	-2.2%	2.3	83%	10.8	-2.7%	61%	5.37	7.8	62.84
D	17.8	+0.6%	5.0	72%	12.8	-2.3%	2.1	84%	10.7	-0.9%	60%	5.75	8.1	
Average	18.2		4.3		13.9		2.7		11.2			Total 299m		Total 225.88
1972														
J	17.6	-1.1%	5.0	72%	12.6	-1.6%	1.9	85%	10.7	±0.0%	61%	5.60	7.0	
F	16.6	-5.7%	4.6	72%	12.0	-4.8%	1.5	88%	10.5	-1.9%	63%	5.98	9.3	60.88
M	16.9	+1.8%	4.3	75%	12.6	+5.0%	2.2	83%	10.4	-1.0%	62%	6.18	9.8	
A	17.0	±0.5%	4.2	75%	12.8	±1.6%	2.4	81%	10.4	±0.0%	61%	5.97	9.5	
M	17.0	±0.0%	4.2	75%	12.8	±0.0%	2.4	81%	10.4	±0.0%	61%	6.17	9.1	64.83
J	17.2	+1.2%	4.4	74%	12.8	±0.0%	2.4	81%	10.4	±0.0%	61%	6.10	8.7	
J	17.6	+2.3%	4.1	77%	13.5	+5.5%	3.1	77%	10.4	±0.0%	59%	6.12	8.8	
A	18.1	+2.8%	4.1	77%	14.0	+3.7%	3.6	74%	10.4	±0.0%	58%	6.21	6.4	65.21
S	18.4	+1.7%	3.9	79%	14.5	±3.6%	4.0	72%	10.5	±1.0%	57%	6.51	6.5	
O	18.5	+0.5%	4.0	78%	14.5	±0.0%	4.0	72%	10.5	±0.0%	57%	5.43	7.1	
N	18.4	-0.5%	4.1	78%	14.3	-1.4%	3.6	75%	10.7	+1.9%	58%	5.76	7.0	60.66
D	18.7	+1.6%	4.5	76%	14.2	-0.7%	3.4	76%	10.8	+0.9%	58%	6.20	6.5	
Average	17.7		4.3		13.4		2.9		10.5			Total 313m		Total 251.57

For notes on coverage see following page.

TABLE XXXV (b)

MONTHLY RETAIL, WHOLESALE AND PRODUCER PRICE OF BROILERS (Oven Ready p/lb) AND MARKETING MARGINS

Year	Retail Price p/lb	Monthly Change	Gross Margin W'sale/ Retail Price	W'sale Price as % Retail Price	W'sale Price p/lb	Monthly Change	Gross Margin Prod. W'sale Price	Prod. Price as % W'sale Price	Prod. Price p/lb	Monthly Change	Prod. Price % Retail Price	Average Weekly Chick Place-ments	Cold Storage Stocks Chicken	Chicken & Capon Through-put Quarterly
1973	p.	%	p.	%	p.	%	p.	%	p.	%	%	millions	1000 tons	millions
J	18.9	+1.1%	4.1	78%	14.8	+4.2%	3.2	78%	11.6	+7.4%	61%	6.18	5.3	
F	20.6	+9.0%	4.5	78%	16.1	+8 8%	4.0	75%	12.1	+4.3%	59%	5.91	5.8	61.72
M	21.3	+3.4%	4.0	81%	17.3	+7.5%	4.9	72%	12.4	+2.5%	58%	6.56	5.4	
A	21.8	+2.3%	4.3	80%	17.5	+1.2%	4.7	73%	12.8	+3.2%	59%	6.34	5.0	
M	21.9	+0.5%	4.4	80%	17.5	+0.0%	4.4	75%	13.1	+2.3%	60%	6.32	5.3	64.68
J	22.2	+1.4%	4.5	80%	17.7	+1.1%	4.6	74%	13.1	+0.0%	59%	6.43	5.4	
J	22.6	+1.8%	3.6	84%	19.0	+7.3%	5.8	69%	13.2	+0.8%	58%	6.13	6.1	
A	23.5	+4.0%	3.0	87%	20.5	+7.9%	6.8	67%	13.7	+3.8%	58%	6.63	6.6	62.22
S	25.5	+8.5%	3.5	86%	22.0	+12.2%	7.3	67%	14.7	+7.4%	58%	7.02	6.6	
O	26.8	+5.1%	4.6	83%	22.2	+0.9%	5.1	77%	17.1	+16.3%	64%	5.73	7.0	
N	26.7	-0.4%	4.4	84%	22.3	+0.5%	5.0	78%	17.3	+1.2%	65%	6.22	8.0	60.69
D	26.4	-1.1%	5.9	78%	20.5	-8.1%	3.2	84%	17.3	+0.0%	66%	6.74	8.3	
Aver-age	23.2		4.2		19.0		5.0		14.0		Total	329m	Total	249.32
1974														
J	26.1	-1.1%	5.6	79%	20.5	+0.0%	3.2	84%	17.3	+0.0%	66%	6.84	8.7	
F	25.6	-1.9%	5.6	78%	20.0	-2.4%	2.3	89%	17.7	+2.3%	69%	6.91	8.4	62.22
M	25.2	-1.6%	6.0	76%	19.2	-4.0%	1.2	94%	18.0	+2.8%	71%	7.46	10.7	
A	25.0	-0.8%	6.1	76%	18.9	-1.6%	0.9	95%	18.0	+0.0%	72%	7.19	11.3	
M	24.6	-1.6%	6.1	75%	18.5	-2.1%	0.5	97%	18.0	+0.0%	73%	6.35	10.6	64.99
J	24.3	-1.2%	6.1	75%	18.2	-1.6%	0.5	97%	17.7	-1.7%	73%	5.90	10.5	
J	23.6	-2.9%	5.8	75%	17.8	-2.2%	0.5	97%	17.3	-2.3%	73%	5.92	12.0	
A	24.0	-1.7%	5.6	77%	18.4	+3.4%	1.7	91%	16.7	-3.5%	70%	5.88	11.8	59.90
S	25.1	+4.6%	5.1	80%	20.0	+8.7%	3.3	84%	16.7	+0.0%	67%	6.06	12.9	
O	26.4	+5.2%	4.4	83%	22.0	+10.0%	5.3	76%	16.7	+0.0%	63%	5.17	12.5	
N	26.4	+0.0%	4.1	84%	22.3	+1.4%	5.1	77%	17.2	+3.0%	65%	5.48	11.8	53.84
D	27.0	+2.3%	4.5	83%	22.5	+0.9%	5.1	77%	17.4	+1.2%	64%	5.99	9.9	
Aver-age	25.3		5.4		19.9		2.5		17.4		Total	326m	Total	240.95

For notes on coyerage see following page.

TABLE XXXV(c)

MONTHLY RETAIL, WHOLESALE AND PRODUCER PRICE OF BROILERS (Oven Ready p/lb) AND MARKETING MARGINS

Year	Retail Price p/lb Monthly		Gross Margin W'sale/ Retail Price	W'sale Price as % Retail Price	W'sale Price p/lb Monthly		Gross Margin Prod. W'sale Price	Prod. Price as % W'sale Price	Prod. Price p/lb Monthly		Prod. Price % Retail Price	Average Weekly Chick Placements	Cold Storage Stocks Chicken	Chicken & Capon Throughput Quarterly
1975	p.	%	p.	%	p.	%	p.	%	p.	%	%	millions	1000 tons	millions
J	27.6	+2.2%	5.1	82%	22.5	±0.0%	4.8	79%	17.7	+1.7%	64%	6.02	9.0	
F	28.2	+2.2%	5.5	81%	22.7	-0.9%	4.6	80%	18.1	+2.3%	64%	6.45	8.3	52.83
M	28.8	+2.1%	6.0	79%	22.8	+0.4%	4.4	81%	18.4	+1.7%	64%	6.81	7.1	
A	29.4	+2.1%	6.5	78%	22.9	+0.4%	4.5	80%	18.4	±0.0%	63%	6.36	5.9	
M	30.5	+3.7%	6.7	78%	23.8	+3.9%	5.8	76%	18.0	-2.2%	59%	6.48	6.0	59.61
J	31.2	+2.3%	6.4	80%	24.8	+4.2%	6.9	75%	17.9	-0.6%	57%	6.45	5.4	
J	31.3	+0.3%	6.2	80%	25.1	+1.2%	6.8	73%	18.3	+2.2%	59%	6.69	5.5	
A	31.3	±0.0%	6.2	80%	25.1	±0.0%	6.7	73%	18.4	+0.6%	59%	7.03	7.0	57.34
S	31.7	+1.3%	6.4	80%	25.3	+0.8%	6.9	73%	18.4	±0.0%	58%	7.06	6.7	
O	30.6	-3.5%	5.4	82%	25.2	-0.4%	6.7	73%	18.5	+0.5%	61%	6.24	6.8	
N	30.1	-1.6%	5.6	81%	24.5	-2.7%	5.8	76%	18.7	+1.1%	62%	5.55	6.6	54.72
D	30.1	±0.0%	6.0	80%	24.1	-1.6%	5.4	78%	18.7p	±0.0%	62%	6.66	7.7	
Aver-age	30.1		6.0		24.1		5.8		18.3		Total	337		224.50

Sources: Retail Price Department of Employment Gazette (Frozen Broilers 3lbs).
Wholesale Price B.P.M.A.
Producer Price 1971/72. F.M.C., 1973/74 A.C.M.S., 1975. N.F.U.(L.W. converted to Oven Ready).
Meat Chick Placements U.K. M.A.F.F.
Cold Storage Stocks M.A.F.F. Whole and Cuts of Chicken in public cold stores (not including private stores).
Throughput M.A.F.F. (England and Wales) Not including birds marketed directly by producers to wholesale markets and consumers.

complicated by inflationary pressure together with the changing situation in the carcase meat sector which has effected the demand for poultry meat.

The trends in prices are perhaps more clearly illustrated on a monthly basis and these are indicated in Table XXXV for the past five years. Average weekly chick placement statistics, cold storage stocks and chicken throughput at the processing stations are also included to indicate their effect on the price situation. It should be noted that the retail prices in this table cover the price of frozen broilers only. They are based upon the price of broilers collected and published each month by the Department of Employment as well as by the Department of Prices and Consumer Protection in recent years. The retail prices in this table are therefore lower than the retail prices in Table XXXIV which included the price of fresh broilers as well as frozen broilers.

The prices and margins on a monthly basis illustrate the very marked changes which have occurred particularly in recent years as well as the volatile nature of the industry.

During the first half of 1971, the price of broilers increased markedly above the level of the previous year, due to a shortage of supplies caused by the fowl pest epidemic. As supplies increased prices began to decline, so that the average price in 1972 was less than in 1971. The market improved in 1973, but since the wholesale price increased markedly more than the producer price the producers share of the wholesale price diminished substantially to as low as 67% in September i.e. the marketing margin increased. (The producers' share of the wholesale price generally tends to decline in percentage terms whenever the price level increases in the wholesale or the retail sectors or vice versa).

Increased demand for broilers in 1973 was partly related to the sharp increase in the price of carcase meat, particularly beef. The marked rise in wholesale prices resulted in an increased share of the retail price, since retailers were attempting to smooth out the level of broiler prices to consumers.

In contrast to the situation in the producer sector, the wholesale share

of the retail price tends to increase when the price rises. It is also notable that the wholesale price swung much more extremely during 1971 and 1972, in percentage terms, than the retail price, whilst producer price changes were minimal in comparison during these years. However, in 1973, unusually marked increases were evident in the producer sector, which was partly caused by the substantial increase in the cost of feedingstuffs as well as increased demand for broilers.

The market began to deteriorate towards the end of 1973 due to the pressure of increased supplies (cold storage stocks were 57% higher in December than in January 1973).

The warning signals were already evident in the retail sector in late 1973, when the retail price began to fall. However, producers ignored this signal and chick placements continued to rise during the first four months of 1974 and cold storage stocks mounted to the highest level ever recorded. Meanwhile the wholesale price dropped substantially.

The serious economic situation of the broiler industry by mid-1974 is reflected in the very low margin of only 0.5p between the producer and the wholesale price, compared to as much as 7.3p in September of the previous year. It is also notable that the monthly decline in retail prices in 1974 was closer to the percentage decline in wholesale prices which was unusual. No doubt this was caused by escalating retail costs of marketing in 1974, e.g. wages and fuel costs. Nevertheless, the margin between the wholesale and the retail price was considerably higher than might be expected at 6.1p in May and June compared to the very low margin of 0.5p between the producer and the wholesale price. Costs also would have likely increased as much for processors and wholesalers as for retailers in this period.

It is clear that producer/processors were operating in a serious loss situation throughout most of 1974. Similarly independent growers faced great difficulties as prices declined and costs increased. Though it should also

be said that the production sector was rather slow in reacting to the market situation and the increased demand for beef as a result of the slump in the beef market. Production of broilers continued to expand in the belief that the bonanza of 1973 would continue even though there were clear warnings as early as November 1973 of the likely situation in 1974.

However, with mounting storage stocks, and declining producer prices, chick placements began to fall increasingly during the rest of 1974. This resulted in a marked rise in wholesale prices of 22% between August and December 1974 and a less marked rise of 9% in the retail sector, since retailers were attempting to smooth out prices. Producer prices rose by only 4%, reflecting as usual the more marked response to the supply/demand situation by the processor sector.

The effect of the decline in supplies upon the level of prices was not as marked as might have been expected during the December 1974 to March 1975 period due to the effect upon the demand for broilers, caused by the increased consumption of beef in this period as a result of the introduction of the Social Beef Scheme.

However the improved economic situation of producers/processors during the latter half of 1975 is reflected in the higher gross margin between the producer and the wholesale price, which more than doubled on average for the year as a whole. It seems likely that the improved situation could continue throughout 1976, <u>provided</u> that expansion of production is kept in balance with the likely further increase in chicken consumption.

PRODUCER/PROCESSOR, WHOLESALE and RETAIL PRICES, MARKETING MARGINS, PRICING POLICY and PROFITS.

Eleven major producer/processing companies produce about three quarters of the total national output of broilers. The bulk of the sales by this sector is sold in the form of frozen broilers. A major proportion of the sales of these organisations will be made direct to the supermarket organisations, so that the normal wholesale sector of the meat trade is frequently excluded from the marketing chain. It is therefore of interest to compare their costs of production with their selling prices and to determine the gross margins between the various sectors.

The marketing of broilers is very different in many respects from the more traditional methods which are employed in the carcase meat sector. The frozen broiler is a standardised product and the marketing chain is much shorter than for carcase meat. Once the frozen broiler has left the producer/processor's factory no change takes place in the form or the packaging of the broiler, whereas carcase meat goes through several processes between the farm, the auction, the abattoir, the wholesaler and the butcher before the consumer finally purchases the meat.

The selling price of the producer/processor is largely determined by the demand/supply situation in the market, though a proportion of the trade is sold at forward contracts at fixed prices.

However, unlike the carcase meat trade, particularly in the butchery sector, the pricing policy of the supermarket organisations is the same for frozen broilers as for other grocery items, i.e. a mark-up is generally applied to the buying price. The pricing policy for fresh birds is different from frozen broilers, in that the pricing policy is similar to that of the carcase meat market. Butchers and poulterers base the fresh poultry price upon the market forces operating at the time of sale. As a result the price of fresh poultry is more flexible. It is also higher than the price of frozen birds.

An indication of the results of the pricing policy of wholesalers and retailers, as well as the costs and selling prices of producer/processors is provided in Table XXXVI. It should be noted that the gross margins in the table for the wholesale and retail sectors are not the equivalent of the difference between the selling price and the wholesale price, and the wholesale price and the retail price respectively.

Evidently, the producer/processor selling price to wholesalers tends to be lower than the selling price to retail organisations such as supermarkets. The gross margin of wholesalers averages 28% of the gross margin between the producer/processor average selling price and the retail price, whilst the gross margin for retailers amounts to 72%. This relationship seems to be fairly stable during the period 1971-74, and accordingly the estimated gross margins for 1975 have been based on these proportions.

The mark-up pricing policy of retailers and wholesalers has remained very stable on an annual basis during the past five years. Indeed the gross margins for the retail trade appear to have declined slightly from 18.5% in 1971 to 17.0% in 1975. The average retail gross margin was 18%, which was slightly lower than the average of 20% for most grocery items. Similarly the gross margins of the wholesale trade have remained very stable at an average of 9%.

However, since the mark-up price policy of retailers and wholesalers is very stable, then the profitability of this sector of the broiler trade must also be relatively stable, which is not to imply that the rate is excessive, since the gross margin tends to be lower than average in the retail grocery trade.

But the very stability of the gross margin rate indicates that changes in the supply/demand situation and in the level of prices will be felt more by the producer/processing sector than by the retail sector. The producing sector therefore takes the brunt in terms of profitability, when supply exceeds the

TABLE XXXVI

PRODUCER/PROCESSOR, WHOLESALE and RETAIL PRICE of FROZEN BROILERS

MARKETING MARGINS and the PROFITABILITY OF THE MARKET SECTORS 1971-75

	1971	1972	1973	1974	1975
			p/lb		
PRODUCER/PROCESSOR COSTS					
Production	10.02	9.57	12.30	16.36	16.40
Processing	2.41	2.17	2.72	3.60	5.00
Transport	0.73	0.77	0.92	1.08	
Total	13.16	12.51	15.94	21.04	21.40 (a)
SELLING PRICE	13.35	13.36	17.21	19.41	23.00 (a)
NET MARGIN (b)	+0.19 (b)	+0.85 (b)	+1.27 (b)	(-1.63) (b)	+1.60 (b) (a)
Net Margin % Selling Price	1.4%	6.6%	7.4%	-8.4%	7.0% (a)
WHOLESALE PRICE	14.10	13.40	18.90	20.00	24.10
Wholesale Gross Cash Margin	1.25	1.30	1.60	1.80	1.99
Cash Margin % Wholesale Price	8.9%	9.1%	8.7%	8.8%	8.3%
RETAIL PRICE	18.10	17.70	23.20	25.30	30.10
Retail Gross Cash Margin	3.30	3.20	4.20	4.50	5.11
Cash Margin % Retail Price	18.5%	18.1%	17.9%	17.8%	17.0%

Source: Price Commission

(a) Estimated.

(b) Net Margin = Surplus over costs (except in 1974). The surplus has to meet overhead and financing charges not already included in the costs, as well as providing the net profit of the producer/processors.

demand of the market and indeed, vice-versa, it benefits when demand increases. Similarly when the market becomes distorted due to a marked change in the price of competitive products, e.g. in 1973 when the price of carcase meat increased sharply, the producer sector would have benefitted more than the retail sector. However, as in 1974, when excess supplies of beef disturbed the market and the consumption of poultry declined well below year earlier levels as far back as 1968, producer/processors had to adjust their selling price well below the cost of production and processing in order to remove the surplus from the market.

The net margins of the producer/processor sector are outlined in Table XXXVI, i.e. the difference between the selling price and the cost of production and processing. The margins indicate the unstable nature of the profitability of this sector as well as the effect of consumer demand, the price of competitive products as well as the rising cost of production.

Demand for broilers increased in 1972, and particularly in 1973 when the price of carcase meat rose sharply. The net margin, as a percentage of the selling price, increased from 1.4% in 1971 to 7.4% in 1973. However, the combination of a drop in consumption, the fall in the price of beef, excess stocks of broilers in cold stores, and a marked rise in the cost of production resulted in the selling price being 1.63p/lb below the cost of production and processing. The loss in the producer/processor sector therefore amounted to 8.4% of the selling price. The retail sector, in this situation, remained profitable, due to their stable mark-up pricing system, though of course their sales would have declined in volume.

The rise in the consumption of poultry during 1975 and a more balanced market resulted in a marked improvement in the selling price in 1975 (19% above 1974) whilst the cost of production remained relatively stable, except for processing and transport costs. The profitability of the producer/processor sector therefore improved to 7.0% in 1975, i.e. similar to the level obtained in 1973. It seems likely that 1976, at least for the first half, should prove

fairly favourable, though it is likely that the cost of production will increase due to the higher cost of feedingstuffs which will further increase during the year due to the operation of the Skim Milk Powder Scheme by the E.E.C. It is estimated that the latter scheme alone will raise the cost of poultry feedingstuffs by between £3 and £4 per ton. The likely higher price of competitive red meat products in 1976 should prove favourable to the selling price of broilers. The situation will depend upon the producing sector's ability not to overexpand production to excessive levels.

Clearly, planning the production and marketing of broilers according to the demand of the market has become increasingly difficult during recent years. Price changes have become more extreme and the market more liable to disruption.

Apart from the effect of inflation, uncertainty about the future level of the supply and price of red meat, the likely level of the price of feedingstuffs, differential treatment of the various livestock sectors by the E.E.C. as well as the effect of changing levels in the export restitutions, indicate the need for greater caution than ever in planning production according to the likely demand of the market. If production is to be a profitable exercise, then certainly greater regard needs to be paid, than was necessary in the past, to all the other many factors which affect the marketing of broilers other than just simply the level of broiler production.

The impression may have been gained outside the industry, that since broiler production has a quick turn round, that it is not so dependent upon time, as the beef industry for example, for planning and programming production. Whilst it is true that the turn round of only 10-11 weeks in the actual production of the finished broiler is much quicker than for red meat, and therefore there can be a quicker reaction to the market situation, nevertheless broiler production is dependent upon a number of stages in the breeding and production programme. In total this amounts to nearly two years back to the initial grand parent stock. For long term planning purposes it needs to have some indication of the likely development of the other meat sectors, as well

as other factors likely to affect the market situation, if the programming of the whole production process is to be successful. Sudden changes at the end of the line can result in an unnecessary waste of resources by the industry.

Although the broiler industry prefers to follow a "go-it-alone" policy without government interference or subsidies, it is not surprising that its reaction may be a trifle vociferous to sudden changes in government or E.E.C. policy which artificially stimulate switches in the supply or the demand for other competitive products or other schemes which may penalise poultry production. The bitter reaction of the poultry industry to the E.E.C. Skim Milk Powder Scheme was no more than to be expected. In particular it seems inequitable that the poultry industry should be penalised for the over production of a product such as milk which has received such favourable treatment from the C.A.P.

PART V

ECONOMICS OF PRODUCTION

Costs, Returns and Margins 1961-71

Frequent reference is made in studies of livestock production, to the remarkable progress which has been made by the broiler industry in comparison with other sectors of agriculture. Some indication of the results which have been achieved is provided in Table XXXVII for the decade 1961-71. The economic results are particularly remarkable in view of the 50% rise in the price of feedingstuffs during this period. It should also be noted that the industry had to contend with a severe outbreak of Newcastle disease in 1971, so that 1970 is perhaps more typical of the results for the end of the decade.

In technical terms, bird weight increased from 3.75 lbs to 4.4 lbs. (L.W.) for a shorter growing period from 71 days to 62 days, whilst the feed conversion rate improved from 2.62 to 2.24. The stocking density rate* declined from 0.75 to 0.65 sq.' per bird (0.60 in 1970). The success of these achievements may be measured by the yardstick - production per square foot/week - which shows a 68% rise between 1961-69 (0.41 lbs./sq'/week to 0.69 lbs.). Output declined slightly in 1970/71 partly due to a higher stocking rate than in 1969 and partly to the effect of the disease outbreak. Nevertheless it was still 51% higher than in 1961. The Production Efficiency Factor shows that performance improved from 143 to 196.* The mortality rate declined towards the mid-1960's, but increased slightly during the latter half of the period. The European Production Efficiency Factor indicates a marked improvement in performance since the index increased from 88 to 139 between 1961 and 1971. (This measure takes account of the weight of the broiler, the feed conversion rate, the mortality rate and the length of the growing period).

Although the rate of inflation was much lower in the 1960's than in recent

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* A description of various yardsticks and measures is included in the Appendix for readers who may not be familiar with the broiler industry.

TABLE XXXVII

COSTS AND RETURNS OF BROILER PRODUCTION (Pence per bird/L.W.)

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
COSTS											
Feed	16.603	16.500	16.692	17.584	17.971	18.309	18.375	18.179	19.275	20.595	23.540
Chick	6.250	6.042	6.021	6.170	6.308	6.508	6.575	6.588	6.575	6.538	6.700
Labour	0.896	0.912	1.096	1.079	1.088	1.117	1.138	1.117	0.879	0.821	0.800
Litter	0.321	0.304	0.300	0.296	0.258	0.283	0.267	0.263	0.263	0.271	0.300
Heat and Light	0.733	0.770	0.808	0.812	0.783	0.858	0.850	0.854	0.766	0.775	0.700
Vacc. and Med.	0.083	0.113	0.459	0.551	0.725	0.513	0.379	0.383	0.313	0.254	0.700+
Water	.	.	0.042	0.050	0.046	0.050	0.046	0.046	0.037	0.037	. +
Insurance	.	.	.	.	0.163	0.175	0.158	0.163	0.129	0.138	0.100
Miscellaneous	0.213	0.288	0.616	0.554	0.783	0.725	0.658	0.624	0.663	0.613	0.800
TOTAL*	25.099	24.929	26.034	27.096	28.125	28.538	28.446	28.217	28.900	30.042	33.640
RETURNS	29.250	29.435	28.667	30.742	30.675	31.013	31.596	31.317	31.283	32.429	37.180
MARGIN (Gross)	+4.151	+4.506	+2.633	+3.646	+2.550	+2.475	+3.150	+3.100	+2.383	+2.387	+3.540

COSTS AND RETURNS (Pence per pound/L.W.)

COSTS											
Feed	4.428	4.342	4.370	4.383	4.394	4.455	4.354	4.238	4.442	4.713	5.340
Chick	1.667	1.590	1.576	1.539	1.542	1.583	1.558	1.536	1.515	1.496	1.523
Other Costs	0.598	0.628	0.869	0.835	0.941	0.906	0.829	0.804	0.702	0.666	0.773
TOTAL*	6.693	6.560	6.815	6.757	6.877	6.944	6.741	6.578	6.659	6.875	7.636
PRICE	7.800	7.746	7.504	7.666	7.500	7.546	7.487	7.300	7.208	7.421	8.450
MARGIN (Gross)	+1.107	+1.186	+0.689	+0.909	+0.623	+0.602	+0.746	+0.722	+0.549	+0.546	+0.814
Average Live-weight (lbs) per bird	3.75	3.80	3.82	4.01	4.09	4.11	4.22	4.29	4.34	4.37	4.40
Average Age (Days)	71	68	67	67	66	65	63	62	61	62	62
Feed Intake (lbs)	9.86	9.55	9.64	10.06	10.01	10.07	10.10	9.96	10.09	10.08	9.86
Feed Conversion	2.62	2.52	2.52	2.51	2.45	2.45	2.39	2.32	2.33	2.31	2.24
Mortality %	3.41%	3.15%	3.04%	3.12%	3.22%	3.74%	3.64%	3.60%	3.81%	3.62%	3.64%
Sq. feet/bird	0.75	0.74	0.73	0.72	0.73	0.69	0.67	0.66	0.59	0.60	0.65
L.W. (lbs) per sq. foot	5.000	5.135	5.233	5.569	5.603	5.957	6.299	6.500	7.356	7.283	6.769
†L.W. (lbs.) sq. ft./week	0.412	0.439	0.452	0.481	0.490	0.528	0.573	0.599	0.687	0.671	0.623
Number of birds in survey (millions)	1.1	2.8	3.5	3.5	3.9	4.4	5.7	8.0	7.0	4.3	5.4

Source: B.O.C.M./SILCOCK *Not including Deadstock Depreciation +Including water 1971 †Including estimated turnround of 2 weeks

years, nevertheless unit costs increased during the decade, e.g. the price of broiler feed rose from £37 to £55 per ton. However increased unit costs were contained by improved efficiency of production, at least until 1969, when the total cost of production per pound was even lower than in 1961. The very marked rise in the price of feedingstuffs between 1969 and 1971 could hardly be contained. Nevertheless for an increase of 50% in the price of feed, the feed cost of production per pound only rose by 21% during the decade. Although the price of chicks increased, the improvement in technical efficiency contained the price rise, so that this item in the cost of production remained below the level for 1961. Economy in the use of labour resulted in a decline in the labour cost of production despite an increase in wage rates of 80% during the decade. Other costs generally increased.

Meanwhile the producer price of broilers gradually declined, though there was a temporary rise in 1971 due to a shortage of supplies caused by the effect of fowl pest. As a result of increased costs and a reduction in prices, margins per bird and per pound were nearly halved by 1970. However the annual margin declined to a lesser extent from 17.8p./annum to 11.46p. due to the shorter turn-round, so that throughput increased from 4.29 batches per annum to 4.80.

The broiler industry is noted for its adaptability to meet changing circumstances, but even this industry could hardly continue to maintain a similar rate of return on capital in the above situation. In any case the fixed capital requirements had increased from 65p./sq' to £1.10/sq'. Although the lower stocking density rate reduced the impact of the higher fixed capital requirements to a certain extent, the annual rate of return on investment declined on average from 36% to 17% (on fixed capital) and from 29% to 14% (fixed and working capital) between 1961 and 1970.

Manchester University Survey 1972-73

In view of the changing structure of the industry already described in the first part of this study, lack of independent survey material (the last University survey being made in 1960) as well as interest in the levels of

performance of broiler units, it was decided that Manchester University should undertake an economic survey of broiler production. Unfortunately, the period chosen turned out to be catastrophic for the industry during which the price of feedingstuffs nearly doubled between the beginning and the end of the period. Apart from the difficulties which the industry faced, an inflationary situation of this scale creates great difficulties in making a comparative study, particularly in economic terms, even when in this case a survey is broken down into quarterly periods.

Further complications occurred during the period of study which affected the level of performance. The feed compounding industry attempted to withstand the pressure of inflation by varying the feed formulations and substituting new items. As a result bird performance tended to deteriorate, particularly the feed conversion rates. Some processing organisations faced labour difficulties, so that the turn-round period had to be extended in many cases.

However, the results of the survey are presented, which no doubt will be of interest, if only to examine the ways in which producers coped with spiralling costs of production.

The Sample

The survey covered 52 units which provided information covering 308 crops (batches). The results have been divided into five quarterly periods, the last quarter ending on September 30th 1973. The number of crops per unit, varied according to the production target weights or the turn-round policy, which in turn depended upon the state of the market and the requirements of the processing industry.

Table XXXVIII - Distribution of Units by Size of Flock

	Number of Crops					
Quarters	1972			1973		
Size of Units Av.No. of Birds	III	IV	I	II	III	TOTAL
10 - 19,000	13	13	13	14	15	68
20 - 49,000	11	11	12	13	12	59
50 - 99,000	19	21	18	16	18	92
100 -149,000	12	10	10	13	14	59
150 -199,000	2	3	2	3	2	12
200 and over	6	3	3	3	3	18
Total	63	61	58	62	64	308

Costs, Returns and Margins

The average costs, returns and margins per bird and per pound (live-weight) and various performance measures are set out on a quarterly basis in Table XXXIX. The figures are presented on a unweighted basis, in order to obviate a bias in favour of the very large sized units. This is necessary for comparative purposes, particularly in an inflationary situation and where there is a wide range in the size of the units. One of the largest units in the survey, for example, had a productive capacity which was double that of the whole of the capacity of the units in the group containing the smallest sized units. The amalgamated (weighted) results are included in Table XL which reflects in particular the lower unit cost of feedingstuffs and chicks for larger units.

The changing costs and returns on a quarterly basis in Table XXXIX need to be compared with some care, particularly on the basis of cost per bird. The results obtained on this basis depend very much not only upon rising unit costs each quarter, but also upon the relationship between such factors as the average weight per bird, the feed conversion rate, the killing age, the length of the turn-round as well as other factors.

The results of the survey indicate the major problem of producers during the period, namely the marked increase in unit costs of production, particularly the cost of feedingstuffs. On average, the cost of feed, per pound live-weight, increased by 57% and at the same time the percentage share of total costs of this item increased from 64% to 72%. Since other costs did not escalate to the same extent, costs in total increased by 40% between the first and the last quarterly period. The price of broilers rose 5% less than total costs. Margins were very narrow at the beginning of the period, so that the disproportionate rise in price, apart from other factors, resulted in an average loss being incurred of 0.14p./pound for the last quarter.

Evidently producers had some justification for their complaint that, in relation to their costs of production, they were not receiving a reasonable

TABLE XXXIX

MANCHESTER UNIVERSITY SURVEY

AVERAGE FINANCIAL AND PHYSICAL RESULTS

PER BIRD and PER POUND (Live-weight)

PENCE PER BIRD

	1972		1973		
Quarter	III	IV	I	II	III
COSTS					
Feedingstuffs	20.430	20.730	24.130	27.911	30.958
Chick	6.666	6.673	6.714	6.914	7.117
Feed + Chick	27.096	27.403	30.844	34.825	38.075
Labour	1.006	1.008	1.000	1.082	1.113
Cleaning	0.334	0.329	0.339	0.352	0.351
Catching	0.260	0.264	0.278	0.294	0.284
Heat and Light	0.801	0.909	0.935	0.915	0.861
Water	0.043	0.045	0.042	0.045	0.045
Litter	0.293	0.293	0.293	0.307	0.310
Vacc. and Med.	0.537	0.627	0.593	0.545	0.520
Insurance	0.184	0.178	0.187	0.190	0.194
D. Deprec.	0.973	0.966	0.966	1.032	1.014
Rep. + Maintenance	0.256	0.256	0.229	0.260	0.239
Miscellaneous	0.157	0.159	0.148	0.170	0.169
TOTAL	31.940	32.437	35.854	40.017	43.175
RETURNS	32.569	32.425	36.163	40.163	42.733
MARGIN	+0.629	-0.012	+0.309	+0.146	-0.442

PENCE PER POUND* (Live-weight)

COSTS					
Feed	5.008	5.204	5.925	6.779	7.840
Chick	1.642	1.692	1.658	1.691	1.810
Feed + Chick	6.650	6.896	7.583	8.470	9.650
Other Costs	1.195	1.281	1.234	1.265	1.303
TOTAL	7.845	8.177	8.817	9.735	10.953
RETURN	7.984	8.155	8.884	9.750	10.810
MARGIN	+0.139	-0.022	+0.067	+0.015	-0.143

AVERAGE PERFORMANCE FACTORS

Average Weight of Bird (lbs)	4.07	3.97	4.07	4.12	3.95
Feed Conversion	2.25	2.24	2.30	2.31	2.30
Mortality Rate %	4.84	4.11	4.48	4.62	4.12
Killing Age (days)	57	56	57	58	56
Stocking Density at Start (per sq.foot)	0.51	0.52	0.53	0.54	0.54
Turn Round (weeks)	10.30	10.40	10.69	10.66	10.70
Site Empty (days)	15	17	18	17	19
L.W.per sq.foot/week (lbs)	0.745	0.708	0.693	0.689	0.672
L.W.per sq.foot (lbs)	7.678	7.361	7.407	7.348	7.189
Feed Cost per ton	£49.78	£52.02	£57.75	£65.69	£76.12
Average Size of Flock	84898	74045	73390	75671	74964
Number of Units	63	61	58	62	64

Unweighted averages. Sum of cost per bird, cost per pound, or performance measures for each unit divided by number of units. See Table XL for weighted averages. *Excluding rejects.

Table XL

AMALGAMATED RESULTS OF MANCHESTER UNIVERSITY SURVEY

Quarter	1972 III	1972 IV	1973 I	1973 II	1973 III
	£	£	£	£	£
COSTS					
Feedingstuffs	1026600	844349	956450	1209416	1387396
Chicks	334276	285014	270565	302193	318872
Feed and Chicks	1360876	1129363	1227015	1511609	1706268
Labour	47229	39231	37304	44566	46234
Cleaning	16192	12648	12215	14507	14103
Catching	13376	11353	11413	13192	12713
Heat and Light	43898	41227	39215	44004	42673
Water	2276	1898	1770	2108	2140
Litter	15287	12265	11771	13255	13678
Vacc. and Med.	33519	34441	32360	28408	28188
Insurance	9749	7719	7560	8711	8897
D. Deprec.	53644	43390	42187	49791	48738
Rep. and Maintenance	13059	11346	9927	11933	11728
Miscellaneous	8761	7342	6631	8279	8373
TOTAL	1617866	1352223	1439368	1750363	1943733
RETURNS	1637906	1346825	1446361	1749940	1939293
MARGIN	+20040	-5398	+6993	-423	-4440
	PENCE PER BIRD (Live-weight)				
	p.	p.	p.	p.	p.
COSTS					
Feed	20.310	19.584	23.706	27.080	30.127
Chick	6.613	6.611	6.706	6.766	6.924
Other Costs	5.084	5.169	5.264	5.346	5.157
TOTAL	32.007	31.364	35.676	39.192	42.208
RETURNS	34.403	31.238	35.849	39.182	42.111
MARGIN	+0.396	-0.126	+0.173	-0.010	-0.097
	PENCE PER POUND (Live-weight)				
COSTS					
Feed	5.013	5.085	5.843	6.711	7.721
Chick	1.632	1.717	1.653	1.677	1.774
Other Costs	1.254	1.342	1.297	1.325	1.322
TOTAL	7.899	8.144	8.793	9.713	10.817
RETURN	7.997	8.111	8.836	9.711	10.792
MARGIN	+0.098	-0.033	+0.043	-0.002	-0.025
Average Weight per bird (Lbs)	4.05	3.85	4.06	4.04	3.90
Feed Conversion	2.27	2.22	2.30	2.31	2.31
Mortality Rate	4.85	3.86	4.50	4.34	3.73
Stocking Density at start	0.48	0.49	0.51	0.52	0.50
L.W./sq. foot	7.975	7.491	7.609	7.452	7.491
Feed cost per ton	£49.55	£51.26	£56.98	£64.98	£75.03
Total Weight sold (million pounds)	20.481	16.604	16.368	18.021	17.970
Total Number Birds killed (millions)	5.055	4.311	4.035	4.466	4.605
Area (million sq. feet)	2.568	2.217	2.151	2.418	2.399
Number of Units	63	61	58	62	64

price from the processors during the last period. The margin between the producer price and the wholesale price increased by 82% between the first and the last period to 6.09p./pound (oven-ready) which is equivalent to a margin of 4.57p./lb/L.W. for the processors. This margin of course would include the cost of processing. During the following year processors incurred considerable losses, which has already been discussed earlier in this study in the section on marketing margins.

The difficulties of producers during this period are reflected in the performance measures which show, on average, that the feed conversion rate deteriorated and the Production Efficiency Index declined from 181 to 172. The length of the turn-round period increased and sites were empty for a longer time. Stocking density rates were higher. As a result production per square foot declined on average, and more significantly, on a time basis, production fell from 0.75 lbs/sq'/week to 0.67 lbs and the E.P.E.F. declined from 137 to 133.

During an inflationary period working capital needs clearly rise as well as the fixed capital requirements of replacing existing houses and equipment. The cost of housing, for example rose from £1.30 per square foot to £1.70 sq'. between 1972 and 1973 (66p./bird space and 92p./bird space depending upon the stocking density which increased from 0.51 to 0.54). The producer's annual investment return on the current value of fixed and working capital therefore declined from 9.8% in the first quarter to as low as 2.5% by the last quarter. In neither case would this be sufficient to recoup capital at current values or to cover interest on capital.

Range in Margins

The distribution of margins, per bird and per pound, which is indicated in Tables XLI and XLII, shows that the range was rather wider than might have been expected from an industry where housing and stock are relatively more standardised than in other sectors of agriculture. Clearly the level of management will vary from unit to unit and reaction to escalating costs of production

TABLE XLI

RANGE IN MARGINS PER BIRD (L.W.)

Quarter	1972 III		1972 IV		1973 I		1973 II		1973 III	
	No.	%	No.	%	No.	%	No.	%	No.	%
Pence Per Bird										
-6.0p. to 4.1p.	1	2%	.	.	.	.	3	5%	5	8%
-4.0p. to 2.1p.	4	6%	5	8%	4	7%	3	5%	13	20%
-2.0p. to 0.1p.	15	24%	23	38%	19	32%	24	38%	19	29%
+0.0p. to 1.9p.	29	46%	30	49%	30	52%	23	37%	15	24%
+2.0p. to 3.9p.	11	17%	3	5%	3	5%	8	13%	11	17%
+4.0p. to 5.9p.	3	5%	.	.	2	4%	1	2%	1	2%
	63	100%	61	100%	58	100%	62	100%	64	100%
Average	+0.629p.		-0.012p.		+0.309p.		+0.146p.		-0.442p.	

TABLE XLII

RANGE IN MARGINS PER POUND (L.W.)

Quarter	1972 III		1972 IV		1973 I		1973 II		1973 III	
	No.	%	No.	%	No.	%	No.	%	No.	%
Pence Per Bird										
-2.00p. to 1.51p.	.	.	.	.	.	.	.	.	2	3%
-1.50p. to 1.01p.	1	2%	3	5%	1	2%	3	5%	4	6%
-1.00p. to 0.51p.	4	6%	3	5%	3	5%	3	5%	13	20%
-0.50p. to 0.00p.	15	24%	22	36%	19	32%	24	38%	18	28%
+0.00p. to 0.49p.	30	47%	31	51%	29	50%	23	37%	15	24%
+0.50p. to 0.99p.	13	21%	2	3%	5	9%	9	15%	12	19%
+1.00p. to 1.49p.	.	.	.	.	1	2%	.	.	.	.
	63	100%	61	100%	58	100%	62	100%	64	100%
Average	+0.139p.		-0.022p.		+0.067p.		+0.015p.		-0.143p.	

SOURCE: Manchester University

together with the cost/price squeeze will have influenced the results. The broiler/feed price ratio for example worsened from 3.6 in the first quarter to 3.2 in the last quarter (number of pounds of broiler feed equal in value to one pound of broiler). Certainly as costs increased the chances of achieving a profit became much more difficult. By the last quarter 57% of the units incurred losses and the range noticeably widened.

Even in years where the ratio between unit costs and broiler prices was more favourable some growers incurred losses. This is a reflection of the inefficient use of resources as a result of poor technical performance. In view of the lack of published material about the actual range in the performance levels of broiler units a great deal of this study will be related to this aspect in both the technical and economic results. Too often references in published material refer to optimum levels of performance with little regard to what is occurring at the grass roots of the industry. This is not to say that broiler growers are inefficient on the whole. This is clearly not the case, otherwise consumers would not have benefited from the marked overall improvement in performance which has taken place over the years, so that chicken is no longer a high priced luxury item largely confined to consumption by the higher income groups as in the past. The aim therefore, in the following sections of this study, is to indicate areas where some improvement in performance could have resulted in a better return to producers in the survey with particular reference to the range in the results.

Range in Costs

The cause of the decline in the rate of profitability is indicated in Tables XLIII and XLIV, which show not only that costs increased, but that there was a marked widening in the distribution of the total costs of production between the units, particularly during the last two quarters.

Feedingstuffs Cost

The cost of feedingstuffs is the most important item in the cost of production. During the course of the survey the price of feedingstuffs increased from

TABLE XLIII

RANGE IN COSTS PER BIRD (L.W.)

Quarter	1972 III		1972 IV		1973 I		1973 II		1973 III	
Pence Per Bird	No.	%	No.	%	No.	%	No.	%	No.	%
25p. to 29p.	11	17%	13	21%	3	5%	2	3%	.	.
30p. to 34p.	47	75%	37	61%	25	43%	4	6%	1	2%
35p. to 39p.	5	8%	10	16%	21	36%	22	36%	18	28%
40p. to 44p.	.	.	1	2%	9	16%	29	47%	17	26%
45p. to 49p.	.	.	.	.	.	.	4	6%	26	40%
50p. to 54p.	.	.	.	.	.	.	1	2%	1	2%
55p. to 59p.	.	.	.	.	.	.	.	.	1	2%
	63	100%	61	100%	58	100%	62	100%	64	100%
Average	31.940p.		32.437p.		35.854p.		40.017p.		43.175p.	

TABLE XLIV

RANGE IN COSTS PER POUND (L.W.)

Quarter	1972 III		1972 IV		1973 I		1973 II		1973 III	
Pence Per Pound	No.	%	No.	%	No.	%	No.	%	No.	%
6p. to 6.9p.	1	2%	.	.	.	.	.	.	.	.
7p. to 7.9p.	43	68%	22	36%	1	2%	.	.	.	.
8p. to 8.9p.	18	28%	36	59%	38	65%	.	.	1	2%
9p. to 9.9p.	1	2%	3	5%	18	31%	49	79%	11	17%
10p. to 10.9p.	.	.	.	.	1	2%	11	18%	21	32%
11p. to 11.9p.	.	.	.	.	.	.	2	3%	19	30%
12p. to 12.9p.	.	.	.	.	.	.	.	.	11	17%
13p. to 13.9p.	.	.	.	.	.	.	.	.	1	2%
	63	100%	61	100%	58	100%	62	100%	64	100%
Average	7.845p.		8.177p.		8.817p.		9.735p.		10.953p.	

SOURCE: Manchester University

an average of £50/ton during the first quarter to an average of £76/ton in the last quarter. The share of feed as a percentage of total costs increased from 64% to 72%. However there was a marked range in the price paid by individual units during each quarter. Prices ranged from £46/ton to £54 in the first quarter and from £63 to £96 in the last quarter. The range in prices was partly related to the date when the flocks were cleared during the quarter and the rate at which the price of feed was escalating. But other factors were also responsible such as the discount rate for bulk purchases (a few units still purchased bagged feed), savings due to prompt payment and the buying skill of some growers who bought forward. As the price of proteins and cereals increased, the compounding industry came under considerable pressure to change their feed formulations in an attempt to contain costs. Lower density and less costly finisher rations were used by many growers. It is unusual for broiler growers to home-mix rations. All the units used ready compounded rations. The mixing of broiler feedingstuffs is a complex process and in an industry which is generally associated with rather narrow margins, the penalty for a mistake in mixing feedingstuffs can be very costly. Growers therefore tend to rely on ready compounded rations and take advantage of the discount system. In any case contracts with the processors frequently specify the use of particular brands of feedingstuffs.

Feed Conversion and Range in Weights per Bird

Since the feed cost is the major item in the total cost of production, then the feed conversion rate (number of pounds to produce one pound of broiler - live-weight) is one of the main determinants of the eventual margin to be made from broiler production.

The weight of a bird is mainly dependent upon the age of the bird, so that the feed conversion rate is also related to the killing age. As a broiler ages the feed conversion rate increases, so that more feed is required to produce each extra pound of broiler. Factors other than age, of course, influence the feed conversion rate such as the strain of bird, the quality of the feed,

management, and whether the flock is "as hatched" or sexed (male birds achieve a higher weight and a lower feed conversion rate than females for the same age) as well as the percentage of the flock that is thinned when this system is practiced.

The results of the survey indicate a deterioration in the feed conversion rate over the five quarters, not as a result of a higher than average age or weight of the finished birds, but in the performance of the stock. In fact the average weight was lower in the last quarter than in the first and the feed conversion rate increased from 2.25 to 2.30. The poorer rate was probably due to changes in the composition of the rations, the use of lower density rations, and other stress factors. The range and the distribution of the weights of the finished broilers and the feed conversion rates are set out in Tables XLV and XLVI. The most popular weight range was in the 3.5 lb to 4 lb category followed by the 4 lb to 4.5 lb group. The poorer feed conversion rates are emphasised in the last quarter, which shows a much wider range than in the first quarter. The Production Efficiency Index declined from 181 in the first quarter to 172 in the last quarter.

It becomes increasingly important to achieve the optimum feed conversion rate for a given weight of a particular strain of bird, when the price of feed may be escalating and particularly when the price of broilers may not be increasing in the same proportion or remains stable. For example, if the price of feed rises by £10 from £70 to £80 per ton, and the feed conversion rate for a particular strain of broiler is 2.00 for a 4 lb bird, the rise in the unit price of feed will cause the cost of feed to increase by 3.6p/bird (0.90p./lb) from 25p. to 28.6p./bird. However if the conversion rate deteriorates to 2.25 then this will cause an additional rise in the feed cost of producing the broiler which will now cost 32.1p/bird (an extra 0.9p./lb) since an additional 1 lb. of feed will be required to produce the 4 lb. bird. (The optimum killing age per crop and per square foot/annum will be discussed at a later stage in the study).

TABLE XLV RANGE IN WEIGHT PER BIRD (L.W.)

Quarter	1972 III		1972 IV		1973 I		1973 II		1973 III		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Pounds per Bird												
3.00 to 3.49	1	2%	7	11%	2	3%	5	8%	4	6%	19	6%
3.50 to 3.99	32	51%	27	44%	25	43%	17	27%	40	63%	141	46%
4.00 to 4.49	23	36%	18	30%	23	40%	28	45%	13	20%	105	34%
4.50 to 4.99	7	11%	9	15%	5	9%	11	18%	7	11%	39	13%
5.00 and over	.	.	.	.	3	5%	1	2%	.	.	4	1%
	63	100%	61	100%	58	100%	62	100%	64	100%	308	100%
Average	4.07		3.97		4.07		4.12		3.95		4.04	

TABLE XLVI RANGE IN FEED CONVERSION RATES

Quarter	1972 III		1972 IV		1973 I		1973 II		1973 III		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Feed Conversion												
2.0 to 2.09	3	5%	5	8%	.	.	1	2%	.	.	9	3%
2.1 to 2.19	12	19%	15	25%	8	14%	6	10%	13	20%	54	18%
2.2 to 2.29	31	49%	27	44%	26	45%	23	37%	23	36%	130	42%
2.3 to 2.39	11	17%	11	18%	15	26%	22	35%	14	22%	73	24%
2.4 to 2.49	5	8%	2	3%	5	8%	6	10%	8	12%	26	8%
2.5 to 2.59	1	2%	.	.	3	5%	2	3%	3	5%	9	3%
2.6 to 2.69	.	.	1	2%	1	2%	2	3%	2	3%	6	2%
2.7 to 2.79	.	.	.	.	.	.	.	.	1	2%	1	..%
	63	100%	61	100%	58	100%	62	100%	64	100%	308	100%
Average	2.25		2.24		2.30		2.31		2.30		2.28	
Production Efficiency Index	181		177		177		178		172		177	

Source: Manchester University.

Chick Cost

The cost of the chick is the second most important item in the total cost of production. It accounted for 21% of total costs during the first quarter and 16% during the last quarter, which together with the cost of feedingstuffs covered 88% of total costs.

Despite the pressure of inflation chick breeders were remarkably successful in limiting the price increase to only 7% during the survey period, so that the price of chicks averaged about £7 per 100 during the last quarter. This is the reason for the relative decline in the share of this item in the total cost of production.

Nevertheless the chick still has an important bearing upon the cost of production and the amount of meat produced by a crop. The earlier the killing age the greater will be the effect of the cost of the chicks on the cost per pound or per bird.

Mortality Rate

Clearly the mortality rate is an important factor in determining the eventual profit to be made from broiler production. Fortunately under normal conditions, the majority of deaths occur during the brooding stage, followed by a slight peak at three weeks. During the clearing stage great care needs to be exercised in catching the birds to prevent a further peak occurring.

Whilst the quarterly average mortality rates did not vary very much from around 4.4% for the whole of the period, nevertheless Table XLVII indicates rather a wide range in the individual results. Very low rates were achieved by some growers and in fact 55% succeeded in attaining a rate below 4%. The much higher rates of the other growers raised the average. During the third quarter, for example, 16% of the units incurred rates of over 8%, of which half were over 10%.

The extra cost of production caused by a rise of 10% in the mortality rate above the average for the last quarter would have resulted in a 3.08p. rise in the cost of production per bird. At the same time, returns would have

TABLE XLVII RANGE IN MORTALITY RATES

Quarter	1972 III		1972 IV		1973 I		1973 II		1973 III		TOTAL	
Mortality Rate	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
0 to 1.9%	4	6%	6	10%	10	17%	9	15%	7	11%	36	12%
2% to 3.9%	28	44%	27	44%	22	38%	24	39%	30	47%	131	43%
4% to 5.9%	16	26%	16	26%	14	24%	13	21%	15	23%	74	24%
6% to 7.9%	10	16%	9	15%	5	9%	6	9%	9	14%	39	13%
8% to 9.9%	2	3%	3	5%	4	7%	5	8%	2	3%	16	5%
10% and over	3	5%	.	.	3	5%	5	8%	1	2%	12	3%
	63	100%	61	100%	58	100%	62	100%	64	100%	308	100%
Average	4.84%		4.11%		4.48%		4.62%		4.12%		4.44%	

TABLE XLVIII RANGE IN STOCKING DENSITY

Quarter	1972 III		1972 IV		1973 I		1973 II		1973 III		TOTAL	
Square Feet Per Bird at Start	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
.40 to .44	20	32%	16	26%	11	19%	4	6%	8	12%	59	19%
.45 to .49	5	8%	11	18%	8	14%	10	16%	9	14%	43	14%
.50 to .54	19	30%	13	21%	19	33%	25	40%	26	41%	102	33%
.55 to .59	8	13%	7	12%	9	16%	11	18%	9	14%	44	14%
.60 to .64	7	11%	10	17%	6	10%	8	13%	6	10%	37	12%
.65 to .69	2	3%	2	3%	2	3%	1	2%	2	3%	9	3%
.70 to .74	2	3%	2	3%	3	5%	3	5%	4	6%	14	5%
	63	100%	61	100%	58	100%	62	100%	64	100%	308	100%
Average	0.51		0.52		0.53		0.54		0.54		0.53	

SOURCE: Manchester University

declined due to a drop in the total weight of the crop, since 10% fewer birds would have been sold.

Other Costs of Production

The remaining costs of production, other than for feedingstuffs and the chicks, accounted for 15% of total costs during the first quarter and 12% in the last quarter. The fall in the share of these costs, as in the case of the chick cost, was due to the disproportionate rise in the cost of feedingstuffs.

Although these items are of less importance, in percentage terms, they have a significant influence upon the profitability of broiler production.

Labour

Whilst the cost of labour only covered 2.5% of total costs, the importance of this item cannot be overemphasised. The performance of a unit, in financial and technical terms, depends to a large extent upon the quality and the ability of the staff who are employed to manage and run the unit. It seems likely, for example, as the industry becomes more intensive, that the quality of stockmanship will make an even greater impact upon the results obtained.

It is not possible to measure this quality. But on the basis of the wide range in the results already noted, it is likely that much of this was due to the level of management and stockmanship. Higher than average results will be associated with workers who are skilled at spotting signs of likely disease outbreaks or indications of stress and who are able to combine this skill with close attention to detail such as the prevention of food wastage and keen observation of changes in the temperature and ventilation rates.

The industry is well known for its economy in the use of labour and the average quarterly results reflect this in the survey. However overzealous cost cutting of this item may lead to a decline in performance levels such as a high feed conversion or mortality rate as a result of skimped management. During the last quarter, for example, the unit with the lowest labour cost (0.475p/bird) also incurred a subsantial loss of 2.045p./bird, whilst the unit with the highest cost achieved a margin of 0.985p./bird. An improvement in the average

feed conversion rate of 5%, in this quarter, would have caused a sufficient cut in the cost of feedingstuffs to compensate for an increase in the labour cost of as much as 40%.

A survey made by the Agricultural Training Board in 1972/73 showed the labour turnover for all workers was very high at 13% for the broiler industry. This was roughly double the rate for agriculture as a whole. It was not as high as for commercial egg production (18%) or turkey production (34%). The turnover for the stockman category was rather higher at 14%, 18% and 40% respectively. The percentages include employees as well as family labour. The latter would be less mobile so that the percentages would have been greater than the figures indicate.

A high rate of turnover not only causes higher costs in training new entrants and has a disrupting effect on the production programme, but there is also the loss incurred in training ex-workers as well as the skill and experience of workers who leave the industry altogether. The length of service amounted to less than 2 years for as much as 38% of workers in the broiler industry in the A.T.B. survey. Altogether 66% of ex-stockmen moved to jobs outside the poultry industry, 93% of poultry manpower had no formal further educational qualifications (including 98% for stockmen and 79% for managers/supervisors) and only 4% had attended short training courses during the previous two years. A good deal of "in-company" training takes place. There is still some dissatisfaction, on the part of the industry, with present formal or academic courses.

The intensive nature of the industry together with the use of labour saving equipment has resulted in a reduction in labour requirements. In the late 1950's one man was capable of looking after 5000 birds. Depending upon the degree of mechanisation it is now claimed that the average is in the region of 40,000 birds per man. However the results of this survey indicate that about 35,000 is more typical. It is not possible to measure this with great accuracy, because varying amounts of casual or part-time labour were involved, as well as the use of contract labour and equipment for catching and cleaning purposes.

The number per man in any case is also related to the stocking density rate and to the length of the growing period.

Other Costs and Performance Measures

Other costs of production mainly include the cost of cleaning and catching on contract, fuel, litter, vaccination and medication, insurance, repairs and an allowance for deadstock depreciation. The latter is very much related to the age and the type of housing and equipment, since these were valued on the basis of the written down value. In an inflationary situation a more realistic indication would be the current replacement value. This is discussed in the light of the present day situation as well as the investment return on capital in the last section of this study.

The relationship between the labour cost and the deadstock depreciation cost is also relevant. Older houses with less labour saving equipment generally cause a higher cost of labour. However it should be said that a number of the older units achieved very good results, which must have been due to a high standard of management and in particular of stockmanship. Similarly the cost of repairs and fuel costs would be related to the age of the houses.

Many of the other costs of production were largely out of the control of growers due to the effect of inflation. Nevertheless the range in the costs was quite wide, which is an indication that some growers were able to tighten up costs. There was considerable variation in the fuel costs. Some of the houses must therefore have been poorly insulated or the ventilation rates were at fault e.g. the fans were running too fast in cold weather. There also appeared to be some cost cutting in the vaccination programmes which is rather a risky way of trimming costs. There was also evidence of under insurance.

Stocking Density, Length of Turn Round and Sites Empty, Number of Batches and Production per sq.'/week

The stocking density (number of square feet per bird) depends upon the weight and age at which the birds are killed, the type of equipment, thinning policy if this is practiced, and very importantly the quality of stockmanship.

TABLE XLIX

RANGE IN TURN ROUND (Days)

Quarter	1972 III		1972 IV		1973 I		1973 II		1973 III		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Number of Days of Turn Round												
60 to 64	7	11%	13	21%	4	7%	5	8%	3	5%	32	10%
65 to 69	11	18%	2	3%	8	14%	7	11%	7	11%	35	11%
70 to 74	26	41%	18	30%	22	38%	13	21%	25	39%	104	34%
75 to 79	13	21%	16	26%	8	14%	24	39%	12	19%	73	24%
80 to 84	4	6%	10	17%	10	17%	10	16%	11	17%	45	15%
85 +	2	3%	2	3%	6	10%	3	5%	6	9%	19	6%
	63	100%	61	100%	58	100%	62	100%	64	100%	308	100%
Average	72		73		75		75		75		74	

TABLE L

RANGE IN NUMBER OF DAYS SITE EMPTY

Number of Days Site Empty												
5 to 9	9	14%	11	18%	1	1%	5	8%	2	3%	28	9%
10 to 14	29	46%	12	20%	21	36%	12	19%	11	17%	85	28%
15 to 19	18	29%	15	24%	18	31%	22	36%	30	47%	103	33%
20 to 24	3	5%	11	18%	8	14%	20	32%	7	11%	49	16%
25 to 29	2	3%	9	15%	5	9%	3	5%	11	17%	30	10%
Over 30	2	3%	3	5%	5	9%	.	.	3	5%	13	4%
	63	100%	61	100%	58	100%	62	100%	64	100%	308	100%
Average	15		17		18		17		19		17	

TABLE LI

RANGE IN NUMBER OF CROPS PRODUCED PER ANNUM (365 days)

Number of Crops Produced over 365 days	4.4	4.5	4.6	4.7	4.8	4.9	5.0	5.1	5.2	5.3	5.4
Number of Units	2	2	3	7	6	10	12	5	3	1	1
% of Units	4%	4%	6%	13%	12%	19%	23%	9%	6%	2%	2%

Average: All Units 4.94 Crops per Annum

SOURCE: Manchester University

Some of the very low rates, i.e. more birds per square foot, were associated with thinning at an earlier age than the majority of the birds taken to the final age of the batch. However some of the units were able to produce very good performance levels for a more intensive stocking density rate and vice versa. Stockmanship matters a great deal in this connection. Table XLVIII shows that there was quite a wide range in the densities. This was not entirely due to the age at killing. The stocking rates partly reflect the processor's requirements. If the average stocking density rate tends to increase, this is often a sign of difficulties in the marketing sector, so that production needs to be temporarily delayed or cut.

Similarly the length of the turnround (number of days per batch including the clean out and waiting period) and more particularly the number of days that the sites are empty, provide an indication of the state of the industry. Sites were empty 4 days longer in the last than in the first quarter and the turn round increased from 72 to 75 days(the killing age fell from 57 to 56 days). Whilst Table L shows that the sites were empty on average for 17 days, the distribution indicates a very wide range indeed over the whole period. As much as 30% of the sites were empty for more than 20 days, and as many as 37% in the fourth quarterly period when the processing sector was involved in difficulties at the factory stage caused by a shortage of labour. However nearly 10% of the units achieved a rate of less than 10 days when the sites were empty.

The longer the turn round and particularly the number of days that a site is empty, the fewer the number of batches that a site can produce over a year, so that the fixed costs of production are spread over a lower output. Again there was a marked range around the average of 4.94 crops/annum (4.4 to 5.4 crops) as Table LI shows.

One of the most useful measures of the performance of a unit is the yardstick - production per square foot/week. This may appear a little confusing to readers who are unfamiliar with the industry. It takes account of time,

TABLE LII RANGE IN OUTPUT - POUNDS (L.W.) PER SQUARE FOOT

Quarter	1972 III		1972 IV		1973 I		1973 II		1973 III		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
LBS. Produced Per Square Foot												
5.0 to 5.9	2	3%	3	5%	8	13%	5	8%	9	14%	27	8%
6.0 to 6.9	21	33%	26	43%	19	33%	25	40%	22	34%	113	37%
7.0 to 7.9	18	29%	16	26%	16	28%	18	29%	18	28%	86	28%
8.0 to 8.9	13	21%	8	13%	6	10%	5	8%	10	16%	42	14%
9.0 to 9.9	9	14%	7	11%	8	14%	8	13%	5	8%	37	12%
10.0 to 10.9	.	.	1	2%	1	2%	1	2%	.	.	3	1%
	63	100%	61	100%	58	100%	62	100%	64	100%	308	100%
Average	7.678		7.361		7.407		7.348		7.189		7.396	

TABLE LIII RANGE IN PRODUCTION - POUNDS (L.W.) PER SQUARE FOOT/WEEK

Quarter	1972 III		1972 IV		1973 I		1973 II		1973 III		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Pounds (L.W.) Per Square Foot week												
0.40 lbs. to 0.49	.	.	1	2%	2	3%	1	2%	.	.	4	1%
0.50 lbs. to 0.59	9	14%	10	16%	12	21%	5	8%	17	27%	53	17%
0.60 lbs. to 0.69	16	25%	28	46%	15	26%	35	56%	23	36%	117	38%
0.70 lbs. to 0.79	18	29%	2	3%	20	35%	11	18%	13	20%	64	21%
0.80 lbs. to 0.89	15	24%	9	15%	8	13%	9	14%	11	17%	52	17%
0.90 lbs. to 0.99	5	8%	11	18%	1	2%	1	2%	.	.	18	6%
	63	100%	61	100%	58	100%	62	100%	64	100%	308	100%
Average	0.745		0.708		0.693		0.689		0.672		7.014	

SOURCE: Manchester University

space and stock performance. All of which are vital to the profitability of production. The higher the output per square foot and the quicker the turnover, the higher will be the margin to be made on an annual basis. (This of course needs to be related to the demand of the market according to the weight and the price of the finished bird). This yardstick is related to the fixed capital resources of the industry. In a similar manner, the supermarket industry measures output on the basis of shelf space and turnover.

On the basis of production per square foot, Table LII shows the range in the results, which again is fairly wide, with some units achieving a much higher rate than others. It also shows that production per square foot declined over the period, which again is a reflection of a decline in performance levels. On average, production declined by 6% from 7.7 lbs to 7.2 lbs per sq.foot in the last quarter. When account is taken of the turn round period, which increased, then production on the basis of a sq'/week shows an even greater decline of 10% from 0.745 lbs to 0.672 sq.ft/week. Due to the relatively short turn round period in comparison to other sectors of agriculture, the broiler industry is able to respond rather more quickly to a deterioration in the market situation or the feed/price ratio. Unlike the more traditional sectors of agriculture a drop in prices does not usually result in increased production to contain margins, possibly because the industry is more market orientated towards demand. Nevertheless there is an inevitable time lag with broilers already in the pipe line and sometimes of course the industry does not read the signs early enough or is taken unawares as in the case of the massive rise in the price of feeding-stuffs.

Performance of Low and High Cost Units

Tables LIV and LIV(a) compare the performance of the five units with the lowest and highest costs of production with each other and with the average of all the units in each quarterly period. The reasons for the differences between the well managed and poorly run units are well illustrated and reinforce the points made earlier in connection with the range in the performance levels and

TABLE LIV

PERFORMANCE OF LOW* AND HIGH* COST UNITS (According to Cost of Production Per Pound L.W.)

Quarter	III 1972			IV 1972			I 1973		
	Low Cost Units	High Cost Units	All Units† Average	Low Cost Units	High Cost Units	All Units† Average	Low Cost Units	High Cost Units	All Units† Average
Average Cost per Lb. (L.W.)	p.	p.	p.	p.	p.	p.	p.	p.	p.
Feed	4.846	5.430	5.008	4.996	5.395	5.204	5.397	6.540	5.925
Chick	1.515	1.825	1.642	1.520	1.974	1.692	1.588	1.805	1.658
Other Costs	0.803	1.419	1.195	0.969	1.725	1.281	1.032	1.474	1.234
TOTAL	7.164	8.674	7.845	7.485	9.094	8.177	8.017	9.819	8.817
Average Cost per Bird									
Feed	22.212	21.305	20.430	21.774	18.589	20.730	22.136	24.122	24.130
Chick	6.930	7.156	6.666	6.599	6.759	6.673	6.501	6.652	6.714
Other Costs	3.669	5.567	4.844	4.122	5.945	5.034	4.218	5.487	5.010
TOTAL	32.811	34.028	31.940	32.495	31.293	32.437	32.855	36.261	35.854
MARGIN PER POUND	+0.738	-0.687	+0.139	+0.532	-0.904	-0.022	+0.340	-0.213	+0.067
MARGIN PER BIRD	+3.396	-2.704	+0.629	+2.352	-3.084	-0.012	+1.474	-0.799	+0.309
Average Performance Factors									
Average weight per Bird (lbs.)	4.58	3.87	4.07	4.34	3.44	3.97	4.10	3.69	4.07
Feed Conversion	2.20	2.42	2.25	2.19	2.31	2.24	2.29	2.28	2.30
Mortality %	3.33	9.33	4.84	3.36	6.09	4.11	3.86	6.42	4.48
Killing Age (days)	60	58	57	59	53	56	56	55	57
Turn Round (days)	81	73	72	72	73	73	73	69	75
Site Empty (days)	21	15	15	13	20	17	17	14	18
Stocking Density sq.ft./bird	0.61	0.46	0.51	0.56	0.50	0.52	0.54	0.51	0.53
Lbs. per sq. ft.	7.466	7.681	7.678	7.754	6.370	7.361	7.387	6.820	7.407
Lbs. per sq. ft./week	0.645	0.742	0.745	0.756	0.629	0.708	0.704	0.694	0.693
Feed Cost per ton (£)	49	50	50	51	52	52	53	64	58
Production Efficiency Index	208	160	181	198	149	177	179	162	177
Output per £100 Feed (£)	163	147	159	160	152	156	155	147	150
Average Size of Units	34,424	69,558	84,898	49,692	73,548	74,045	67,095	79,387	73,390

* 5 Units with lowest or highest costs per lb. each quarter

† All Units in survey

SOURCE: Manchester University

TABLE LIV(a)

PERFORMANCE OF LOW* AND HIGH* COST UNITS (According to Cost of Production Per Pound L.W.)

Quarter	II 1973			III 1973		
	Low Cost Units	High Cost Units	All Units† Average	Low Cost Units	High Cost+ Units	All Units† Average
Average Cost Per Pound L.W.	p.	p.	p.	p.	p.	p.
Feed	6.678	7.391	6.779	6.308	8.775	7.840
Chick	1.530	1.853	1.691	1.726	2.047	1.810
Other Costs	0.922	1.469	1.265	1.176	1.454	1.303
TOTAL	9.130	10.713	9.735	9.210	12.276	10.953
Average Cost per Bird L.W.						
Feed	30.296	27.811	27.911	27.119	31.902	30.958
Chick	6.906	6.921	6.914	7.450	7.432	7.117
Other Costs	4.178	5.571	5.192	5.035	5.241	5.100
TOTAL	41.380	40.303	40.017	39.604	44.575	43.175
MARGIN PER POUND	+0.693	-1.062	+0.015	+0.674	-0.905	-0.143
MARGIN PER BIRD	+3.124	-3.981	+0.146	+2.955	-3.161	-0.442
Average Performance Factors						
Average weight per Bird (lbs.)	4.53	3.76	4.12	4.30	3.64	3.95
Feed Conversion	2.21	2.56	2.31	2.18	2.44	2.30
Mortality %	2.20	9.54	4.62	1.95	5.32	4.12
Killing Age (days)	59	57	58	57	55	56
Turn Round (days)	74	68	75	72	81	75
Site Empty (days)	15	11	17	15	26	19
Stocking Density at start (sq.')	0.62	0.53	0.54	0.47	0.51	0.54
Lbs. per sq. foot	7.144	6.392	7.348	8.754	6.723	7.189
Lbs. per Sq.ft./week	0.677	0.655	0.689	0.856	0.593	0.672
Feed Cost per ton (£)	68	64	66	65	81	76
Production Efficiency Index	205	147	178	197	149	172
Output per £100 Feed £	147	131	144	157	130	138
Average Size of Units	31,332	45,202	75,671	55,080	38,505	74,964

* 5 Units with lowest or highest costs per lb. each quarter

† All units in Survey

\+ Excluding Units averaging over £90/ton III 1973

SOURCE: Manchester University

the profitability of production. The results of the well managed units are particularly good in the last two quarters.

A recent estimate of the biological losses of broiler production has indicated that this was of the order of £19 millions in 1974. The estimate was based on the failure of the average broiler unit to achieve the level of the estimated performance of the best flocks in England and Wales. Certainly the evidence of the best units in the Manchester survey show that considerable savings could be achieved.

Returns

On the returns side, the factors which influence the extent of the margin of profit to be made from broiler production, are the number of birds produced per crop and more particularly the total weight of the crop in relation to the price of broilers. Unlike most other sectors of agriculture in the E.E.C., there is no intervention system or basic guaranteed price for poultry meat, so that the price which the grower receives is ultimately dependent upon the success of the marketing policy of the processing sector or other factors already mentioned earlier in this study.

During the course of the survey period, the price of broilers increased mainly as a result of escalating costs of production. Although the average price rose, the price received by an individual grower varied not only according to the date when the site was cleared within each quarterly period, but also for a number of other reasons. These are related to the operation of the contract system which is a distinctive feature of the industry.

The price per pound depends mainly upon the type of contract which is drawn up between the processor, which may be a company or a co-operative, and the individual grower or quite frequently a group of growers. In the case of a co-operative the producers will also own the processing station. Contracts vary according to the degree of risk involved. But in the main the price per pound varies according to a sliding scale which is related to the age and the weight of the birds. The scale varies from processor to processor and upon

market demand for the various weight grades. The price generally increases as the bird ages to compensate for the decline in the feed conversion rate. The price may also be higher for the lighter weight grades though this will depend upon the market situation. Due to escalating feed costs a further sliding scale has been introduced to take account of any changes in the price of feed during the growing period. At one point the price of feed was changing very frequently indeed.

At the same time incentive schemes may be included by some processors to reward producers for higher than average performance levels, or penalties for not meeting the specifications of the contract e.g. weight for age. Bonus schemes may also be incorporated, so that growers who use specified brands of feed or chicks are paid a little extra per pound, or less if the specified feed is not used. Down grading (for quality) at the processing station will reduce the average price per pound, and the extent of the rejection percentage will cut the total returns of an individual crop. If the birds are thinned out at an earlier stage from the main clearing stage, then the percentage thinned will affect the average weight per bird for the whole crop as well as the average price per pound. Total output will be higher due to the more intensive use of the houses. Prices will also vary according to whether the crop is as hatched or sexed.

Apart from the basic price which is related to the particular specifications of a contract, growers may receive further payment in the form of an equalization payment in the case of co-operatives or a market increment payment which takes account of the market situation.

In view of the complicated nature of the contract system and the price which the grower finally receives, it is difficult to compare the value of the different types of contracts. This will in turn depend upon the particular needs of each grower in respect of the degree of risk that he is prepared to take in marketing his birds or in the amount of security which he requires. The higher the risk the looser the contract will be. In a favourable market

situation, the higher the price will be and the reverse when over production occurs when there may be difficulties in disposing of the birds at all. The degree to which a grower is linked to a processor is very much related to the question of working capital, since many contracts do not involve actual cash payment by the grower for items and services, such as the feed, chicks, vaccination and catching, which are provided by the processor. These items are deducted from the agreed price to the grower in the final assessment of the cash payment made by the processor. This system is particularly attractive to growers since working capital needs are very much reduced.

The various types of contract are so finely balanced between the basic price, the incentive schemes, bonus payments, penalties etc., that it is rather difficult for a grower to assess which will be most advantageous to his situation. This is particularly difficult in an inflationary period. In practice, the value of the payments do not vary a great deal from one processor to another when all the factors are taken into account. Producers do of course change processors where there is sufficient incentive to do so. The price paid is also related to the success of the marketing policy of the processor or the co-operative. The choice of a processor may also be related to other factors such as the degree of expertise of the field workers who are employed by the processors to provide management and husbandry advice as well as veterinary services.

Although the contract system appears to have a limiting effect upon the producer price, the individual grower whose level of performance is above the average will benefit proportionately from the incentive schemes and will obtain a higher than average price. Reference has already been made to the effect of stockmanship upon the costs of production. Clearly the better this is the higher the returns will be both in the numbers produced and in the price per pound, as a result of meeting the contract specifications through better performance levels, lower down grading and fewer rejects.

Scale of Operation

The development of the broiler industry has been associated with scale

of operation on the production side. Large scale units have been established not only to take advantage of the economies to be derived from scale of operation, but also to meet the needs of the processing and supermarket industries, which require regular bulk delivery of broilers of uniform quality within specified weight ranges. The rapidly changing structure of the industry has reached a stage where the so called small units in fact operate on a fairly large scale and they reap many of the benefits of economies of scale. During the earlier stages of the development of the industry the economies of scale would have been much more marked between the small and the large units.

There is a good deal of speculation about the performance of large scale units. In particular opinions are divided over the question that diseconomies of scale may be manifested beyond a certain point. Accordingly the results of the survey have been divided into four size groups for comparative purposes. These are indicated in Tables LV(a)-(e) (weighted-averages) which cover the five quarterly periods. Unfortunately for the purpose of this exercise, the period chosen for the survey turned out to be a very unsettling time for the industry for the reasons already mentioned earlier in the study. In particular there was a good deal of variation and experimentation in the formulation of the rations as well as in the use of low density rations. These likely caused a deterioration in the feed conversion rate or delayed the killing age for specified weights in some cases. The results therefore are not as typical as might have been expected in a normal year. The industry has since learnt to cope with these problems and overall performance has improved. Apart from variation due to the range in the results, which also applies within each size group, there are also other problems in comparing performance levels between size groups.

Although the production of broilers is relatively standardised, each unit is different from another in terms of the age of the house and the amount of labour saving equipment. The smaller units for example tended to be associated with older houses. Expansion also causes some variation in the results from

an individual unit which may be operating with the original old house together with a new house which will be better insulated and probably more labour saving. The quality of management and very importantly the level of stockmanship would also have varied, so that none of the units are exactly comparable. A further complication occurred, since the smaller units tended to concentrate on the production of heavier weight birds than the large units, though there was some variation on a quarterly basis. For these reasons, therefore, any conclusions reached about scale of production can only be tentative.

The results indicate, as might be expected, that the largest units derived an advantage so far as the unit cost of feedingstuffs and chicks were concerned, since the price paid for these items was lower than for the small units. Since these items cover such a high percentage of total costs then this clearly placed the large units in an advantageous position. Similarly there were economies in the use of labour. The labour cost was markedly higher for the smallest size group. However, there are signs of diseconomy in the use of labour in the largest size group compared to the group containing units of 50-100,000 birds. Although the larger sized units were evidently deriving economies from scale of operation, so far as the cost of feed, chicks and labour were concerned these had to be balanced against the higher input of capital invested by the larger sized units in more expensive labour saving equipment and in the use of more modern houses which would have cost more to establish due to the effect of inflation. Although other costs of production pale into less significance within the total cost of production, nevertheless they influence the resultant margins to be obtained from broiler production. As scale of operation increased, other costs rose which also seems to occur in other sectors of agriculture. This could be due to scale of operation, in that the organisation of a small unit is more flexible or that the owners are prepared to take much more risky measures in trimming costs particularly in an inflationary situation. Large sized units, with more at risk, might not be prepared to take such measures or alternatively it could be an indication of inflexibility once the production

programmes have been planned. Many of the small units were under insured and trimmed expenditure on repairs and maintenance. It is very evident that they cut expenditure on vaccination and medication, though towards the end of the period the largest units also seemed to be trimming these costs. A high medication cost is not necessarily an indication of extravagance. It could be that this shows that good managers spot the likelihood of disease outbreaks at an early stage and medicate accordingly. As a result better performance levels are achieved. However at the same time, the larger the unit the more likely the higher the medication cost will be in view of the extent of the financial risks involved with disease outbreaks.

The range in the average mortality rates was fairly narrow between the various size groups, so that contrary to generally held opinions, there was no evidence to suggest that increased scale of operation is related to high mortality rates. Indeed the rates for the largest units were lower in some quarterly periods which may have been due to the greater use of medicaments.

Comparing the physical performance measures is complicated for the reasons already mentioned, but particular note should be paid to the stocking density rates and the turn round rates. The stocking density rates were much lower for the larger units, i.e. more birds were stocked per square foot. At the same time the larger units tended to operate thinning programmes. The results indicate that the Production Efficiency Index and the E.P.E.I. were generally better for the smallest units, possibly because the houses were smaller and the stocking rate was much higher. However production on the basis of the number of pounds of broiler produced per square foot, and per square foot/week, show that this was much higher for the larger units and particularly for the 50-100,000 bird group. On the basis of profitability per annum therefore the performance of this group generally indicated better results. Certainly it was the only group in the last quarter to show a profit as well as the highest margin in two other quarters. It is also clear that the group (20-50,000 birds) encountered difficulties and also the largest size group. The smallest size

group tended to vary from the highest margin in the first quarter to the heaviest loss in the last quarter.

If the results are measured on the basis of the return on fixed capital investment and are also related to the stocking density rates, then the units in the 50-100,000 size group also tend to show the best returns. Even when the houses and equipment are valued on the basis of the current written down value which tends to favour the smallest units with the oldest houses. The annual return on fixed capital valued on this basis was 2.5%, 3.5%, 14.0% and 8.0% respectively (from the smallest to the largest size group) for the last quarter, without making any allowance for interest on capital or additional capital required to cover the working needs of the units. In many respects this method gives a false impression of the returns as well as the effect of scale, since the written down capital value is less for the small units and more importantly it does not take account of the effect of capital inflation and the cost of replacing existing houses. On this basis the relationship between the groups again tends to favour the larger units so that the return amounted to 1%, 2%, 8.4% and 5.4% respectively. The return has declined for all groups but less in proportion for the largest size group because the amount of capital required to replace a unit will be lower due to the discount system as well as the tendency for the larger units to house stock more densely, which results in a higher output per square foot. At the same time the spiralling rise in the price of the major items in the cost of production will tend to favour the larger sized units since they will benefit more than the small units from the advantages of the discount system for these items.

Although the results are not absolutely clear cut between the various size groups, nevertheless the third group (50-100,000 birds) of units does tend to show the optimum results. So that there is some confirmation of expert opinion that the optimum size of unit could be in the region of 80,000 birds. This size of unit would obtain most of the benefits of scale without loss of performance. It could be operated by two men with some part-time assistance

TABLE LV(a)

RESULTS RELATED TO SIZE OF UNIT

Quarter
III 1972

Size of Units (No. of Birds)	10-19,000	20-49,000	50-99,000	100,000+
Average Cost per Bird	p.	p.	p.	p.
Feed	21.849	19.693	20.161	20.352
Chick	6.704	6.671	6.770	6.540
Feed + Chick	28.553	26.364	26.931	26.892
Labour	1.241	0.951	0.912	0.925
D. Depreciation	0.760	1.041	0.977	1.113
Vacc. & Med.	0.325	0.470	0.437	0.745
Other Costs	2.034	2.452	2.457	2.477
TOTAL	32.913	31.278	31.714	32.152
Returns per Bird	34.809	31.778	31.950	32.518
Margin per Bird	+1.896	+0.500	+0.236	+0.366
Average Cost per Pound (L.W.)				
Feedingstuffs	4.996	4.916	5.040	5.014
Chick	1.533	1.665	1.692	1.611
Other Costs	0.997	1.227	1.196	1.296
TOTAL	7.526	7.808	7.928	7.921
Returns per Pound	7.959	7.933	7.987	8.011
Margin per Pound	+0.433	+0.125	+0.059	+0.090
Average Weight per Bird(lbs L.W.)	4.37	4.01	4.00	4.06
Feed Conversion	2.22	2.22	2.27	2.27
Mortality Rate %	3.92	3.94	5.38	4.79
Stocking Density (sq'/bird at start)	0.61	0.55	0.48	0.47
Killing Age (days)	57	56	58	58
Turn Round (weeks)	10.57	10.14	10.43	10.14
Live-Weight per sq.'	6.875	7.001	7.796	8.250
Live-Weight per sq'/week	0.650	0.690	0.747	0.814
Feed Cost per ton (£)	£50.39	£49.70	£49.76	£49.39
Av.Number of Chicks Started	14,245	33,849	71,348	171,771
No. of Units in each Size Group	13	11	19	20

Source: Manchester University.

TABLE LV(b)

RESULTS RELATED TO SIZE OF UNIT

Quarter
IV 1972

Size of Unit (No. of Birds)	10-19,000	20-49,000	50-99,000	100,000+
Average Cost per Bird	p.	p.	p.	p.
Feed	23.042	21.253	20.271	18.689
Chick	6.804	6.891	6.564	6.491
Feed + Chick	29.846	28.144	26.835	25.180
Labour	1.248	0.994	0.891	0.884
D.Depreciation	0.835	1.069	0.913	1.064
Vacc. and Med.	0.379	0.510	0.708	0.924
Other Costs	2.293	2.480	2.382	2.505
TOTAL	34.601	33.197	31.729	30.557
Returns per Bird	34.529	33.542	31.904	30.277
Margin per Bird	-0.072	+0.345	+0.175	-0.280
Average Cost per Pound (L.W.)				
Feedingstuffs	5.467	5.207	5.170	4.983
Chick	1.614	1.688	1.674	1.731
Other Costs	1.128	1.238	1.248	1.433
TOTAL	8.209	8.133	8.092	8.147
Returns per Pound	8.192	8.217	8.137	8.072
Margin per Pound	-0.017	+0.084	+0.045	-0.075
Average Weight per Bird (lbs L.W)	4.22	4.08	3.92	3.75
Feed Conversion	2.27	2.19	2.25	2.21
Mortality Rate %	4.59	4.03	3.74	3.84
Stocking Density (sq'/bird at Start)	0.60	0.56	0.48	0.48
Killing Age (days)	57	56	56	54
Turn Round (weeks)	10.71	10.29	10.34	10.29
Live-Weight per sq'	6.684	6.969	7.768	7.490
Live-Weight per sq'/week	0.624	0.677	0.751	0.728
Feed Cost per ton (£)	£54.03	£53.21	£51.59	£50.52
Av.No. of Chicks Started	13,980	33,163	69,557	156,885
No. of Units in Each Size Group	13	11	21	16

Source: Manchester University.

TABLE LV(c)

RESULTS RELATED TO SIZE OF UNIT

Quarter I 1973

Size of Units (No.of Birds)	10-19,000	20-49,000	50-99,000	100,000+
Average Cost per Bird	p.	p.	p.	p.
Feed	26.019	23.885	23.349	23.699
Chick	6.808	6.580	6.699	6.724
Feed + Chick	32.827	30.465	30.048	30.423
Labour	1.226	1.039	0.830	0.936
D.Depreciation	0.789	1.120	0.877	1.153
Vacc. & Med.	0.329	0.462	0.629	1.000
Other Costs	2.342	2.715	2.268	2.596
TOTAL	37.513	35.801	34.652	36.108
Returns per Bird	37.767	36.347	35.539	35.791
Margin per Bird	+0.254	+0.546	+0.887	-0.317
Average Cost per Pound (L.W.)				
Feedingstuffs	6.126	5.882	5.880	5.792
Chick	1.603	1.621	1.687	1.643
Other Costs	1.103	1.314	1.159	1.390
Total	8.832	8.817	8.726	8.825
Returns per Pound (L.W.)	8.891	8.951	8.949	8.748
Margin per Pound	+0.059	+0.134	+0.223	-0.077
Average Weight per Bird (lbs L.W.)	4.25	4.06	3.97	4.09
Feed Conversion	2.34	2.25	2.27	2.32
Mortality Rate %	4.05	3.56	4.97	4.42
Stocking Density(sq'/bird at start)	0.63	0.59	0.52	0.50
Killing Age (days)	58	56	56	56
Turn Round (weeks)	10.75	11.00	10.43	10.68
Live-weight per sq'	6.778	6.879	7.696	7.780
Live-weight per sq'/week	0.631	0.625	0.738	0.728
Feed Cost per ton (£)	£58.62	£58.69	£57.96	£56.00
Av.No. Chicks Started	14,259	32,610	75,780	154,392
No. of Units in each Size Group	13	12	18	15

Source: Manchester University

TABLE LV(d)

RESULTS RELATED TO SIZE OF UNIT

Quarter II 1973

Size of Units (No. of Birds)	10-19,000	20-49,000	50-99,000	100,000+
Average Cost per Bird	p.	p.	p.	p.
Feed	29.747	28.258	27.858	26.409
Chick	7.105	7.086	7.061	6.576
Feed + Chick	36.852	35.344	34.919	32.985
Labour	1.332	1.052	0.972	0.978
D. Depreciation	0.834	1.195	0.925	1.199
Vacc. and Med.	0.380	0.430	0.650	0.678
Other Costs	2.350	2.590	2.488	2.659
TOTAL	41.748	40.611	39.954	38.499
Returns per Bird	42.251	41.036	40.564	38.140
Margin per Bird	+0.503	+0.425	+0.610	-0.359
Average Cost per Pound (L.W.)				
Feedingstuffs	6.924	6.786	6.682	6.697
Chick	1.654	1.702	1.694	1.668
Other Costs	1.140	1.265	1.208	1.397
Total	9.718	9.753	9.584	9.762
Returns per Pound (L.W.)	9.835	9.855	9.730	9.671
Margin per Pound	+0.117	+0.102	+0.146	-0.091
Average Weight per Bird (lbs L.W.)	4.30	4.16	4.17	3.94
Feed Conversion	2.32	2.26	2.27	2.34
Mortality Rate %	4.85	4.62	3.72	4.51
Stocking Density (sq'/bird at start)	0.65	0.60	0.51	0.51
Killing Age (days)	58	58	58	57
Turn Round (weeks)	10.49	10.52	10.93	10.71
Live-weight per sq'	6.632	6.922	8.144	7.340
Live-weight per sq'/week	0.632	0.658	0.745	0.685
Feed Cost per ton (£)	£66.89	£67.30	£66.06	£64.03
Av.No. of Chicks Started	13,832	33,264	72,913	152,576
No. of Units in each Size Group	14	13	16	19

Source: Manchester University.

TABLE LV(e)

RESULTS RELATED TO SIZE OF UNIT

Quarter III 1973

Size of Units (No. of Birds)	10-19,000	20-49,000	50-99,000	100,000+
Average Cost per Bird (L.W.)	p.	p.	p.	p.
Feed	32.688	32.747	29.886	29.726
Chick	7.328	7.480	6.960	6.809
Feed + Chick	40.016	40.227	36.846	36.535
Labour	1.365	1.107	0.971	0.981
D.Depreciation	0.821	1.168	0.997	1.090
Vacc. & Med.	0.401	0.329	0.609	0.664
Other Costs	2.275	2.583	2.413	2.516
TOTAL	44.878	45.414	41.836	41.786
Returns per Bird	44.270	44.654	42.265	41.566
Margin per Bird	-0.608	-0.760	+0.429	-0.220
Average Cost per Pound (L.W.)				
Feedingstuffs	8.043	7.928	7.649	7.702
Chick	1.803	1.811	1.781	1.764
Other Costs	1.196	1.256	1.277	1.361
Total	11.042	10.995	10.707	10.827
Returns per Pound	10.893	10.811	10.817	10.770
Margin per Pound	-0.149	-0.184	+0.110	-0.057
Average Weight per Bird (lbs.L.W.)	4.06	4.13	3.91	3.86
Feed Conversion	2.32	2.26	2.28	2.32
Mortality Rate %	4.31	5.07	3.40	3.67
Stocking Density (sq'/bird at start)	0.60	0.57	0.50	0.50
Killing Age (days)	55	57	57	57
Turn Round (weeks)	10.49	10.98	10.86	10.65
Live-weight per sq'	6.416	6.837	7.555	7.655
Live-weight per sq'/week	0.612	0.623	0.696	0.719
Feed Cost per ton (£)	£77.62	£78.76	£75.17	£74.30
Av.No of Chicks Started	13,861	30,665	73,99	152,097
No. of Units in each Size Group	15	12	18	19

Source: Manchester University.

and it would fit in with the requirements of the processing stations. However it should be said that the range in the results within each size group indicates that success depends very much upon the level of management. This applies particularly to very large sized units where a considerable degree of expertise is required. That this expertise is available within the industry is shown by the successful operation of mammoth sized units though admittedly they are still few and far from the average size of unit in the industry.

Costs and Returns of Production 1973-1976

The situation in respect of the costs and returns of production is brought up-to-date to June 1976 in Tables LVI and LVII. Much of this information has been kindly provided by the National Farmers' Union. The standardised production data and costs are assessed on the basis of changes which have occurred in production patterns and prices at a specific date for each year (June 1st). The estimates are based upon information collected by the N.F.U. in consultation with A.D.A.S. Prices ruling eight weeks after this date have been applied to the N.F.U. data to determine the likely returns of production (the price is necessarily a provisional estimate for the last period in 1976). Deadstock depreciation relates to the replacement and not the written down value of existing houses and equipment, except in 1972.

The average costs of production (Table LVII) are based upon costings collected by the N.F.U. during the period December to May each year. The results differ slightly from the standardised costs, which would be applied to the period, partly because the flocks in practice would be cleared out at various dates during the period which would have affected unit costs of production. Also the units generally achieved a rather better level of performance in practice than the estimated standards, since the latter are based on the likely average performance of the industry taking into account both well and poorly managed flocks. The deadstock depreciation rate is based upon the written down value in this table.

The results show the major problems of the industry in recent years,

TABLE LVI

AVERAGE BROILER STANDARD PRODUCTION

COSTS, MARGINS and MANAGEMENT FACTORS

	1972 (b)	1973 (b)	1974 (b)	1975 (b)	1976 (b)
	PER BIRD LIVE-WEIGHT				
COSTS	p.	p.	p.	p.	p.
Feed	17.985	29.752	41.032	38.811	47.238
Chick	6.710	7.000	7.653	8.400	9.184
Labour	1.130	1.420	1.525	1.668	2.143
Clean Out	0.250	0.260	0.290	0.300	0.300
Catching	0.260	0.260	0.300	0.350	0.800
Heat and Light	0.740	0.700	1.025	1.320	2.642
Water	0.040	0.040	0.050	0.065	0.076
Litter	0.275	0.300	0.560	0.503	0.674
Vacc. & Med.	0.220	0.270	0.341	0.342	0.275
Insurance	0.285	0.325	0.356	0.366	0.477
D. Deprec.	0.875	1.810	2.105	2.667	3.003
Rep. & Maintenance	0.130	0.175	0.205	0.260	0.260
Miscellaneous	0.115	0.144	0.151	0.220	0.270
TOTAL (a)	29.015	42.456	55.593	55.272	67.342
RETURNS	32.760	42.000	51.600	57.960	68.000 (c)
MARGIN (a)	+3.745	-0.456	-3.993	+2.688	+0.658
	PER POUND LIVE-WEIGHT				
COSTS					
Feed	4.282	7.084	10.258	9.241	11.115
Chick	1.598	1.667	1.913	2.000	2.161
Other Costs	1.028	1.358	1.727	1.920	2.569
TOTAL (a)	6.908	10.109	13.898	13.161	15.845
PRICE	7.800	10.000	12.900	13.800	16.000 (c)
MARGIN	+0.892	-0.109	-0.998	+0.639	+0.155
Killing Weight (lbs)	4.20	4.20	4.00	4.20	4.25
Killing Age (days)	56	56	56	56	55
Feed Conversion	2.10	2.30	2.30	2.25	2.24
Mortality Rate %	4.0	4.0	4.0	4.5	4.0
Turn Round (days)	64	70	74	75	75
Stocking Density sq'/ Bird	0.51	0.59	0.59	0.59	0.56
Live-Weight per sq'	8.235	7.119	6.780	7.119	7.589
L.W. per sq'/week	0.903	0.712	0.644	0.665	0.708
Production Efficiency Index	200	183	174	187	190
Fixed Capital Investment sq'	£1.30	£1.50	£1.76	£2.20	£2.61
Price of Feedingstuffs per ton	£46	£69	£100	£92	£111

Source: N.F.U. (a) Excluding general farm overheads (b) At June 1st each year
(c) Estimate based on price end June +0.5p.

TABLE LVII

AVERAGE COST OF BROILER PRODUCTION and MANAGEMENT FACTORS

COST PER BIRD (L.W.)

COSTS	1972/73 (b) p.	1973/74 (b) p.	1974/75 (b) p.	1975/76 (b) p.
Feed	25.757	43.328	43.699	41.973
Chick	6.708	7.650	8.056	9.002
Labour	0.967	0.914	1.258	1.250
Clean Out	0.247	0.225	0.260	0.297
Catching	0.240	0.286	0.345	0.369
Heat and Light	0.653	0.968	1.410	1.488
Water	0.039	0.049	0.063	0.078
Litter	0.291	0.324	0.443	0.590
Vacc. + Med.	0.392	0.264	0.246	0.199
Insurance	0.188	0.238	0.278	0.296
D.Deprec.	0.593	0.763	0.980	1.171
Rep. and Maintenance	0.151	0.132	0.230	0.166
Miscellaneous	0.144	0.100	0.165	0.254
TOTAL (a)	36.370	55.241	57.433	57.133

COST PER POUND (L.W.)

Feed	5.854	10.568	10.139	9.627
Chick	1.525	1.866	1.869	2.065
Other Costs	0.887	1.039	1.318	1.412
TOTAL (a)	8.266	13.473	13.326	13.104
Average L.W. lbs/bird	4.40	4.10	4.31	4.36
Average Killing Age	57	56	57	56
Turn Round (days)	73	74	80	77
Feed Conversion	2.26	2.27	2.32	2.21
Mortality %	3.64	4.20	4.52	4.26
Stocking Density sq'/bird	0.59	0.67	0.59	0.56
L.W. per sq'(lbs)	7.458	6.119	7.305	7.786
L.W. per sq'/week (lbs)	0.714	0.581	0.639	0.708
Production Efficiency Index	195	181	186	197
Average Price of Feed/ton(£)	£58	£97	£98	£98

Source: N.F.U.

(a) Excluding farm overheads

(b) December to May e.g. December 1975 to May 1976.

namely escalating unit costs of production. The price of feed declined slightly in mid-1975, but it has increased again in recent months due partly to the effect of the E.E.C. Skimmed Milk Powder Scheme, which has caused a rise in the price of proteins in particular. The price of broiler feedingstuffs is presently £111 per ton compared to £46 per ton in 1972. During the past two years, other costs of production have increased substantially, particularly the cost of fuel and wage rates have doubled. The cost of establishing a new unit has increased, on average, from £1.30 per sq' in 1972 to £2.60 in 1976. The price of broilers has increased, but the price depends upon the market situation. The difficult situation which occurred in 1974 and early 1975 is not reflected fully in the standardised returns, since these refer each year to the situation in June. However they are sufficiently pronounced to provide some indication of the losses incurred by the industry and the marketing difficulties already discussed earlier in this study. The market improved partly as a result of increased demand for chicken following the ending of the Social Beef Scheme in March 1975 and partly due to a reduction in supplies caused by the decline in chick placements. Profitability therefore improved during the second half of 1975 and the first half of 1976. However the recent rise in the price of feedingstuffs will likely reduce the level of profitability in mid-1976.

The economic results indicate some of the risks involved in broiler production. Measured on the basis of the annual return on fixed capital investment (replacement value) this varied from a negative return of -9% in 1974 (based on the mid-year results) to +20% for 1975 and is likely to be about 12% at the current time. This calculation only covers the fixed capital needs and does not include the working capital requirements, which vary from unit to unit, or an allowance for interest on capital. Certainly a great deal more is at stake than during the early years of the development of the industry.

Table LVII shows that the level of performance tended to decline in 1973/74 for the reasons already mentioned earlier in this study as well as to the effect

TABLE LVIII

U.K. ANNUAL PRICE INDICES FOR CHICKEN AND POULTRY FEEDINGSTUFFS

CATTLE AND CATTLE FEEDINGSTUFFS Base 1954/55 - 1956/57 = 100

Year	Chicken[a]	Poultry[b] Compounded Feedingstuffs	Cattle[c]	Cattle[b] Compounded Feedingstuffs
1954/55	98.8	99.0	98.6	97.8
1955/56	104.0	99.4	97.3	99.6
1956/57	97.2	101.6	104.1	102.6
1957/58	99.3	88.9	106.8	91.3
1958/59	94.1	88.6	107.3	90.2
1959/60	91.2	88.9	106.3	93.9
1960/61	82.4	86.0	106.8	90.3
1961/62	72.1	87.1	113.6	91.6
1962/63	75.5	89.8	113.3	94.2
1963/64	73.6	93.8	115.1	98.7
1964/65	72.4	96.4	121.3	98.5
1965/66	68.2	98.8	123.6	100.8
1966/67	69.0	99.1	123.4	100.0
1967/68	66.4	101.5	130.8	104.1
1968/69	65.7	104.2	141.4	106.6
1969/70	65.3	110.9	148.1	109.6
1970/71	72.2	129.3	163.3	126.1
1971/72	68.3	121.5	174.5	122.0
1972/73	70.6	146.4	232.0	142.7
1973/74	104.8	227.8	252.3	214.7
1974/75	128.6	237.6	269.4	233.0

Index based on M.A.F.F. Annual Harvest Series. (Index 1954/56 linked to 1964/66 and 1968/71).

(a) 1954/55 to 1963/64 Chickens, broilers and hens.
1964/66 to 1974/75 Broilers and chickens.

(b) Great Britain only.

(c) Steers and heifers certified at auction markets (gross price including Fatstock Guarantee payments and from August 1974 payments under Beef Premium Scheme).

of Gumboro disease. No doubt the use of the new Gumboro vaccine has partly influenced recent levels. Certainly a marked improvement has occurred in terms of production per square foot, and in the feed conversion rate which is 2.21 for an average weight of 4.36 lbs in 1976. Accordingly the P.E. Index is even better than in 1973.

Despite the problems of recent years the broiler industry can be justly proud of its record since the mid-1950's. As Table LVIII shows the M.A.F.F. index for the price of chicken only increased by 30% during the twenty years since 1955, whereas the price of compounded feedingstuffs rose by 138%. During the same period the price of cattle rose by 173% for the same increase in the cost of feedingstuffs.

The Optimum Killing Age - Length of Growing Cycle and Annual Returns

So far this study has mainly considered the economics of broiler production in terms of production on a single crop basis. But broiler production is a continuous process throughout the year. This raises the problem of the optimum return to be achieved on an annual basis, which is related to the optimum use of time (cycle length) and space (fixed area of a unit). The solution to this problem is rather complicated, since it also depends upon the relationship between a number of other factors, some of which are beyond the control of producers such as increases in the price of feedingstuffs or the effect of inflation.

The optimum killing age for a continuous cropping programme is different from that of the production of an occasional crop. The variable costs for the latter will generally only consist of the feedingstuffs cost, so that for a given price of broiler per pound, the higher the price of feedingstuffs the earlier will be the killing age. This is caused by the feed conversion rate which deteriorates as a bird ages, i.e. a larger amount of feed is required to produce each additional pound of broiler. Similarly the lower the price of feedingstuffs the later the killing age will be. The killing age for an occasional crop will be later than for the continuous production system, since the former system is not related to the number of crops which may be produced

per annum.

The likely optimum killing age on the continuous production system is perhaps best illustrated by the results which might be obtained by a single unit killing at various ages at the present time. These are tabulated in Table LIX for a unit of 20,000 sq' using as hatched chicks and allowing 14 days between each crop. The weight for age and the feed conversion rates are rather better than might be obtained by the average unit but are nevertheless commercially viable. The rates have been kindly provided by B.O.C.M./Silcock Ltd. They are based upon the results of growing trials and have been adjusted to commercial practice. The costs of production are based upon recent N.F.U. data. The stocking density rates approximate to the Codes of Welfare. The latter would appear to be in need for updating since they are rather impractical in view of recent improvements in broiler performance rates. The price of feedingstuffs and broilers is varied to illustrate the effect of changes in the main price determinants of profitability upon the annual returns according to cycle length. The results therefore are theoretical in economic terms, but may be considered to be fairly representative of the present day situation with feedingstuffs at £110/ton and broilers at 16.5p/lb. for a well run unit of this size. It should be noted that the margins do not include any allowance for overheads or for interest on capital.

The later the killing age the heavier the bird will be, but more space per bird will be required and fewer crops per annum will be produced. In total, therefore, not only does the number of birds decline, but the total weight in pounds, falls as the length of the growing cycle increases on an annual basis. The increased live-weight of the bird does not compensate for the drop in the number of birds produced. On a 70 day killing age cycle (turn round 84 days) about half the number of birds are produced as on the 49 day cycle and the total weight falls by 25%. The number of crops falls from 5.79 to 4.35 per annum.

The optimum killing age is further complicated by the effect of the variable costs of production. On an annual basis, as well as the cost of

TABLE LIX

ESTIMATED ANNUAL PRODUCTION, COSTS, RETURNS and MARGINS ACCORDING TO LENGTH OF GROWING CYCLE-1976

KILLING AGE (days)	35	42	49	56	63	70
Average Weight per Bird (lbs).	2.35	3.02	3.67	4.35	4.97	5.54
Feed Conversion	1.75	1.92	2.07	2.20	2.35	2.51
Feed Intake per bird (lbs)	4.12	5.79	7.60	9.58	11.68	13.90
Stocking Density sq'/bird	0.32	0.40	0.48	0.56	0.64	0.72
No.of birds produced per Crop	62500	50000	41667	35714	31250	27778
Turn Round per Crop (days)	49	56	63	70	77	84
No.of Crops per annum	7.45	6.52	5.79	5.21	4.74	4.35
No.Birds produced per annum	465,625	326,000	241,252	186,070	148,125	120,834
No.Pounds " " "	1,094,219	984,520	885,395	809,405	736,181	669,420
Production Change (lbs)	.	-109,699	-99,125	-75,990	-73,224	-66,761
Total Food Consumption (tons)	856.42	842.65	818.53	795.78	772.37	749.82
Variable Costs per Annum	£	£	£	£	£	£
Feedingstuffs(£110/ton)	94206	92692	90038	87536	84961	82480
Chicks (£9/100)	41906	29340	21713	16746	13331	10875
Brooding (1.5p/bird)	6984	4890	3619	2791	2222	1813
Other Variable Costs(3.805p/bird)	17717	12404	9180	7080	5636	4598
Total Variable Costs	160813	139326	124550	114153	106150	99766
Total Variable Costs						
(i) Feed at £100/ton	152249	130899	116365	106195	98426	92268
(ii) Feed at £110/ton	160813	139326	124550	114153	106150	99766
(iii) Feed at £120/ton	169377	147752	132736	122111	113873	107264
(iv) Feed at £140/ton	186506	164605	149106	138026	129321	122261

Unit size 20,000 sq'/as hatched chicks.

continued...

TABLE LIX (Continued)

ESTIMATED ANNUAL PRODUCTION, COSTS, RETURNS and MARGINS ACCORDING TO LENGTH OF GROWING CYCLE

KILLING AGE	35	42	49	56	63	70
Change in Total Variable Costs	£	£	£	£	£	£
(i) Feed at £100/ton	.	-21350	-14534	-10170	-7769	-6158
(ii) Feed at £110/ton	.	-21487	-14776	-10397	-8003	-6384
(iii) Feed at £120/ton	.	-21625	-15016	-10625	-8238	-6609
(iv) Feed at £140/ton	.	-21901	-15499	-11080	-8705	-7060
Marginal Costs per lb		p.	p.	p.	p.	p.
(Change in Variable Costs ÷ Prod.Change)						
(i) Feed at £100/ton	.	19.462	14.662	13.383	10.610	9.224
(ii) Feed at £110/ton	.	19.587	14.902	13.682	10.929	9.562
(iii) Feed at £120/ton	.	19.713	15.149	13.982	11.250	9.899
(iv) Feed at £140/ton	.	19.965	15.636	14.581	11.888	10.575
	£	£	£	£	£	£
TOTAL RETURNS at 16.5p./lb	180546	162446	146090	133552	121470	110454
MARGIN OVER VARIABLE COSTS						
(i) Feed at £100/ton (Price 16.5p/lb)	+28297	+31547	+29725	+27357	+23044	+18186
(ii) Feed at £110/ton "	+19733	+23120	+21540	+19399	+15320	+10688
(iii) Feed at £120/ton "	+11169	+14694	+13354	+11441	+ 7597	+ 3190
(iv) Feed at £140/ton "	- 5960	- 2159	- 3016	- 4654	- 7851	-11807
MARGIN OVER VARIABLE COSTS						
(a) Broiler Price 15p./lb (Feed £110/ton)	+3320	+ 8352	+ 8259	+ 7258	+ 4277	+ 647
(b) " " 16p./lb "	+14262	+18197	+17113	+15352	+11639	+ 7341
(c) " " 17p./lb "	+25204	+28042	+25967	+23446	+19001	+14035
(d) " " 18p./lb "	+36146	+37888	+34821	+31540	+26363	+20730
Fixed Costs per Annum	7147	7147	7147	7147	7147	7147
Deadstock Depreciation (b) per Annum	5200	5200	5200	5200	5200	5200
	12347	12347	12347	12347	12347	12347
MARGIN(a) over Variable and Fixed Costs						
Feed at £110/ton. Broilers at 16.5p/lb	+7386	+10773	+9193	+7052	+2973	-1659

(a) Excluding Overhead costs and interest on capital.

(b) Based on Replacement Value of Houses and Equipment

Unit Size 20,000 sq'/as hatched chicks.

feedingstuffs, these will include the cost of the chicks, brooding and other items such as catching and clean out. These will vary per pound of broiler produced according to the number of crops produced, i.e. the length of the cycle. They will have a more marked effect than in the past because the price of these items has increased. It should also be mentioned that the latter items are often ignored in making calculations about the optimum killing age on an annual basis.

As the cycle length increases the variable costs decline in total and very significantly the marginal costs of production per pound decline as the killing age increases on the continuous production system. The optimum killing age will occur when the additional variable cost - the marginal cost - of producing an additional pound of broiler is equal in value to the price per pound of broiler, i.e. at the point beyond which any further weight gain per bird becomes uneconomic and where the profit margin will be at its maximum. The fixed annual costs of production will remain the same regardless of the killing age. Since the marginal cost of production declines as the killing age is delayed under the continuous cropping system, then the higher the price per pound, the earlier will be the optimum killing age, or the lower the price the later this will occur. This is indicated in the table according to the price of broilers, which shows that the margin per annum increases the earlier the birds are killed, but not of course earlier than when the price per pound equals the marginal costs. Although the cost of feedingstuffs is the most important item in the cost of broiler production, the effect of this item upon the total variable costs per annum is not as marked as the other variable cost items. Between 49 and 70 days, the total cost of feedingstuffs only declined by 8%, whereas other variable costs were halved. The fall in these items is caused by the drop in the total number of birds produced and the deterioration in the feed conversion rate (2.07 at 49 days and 2.51 at 70 days).

The results indicate that the optimum killing age lies between 6 and 7 weeks with feed at £110/ton and the price of broilers at 16½p./lb. At this point the margin between the total returns and the variable costs is at its

maximum. It is interesting to compare these results with similar calculations made by Jones* in 1962. These indicated that the optimum killing age was 10½ weeks, with broilers at 8.3p/lb and feed at £42/ton, the average weight being 4.21 lbs per bird, for a feed conversion rate of 2.57. The reason for the earlier optimum killing age today is due to the marked rise in weight per bird for a shorter growing period, the improvement in the feed conversion rate as well as changes in the price of broilers and feedingstuffs.

The results in the table cover as hatched chicks. In the case of sexed flock growing, the optimum killing age will be slightly earlier for cockerels because their growth rate is rather faster than for pullets. Trials conducted by Spillers Farm Feeds Limited, for example, indicate that at 56 days the body weight would be 4.94 lbs (F/c 2.07) for cockerels and 4.01 lbs (2.22) for pullets. The point already made earlier in this study about the length of time that sites are empty is also very relevant to the annual margins. If nearly 6 crops can be produced in one year allowing 14 days for cleaning and resting, then nearly one crop will be lost if the sites are empty for one week longer.

Since the optimum killing age is about 47 days on an annual basis, the question arises, why do producers continue to produce a heavier weight bird which involves a longer growing cycle? The more astute producers of course do not do this! The larger units in the Manchester Survey, for example, tended to produce lower weight broilers than the small units so that L.W./sq'/week was much higher for the larger units. Much will depend of course upon the feed conversion rates which are achieved in practice.

However, since the broiler industry is a market orientated industry, it aims to meet market demand, which is for birds between 2½ to 4 lbs (oven ready weight) and 78% of birds processed are in this category. This is equivalent to an average of 4.3 lbs L.W. The range in the weights required however does allow a producer some leeway in his target weights. In any case processors operate a sliding scale payment scheme which compensates to some extent for the higher

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* W.D. Jones. "Relationship between prices, bird weights and profits in broiler production". Br.Poultry Science, Vol.3, No.1, 1962.

costs of producing the heavier weight, longer cycle length birds. The thinning policy operated by some producers also makes for the maximum use of a fixed floor area.

When the margin between the costs and returns of production is so finely balanced in an inflationary situation, it takes a very astute producer to judge the optimum killing age particularly as in the case in recent weeks when the price of feedingstuffs has increased by as much as £6/ton within the first three weeks of June, whilst the price of broilers has changed in fractions of a penny. The planning of long term production programmes by large integrated organisations in order to maximise returns is similarly complicated. It should not be forgotten that a fully integrated programme from the initial grand parent breeding stage to the processing factory stage covers nearly two years.

Definition of Terms

Costs

Feedingstuffs - Charged at net cost delivered to the units.

Labour - Paid labour charged at actual cost, including employer's share of National Insurance and Graduated Pension contributions. Standard rates were charged for unpaid family labour.

Deadstock Depreciation - 10 per cent on houses and equipment.

Miscellaneous Costs - Include direct miscellaneous costs but there is no charge for general farm overheads or allowance for interest on capital.

F/C - Feed Conversion. $\frac{\text{Total Food Consumption (lbs)}}{\text{Total Production of broilers (lbs)}}$

Turn Round Killing age (days) + site empty (days).

L.W. per sq'/week $\frac{\text{Production (lbs L.W.)}}{\text{Fixed floor area (sq')}} \div \text{Turn Round (weeks)}$

P.E.I. Production Efficiency Index $\frac{\text{Av. L.W. per Bird (lbs)}}{\text{F/C rate (lbs)}}$

E.P.E.I. European Production Efficiency Index.

$$\frac{(\text{Av. L.W.} \times \text{No. Chicks Started}) \times (\text{AV. L.W. per Bird Sold})}{(\text{Age in days}) \times (\text{Weight of Food Consumed per Bird})} \times 10{,}000 \div 2.2045$$

Stocking Density Rate $\frac{\text{Size of Unit (sq')}}{\text{No. of chicks started}}$

Broilers are housed more intensively as the rate declines, i.e. more birds per sq'-fewer sq' per bird.

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