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Egg

UNIVERSITY OF MANCHESTER

DEPARTMENT OF AGRICULTURAL ECONOMICS

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ECONOMIC PROGRESS AND PROBLEMS

OF THE

EGG AND POULTRY MEAT INDUSTRIES

by

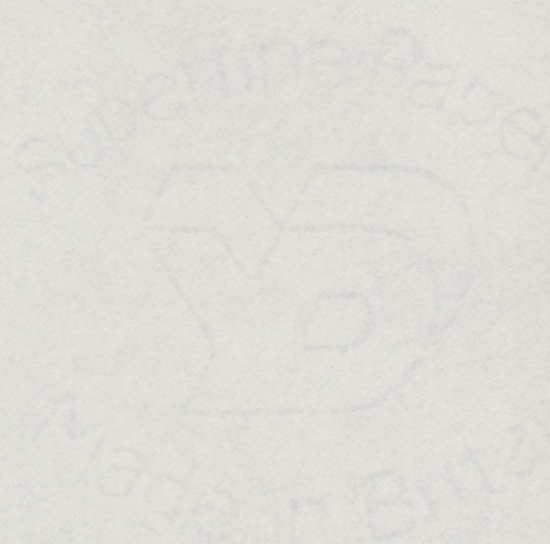
D. I. Sue Richardson

Sir John Eastwood Senior Fellow

The Sir John Eastwood Research Project

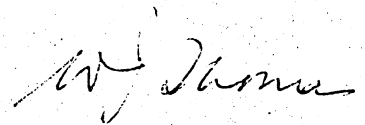
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PREFACE

At a recent World Poultry Congress Mrs. D.I.S. Richardson was given the signal honour of being asked to present the opening paper of the Conference. This honour no doubt arose from her long and distinguished work on the economic problems of the poultry industry in the United Kingdom and in the World at large. Her paper is wide ranging and conveniently gathers together a great deal of information which should be of interest and value to those who work in the industry. It is with the purpose of making it available to a wider public that the Department of Agricultural Economics is re-issuing it as a bulletin. We are re-issuing it as one of a series of publications from the Sir John Eastwood Research Project, in appreciation of the generous financial support which Sir John Eastwood has provided to the University of Manchester.



Professor W. J. Thomas

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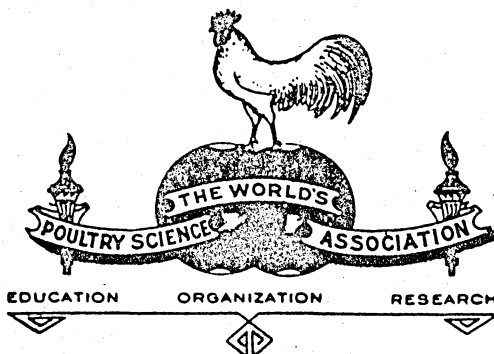
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OFFICE OF THE PRESIDENT

Rio de Janeiro, Brazil
19 September 1978

ECONOMIC PROGRESS AND PROBLEMS OF
THE EGG AND POULTRY MEAT INDUSTRIES

It was my privilege to read Mrs. D.I. Sue Richardson's paper before it was presented at the XVith World's Poultry Congress in Rio de Janeiro and to hear Mrs. Richardson make the actual presentation. She and the University she represents are to be commended for this outstanding endeavor.

It was a signal honour for the University of Manchester to have its own Sir John Eastwood Senior Fellow present the opening paper at the Congress. This undoubtedly reflects her professionalism, rather than a "ladies first" approach. Its significance can be appreciated even more when it is realized that well over 4,000 individuals from more than 60 countries on the six major continents and other areas of the world took part in the XVith World's Poultry Congress.

Mrs. Richardson demonstrated quite clearly the growing importance of eggs and various poultry meats to the world economy and the dramatic increase in poultry industry productivity in recent decades. She stated with succinct clarity that eggs and poultry meat can play an even more vital role in world nutrition as we approach and enter the next Century.

The future of the poultry industry is not without its problems, as Mrs. Richardson so eloquently explained. It is to be hoped that those who are in a position to respond will heed her call for more research in the fields of poultry economics and marketing research and education and her conclusion that "More encouragement needs to be given to participation of women in both the academic field and the commercial sector of the industry."

My sincere congratulations to the University of Manchester, Mrs. Sue Richardson, and Sir John Eastwood.

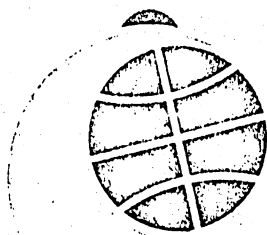
A. William Jasper, Ph.D.
President

AWJ/jv

c/o AMERICAN FARM BUREAU FEDERATION • 225 TOUHY AVENUE • PARK RIDGE, ILLINOIS, U.S.A. 60068

TELEPHONE: (312) 696-2020

CABLE: AMFARBUR



CONGRESSO MUNDIAL DE AVICULTURA XVI WORLD'S POULTRY CONGRESS XVI CONGRÈS MONDIAL D'AVICULTURE XVI WELTCONGRESS FÜR GEFLÜGELZÜCHTUNG

World's Poultry Science Association
Brazil Branch

Associação Mundial de Ciência Avícola
Seção Brasileira

São Paulo, 30 Outubro de 1.978

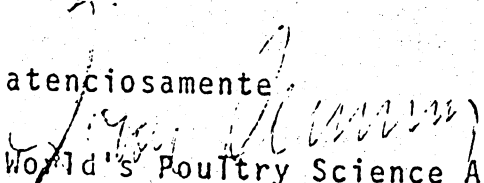
Mrs. D.I. Sue Richardson
Sir John Eastwood Fellow
University of Manchester

É com grande prazer que em nome da World's Poultry Science Association e da Comissão Organizadora do XVI Congresso Mundial de Avicultura desejamos transmitir-lhe os nossos mais sinceros agradecimentos por sua valiosa colaboração para o sucesso do XVI Congresso Mundial de Avicultura, realizado no Rio de Janeiro em setembro último. O grande interesse despertado pela apresentação de sua conferencia especial, abrindo os trabalhos científicos do Congresso Mundial, demonstrou que os organizadores do conclave estavam certos ao convidá-la. Ficou também patente o enorme interesse que os assuntos ligados à economia de mercado passam a ter nos congressos, e outras reuniões de avicultura.

Tenho muita satisfação em informá-la que entre os congressistas do Brasil, com os quais mais tive contato após o congresso, o seu trabalho tem merecido menção especial. Não temos a menor dúvida em afirmar que no Setor de Economia e Marketing, no Programa Científico do XVI Congresso Mundial de Avicultura, o seu trabalho "Progresso Econômico e problemas da indústria da carne de aves e de ovos", foi o que apresentou maior destaque. Trabalhos desta natureza são principalmente importantes para países como o Brasil, onde a avicultura vem desenvolvendo-se em ritmo muito acelerado nos últimos anos.

Desejamos cumprimentá-la pelo êxito alcançado e esperamos que continue em seu trabalho a dedicar grande atenção aos problemas da economia avícola. Conte com a nossa colaboração, agora como presidente da World's Poultry Science Association, para ajudá-la em tudo o que for possível.

atenciosamente


World's Poultry Science Association
Presidente.

Translation of Statement by Mr. L. Von Schmidt, President of XVith World's Poultry Congress and newly elected President of the World's Poultry Science Association.

XVith WORLD'S POULTRY CONGRESS
RIO DE JANEIRO 1978

World's Poultry Science Association

Brazil Branch

To: Mrs. D.I. Sue Richardson
Sir John Eastwood Fellow
Manchester University.

On behalf of the Organising Committee of the XVith World's Poultry Congress, it gives me great pleasure to convey to you our most sincere thanks for your valuable contribution to the success of the World Congress, which took place in Rio de Janeiro in September. The considerable interest shown in your paper proved that the Organising Committee were right in inviting you to present the opening paper for the scientific sessions of the Congress. It was also apparent that this will encourage further interest in the field of poultry economics and marketing at future World Congresses and at other poultry conferences.

It is also my pleasure to state that among the Congress participants from Brazil with whom I have been in contact since the Congress, that your paper has been especially mentioned. I myself, would like to confirm also that your paper "Economic Progress and Problems of the Egg and Poultry Meat Industries" resulted in great interest being shown in the economics and marketing session of the Congress. Work of this nature is especially important for countries, such as Brazil, where the poultry industry has developed very rapidly in recent years.

We would like to extend our congratulations to you for your excellent presentation. We hope that you will continue to give particular attention in your work to the problems of the economics of the poultry industry. Meanwhile, as the newly elected President of the World's Poultry Science Association, I look forward to our further collaboration in this field in the future.

Lauriston Von Schmidt

President - 1978/82
World's Poultry Science Association.

ACKNOWLEDGEMENTS

The Department has developed a special relationship with the poultry industry in the United Kingdom and on an international basis over the past 25 years. The work of the Department in the field of poultry economics and marketing culminated with the establishment of the Eastwood Poultry Research Project, thanks to the generous gift donated by Sir John Eastwood to Manchester University.

This paper, presented at the XVIth World's Poultry Congress in Rio de Janeiro this year, is the result of work on part of the project. In writing the paper, the author would like to acknowledge, with grateful thanks, the helpful advice she has received from the many individuals in poultry organisations, government agricultural departments and universities throughout the world and in particular from members of the World's Poultry Science Association and F.A.O. over many years.

The field of poultry economics and marketing within W.P.S.A. did not develop, in earlier years, to the same extent as perhaps other sectors of the Association. However recent developments are encouraging with greater interest being shown in the subject. Within the European Federation we have seen the establishment of Working Groups, including the Economics and Marketing Group, which should serve as a further stimulus to the development of studies in this field.

Within the Department of Agricultural Economics, the author would also like to thank Mrs. Rajinder Jasdhoal and Miss Jennifer Vaughan for their careful typing of this report.

D.I. Sue Richardson
Sir John Eastwood Senior Fellow

ECONOMIC PROGRESS AND PROBLEMS OF THE EGG AND POULTRY MEAT INDUSTRIES

by

D. I. Sue Richardson*

Summary of Paper

The paper examines the progress and problems of the egg and poultry meat industries on a world basis covering the Developed, the Centrally Planned and Developing Economy Countries.

Progress in the productivity of these industries has been remarkable in terms of yield, feed conversion and economies achieved due to the development of the intensive systems of production, scale of operation and integration.

Egg production has not increased at the same pace as poultry meat production, especially in the Developed Countries in recent years, in contrast to the situation in the Centrally Planned and Developing Countries, which are encouraging further expansion of the egg industry. Turkey meat production has the greatest potential for growth, particularly in the developed countries.

Poultry meat has made a marked inroad into total world meat supplies. The share of poultry meat is now 19%. Red meat shows a slower growth rate.

Development and problems of the international trade in eggs and poultry meat are discussed. Although world trade is mainly concentrated in Europe, the pattern has changed in recent years. The Near East's share of world poultry meat imports is now 17% - only 1% in the early 1960's, and the Developing Countries as a whole now take 36% (only 10% in the early 1960s). Dominance of the Netherlands in world export trade. New countries emerging, e.g., Brazilian export of broilers. Recovery of international trade in eggs. Importance of egg products as a stabilising factor. International trade distorted by growth of protectionism in form of import controls, tariff barriers and other regulations. Harmonisation and standardisation of marketing, veterinary and sanitary regulations desirable.

Major problem is still matching supply according to the demand of the market in the egg sector due partly to the fragmented nature of the egg industry. Difficulties in EEC market in 1978. Poultry meat sector tending to become more balanced due to greater concentration and integration as well as awareness of market requirements. Supply management and free market systems compared. Industries likely to become more internationally integrated.

Marked rise in poultry meat consumption, but rate tending to slow down in many developed countries. Growth will more likely be more difficult in the future, though long way to go to the level of USA. Growth potential likely to be highest for turkeys due to potential in cut-up and processed market. Poultry meat is taking an increasing share of the consumption of all types of meat.

* Biographical Details - D.I. Sue Richardson

Sir John Eastwood Senior Fellow, Agricultural Economics Department, Manchester University.

Chairman - Statistics Committee, International Egg Commission.

Chairman - Working Group No.1 (Economics and Marketing). European Federation W.P.S.A.

Council Member - W.P.S.A.

Egg consumption problems. Level is stagnating in several developed countries, or even declining as in the United States. However, the situation is not the same for all countries. Consumption in Japan has increased by 125% since the early 1960s. Marked gains are taking place in the Centrally Planned Countries, particularly in Poland, as well as in the Developing Countries, especially in the Middle East.

Poultry products are now providing a larger share of the total supply of world animal protein provided by meat products. Comparative measures of output and efficiency in the use of feedingstuffs are indicated for various animal species. Greater reproductive capacity helps put poultry high on efficiency list. Amount of animal products that can be produced from the produce of one hectare (UK conditions), including an allowance for breeding populations necessary to maintain productive populations, indicate that turkey production and milk production (high concentrate milk production system associated with veal production) provide the highest yield with 144 kgs of edible protein per hectare. Egg production provides 138 kgs, broilers 137 kgs, milk (high concentrate milk production system associated with 18 month beef production) 120 kgs, bacon 80 kgs, suckler beef 35 kgs, and sheep 32 kgs of edible protein per hectare.

Agricultural policy has tended to neglect the importance of the poultry industry in the developed countries. But expansion is planned by the Centrally Planned economy countries. Governments in the Developing Countries are encouraging the development of the industry and F.A.O. is active with programmes in several countries. Need for greater cooperation by poultry industry on an international basis, e.g., I.E.C., World Turkey Federation, to represent the needs of the industry. Hopefully an Inter-Professional Organisation for Eggs and Poultry Meat will soon be established in the EEC.

Eggs, broilers and turkeys are better value for money than red meat and bacon. It takes 8 minutes work to cover the retail price of one pound of eggs, 13 minutes for broilers, and 14 for turkeys, compared with 47 minutes for sirloin of beef, 53 for rump steak, 35 for leg of lamb, 28 for loin of pork and 29 minutes for one pound of bacon. Eggs, broilers and turkeys are also better value for money on the basis of the retail price of edible meat, as well as the number of grammes of protein for one penny.

Supply management and free market systems are discussed, as well as problems associated with anti-factory farming lobbies. Need for more research in poultry economics and marketing and improvement in educational opportunities.

Further improvements are needed in the coverage of poultry statistics and price data for market intelligence purposes in both sectors of the poultry industry, and particularly covering the various types of poultry meat.

Introduction

First of all, may I thank the Brazilian Branch of the W.P.S.A., for the great honour of being asked to present the opening paper for the World Poultry Congress.

It has proved rather difficult to decide upon the content of my paper, because such a wide field of interests in the scientific and economics field and so many countries are represented at the Congress. However, as this is a World Congress, I thought it would be of interest to take a global view and to concentrate on the progress and problems of the two industries on an international basis. The paper largely covers aspects of the productivity of the poultry industry, changes and problems of production, international trade, consumption, the question of the use of feedingstuffs by the industry and the position of poultry products in relation to the red meat sector.

Productivity of the Industry

One of the outstanding features of the progress of the poultry industry, has been the remarkable rate of growth in the productivity of egg and poultry meat production, which cannot be matched by any other sector of agriculture. The average yield of farm flocks has increased by 50% to 236 eggs per layer in the United States during the past 20 years. In the E.E.C. the average yield has risen from 181 eggs per layer in 1970 to 235 in 1977, so that fewer birds are needed to produce the same quantity of eggs and thus achieving economy in the use of feedingstuffs, apart from the improvement in the feed conversion rate which has also taken place. It should be noted that these results cover the average for all farm flocks. Some flocks in the United Kingdom regularly achieve yields of over 280 eggs per layer.

Similarly tremendous achievements have been made in the poultry meat sector. In the United Kingdom, the feed conversion rate for broilers was 3.2:1 in the early 1950's, compared to 2.1:1 today, and the growing period has been

reduced from 10/12 weeks to only 53 days for farm flocks. Turkey production, as well, has made great strides in its rate of progress. In 1957, it took 20 weeks to produce a turkey (female/white) weighing 9.11 pounds with a feed conversion of 5.44:1. Today, it only takes 13 weeks to produce a turkey (middle weight type birds) weighing 9.2 pounds for a feed conversion rate of 2.29:1. The conversion rate is even better than this for heavier/catering weight turkeys (13 weeks, 9.9 pounds, f/c 2.20:1).

Economies are also achieved by means of scale of operation and the intensive systems of housing and environmental control. The breeding of more productive stock, progress in the nutritional field, in the level of management as well as in the integration of the industry, have all contributed to the rate of change and of progress.

As far as the future is concerned, one must wonder whether the productive momentum can be maintained. It seems to have slowed down in recent years. However a recent forecast covering the next 25 years, indicates that by the turn of the century, broiler performance could improve so that a 2.0 kilogram broiler might be produced at 36 days for a feed conversion rate of 1.4:1 (J.D.H. Archibald, 1978). I trust that some of us will be around to cheer this achievement at the XXII World's Poultry Congress in the year 2002!!

World Egg Production

Although world egg production has not increased at the same rate as poultry meat production, nevertheless it has risen by as much as 53 per cent since the early 1960's. By 1977, world production reached 25 million tons. This provides some indication of the remarkable growth of this sector of the agricultural industry.

However, as Table I shows, the rate of increase has slowed down in recent years. During the past seven years, production rose by 18 per cent, compared to 30 per cent during the previous seven years. The decline in the rate of

TABLE I

WORLD EGG PRODUCTION

	<u>1961-65</u>	<u>1970</u>	<u>1975</u>	<u>1976</u>	<u>1977</u> ^(a)	% Change		
						<u>1970/</u> <u>1961/65</u>	<u>1977/70</u>	
	-----million metric tons-----							
<u>WORLD</u>	<u>16.33</u>	<u>21.20</u>	<u>23.63</u>	<u>24.05</u>	<u>24.91</u>	<u>+30%</u>	<u>+18%</u>	
<u>Developed Market Economies</u>	<u>9.03</u>	<u>11.33</u>	<u>11.44</u>	<u>11.66</u>	<u>11.86</u>	<u>+25%</u>	<u>+ 5%</u>	
N.America	4.12	4.38	4.10	4.12	4.16	+ 6%	- 5%	
W.Europe	3.73	4.74	5.05	5.22	5.26	+27%	+11%	
Oceania	0.19	0.24	0.26	0.24	0.23	+26%	- 4%	
Others	0.99	1.97	2.03	2.07	2.20	+99%	+12%	
<u>Developing Market Economies</u>	<u>2.00</u>	<u>2.93</u>	<u>3.67</u>	<u>3.83</u>	<u>3.96</u>	<u>+47%</u>	<u>+35%</u>	
Africa	0.30	0.39	0.46	0.48	0.50	+30%	+28%	
Latin America	1.02	1.52	1.80	1.84	1.92	+49%	+26%	
Near East	0.22	0.32	0.46	0.52	0.51	+45%	+59%	
Far East	0.46	0.70	0.94	0.98	1.02	+52%	+46%	
<u>Centrally Planned Economies</u>	<u>5.30</u>	<u>6.94</u>	<u>8.52</u>	<u>8.56</u>	<u>9.09</u>	<u>+31%</u>	<u>+31%</u>	
Asia	2.76	3.45	3.82	3.95	4.05	+25%	+17%	
Europe + USSR	2.54	3.50	4.70	4.62	5.04	+38%	+44%	
	-----million people-----							
<u>WORLD POPULATION</u>	<u>3161</u>	<u>3610</u>	<u>3966</u>	<u>4043</u>	<u>4121</u> ^(b)	<u>+14%</u>	<u>+14%</u>	

Source: F.A.O.

(a) Provisional (b) Estimate

Due to rounding World Total may not equal total for regions.

expansion has been very marked in the Developed Countries, from 25 per cent between 1961/5 and 1970 to 5 per cent between 1970 and 1977. Indeed, in N. America the situation has changed from a rise of 6 per cent for the earlier period, to a fall of 5 per cent between 1970 and 1977. Production has also fallen in the Oceania Region.

In contrast, the Developing Countries show a marked rise of growth of as much as 98 per cent between the early 1960's and 1977 (132 per cent in the Near East and 88 per cent in Latin America). The industry has been encouraged to grow in the Centrally Planned Countries, where production has expanded by 72 per cent and indeed it is now increasing at a faster rate in recent years than in the early 1960's.

World Poultry Meat Production and Share of Total Supplies (including Red Meat)

Poultry meat production is making a considerable impact upon the pattern of total world meat supplies, i.e. including red meat, since the point of take-off of the industry in the 1950's.

World poultry meat production amounted to 24 million tons in 1977, and as Table II shows, the supply rose by 106 per cent between the early 1960's and 1977. By comparison, red (carcase) meat production only increased by 40 per cent during the same period.

Poultry meat has therefore made quite an inroad into the total world meat market by increasing its share of total meat production from 13.9 per cent in the early 1960's to 19.3 per cent in 1977. The gain has been made, not only because the supply of poultry meat has increased, but because mutton, lamb and pig meat supplies have not increased at the same rate, so that their share of total meat supplies has declined from 45 per cent to 40.5 per cent.

Among the Developed Countries, the United States is still the largest poultry meat producing country in the world, covering 30 per cent of total world production. Marked gains have been made in W. Europe, with a rise of

TABLE II

WORLD POULTRY MEAT, RED MEAT and TOTAL MEAT PRODUCTION (1000 metric tons)

	POULTRY MEAT				RED MEAT (a)			TOTAL MEAT (b)		POULTRY MEAT % SHARE TOTAL MEAT	
	1961/ 65	1970	1977 ^P	% Change 1977/61-65	1961/ 65	1977 ^P	% Change 1977/61-65	1961/ 65	1977 ^P	1961/ 65	1977 ^P
<u>WORLD</u>	<u>11728</u>	<u>17673</u>	<u>24192</u>	<u>+106%</u>	<u>72303</u>	<u>101505</u>	<u>+40%</u>	<u>84031</u>	<u>125697</u>	<u>13.9%</u>	<u>19.3%</u>
<u>Developed Market Economies</u>	<u>7047</u>	<u>10870</u>	<u>14035</u>	<u>+99%</u>	<u>33623</u>	<u>47038</u>	<u>+40%</u>	<u>40670</u>	<u>61073</u>	<u>17.3%</u>	<u>23.0%</u>
N.America	4840	6768	7874	+63%	15258	20082	+32%	20098	27956	24.1%	28.2%
W.Europe	1963	3456	4683	+139%	14598	20936	+43%	16561	25619	11.9%	18.3%
Oceania	64	130	230	+259%	2408	3756	+56%	2472	3986	2.6%	5.8%
Others (c)	180	516	1249	+594%	1359	2263	+66%	1539	3512	11.7%	35.6%
<u>Developing Market Economies</u>	<u>1422</u>	<u>2124</u>	<u>3523</u>	<u>+148%</u>	<u>14532</u>	<u>19912</u>	<u>+37%</u>	<u>15954</u>	<u>23435</u>	<u>8.9%</u>	<u>15.0%</u>
Africa	264	345	493	+87%	2550	3284	+29%	2814	3777	9.4%	13.1%
Latin America	621	1003	1723	+178%	7794	10751	+38%	8415	12474	7.4%	13.8%
Near East	182	210	563	+209%	1623	2318	+43%	1805	2881	10.1%	19.5%
Far East	354	564	740	+109%	2524	3503	+39%	2878	4243	12.3%	17.4%
Others	2	2	4	+100%	40	57	+43%	42	61	4.8%	6.6%
<u>Centrally Planned Economies</u>	<u>3259</u>	<u>4679</u>	<u>6634</u>	<u>+104%</u>	<u>24149</u>	<u>34555</u>	<u>+43%</u>	<u>27408</u>	<u>41189</u>	<u>11.9%</u>	<u>16.1%</u>
Asia	2040	2771	3455	+69%	10707	13886	+30%	12747	17341	16.0%	19.9%
Europe	1219	1908	3179	+161%	13442	20669	+54%	14661	23848	8.3%	13.3%

Source: F.A.O.

(a) Beef, Veal, Mutton, Goat, Pigmeat and Horsemeat (excluding poultry meat)

(b) Including poultry meat

(p) Provisional - 1977. (Due to rounding total of regions may not add to World total for each year).

(c) Israel, Japan and S.Africa.

139 per cent between 1961/65 and 1977, and where the share of total meat production has increased from 12 per cent to 18 per cent. Even in the Oceania Region, where the Australians are notable consumers of beef, poultry meat production has increased by 259 per cent. Although Oceania's share of total meat production is much lower than for other regions, nevertheless this has more than doubled during the period from 2.6 per cent to 5.8 per cent.

The most significant change which has occurred among the Developed Countries has taken place in Japan, where production has increased 12 times from 73,000 tons in the early 1960's to 851,000 tons (p) in 1977. Poultry meat's share of total meat production has made a remarkable gain from 9 per cent to 36 per cent. In fact from being relatively insignificant in the world league in the early 1960's, Japan has now become the sixth largest poultry meat producing country in the world, following the United States, China, U.S.S.R., Italy and France. Substantial gains have also been made in South Africa and in Israel. The latter country is well known for a very high level of the consumption of both poultry meat and of eggs.

The growth of poultry meat production has been even more dynamic in the Developing Countries. In many of these countries, this development is being actively encouraged by government policy and indeed F.A.O. is playing an important role in setting up development programmes. At the same time, international poultry companies have also assisted a great deal in fostering the development of the industry in these countries, by means of the introduction of more productive stock, by supplying package deals and very importantly the provision of expert advice and training schemes covering production methods and marketing systems. One has only to walk round the Exposition, which is being held concurrently with the Congress, to see the wide range of stock, housing systems, and disease control measures which are applicable both for large scale and small scale operations.

Production in the Developing Region of the world has climbed by 148 per cent since the early 1960's, and its share of total meat production has risen from 9 per cent to 15 per cent. In the Near East, production is now three times higher, and its share has increased from 10 per cent to 20 per cent. The rise in Latin America is also of interest because several countries in this region are normally associated mainly with beef production. However, in Latin America, poultry meat production has increased by 178 per cent, compared to only 38 per cent for red meat production (F.A.O. data), so that poultry meat's share has doubled from 7 per cent in the early 1960's to 14 per cent in 1977. Forecasts indicate that production will rise by a further 10 per cent in 1978 in Brazil above the 1977 level, following a rise of 15 per cent in 1977 above the previous year.

The Centrally Planned Countries have similarly concentrated on the expansion of the poultry meat sector. This has increased by 104 per cent during the period, and poultry meat's share of total meat production has increased from 11.9 per cent to 16.1 per cent. It is estimated that poultry meat production in the U.S.S.R. rose by 14 per cent in 1977, with an expected rise of 8 per cent in 1978. The major part of production in the U.S.S.R. covers meat from layers (65 per cent). Although broiler and turkey meat only cover 14 per cent and 1 per cent respectively, of total poultry meat production, these sectors are expanding rapidly with 1977 gains of 21 per cent and 5 per cent each, and further rises of 20 per cent and 33 per cent each are forecast for 1978.

Share of World Poultry Meat Production by Type of Meat

Unfortunately, there is no statistical series available to indicate the changing share of the various types of poultry meat on a total world basis. However, thanks to the U.S.D.A., statistics are available covering 38 major producing countries. These show a breakdown of 70 per cent broiler meat, 15 per cent fowls, 10 per cent turkey meat and 5 per cent other poultry in 1977.

Turkey Industry Developments

Although broilers take up the major share of poultry meat supplies, it might be of interest to concentrate, for a change, on the development of the turkey industry. Its potential for a more rapid rate of growth is perhaps greater than for broilers in percentage terms, particularly in view of the potential in the cut-up and further processing market, where great strides have been made in recent years. The turkey sector has not received the attention it deserves, partly because the statistics were not available for earlier years, and partly because its growth has been more recent than that of the broiler industry.

The U.S.D.A. turkey statistics cover 25 major producing countries, and as Table III shows, a spectacular rise of 37 per cent in production has occurred since the early 1970's, amounting to an estimated 1.7 million tons in 1978. During this period poultry meat production increased by 30 per cent. In other words, a higher share of the total poultry meat market is being taken up by turkeys. This is a notable feature of the E.E.C., where broiler production has expanded by 24 per cent, whereas turkey production has increased by as much as 89 per cent since the early 1970's (France by 154 per cent and Italy by 117 per cent). Turkey meat's share of poultry meat production has climbed from 9 per cent to 14 per cent. The rate of production increase has not been as high in the United States, where nevertheless turkey meat covers 17 per cent of total poultry meat production. The country which has the highest share is Israel with as much as 27 per cent.

Indeed a further indication of the growing importance of the turkey industry is evident if a comparison is made with a more traditional meat sector such as sheep, lamb and goat meat production. In the E.E.C. in the early 1970's, turkey production was 42 per cent lower than the level of the production of these products. By 1977, it was only 10 per cent lower, despite a rise of 16 per cent in sheep, lamb and goat meat production. By 1978/79, turkey

TABLE III

TURKEY PRODUCTION IN MAJOR TURKEY PRODUCING/CONSUMING COUNTRIES ('000 metric tons)

REGION AND COUNTRY	Average 1969/73	1974	1975	1976	1977 ^(a)	Forecast 1978	% Change 1978/1969/73
<u>N.America</u>							
Canada	99	110	86	94	98	93	-6%
Mexico	*	25	28	30	30	32	*
U.S.A.	813	867	818	932	905	970	+19%
<u>Total</u>	<u>932 (b)</u>	<u>1002</u>	<u>932</u>	<u>1056</u>	<u>1033</u>	<u>1095</u>	<u>+17%</u>
<u>S.America</u>							
Argentina	*	*	7	6	5	7	*
Peru	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>0%</u>
<u>Total</u>	<u>6 (b)</u>	<u>7 (b)</u>	<u>8</u>	<u>7</u>	<u>6</u>	<u>8</u>	<u>*</u>
<u>Europe</u>							
Belgium/Luxembourg	1	1	1	1	1	1	0%
Denmark	5	6	3	4	6	6	+20%
France	56	114	105	122	131	142	+154%
Germany, Fed.Rep.	16	18	18	23	28	31	+94%
Ireland	4	4	4	5	6	6	+50%
Italy	89	164	170	174	190	193	+117%
Netherlands	13	17	16	14	13	11	-15%
United Kingdom	77	89	95	94	98	102	+32%
<u>Total EEC</u>	<u>260</u>	<u>413</u>	<u>412</u>	<u>437</u>	<u>473</u>	<u>492</u>	<u>+89%</u>
Austria	*	1	1	1	1	2	*
Greece	2	2	2	2	3	3	+50%
Norway	*	*	*	1	1	1	*
Portugal	*	2	2	3	3	3	*
Spain	1	4	5	9	10	10	+900%
Sweden	2	2	2	1	1	1	-50%
<u>Total W.Europe</u>	<u>267 (b)</u>	<u>424</u>	<u>424</u>	<u>454</u>	<u>492</u>	<u>512</u>	<u>+92%</u>
Poland	*	3	3	6	8	9	*
Yugoslavia	*	13	13	16	17	18	*
<u>Total E.Europe</u>	<u>14 (b)</u>	<u>16</u>	<u>16</u>	<u>22</u>	<u>25</u>	<u>27</u>	<u>*</u>
<u>TOTAL EUROPE</u>	<u>281 (b)</u>	<u>440</u>	<u>440</u>	<u>476</u>	<u>517</u>	<u>539</u>	<u>+92%</u>
<u>SOVIET UNION</u>	<u>*</u>	<u>14</u>	<u>14</u>	<u>10</u>	<u>15</u>	<u>20</u>	<u>*</u>
<u>Asia and Oceania</u>							
Israel	18	33	33	39	41	43	+139%
Turkey	5	5	5	5	6	6	+20%
Australia	6	8	8	6	7	6	0%
<u>Total</u>	<u>28</u>	<u>46</u>	<u>46</u>	<u>50</u>	<u>54</u>	<u>55</u>	<u>+96%</u>
<u>GRAND TOTAL</u>	<u>1257 (b)</u>	<u>1509</u>	<u>1440</u>	<u>1599</u>	<u>1625</u>	<u>1717</u>	<u>+37%</u>

Source: U.S.D.A.

(a) Preliminary. *Not available, negligible or zero

(b) Estimated

Totals may not add due to rounding.

production most likely will have overtaken the production of these meats.

So far as the international market is concerned, the United States is the major exporting country with 25,000 tons exported in 1977, of which 43 per cent was exported to W. Germany. American exports of turkey parts accounts for 80 per cent of her total export of turkeys. The Netherlands, France, Israel, Denmark and the United Kingdom are all active in the export field.

International trade is as distorted by various measures and regulations in the turkey sector as much as in other sectors of the poultry trade. The turkey industry in the E.E.C. is seeking stronger curbs, especially covering cooked and preserved turkey products, which at present are not subject to E.E.C. agricultural import levies, additional levies or M.C.A.'s, but only to the G.A.T.T. agreement limiting the import levy to a maximum of 17 per cent ad valorem. E.E.C. producers feel that this places the industry in an unfair competitive position with Third Countries, such as the United States, where the cost of feedingstuffs is much lower than in the E.E.C. - this being the major item in the cost of turkey production. The United States, on the other hand, is seeking greater liberalisation of trade.

International Trade Problems

In theory, the purpose of international trade, in products such as poultry meat and eggs, should be to supply the needs of countries where domestic production is not sufficient to meet the needs of consumer demand, e.g. W. Germany which is 78 per cent self-sufficient in egg supplies, or to iron out short term surpluses or shartages. At the same time, the egg products trade acts as a stabilising factor for the shell egg market.

However, in practice, the situation is complicated by the very success of the industry in its rate of progress in productivity terms. The industry is very volatile in response to the price situation, which is further complicated by the inelastic nature of the demand for eggs, particularly in the

developed countries. Thus a minimal increase in supplies in response to an improvement in the level of prices results in a disproportionate effect on the price level, and so resulting in a feast and famine situation for producers. In any case, it should not be forgotten that although there is now much greater technical control of production through the intensive systems of production, the poultry industry is still subject to problems which affect animal husbandry in other sectors of agriculture, e.g. weather or disease problems, which affect the level of supplies.

Agricultural policy has sought to solve the problem of the imbalance between supply and demand by means of various measures to control the level of production, to protect the home market from the effect of imports and the dumping of surpluses or to encourage exports. Producer organisations, in many countries, attempt to control supplies by means of various supply management schemes, e.g. in Canada, New Zealand and in Australia. Agricultural policy towards other agricultural products also affects the situation in the poultry industry, e.g. the C.A.P. cereal protection policy, which results in high feed costs for livestock producers in the E.E.C., and thus the necessity to compensate producers by means of the E.E.C. levy and export restitution system.

In order to minimise the effect of imports upon the domestic market or to encourage exports particularly during periods of overproduction various protective measures have been introduced, and indeed seem to have gathered momentum over time. These measures distort international trade and restrict the free movement of poultry products between countries.

In the main, the measures take the form of tariff barriers and import controls. However, the growth of protectionism has seen the development of other measures which are thinly disguised on health, sanitary or veterinary grounds, which are more stringently observed whenever production is excessive. International trade is further inhibited by the multiplicity and lack of

uniformity of the regulations. Harmonisation in this field would be beneficial to producers, the trade and consumers. Since its foundation as an international organisation, one of the specific aims of the International Egg Commission, has been to establish international acceptable marketing standards, including the harmonisation of veterinary and sanitary regulations both in the shell egg and egg products field.

Similar problems occur in the trade in poultry meat. Certainly the various regulations produce a number of anomalies which have a disruptive effect upon the market. Despite attempts to improve the situation, it seems unlikely that the restrictions on international trade will become more liberalised except between countries on a reciprocal basis as has happened within the E.E.C.

International Trade in Shell Eggs and Egg Products

Although I have listened with great sympathy for many years, to the trials and tribulations of traders in the international egg market, surprisingly enough as Table IV shows, the trade in eggs and egg products seems to have recovered in recent years! Perhaps the challenge of dealing with the anomalies and intricacies of the marketing regulations has caused the trade to work even harder to overcome the problems!

World trade in shell eggs amounted to 545,000 tons in 1976 (Table V). This was 28 per cent higher than in the early 1960's. However, it should be said that the higher percentage rise in the level of production, together with the trend towards greater self-sufficiency, have caused the trade in shell eggs to cover a lower percentage (2.3%) of world output than in the early 1960's.

The Netherlands continues to dominate the export trade (27 per cent of world exports in 1976). No doubt its share will be even higher than this in 1978 due to the recent marked expansion of the Dutch industry. The main

TABLE IV
 *
WORLD TRADE IN SHELL EGGS and EGG PRODUCTS (Shell Egg Equivalent) 1000 Metric Tons

SHARE OF TOTAL EGG PRODUCTION

	<u>1961/65</u>	<u>1970</u>	<u>1975</u>	<u>1976</u>	<u>% Change 1976/1961/5</u>
<u>WORLD PRODUCTION</u>	<u>16333</u>	<u>21204</u>	<u>23628</u>	<u>24052</u>	<u>+47%</u>
<u>SHELL EGG EXPORTS</u>	427	413	567	545	+28%
Exports % World Production	2.61%	1.95%	2.40%	2.27%	
<u>EXPORT EGG PRODUCTS (s.e.e.)</u>	92	131	115	124	+35%
<u>SHELL + EGG PRODUCT EXPORTS (s.e.e.)</u>	<u>519</u>	<u>544</u>	<u>682</u>	<u>669</u>	<u>+29%</u>
<u>% SHARE OF WORLD PRODUCTION</u>	3.18%	2.57%	2.89%	2.78%	

Source: F.A.O.

TABLE V
INTERNATIONAL TRADE IN SHELL EGGS (Metric tons)

	IMPORTS						EXPORTS					
	1961/65	1970	1975	1976	% Share of World Trade		1961/65	1970	1975	1976	% Share of World Trade	
					1961/5 %	1976 %					1961/5 %	1976 %
<u>WORLD</u>	<u>399760</u>	<u>397153</u>	<u>515301</u>	<u>510331</u>	<u>100.0</u>	<u>100.0</u>	<u>427209</u>	<u>412883</u>	<u>567131</u>	<u>545288</u>	<u>100.0</u>	<u>100.0</u>
<u>Developed Market Economies</u>	<u>313051</u>	<u>259522</u>	<u>322301</u>	<u>320358</u>	<u>78.3</u>	<u>62.8</u>	<u>268824</u>	<u>251324</u>	<u>375944</u>	<u>367705</u>	<u>62.9</u>	<u>67.4</u>
N.America	4014	18490	11154	13333	1.0	2.6	10286	14543	21797	21712	2.4	4.0
W.Europe	308930	240714	310712	306148	77.3	60.0	232627	229029	345379	333171	54.4	61.1
Oceania							2935	2747	1868	1999	0.7	0.4
Others (a)	107	318	435	877	0.0	0.2	22976	5005	6900	10823	5.4	1.9
<u>Developing Market Economies</u>	<u>61325</u>	<u>94265</u>	<u>142632</u>	<u>151043</u>	<u>15.3</u>	<u>29.6</u>	<u>23534</u>	<u>25769</u>	<u>24750</u>	<u>26730</u>	<u>5.5</u>	<u>4.9</u>
Africa	3941	1013	5305	10664	1.0	2.1	1642	555	709	732	0.4	0.1
Latin America	7961	7471	6113	7193	2.0	1.4	6218	3575	924	638	1.4	0.1
Near East	7899	36009	71420	78411	1.9	15.4	3430	15128	17604	19479	0.8	3.6
Far East	40811	48395	57936	52905	10.2	10.3	12242	6509	5512	5880	2.9	1.1
Others	713	1377	1858	1870	0.2	0.4	2	2	1	1	0	0
<u>Centrally Planned Economies</u>	<u>25384</u>	<u>43366</u>	<u>50368</u>	<u>38930</u>	<u>6.4</u>	<u>7.6</u>	<u>134851</u>	<u>135790</u>	<u>166437</u>	<u>150853</u>	<u>31.6</u>	<u>27.7</u>
Asia	2	-	3	-	0	0	33364	37652	44361	51410	7.8	9.4
Europe + USSR	25382	43366	50365	38930	6.4	7.6	101487	98138	122076	99443	23.8	18.2

Source: F.A.O.

(a) Israel, Japan, S.Africa.

Due to rounding World Total may not equal total for regions.

importing country is W. Germany with 42 per cent of world imports. International trade mainly takes place in Europe, the Centrally Planned Countries and the U.S.S.R., which together cover 70 per cent of world imports.

However, significant changes have occurred in the pattern of world trade. The share of world imports accruing to the Developing Countries has increased from 15 per cent in the early 1960's to 30 per cent in 1976. In particular the market in the Middle East has been very active in recent years. Only 2 per cent of world imports covered this area in the early 1960's, whereas 15 per cent is now imported by these countries. Imports have increased from 7899 tons in the early 1960's to 78411 tons in 1976 - a massive rise of 893 per cent. No doubt the level will have been even higher than this in 1977.

However, with the marked development of the industry in the Middle East assisted by the major international poultry breeding and feedingstuffs companies as well as housing and equipment manufacturers, it is unlikely that this market will continue for much longer as an ever open door for the surpluses of other countries. Already there is evidence of keen competition for this market together with difficult marketing problems in this area in 1977 and 1978, and already the introduction of import controls by some countries. (Import of shell eggs into Syria declined 50 per cent between 1974 and 1976).

Far from being a static market, the share of international trade tends to vary, e.g. the decline of French exports, the marked fall in Danish exports and the United Kingdom has now become a net exporting country, whereas in earlier years it was an important importing country. The United States also seems to have become active in the egg export field (U.S. shell egg exports more than doubled between 1976 and 1977, and egg products nearly trebled in 1977).

International Trade in Egg Products

World trade in egg products is similarly at a higher level than in the early 1960's (Table VI). In fact this trade has increased by 35 per cent

TABLE VI
INTERNATIONAL TRADE IN EGG PRODUCTS

LIQUID EGG PRODUCTS (Metric Tons)												
	IMPORTS					EXPORTS						
	1961/65	1970	1975	1976	%Share of World Total		1961/65	1970	1975	1976	%Share of World Total	
					1961/5	1976					1961/5	1976
					%	%					%	%
<u>WORLD</u>	<u>33769</u>	<u>65840</u>	<u>62361</u>	<u>75681</u>	<u>100</u>	<u>100</u>	<u>35469</u>	<u>65747</u>	<u>63095</u>	<u>74734</u>	<u>100</u>	<u>100</u>
<u>Developed Market</u>												
<u>Economies</u>	<u>31848</u>	<u>64900</u>	<u>61076</u>	<u>74324</u>	<u>94%</u>	<u>98%</u>	<u>23884</u>	<u>53409</u>	<u>57149</u>	<u>64888</u>	<u>67%</u>	<u>87%</u>
N.America	58	2393	1067	1278	..	2%	788	102	4129	2081	2%	3%
W.Europe	31613	33983	32867	44417	94%	59%	11192	31012	28704	37959	32%	51%
Oceania							9523	17882	14301	14823	27%	20%
Other Dev.	177	28524	27142	28629	..	37%	2381	4413	10015	10025	7%	13%
<u>Developing Market</u>												
<u>Economies</u>	<u>177</u>	<u>940</u>	<u>1285</u>	<u>1357</u>	<u>..</u>	<u>2%</u>	<u>442</u>	<u>68</u>	<u>53</u>	<u>52</u>	<u>1%</u>	<u>..</u>
<u>Centrally Planned</u>												
<u>Economies</u>	<u>1744</u>	<u>..</u>	<u>..</u>	<u>..</u>	<u>5%</u>	<u>..</u>	<u>11143</u>	<u>12270</u>	<u>5893</u>	<u>9794</u>	<u>31%</u>	<u>13%</u>
Asia C.P.E.	..	..	..	..	..	..	4430	7500	4000	9000	12%	12%
Europe + USSR	1744	..	..	..	5%	..	6713	4770	1893	794	19%	1%
DRIED EGG PRODUCTS (Metric Tons)												
<u>WORLD</u>	<u>10779</u>	<u>7563</u>	<u>6852</u>	<u>6836</u>	<u>100%</u>	<u>100%</u>	<u>9655</u>	<u>9959</u>	<u>7380</u>	<u>6313</u>	<u>100%</u>	<u>100%</u>
<u>Developed Market</u>												
<u>Economies</u>	<u>8175</u>	<u>7367</u>	<u>6304</u>	<u>6234</u>	<u>76%</u>	<u>91%</u>	<u>5612</u>	<u>7867</u>	<u>5121</u>	<u>5066</u>	<u>58%</u>	<u>80%</u>
N.America	128	1554	684	606	1%	9%	1829	216	1125	722	19%	11%
W.Europe	8022	5016	4077	3693	74%	54%	3712	7594	3899	4247	38%	67%
Oceania	..	3	..	..	..	..	71	57	97	97	1%	2%
Other Dev.	25	794	1543	1935	..	28%	..	..	..	..	..	..
<u>Developing Market</u>												
<u>Economies</u>	<u>427</u>	<u>99</u>	<u>70</u>	<u>44</u>	<u>4%</u>	<u>1%</u>	<u>301</u>	<u>5</u>	<u>..</u>	<u>44</u>	<u>3%</u>	<u>1%</u>
<u>Centrally Planned</u>												
<u>Economies</u>	<u>2177</u>	<u>97</u>	<u>478</u>	<u>558</u>	<u>20%</u>	<u>8%</u>	<u>3742</u>	<u>2087</u>	<u>2259</u>	<u>1203</u>	<u>39%</u>	<u>19%</u>
Asian C.P.E.	..	..	..	..	..	..	2060	1000	1500	1000	21%	16%
Europe + USSR	2177	97	478	558	20%	8%	1682	1087	759	203	17%	3%

Source: F.A.O. Due to rounding World Total may not equal total for regions.

(6 per cent higher than the shell egg trade). One of the reasons for the higher rise of the trade in egg products is that it is advantageous for countries to convert shell eggs into egg products for storage purposes during periods of surplus egg production, rather than to disrupt the shell egg market by a sudden and abrupt increase in supplies. The possibilities of dumping surplus shell eggs has become increasingly difficult due to the protective measures already described.

The export trade in egg products is also dominated by the Netherlands (26 per cent Liquid/Frozen and 30 per cent Dried egg products in 1976.). Australia and South Africa are also very active in the market. Although Europe is the main area of trade covering 59 per cent of world imports. Japan imports more egg products than any other country (38 per cent Liquid/Frozen and 26 per cent Dried eggs of total world imports).

No doubt the international market in both shell eggs and egg products will be under severe pressure this year (1978) due to the very marked expansion of the industry particularly in Europe.

International Trade in Poultry Meat

Unlike the trade in eggs, world trade in poultry meat has increased at a faster rate, in percentage terms, than world production. International trade has increased by nearly 150 per cent, whereas production has risen by 100 per cent since the early 1960's. World trade now covers 3.4 per cent of production compared to 2.7 per cent in the early 1960's.

Trade is mainly concentrated in the European area and as Table VII shows, the Netherlands dominates the export trade with 26 per cent of world exports. The Netherlands was 232 per cent self sufficient in poultry meat production in 1977, i.e. of a total production of 342,000 tons, only 103,000 tons were retained for home consumption. The United States is the second most important exporting country with 22 per cent of world trade. Exports from the United States

TABLE VII

INTERNATIONAL TRADE IN POULTRY MEAT (Fresh, Chilled, or Frozen) (1000 Metric Tons)

	IMPORTS						EXPORTS					
	1961/65	1970	1975	1976	% Share World Trade		1961/65	1970	1975	1976	% Share World Trade	
	-----'000 metric tons-----						-----'000 metric tons-----					
					1961/5	1976					1961/5	1976
<u>WORLD</u>	<u>307.7</u>	<u>487.4</u>	<u>666.4</u>	<u>730.7</u>	<u>100%</u>	<u>100%</u>	<u>321.1</u>	<u>501.8</u>	<u>699.3</u>	<u>798.3</u>	<u>100%</u>	<u>100%</u>
<u>Developed Market Economies</u>	<u>258.8</u>	<u>311.0</u>	<u>384.4</u>	<u>400.8</u>	<u>84%</u>	<u>55%</u>	<u>260.1</u>	<u>386.3</u>	<u>492.3</u>	<u>594.7</u>	<u>81%</u>	<u>75%</u>
N. America	5.2	1.2	10.4	24.3	2%	3%	94.5	61.7	93.9	176.8	29%	22%
W. Europe	250.3	299.1	352.4	338.8	81%	46%	164.8	321.3	386.9	402.4	51%	50%
Oceania	0.2	..	-	-	-	-	0.3	1.9	5.2	5.0	..	1%
Other Dev.	3.1	10.7	21.6	37.7	1%	5%	0.6	1.4	6.3	10.4	..	1%
<u>Developing Market Economies</u>	<u>31.3</u>	<u>91.2</u>	<u>221.9</u>	<u>261.8</u>	<u>10%</u>	<u>36%</u>	<u>0.9</u>	<u>2.4</u>	<u>8.0</u>	<u>10.6</u>	<u>0.3%</u>	<u>1.3%</u>
Africa	8.1	3.5	8.8	14.5	3%	2%	0.1	0.2	0.2	0.4	..	0.1%
Latin America	12.5	26.2	52.4	56.2	4%	7%	0.4	0.2	4.5	5.6	0.1%	0.7%
Near East	0.5	17.3	99.2	124.8	..	17%	..	0.8	1.1	1.1	..	0.1%
Far East	9.7	37.4	52.4	57.2	3%	8%	0.4	1.2	2.2	3.6	0.1%	0.4%
Other	0.5	6.8	9.0	9.1	..	1%	..	..	..	..	..	..
<u>Centrally Planned Economies</u>	<u>17.6</u>	<u>85.2</u>	<u>60.1</u>	<u>68.1</u>	<u>6%</u>	<u>9%</u>	<u>60.0</u>	<u>113.1</u>	<u>199.0</u>	<u>193.0</u>	<u>19%</u>	<u>24%</u>
Asia CPE	..	-	1.2	-	..	-	0.3	12.6	22.8	20.8	..	3%
Europe + USSR	17.6	85.2	58.9	68.1	6%	9%	59.8	100.5	176.2	172.2	19%	21%
<u>EXPORTS % SHARE OF TOTAL WORLD PRODUCTION</u>							<u>2.74%</u>	<u>2.84%</u>	<u>3.20%</u>	<u>3.44%</u>		

Source: F.A.O.

Due to rounding total of regions may not equal World Total

in 1977, at 183,000 tons were 100 per cent higher (double) than the level of exports in the early 1960's, the main markets for American exports being Japan, Hong Kong and Canada. The Centrally Planned Countries are also active in the export field. Hungary accounts for 13 per cent of world exports.

Although W. Europe tends to be the main importing area, with W. Germany as the main market with 34 per cent of total world imports, there have been notable shifts in the pattern of world trade. The share accruing to W. Europe has dropped from 81 per cent in the early 1960's to 46 per cent. In contrast the share of the Developing Market Economy countries has increased from 10 per cent to as much as 36 per cent.

In particular the market in the Near East has become especially active due to the recent improvement in the standard of living in these countries. Imports by the Near East Region have increased dramatically from only 500 tons in the early 1960's to 125,000 tons in 1976. The share of total world imports has climbed from less than 1 per cent, to as much as 17 per cent in 1976. The market has grown at a spectacular rate in recent years. Imports have more than doubled between 1974 and 1976, and no doubt the level will have been even higher in 1977. The Middle East situation demonstrates how much the pattern in world trade can alter even within a short period.

However, this could be a short term phenomenon. Competition for the market is already severe. How long this region will remain as a major importing region is problematical, particularly in view of the growth of indigenous production. The rate of growth of domestic production could accelerate at such a pace that this area could soon become relatively self-sufficient in the short term.

Apart from countries in the E.E.C., the United States and the Centrally Planned countries, other countries are becoming active in the export field, particularly Brazil which is also a major producer of cereals, especially soya beans. In earlier years, Brazil was not active in the poultry meat export field. However, by 1976 exports reached 20,000 tons and of this amount as

much as 18,600 tons were exported to the Middle East., i.e. 15 per cent of total Middle East imports. In 1977, total Brazilian exports increased to 33,000 tons and there was a sharp rise to 30,545 tons exported to the Middle East.

Even the more traditional sectors of the international market are also far from static. Some curious situations have arisen in recent years in the E.E.C. market, which must be even more perplexing for Third Countries! W. Germany is only 56 per cent self-sufficient in poultry meat supplies, which necessitates the need for imports which are mainly obtained from other E.E.C. countries. Though in fact 15 per cent of German imports are obtained from Third Countries, which implies that the levy system does not seem to act as a complete barrier to Third Countries! However, since the E.E.C. market as a whole is sometimes under considerable pressure (the E.E.C. was 104.9 per cent self-sufficient in 1977) this necessitates the need for exports to relieve the market, particularly since the C.A.P. intervention system does not apply to poultry products. As a result, curious situations arise particularly if viewed from outside the E.E.C., so that, for example, even W. Germany, the largest importing country in the world, has become involved in the export trade. Last year, for example, W. Germany exported 28,000 tons largely to Third Countries, when as much as 16,000 tons were exported to Saudi Arabia and 8,000 tons to the U.S.S.R. W. German exports to the Middle East were in fact at a higher level than a major exporting country such as the Netherlands with 8160 tons exported to the Middle East and Belgium with 9377 tons.

Export refunds are available to E.E.C. exporters in order to compensate producers for the higher price they have to pay for feedingstuffs due to the C.A.P. and to allow exporters to be competitive on world markets. Export refunds are not only a feature of the E.E.C. The industry is assisted in several countries either in the form of direct or indirect subsidies or refunds, or special assistance such as cheap credit, or in one form or another. It is

difficult to measure some forms of assistance. The industry in the United States for example, must obtain considerable assistance from the excellent market intelligence system operated by the U.S.D.A. Foreign Agricultural Service. Exporters in Brazil benefit from a 15 per cent tax credit applied to the F.O.B. value of export sales and exporters are eligible for subsidised credit to help finance the processing costs of broilers for export. The E. European industry is also backed by government assistance. Foreign exchange rates are difficult to measure for these countries. Certainly international trade is as much distorted by these factors as by import controls, veterinary regulations and so on as in the egg trade.

Egg Consumption

While the level of world egg production has increased by 18 per cent between 1970 and 1977, so that total world egg consumption will have increased by a similar amount, consumption per capita has not increased at the same rate because the population of the world has risen by 14 per cent during the same period.

On the basis of the production data, consumption only amounted to 6.05 kilograms per capita for the world as a whole in 1977. This was only a rise of 3 per cent since 1970. However, this average covers a wide range both on an area and on an individual country basis.

One of the major problems of the egg industry in the Developed Countries in the 1970's is the stagnation or even the decline in the level of egg consumption in several countries. Consumption has dropped from 309 eggs per capita in 1970, by 37 eggs to an all time low of 272 eggs per capita in 1977 in the United States, and by 26 eggs to 249 in the United Kingdom. Statistics covering the level of consumption in O.E.C.D. countries between 1955 and 1976 (O.E.C.D. data are not yet available for 1977) are indicated in Table VIII. These show that although the average was 13 per cent higher in 1976 than in

TABLE VIII

EGG CONSUMPTION PER CAPITA - O.E.C.D. COUNTRIES (Kgs)

	<u>1955</u>	<u>1960</u>	<u>1965</u>	<u>1970</u>	<u>1976</u>	<u>1976/55</u> % Change	<u>1976/70</u> % Change
<u>O.E.C.D. (Total)</u> (a)	<u>12.2</u> (b)	<u>12.8</u>	<u>13.6</u>	<u>14.8</u>	<u>14.1</u>	<u>+13%</u>	<u>-5%</u>
<u>O.E.C.D. N.America</u>	<u>21.5</u>	<u>19.5</u>	<u>18.2</u>	<u>18.1</u>	<u>16.0</u>	<u>-26%</u>	<u>-12%</u>
Canada	16.3	15.7	14.4	14.8	12.4	-24%	-16%
U.S.A.	22.0	19.9	18.6	18.4	16.4	-25%	-11%
<u>JAPAN</u>	<u>4.1</u>	<u>7.1</u>	<u>13.0</u>	<u>16.4</u>	<u>16.0</u>	<u>+290%</u>	<u>-2%</u>
<u>OCEANIA</u>	<u>11.0</u>	<u>12.9</u>	<u>13.3</u>	<u>13.3</u>	<u>13.2</u>	<u>+20%</u>	<u>-1%</u>
Australia	10.5	11.9	12.4	12.5	12.4	+18%	-1%
New Zealand	12.9	17.1	17.3	17.2	17.2	+33%	+0%
<u>O.E.C.D. EUROPE</u>	<u>9.3</u> (b)	<u>10.5</u>	<u>11.1</u>	<u>12.4</u>	<u>12.5</u>	<u>+34%</u>	<u>+1%</u>
<u>E.E.C.</u>	<u>10.4</u>	<u>12.2</u>	<u>12.6</u>	<u>13.9</u>	<u>13.6</u>	<u>+31%</u>	<u>-2%</u>
Belgium	13.0	14.0	13.0	13.7	10.8	-17%	-21%
Luxembourg	9.8	9.6	9.0	11.8	11.1	+13%	-6%
Denmark	9.1	10.3	12.4	11.0	11.6	+27%	+5%
France	9.7	10.7	11.2	12.4	13.0	+34%	+5%
Germany	10.0	13.3	13.6	16.5	16.8	+68%	+2%
Ireland	17.8	16.6	15.7	13.9	12.3	-31%	-12%
Italy	7.6	8.7	9.7	11.2	11.1	+46%	-1%
Netherlands	11.0	11.8	12.1	11.9	11.5	+5%	-3%
U.K.	13.2	15.5	15.5	16.1	14.5	+10%	-10%
<u>OTHER OECD - EUROPE</u>	<u>6.0</u> (b)	<u>6.4</u>	<u>7.7</u>	<u>9.1</u>	<u>10.2</u>	<u>+70%</u>	<u>+12%</u>
Austria	13.5	13.5	13.6	14.1	14.4	+7%	+2%
Finland	7.8	7.9	9.2	10.4	11.0	+41%	+6%
Greece	5.0	6.4	9.6	10.3	13.4	+168%	+32%
Iceland	5.1	5.7	6.3	9.3	13.6	+167%	+46%
Norway	7.9	7.8	8.6	9.5	9.2	+16%	-3%
Portugal	3.2	3.5	3.9	4.4	3.8	+19%	-14%
Spain	5.7	6.8	10.2	13.9	17.0	+151%	+22%
Sweden	11.4	11.9	11.6	12.7	12.3	+8%	-3%
Switzerland	9.5	9.6	10.3	11.4	11.0	+16%	-4%
Turkey	2.3	2.5	2.4	2.8	3.8	+65%	+36%
Yugoslavia	2.6	3.3	3.9	6.7	7.9	+204%	+18%

Source: O.E.C.D.

(a) Excluding Yugoslavia

(b) 1956 (not available 1955). Individual countries 1955 available.

1955, a downward trend is evident because consumption declined by 5 per cent between 1970 and 1976. This was mainly caused by a drop of 12 per cent in N. America, 2 per cent in the E.E.C., and a decline in Sweden, Switzerland, Norway, Portugal and in Oceania.

More up-to-date data reveal that there has been some recovery in the E.E.C. in 1977 to an average of 235 eggs per capita. But the level is still lower than the average for 1970 which was 238 eggs. Consumption has increased particularly in Germany, Denmark and in France. The recovery may only be short lived within the long term downward trend.

It is difficult to explain the decline in egg consumption. Eggs are good value for money* in comparison with other food products, but the income elasticity of demand is very low for eggs. Consumption has been affected by changes in lifestyles, and the decline in eating a good breakfast. In the United States, in particular, the level has been affected by exaggerated publicity in connection with the problem of cholesterol. The Report of the Advisory Panel of the Committee on Medical Aspects of Food Policy (Nutrition) on Diet in relation to Cardiovascular and Cerebrovascular Disease (Diet and Coronary Heart Disease) indicates - "We have found no evidence which relates the numbers of eggs consumed to a risk of I.H.D. (Ischaemic Heart Disease)". A recent study made by the School of Health, U.C.L.A., concluded that a more sensible lifestyle and a more balanced food intake could result in 7 to 11 years being added to the life of the average American citizen by following these rules (1) Eat breakfast. (2) Eat three square meals a day. (3) Avoid snacks. (4) Get 7 to 8 hours sleep each day. (5) Exercise 2 or 3 times a week. (6) Keep weight down to normal bounds. (7) Drink only in moderation. (8) Avoid smoking. (Follow these rules and we should all be at the Congress in the year 2002!!).

* See later section - Value for Money of Eggs, Poultry Meat and Red Meat. (pp. 35-38).

Although the pattern of consumption is rather depressing for many Developed Countries, the situation is more favourable in some countries. A substantial rise of 290 per cent (from 4.1 kgs in 1955 to 16.0 kgs of eggs per capita in 1976) has taken place in Japan, though a slight fall is evident for Japan in 1977. Spectacular increases have occurred since 1955 in Greece (+168%), in Spain (+151%) and in Yugoslavia (+204%).

Israel is top of the egg eating league, with 400 eggs per capita in 1976. However, even in Israel, consumption has declined to an estimated 380 eggs, due partly to the cut in the consumer subsidy.

The Centrally Planned Countries manifest a very different pattern of development than the Developed Countries in recent years. In E. Europe together with the U.S.S.R., consumption has increased by 24 per cent since 1970. Some countries have overtaken consumption levels in W. Europe. It is as high as 299 eggs per capita in Czechoslovakia. Remarkable gains have taken place in Poland and consumption has increased by 36 per cent in the U.S.S.R. since 1970. Although the level is still sadly low in the Developing Countries with an average of 1.94 kgs of eggs per capita there are grounds for some encouragement, because consumption has increased by 13 per cent on a per capita basis since 1970. Production has increased at a faster rate than the rise in the size of the population. The need for some improvement to take place in the level of nutrition is essential for the welfare of the population in these countries. It is to be hoped that the encouraging sign of a higher level of egg consumption will continue, and so help to alleviate the lamentable level of human nutrition particularly in the Third World.

Advertising

The egg industry in many countries has sought to stem the downward trend in demand by means of advertising and sales promotion. A good deal of controversy surrounds the question of the effect of advertising. Recent research

at Manchester University indicates that, during the period 1971 to 1976, real per capita generic egg advertising in the United Kingdom had an insignificant effect upon egg sales. It is possible that this was due to the low level of advertising expenditure, i.e. that it was pitched at too low a level to have much effect on purchases. There could well be increasing returns to scale in egg advertising. Certainly, the provisional results of the U.K. Eggs Authority Double Weight TV Advertising Test in the Scotland/Border Area support this view. (Advertising expenditure has been doubled in this area, i.e. viewer ratings have been doubled, with England and Wales as the control area). The Test is still in progress, but preliminary data show that purchases of eggs were 12 per cent higher in the Test Area than in England and Wales during the first six months of the test.

Poultry Meat Consumption

The pattern of the development of poultry meat consumption and likely demand in the future is very different from that of egg consumption.

The very marked rise in the consumption of poultry is due to a number of factors, which have favoured the growth of consumption. The main causes have been the rise in the standard of living, which has resulted in changes in the pattern of food consumption, the effect of consumer preference for more palatable foods and the relationship between the price of poultry meat and the higher price of competing food products such as red meat. The age structure of the population is also important. The percentage of elderly people is increasing. Poultry meat is popular with pensioners because it is easily digested and is relatively cheap. The distribution of income among the population also has had an important effect, since incomes are now more evenly spread throughout the population than in earlier years. Religion too affects choice. Pork, for example is not eaten by Moslems. A recent survey in the United States showed that black families spend more money on poultry meat and eggs than white households.

Poultry meat is no longer a luxury food mainly consumed by the higher income groups. It is a low priced source of meat consumed regularly by all sectors of the population in the Developed Countries. It is very competitively priced in comparison with other meat, e.g. in the United Kingdom in June this year, the average retail price of broilers was 44p per pound, turkey 49p, sirloin (without bone) 164p, fore rib (with bone) 89p, leg of lamb 123p, loin of pork (with bone) 95p and bacon 99p.

The O.E.C.D. countries listed in Table IX show that poultry meat consumption has increased on average from 8.6 kgs per capita in the early 1960's, by 66 per cent to 14.3 kgs in 1976. In the E.E.C., consumption has increased by 89 per cent to 12.5 kgs in 1977. The percentage rise for O.E.C.D. as a whole is lower because of the effect of the 35 per cent rise in N. America - consumption was at a much higher level in Canada and the United States in the early 1960's.

Israel, again as for egg consumption, shows the highest level of consumption with an average of 37 kgs per capita (1977 estimate).

Although consumption has increased substantially since the 1960's, the rate of increase has slowed down in many countries in recent years, so that it will be more difficult to raise the level in the future. However, prospects for further growth do favour the turkey sector, particularly in view of likely developments in the cut-up and further processing market. The price of turkey meat compares very favourably with red meat. A recent experiment conducted by the British Turkey Federation, to determine the amount of meat that could be purchased for £4.00, showed that this could purchase 3 pounds of lean turkey meat, compared with only 2 pounds of lamb, 2 pounds of beef or 2½ pounds of pork (the weight of the red meat included the fat as well as the meat, so that in fact the experiment was biased in favour of the red meat). Turkey and broiler meat have a low fat content, which is also attractive to consumers. The dietary recommendations of the recent report of the Joint Working Party

TABLE IX

POULTRY MEAT, RED MEAT^(c) and TOTAL MEAT^(a) CONSUMPTION PER CAPITA (Kgs) - O.E.C.D. COUNTRIES

	POULTRY MEAT					RED MEAT ^(c)			TOTAL MEAT ^(a)		POULTRY MEAT % SHARE OF TOTAL MEAT	
	1962	1965	1970	1976	% Change 1976/62	1962	1976	%Change 1976/62	1962	1976	1962	1976
O.E.C.D. TOTAL ^(b)	8.6	9.8	12.8	14.3	+66%	55.1	65.4	+19%	63.7	79.7	13.5%	17.9%
O.E.C.D. N.America	16.5	18.3	22.3	22.2	+35%	78.0	92.2	+18%	94.5	114.4	17.5%	19.4%
Canada	14.1	16.6	20.5	20.6	+46%	63.5	79.1	+24%	77.6	99.7	18.2%	20.7%
U.S.A.	16.8	18.5	22.5	22.4	+33%	79.6	93.6	+18%	96.4	116.0	17.4%	19.3%
JAPAN	1.3	2.2	5.0	7.1	+446%	8.9	18.8	+111%	10.2	25.9	12.8%	27.4%
OCEANIA	4.3	5.6	10.3	14.6	+240%	106.2	106.3	+0%	110.5	120.9	3.9%	12.1%
Australia	4.7	6.3	11.4	15.7	+234%	105.4	106.7	+1%	110.1	122.4	4.3%	12.8%
New Zealand	2.8	3.0	5.6	9.5	+239%	109.3	104.9	-4%	112.1	114.4	2.5%	8.3%
OECD - EUROPE ^(b)	5.8	7.0	9.4	11.6	+100%	52.3	60.7	+16%	58.1	72.3	9.9%	16.0%
E.E.C.	6.6	8.2	10.3	12.3	+86%	58.5	70.5	+21%	65.1	82.8	10.1%	14.9%
Belgium	8.2	7.7	8.7	10.6	+29%	60.5	80.3	+33%	68.7	90.9	11.9%	11.7%
Luxembourg	3.7	3.8	5.1	8.3	+124%	58.1	63.3	+9%	61.8	71.6	6.0%	11.6%
Denmark	9.4	10.9	12.2	14.7	+56%	70.9	86.9	+23%	80.3	101.6	11.7%	14.5%
France	5.5	6.3	8.4	8.8	+60%	65.3	83.6	+28%	70.8	92.4	7.8%	9.5%
Germany	5.3	7.3	9.8	12.3	+132%	62.0	81.0	+31%	67.3	93.3	7.9%	13.2%
Ireland	6.2	10.0	11.8	16.4	+165%	29.1	50.8	+75%	35.3	67.2	17.6%	24.4%
Italy	2.8	4.4	6.2	6.8	+143%	51.9	66.3	+28%	54.7	73.1	5.1%	9.3%
Netherlands	6.6	7.5	10.9	11.6	+76%	69.1	59.8	-13%	75.7	71.4	8.7%	16.3%
U.K.	3.4	4.3	7.4	10.3	+203%	33.0	40.7	+23%	36.4	51.0	9.3%	20.2%
OTHER OECD EUROPE ^(b)	5.6	6.2	8.1	9.7	+73%	59.5	72.0	+21%	65.1	81.7	8.6%	11.9%
Austria	0.4	0.4	0.9	2.5	+525%	38.1	57.6	+51%	38.5	60.1	1.0%	4.2%
Finland	3.0	4.4	8.4	13.0	+333%	23.3	52.6	+126%	26.3	65.6	11.4%	19.8%
Greece	1.1	1.0	1.5	2.3	+109%	81.9	75.1	-8%	83.0	77.4	1.3%	3.0%
Ireland	0.8	0.8	1.5	2.0	+150%	38.5	45.4	+18%	39.3	47.4	2.0%	4.2%
Norway	4.5	4.9	6.5	12.1	+169%	24.4	35.9	+47%	28.9	48.0	15.6%	25.2%
Portugal	3.6	7.5	14.8	19.5	+442%	21.6	44.4	+106%	25.2	63.9	14.3%	30.5%
Spain	1.9	2.6	3.4	4.7	+147%	50.5	59.2	+17%	52.4	63.9	3.6%	7.4%
Sweden	4.8	5.5	6.4	7.0	+46%	56.3	72.2	+28%	61.1	79.2	7.9%	8.8%
Switzerland	1.5	1.5	2.8	4.7	+213%	15.5	19.1	+23%	17.0	23.8	8.8%	19.8%
Turkey	3.2	4.1	6.9	9.4	+194%	23.6	49.7	+111%	26.8	59.1	11.9%	15.9%
Yugoslavia												

Source: O.E.C.D.

(a) Including Beef, Veal, Pigmeat, Mutton, Lamb, Goat meat, Horse meat, Poultry and Edible Offals.

(b) Excluding Yugoslavia

(c) Including Beef, Veal, Pigmeat, Mutton, Lamb, Goat meat, Horse, and Edible Offals - but excluding Poultry meat

of the Royal College of Physicians of London and the British Cardiac Society, on the Prevention of Coronary Heart Disease, very strongly recommends that more poultry meat and fish should be consumed and that a reduction should be made in the intake of red meat to lower the intake of fat, in order to produce a healthier diet.

The very competitive position of poultry meat is demonstrated by the level of red meat consumption in Table IX for O.E.C.D. countries.* The consumption of red meat has only increased by 19 per cent since the early 1960's to 65.4 kgs in 1976. Poultry meat is taking an increasing share of total meat consumption. Its share has risen from 13.5 per cent in the early 1960's to 17.9 per cent in 1976 and in the E.E.C. from 10 per cent to 15 per cent. More striking gains have been made in some countries than in others, e.g. Japan where poultry meat consumption has increased by 446 per cent to 7.1 kgs per capita and the share of total meat has risen from 12.8 per cent to as much as 27.4 per cent. Substantial gains have also taken place in Spain (the heaviest poultry meat consuming country in Europe with 19.5 kgs per capita) and 31 per cent of total meat consumption. Red meat consumption is now lower in the United Kingdom and in New Zealand than in the early 1960's. In fact U.K. consumption is at a higher level than mutton and lamb, pork, or bacon and ham, and it is second to the level for beef.

Consumption in the Centrally Planned Countries has also increased in recent years. Hungary shows the highest level with 19 kgs per head and Bulgaria with 13 kgs.

The level of consumption in the Developing Countries was extremely low in 1970 - only 1.25 kgs per capita of poultry meat. Total meat consumption was also very low at 11.36 kgs, and it has only increased to 11.7 kgs in 1977 (+1%). Poultry consumption, however, has increased by 38 per cent to 1.72 kgs

* See Value for Money Section, pp. 35-38.

in 1977, and it has gained in its share of total meat consumption from 11 per cent to 15 per cent. Red meat consumption has declined by 4 per cent, from 10.12 kgs in 1970 to 9.74 kgs in 1977. It seems likely that with the higher potential rise in the growth of the population in the Developing Countries, that total consumption will rise at a faster rate than in the Developed Countries in the future, i.e. poultry meat consumption.

Turkey meat consumption has expanded at a marked rate in many countries. Israel consumes the highest amount with 7.8 kgs per capita, U.S.A. with 4.2 kgs (a rise of 48 per cent since 1960). Italians eat more turkey meat than any other country in the E.E.C. (3.4 kgs). The average for France is 2.3 kgs and consumption has increased from 0.36 kgs in 1960 in the United Kingdom to 1.66 kgs in 1977. Recent research indicates that the income elasticity of demand for Other Poultry (mainly turkeys) is very positive at 0.86 for the U.K., i.e. any addition in income will tend to favour the purchase of turkeys. The price elasticity of demand is -0.11, i.e. an increase in the price of turkey has very little effect in lowering purchases.

Efficiency in the Use of Feedingstuffs by the Poultry Industry

The Argument About the Use of Feedingstuffs by Different Animal Species

Present day problems of the poultry industry are not only economic but political in nature. In particular there has been a good deal of controversy over the question of the use of feedingstuffs, which is bound up with agricultural policy towards the poultry industry. While the world food situation is not as critical as in 1973, nevertheless supplies are inadequate in many parts of the world, especially the supply of protein.

Poultry products are now supplying an increasing share of world animal protein supplies than other meat products, due to the more rapid rise in the level of poultry production, together with the greater productivity of egg and poultry meat production.

In any argument about the use of animal proteins compared to plant proteins for human consumption, it needs to be noted that a higher proportion of animal rather than plant protein is retained and made use of by the body. The net protein utilization value (N.P.U.) is 100% for eggs, 80% for meat and poultry and 75% for milk, whereas it is only 56% for maize, 52% for wheat and 47% for beans (British Nutrition Foundation). Plant protein is more difficult to digest because parts of the tough starchy membranes that enclose the food in plants are not broken down by the digestive processes.

Agricultural policy needs to be directed according to the efficiency with which the various animal species convert food into protein. Animals compete with humans for a share of world protein supplies, not entirely of course, because certain products are not suitable for human consumption. Ruminants compete with this share partly because concentrates are used in their diets and also because of the competition to produce crops for human food, rather than as pasture or as arable land.

Major sources of protein supplies for animal production are soya beans and fish meal. Brazil is a major supplier of soya beans. Production has soared from only 354,000 tons in 1961/65 to 11 million tons in 1976 in Brazil. World production has doubled during this period. The production of industrial proteins will likely alleviate the protein situation. Recent estimates made by I.C.I. indicate that the European compound industry will use 20 million tons of protein supplements in the 1980's (mainly for veal and poultry production) and that 2 million tons could be in the form of industrially produced single cell proteins.

It is worthwhile, therefore, to examine the position of poultry products in relation to other animal products in so far as the use of available resources is concerned. The biological efficiency of the different animal species is of particular importance in any measurements of this nature. We are fortunate in the United Kingdom that there has been a good deal of independent and

unbiased research into this question, and in particular the results of the work of Professor Holmes of Wye College, University of London.

Too often in the past, comparisons have been made simply on the basis of the performance of the productive populations of animals or birds, i.e. without reference to any allowance being made for the needs of the breeding populations to provide the raw material for the production of meat, milk or eggs. Comparisons have been made erroneously on the basis of the yields, feed conversion rates of single animals, which are valueless without reference to the reproductive capacities of the species and the requirements of the breeding stock necessary to produce and maintain the productive populations, e.g. the dam in the case of milk and beef production, the sow for pork production, the ewe for lamb production and breeding stock for egg, turkey and broiler meat production. In the case of the reproductive index, the index is markedly higher for breeding stock for turkeys, broilers and for egg production than for mammals. A cow averages 0.9 calves per annum, whereas a broiler breeder will average 150 eggs or more per annum.

When comparisons are made on the basis of the requirements of the total population, (Table X) including the feed requirements of the breeding population, their maintenance, rearing of replacements as well as the actual production of the productive populations to produce beef, pork, poultry meat, eggs and other meats, then so far as the protein efficiency rate is concerned, eggs head the list with a rate of 22.2 per cent, followed closely by milk production (high concentrate system) with 19.9 per cent, turkeys with 18 per cent and broilers with 17.4 per cent. The rate for pork production is much lower at 14.3 per cent and it is only 4.4 per cent for suckler beef production and 4 per cent for sheep. A combination of a production system of milk (high concentrates) with 18 month beef production results in an efficiency rate of 17.5 per cent. Eggs, milk, pig meat and broiler production also show high efficiencies of conversion of metabolisable energy and of gross energy. On

the basis of the production of protein per unit of gross energy, poultry production yields the highest returns because poultry feeds contain a higher proportion of ME in the gross energy.

Perhaps the most interesting results of Holmes' research is contained in his measurement of the likely output which may be obtained from the amount of food which may be produced from 1 hectare, again taking into account the needs of the productive populations and the requirements of the breeding stock necessary to maintain these populations. His work is of course, related to U.K. conditions. These results are also indicated in Table X.

His calculations show that turkey meat production or milk (high concentrates system with veal production) give the highest yield of protein of 144 kgs edible protein per hectare, followed by milk (high concentrate system) with 142 kgs, eggs or milk (low concentrates) with 138 kgs, and broilers with 137 kgs edible protein per hectare. The milk with cereal beef system or milk with the 18 month beef system (both high concentrates) yields 120 kgs. However, bacon is much lower at 80 kgs, and it is only 35 kgs for suckler beef (0.9 calves per annum) and 32 kgs for sheep with lamb production.

These results may be said to oversimplify the situation on a national basis. Ruminants, for example, are able to utilize roughages and much of the grazing area of a country is only suitable for sheep, goat and hill cattle production. The situation will vary a good deal from country to country. Nevertheless the results provide a useful method of assessment and a more realistic basis, than earlier studies of the comparative output and efficiency in the use of feedingstuffs by the various species. Certainly, poultry meat and egg production emerge in a very favourable light. "The high cost of rearing and maintaining a female which produces only a small number of progeny severely reduces feed efficiency. The dairy cow is an exception to this generalisation, because of its concurrent high level of milk production" (Holmes).

In a situation, where the supply of concentrated animal feed was reduced,

TABLE X

LIFETIME EFFICIENCIES ^(a) and POPULATION YIELDS ^(a)

	EFFICIENCIES			OUTPUT PER HECTARE ^(d)			
	Protein ^(b)	Energy ^(b)	P/E ^(c)	Edible Protein	Edible Energy	Yield of Product	
	%	%	g.	Kgs	MJ	Carcase Weight Kgs	Eggs Kgs
<u>Eggs</u>	22.2	18.6	2.86	138	8920	85	1250
<u>Broiler</u>	17.4	14.2	2.62	137	7470	1225	-
<u>Turkey</u>	18.0	8.1	2.76	144	4200	1000	-
<u>Rabbit</u>	13.1	9.6	2.36	118	4764	730	-
<u>Bacon</u>	14.3	16.0	1.67	80	7656	745	-
<u>Sheep</u>	4.0	6.0	0.55	32	3500	268	-
<u>Suckler Beef with calf finished in 18 months</u>	4.4	5.2	0.64	35	2830	255	-
<u>Milk (low concentrates)</u>	18.8	19.6	2.36	138	11470	60	<u>Milk</u> 3940
<u>Milk (low conc.) and 18 months Beef</u>	16.4	17.4	2.06	116	9490	166	2800
<u>Milk (low conc.) and 24 months Beef</u>	15.7	16.5	1.94	110	9350	162	2600
<u>Milk (high concentrates)</u>	19.9	20.7	2.49	142	11740	52	4100
<u>Milk (high conc.) and 18 months Beef</u>	17.5	17.9	2.19	120	9883	150	3000

Source: W. Holmes, Royal Society, 1976.

- (a) Single animals/birds plus allowance to include food intake for rearing pullets to point of lay and cow to calving, maintaining dam and parent stock and credit for carcass value of culled breeding stock.
- (b) Edible protein (or energy) as % of intake of protein (or energy).
- (c) Edible output protein (grams) per MJ Metabolisable Energy input.
- (d) Outputs which may be obtained from breeding and productive populations see definition in (a); fed from the produce of 1 hectare (concentrates derived from crops yielding 4000 Kg/ha and grazing and conserved grass from crops yielding 6000-7000 Kg utilized DM/ha (higher figure for dairy herds)).

Professor Holmes feels that for countries with large areas of grass or potential grassland that it would be appropriate to allot these supplies, in limited amounts to dairy herds, to efficient poultry units and in limited amounts to pig herds. Full use of the pasture resources would then be made by species able to do so.

The poultry industry should take note of the fact that in the argument covering the protein efficiency rates of various types of meat, that a new concept is being introduced into some of the calculations, i.e. the protein content of the skin of poultry may be excluded, which places poultry meat lower down the scale (the skin is included in the above calculations). This concept is erroneous because the skin of poultry is consumed, both if the bird is roasted, grilled or is consumed in further processed forms. In the Far East, I understand that everything but the "quack" in ducks is eaten, including some surprising parts! It is important that the poultry industry should keep a watchful eye on official tables publishing the composition of foods, which are used as well by nutritionists when planning diets.

Although eggs and poultry meat emerge in a favourable light, it would hardly be correct to assume from this, that so far as protein conversion is concerned, that one should advocate that animal production should be limited to turkey production or milk (high concentrates with veal system) production - much as the turkey industry would no doubt like to see this happen!

Agricultural policy needs to be concerned not only with the use of resources but also with the cost of production and marketing, and as importantly to the needs of consumers. People require not only an adequate and balanced diet, but also variety. Not unimportantly the relative price levels determine the choices which consumers make. Agricultural policy does seem to be obsessed with assisting the 4 legged animal species, e.g. the C.A.P. in the E.E.C., which assists milk and beef production by means of the intervention system, or other schemes such as the Social Beef Scheme in 1974/5, which abruptly

distorted the poultry meat market, or indeed the Skim Milk Powder Scheme which raised the cost of feedingstuffs for the poultry industry. Perhaps agricultural policy could be directed a little more towards the advantages to be obtained from poultry production.

Value for Money of Poultry Meat, Eggs and Red Meat

Consumers, on the other hand, seem to understand the value of poultry products. On the basis of the value for money, both eggs and poultry meat again emerge in a favourable light (Table XI), particularly since the price of red meat has escalated in recent years.

The calculations in this table are based upon the most up-to-date official retail price data for June 1978, which were available at the time of writing this paper. The retail prices cover broilers, turkeys, eggs and various joints and cuts of red meat and bacon. These show that the price of eggs, broilers and turkeys was markedly below the price of red meat and bacon, e.g., eggs were 28.5p per pound, broilers 44.3p, turkeys 49.0p, sirloin of beef 164p, leg of lamb 123p, loin of pork 95p, and back bacon 99p. The price of sirloin was nearly 6 times the price of eggs, 3.7 times the price of broilers, and 3.3 times the price of turkeys.

The amount of money spent on these products by consumers is, of course related to wage rates. The average earnings rate for men was 207p per hour (p) i.e. for men 21 years and over, all occupations, including overtime. On the basis of the average earnings rate, it therefore took 8 minutes work to cover the price of one pound of eggs, 13 minutes for a pound of broiler and 14 minutes for turkeys, compared to 53 minutes for rump steak, 47 for sirloin, 35 for leg of lamb, 28 for loin of pork and 29 minutes for a pound of bacon.

Figures are also included covering the number of minutes needed to be worked by women (18 years and over, all occupations, including overtime) to pay for the various products. As their average rate is lower than for men (74% of the rate for men), then clearly women have to work for a longer period

TABLE XI - VALUE FOR MONEY

Retail Price of Poultry Meat, Eggs and Red Meat - June 1978. Number of Minutes of Work Equal in Value to 1 pound of Meat and Eggs (Men & Women). Retail Price of Meat and Eggs - Edible Basis. Number of Grammes of Protein which may be obtained for 1 penny

	(a)		Edible Matter % Weight Purchased	Price per lb Edible Matter	Price per kg Edible Matter	(b)	
	Retail Price June 1978	Number of Minutes work = in Value to 1 lb. product (Men) (Women) ...Minutes...				Composition of Food. Protein Grams per kg of Edible Matter	Number of Grams of Protein for 1 penny
	p./lb		%	p./lb	p./kg		g.
Eggs (Grade 4)	28.5	8 11	89%	32.0	70.5	123g	1.75g*
Broilers (frozen)	44.3	13 17	64%	69.2	152.6	176g	1.15g
Turkeys (frozen)	49.0	14 19	70%	70.0	154.3	206g	1.34g
Beef Sirloin (without bone)	164.1	47 64	92%	178.4	393.3	166g	0.42g
Fore Rib (with bone)	88.5	26 35	75%	118.0	260.1	160g	0.62g
Rump Steak	183.7	53 72	95%	193.4	426.4	189g	0.44g
Lamb							
Loin (with bone)	130.9	38 51	82%	159.6	351.8	146g	0.42g
Shoulder (with bone)	87.2	25 34	78%	111.8	246.5	156g	0.63g
Leg (with bone)	123.1	35 48	77%	159.9	352.5	179g	0.51g
Pork							
Leg (foot off)	76.7	22 30	85%	90.2	198.8	166g	0.84g
Loin (with bone)	94.5	28 37	83%	113.9	251.1	159g	0.63g
Bacon							
Gammon	101.4	29 40	93%	109.0	240.3	176g	0.73g
Bacon-back smoked	99.4	29 39	93%	106.9	235.7	142g	0.60g
Bacon-streaky smoked	73.8	22 29	85%	86.8	191.4	146g	0.76g

(a) Department of Employment Gazette. Retail Prices. (b) Composition of Food. McCance and Widdowson.

* Price of eggs is seasonal in nature. Av. price in 1977 - 33p/lb. (1.5g Protein/lp).

to pay for the various products. No doubt they are more price conscious in the process. The proportion of women working outside the home is increasing in most countries. Frequently their wages will be used to buy the family's food, while the husband's wage may be used to pay for other items of family expenditure such as rent, mortgage repayments, rates, insurance, running costs of a car, etc.

Consumers will largely determine their choice of food on the basis of the prices shown in the shops, as well as their preferences for the different types of meat. Though they may tend to disregard the proportion of the inedible matter in the joints, when they make their choices, it is perhaps more realistic to make comparisons, on a value for money basis, according to the value of the edible matter.

Accordingly the price data in Table XI have been converted to the price per pound and per kilogram of the edible matter of the products listed. Frequently poultry is rather unfairly criticised on the grounds that the carcass contains a higher proportion of inedible matter than red meat, without full account being taken either of the comparative values of the edible matter or the relative price levels of the different types of meat. Because the price of poultry meat is much lower than for red meat, on the basis of the edible matter, the price per pound of edible meat is still much lower for poultry meat than for red meat. Eggs are extremely good value. The price of the edible matter of sirloin (178p per pound) is $2\frac{1}{2}$ times the price of the edible matter of broilers (69p) and turkeys (70p) and $5\frac{1}{2}$ times the price of eggs (32p).

While the nutritional value of food may not be an overriding factor in the choice of meat by consumers, nevertheless people are now much more conscious of the need for a balanced diet, particularly women and nutritionists in the institutional market. Presumably in purchasing meat they are aiming for the protein value of meat.

On this basis, the value for money may be measured by calculating the

number of grammes of protein which may be purchased for one penny, according to the price per kilogram of edible meat, as well as the composition of the protein content which will vary for the different types of meat. These data are also included in Table XI. Eggs are very high on the list with 1.75 grammes of protein for one penny, turkey 1.34g, broilers 1.15g, whereas red meat tends to be well below these rates, e.g. rump steak 0.44g for one penny, sirloin 0.42g, leg of lamb 0.51g, loin of pork 0.63g and bacon 0.60g for one penny. The situation for other countries will depend upon the relative price levels, but no doubt a similar pattern will emerge in most developed countries in a comparative examination of this nature. In view of their better value for money, it is little wonder in these inflationary days, that poultry meat consumption has increased, whereas many joints of red meat are now considered to be in the luxury class - an unimaginable situation 25 years ago.

Production Control, Supply Management or the Free Market System

Although the achievements of the poultry industry have been substantial in the production and marketing fields, the industry still has to solve the major problem of achieving the delicate balance between supply and demand.

On the whole, the poultry meat sector seems to prefer the rigours of the free market system in most countries. In the past, both the broiler and the turkey sectors tended to be rather volatile. But these industries are now more closely integrated and pay more regard to the need to plan and discipline production according to the demand of the market. The egg industry is still very fragmented in many countries, so that balancing supply and demand is more difficult. Due to the inelastic nature of the demand for eggs, a slight rise in the level of production has a disproportionate effect upon the price level, so that a feast and famine situation tends to prevail, as producers respond to the price situation. The E.E.C. egg market, for example, is once again faced with an "egg lake". E.E.C. producers are paying the price for

overexpansion, despite earlier warnings not to expand made by the various poultry organisations. In the United Kingdom, the producer price of eggs will likely average only about 25p per dozen this summer, whereas the cost of production is 35p, i.e. producers are operating in a loss making situation of 10p per dozen - the worst situation that producers have faced for many years.

Several countries, particularly where farming organisations seem to have a strong political voice, seem to be opting for various types of supply management schemes in the egg sector in particular, e.g. the Canadian quota scheme covering production and imports, the Entitlement Scheme in New Zealand, the two-tier price arrangements for feedingstuffs in Norway, which makes it uneconomic to expand beyond the 5000 layer size unit, the Swedish system which operates a levy related to the expected surplus situation, the Australian quota system as in Israel, and the establishment of large scale units is discouraged in Switzerland. Producer organisations are calling for some form of control in the E.E.C.

Do these systems work? Do the regulations which discourage the establishment of large scale units and new entrants to the industry in fact put the clock back, especially in view of the economies associated with scale of operation and marketing? Only time will tell. Producers, themselves, voted for the ending of the British Egg Marketing Board. It is also of interest that South Africa has abandoned the production control system in favour of the discipline of the market forces of competition. The Canadian system is attractive in many ways, particularly to producers because the price of eggs is linked to the cost of production. It is perhaps of interest that most countries involved in supply management schemes are not similarly enthusiastic about any form of international commodity agreement to introduce more stable conditions on the international market.

The successful operation of supply management schemes depends very much on the extent of the control of the system and the cooperation of producers.

Earlier schemes have often failed because producers have found loopholes in the operation of the system. The schemes have often been haphazard and piecemeal. However, as the industry has become more rationalised and there are fewer units, it should be easier to operate these schemes. The new generation of producers have different attitudes and understand the needs to discipline production according to the demand of the market. The problem really is that any form of control introduces a note of inflexibility. It stems the tide of progress and discourages new entrants with fresh ideas into the industry.

Countries such as the United States, the United Kingdom and the Netherlands seem to prefer the rigours of the free market. However, there seems to be a good deal of confusion about the concept of a "free market". This does not necessarily mean that production is not geared to the market. Integrated organisations, whether they are vertically or horizontally integrated, plan production according to the demand of their particular markets. The programmes are planned several years ahead. This applies as much to cooperatives and integrated companies as to producer-retailers (direct sellers). At present day costs of production and the necessary capital investment, they cannot afford to do otherwise. The free market system is open and competitive, where the profit motive operates. State operated concerns, on the other hand, sometimes tend to operate less efficiently because the same impetus is lacking. This is the basic difference between an organisation such as Eastwoods or independent direct producer-sellers, and state run organisations.

Each country, of course, needs to operate whichever system suits the country's particular needs as well as government policy. The smaller the country the easier it should be, in theory, to operate supply management schemes. No one system is particularly appropriate to every country in the world.

However, some guidance is needed for the industry in the Developing Countries, where the industry is expanding very rapidly. Production can be allowed to expand too quickly, so that marketing gets out of hand. Egg

production has increased by 50 per cent during the past 10 years in Latin America, and no doubt marketing problems are beginning to develop in several of your countries. The subject of Supply Management will form the basis of an important paper and debate at the International Egg Marketing Conference, which is being held concurrently with the World Congress.

Welfare Problems

The production of eggs and poultry meat follows strict codes of practice laid down by government regulations in many countries. Nevertheless, the industry does face a problem from the anti-factory farming lobbies, particularly in Denmark where the battery system is banned, and which has placed Denmark in a difficult competitive position on world markets, and also in the United Kingdom, Sweden and in Switzerland. The poultry industry practices a welfare code, whether this is laid down formally by government regulations or not. It is not in the interest of stock performance or good husbandry practice to do otherwise.

Rather than pursuing a headlong collision course with these organisations, the industry might well be wiser to follow Dr. Lindgren's advice to consider any reasonable demands. Dr. Lindgren (Chairman of the Working Group - Bird Welfare and Poultry Production W.P.S.A. European Federation) wrote a most useful article on this subject in the W.P.S.A. Journal in 1976. His recommendations are well worth following both on a national and international basis.

However, one can sympathise with the view expressed, by the editor of the Indian Poultry Adviser, about some of the unreasonable demands of the anti-factory farming lobbies ... "They could as logically advocate a return to hand milking, because milk maids are psychologically more comforting for the cow"! Certainly some of their ideas would appreciably increase the cost of production and hence the retail price of eggs and poultry meat.

Poultry Statistics and Market Intelligence

While there may be differences of opinion on the best method of matching supply according to the demand of the market, I think that the poultry industry fully supports the need for an adequate market intelligence service. Lack of information and reliable statistics militates against the efficient production and marketing of poultry products. The 1970's have seen a marked improvement in this field. But information gaps still exist. In the egg industry, we still lack up-to-date data on the structure of the industry, the age-profile of laying flocks, slaughtering rates and force-moulting data, which are so necessary for forecasting purposes. Chick placement statistics are not sufficient for this purpose.

The poultry meat industry tends not to be as well serviced in many countries as it might be, including the E.E.C., though again an improvement has taken place. Nevertheless poultry meat statistics are frequently still lumped together with red meat statistics, or are simply not available. Turkey statistics may be looked upon merely as guesstimates for many countries. Separation into the different types of poultry meat is needed. The turkey meat industry is very different from the broiler industry. More information is needed about the duck industry as well. Consumption data are often unreliable or not available in many countries. Yet this is essential information for marketing purposes.

International Poultry Organisations

During recent years the poultry industry has become much more international in character. We have seen the growth of multi-national companies, which operate all over the globe. At the time of writing this paper, two companies are competing in a take-over bid for the Eastwood Company in the United Kingdom. The outcome has yet to be decided.

At the same time, we have seen the development of interdisciplinary co-operation within W.P.S.A. In this connection, our President, Dr. A.W. Jasper

has certainly stimulated development in the field of economics and marketing, which in earlier years was rather a weak sector of W.P.S.A. activities. We now have a Working Group in the European Federation, which covers this field.

Other organisations have progressed in representing the interests of the industry, e.g. the International Egg Commission and the World Turkey Federation. It is hoped that we shall soon see the establishment of the Inter-Professional Organisation for Poultry Meat and Eggs in the E.E.C. These are very healthy signs for the future progress of the industry.

Conclusion

During the course of this paper, I have aimed to concentrate on the international aspects of the progress and problems of the industry, which I thought would be of interest to such a wide field of experts, who are gathered together again from all parts of the world for our Congress.

Sadly during the past year, we have lost some notable scientists and leaders of the industry. In particular the late Syd Fox who contributed so much to the industry and his students through his work at Reading University, and Rupert Chalmers-Watson, a great leader and visionary in the commercial sector, as well as a strong supporter of W.P.S.A. and the academic world.

Unfortunately, a cutback in training, poultry education and research seems to be occurring in some countries. This seems to be most unwise. The young are the lifeblood and the potential leaders of our industry and in the academic world. A lack of well trained entrants could well penalise the progress of the industry in the future. We have been most fortunate at Manchester University, as a result of the remarkable gift which Sir John Eastwood generously donated to the University for research purposes. Official research funds are very limited, so may be the poultry industry might follow Sir John's example with more support for academic research purposes. Certainly as a world organisation, W.P.S.A. is very conscious of the need for research to be extended,

which in the long run is very much in the interest of the further development of the industry, a point which the late Syd Fox made on the memorable occasion, when sadly he gave his last paper to the industry.

When Mr. L. von Schmidt, the President of the Congress, on behalf of the Brazilian Branch, kindly invited me to present one of the seven invited papers, he mentioned that this would be an unique occasion for a Congress, because the opening paper would be given by a woman! So in my closing remarks I would like to make a special plea.

So far as the commercial sector of the poultry industry is concerned, I feel that the marketing sector still does not seem to understand the implications of the changing role of women in society today. The marked changes, which have occurred, require a considerable revision to marketing strategy and production programmes to fit the needs of women, particularly since such a high proportion of women today work outside the home. The outlook of women has widened. They are no longer bound by the narrow confines of the home. Their lifestyles are very different from earlier years. Consequently their requirements in the market place are very different from those of earlier generations, particularly in the food sector.

W.P.S.A. is an unique organisation. It is very interdisciplinary in character. Membership is open equally to men and to women. However, the participation of women in the organisation and membership of W.P.S.A. seems to be rather minimal. This is no fault of W.P.S.A., but is merely a reflection of the past or present educational system in many countries. This has resulted in fewer women being as well qualified as men. The situation can only be improved by giving greater opportunities to young women in the educational field. I hope therefore, that W.P.S.A. through its various Branches throughout the world will pave the way by encouraging this development and so encourage more participation by women in both the academic field as well as in the commercial sector of the industry.

In thanking the Brazilian Branch for the great honour which you have accorded to me today, I would also like to place on record my gratitude for the tremendous help and advice, which I have received in my work from so many members of W.P.S.A. throughout the world. Personally, I look upon W.P.S.A. as being rather more than a scientific organisation - the spirit of friendship it has established between members from so many countries is truly a remarkable feature of the many achievements of the Association.

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