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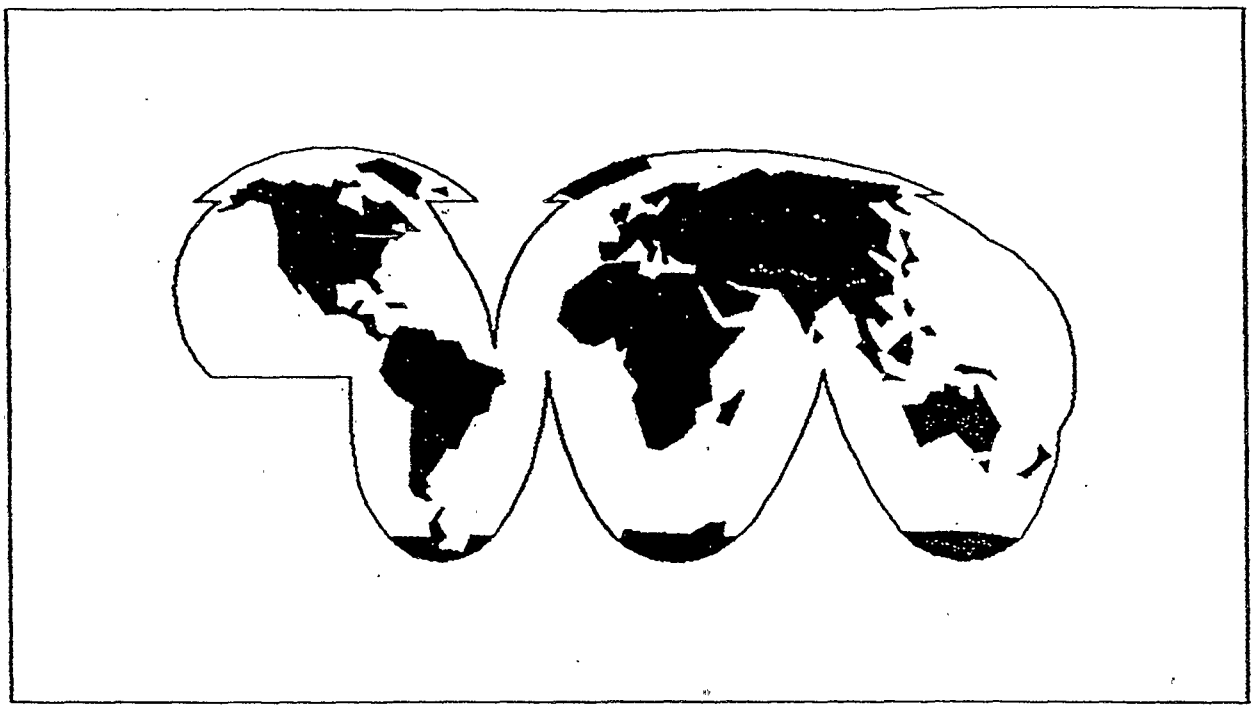
Flexible Specialisation and Agro-Industry in Honduras



Robin Murray

A Report

Prepared for the United Nations Industrial Development Organisation and the United Nations Development Programme on behalf of the Government of Honduras

November 1992

Institute of Development Studies

FLEXIBLE SPECIALISATION AND AGRO-INDUSTRY

IN HONDURAS

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November 1992

Terms of Reference

The terms of reference are given in Appendix 1. The broad brief was to prepare an assessment of the current situation and perspectives of the agro industrial sector with special reference to the processing of meat and milk, of fruit and vegetables and of oil and fats. The study was to focus on new forms of competition, and the extent to which the principles of flow, standardisation, rapid changeover times, stock reduction, quality, product design and packaging, and the multi-skilling of labour were relevant to and had been adopted in Honduran agro industry. This was to be done through visits to a sample of 15 firms.

The study was to consider the relationship of the agro industrial sector with other parts of the food system, (including primary production, services and finance) as well as with the industry overseas, paying particular attention to the need for new competitive strategies for agro industries in the light of the programme of structural adjustment.

The aim was:

- to outline policies, incentives and common services which would encourage development in the sector within a framework of co-operative competition,

- to propose a plan of action to improve productivity in the branch and among the selected enterprises.

The study was to take 23 working days.

Methodology and coverage

The research visit took place in August and September 1992. The researcher and counterparts visited thirty food factories, ten retailers and caterers, and a further fifteen bodies with involvement in the food industry - banks, research services, quality control departments, colleges, consultants, government departments and farmers. The factories visited were broadly spread, from Choluteca in the South, to Tegucigalpa and Comayagua in the centre, Guaimaca in the East, and San Pedro Sula, El Progreso, Guayamas, and La Ceiba in the North. At the end of the mission, the employers association, Andi, hosted a meeting with those who had been visited in which the broad conclusions of the mission were presented and discussed. A list of those visited is contained in Appendix 2.

The report which follows is necessarily preliminary. It is intended to raise certain problems that became clear in the course of our visits, and to suggest a number of strategies to help the restructuring of the industry.

It starts with a brief survey of the Honduran food system and its significance within the national economy (Chapter 1). It then focuses on the key aspects of the new competition which bear on the Honduran food industry - stocks, waste, and quality (Chapter 2). Chapters 3 and 4 cover the two main sub-systems identified for the study - livestock and fruit and vegetables (including palm oil). There follows a section on interfirm organisation, the different types which are found in the international food industry (Chapter 5) and their relative presence in Honduras (Chapter 6). The final chapter (7) outlines a 10 point plan of action and a strategy for further work.

I would like to thank my counterparts from SECPLAN, Diana Mondragon, Edna Salazar, Concepcion Nieto, Doria Ardon, and Carmen Areas; my colleagues from UNIDO , Christian Gillen,

Ligia Barrios, Ligia Martinez and Juan Jose Oliva, and the many people to whom we talked who were so generous with their time.

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INTRODUCTION

Chapter 1

The Food Industry in Honduras

Significance in the national economy

The food sector remains the predominant core of the Honduran productive economy and its growth. Primary food production alone accounts for 25% of GDP, the processing of food and drink constitutes half of all manufacturing production (48%) and a further 6% of GDP. When we take into account the food related elements of transport, of the basic utilities, of machinery, of trade, restaurants and hotels, of finance, and government services, then the food sector makes up at least half Honduran domestic production.

There is no other productive sector that approaches it. Timber and wood manufacturer account for only 3% of national production, and their share has been falling. There has been some growth in chemicals, non metallic minerals, and engineering, but all non-food manufacturing accounted for no more than 9% of national growth in the 1980's, equal to the contribution of food manufacturing alone. If we look at the national statistics, the main growth apart from food took place in the utilities, in transport, in finance and business services, in housing and in personal services. All of these were closely linked to the food economy and the income it generates.

Of the economically active population, at least 60% are directly concerned with food, and in foreign trade the sector is even more significant, accounting for 87% of all exports in 1990.

Food processing

The bulk of food production is in the primary sector, and is sold unprocessed, whether as exports like bananas, pineapples or coffee, or to the home market. Food processing accounts for less than a quarter (23% in 1990) of the value added in food production as a whole.

The composition of food processing is shown in Table 1.

Table 1

Composition and Growth of the Honduran Food Industry 1980-1990

'000's of lempiras at constant 1978 prices

	1980	1990	percentage change
Livestock	44,246	45,532	3
Fruit and veg. processing	8,280	5,689	-31
Sugar, oils and fats	51,460	97,078	89
Flourmilling and bakeries	32,984	46,040	40
Other products	9,629	14,528	51
All Food Processing	146,599	208,867	42

Source: Central Bank

Table 1 comprises three main sub-sectors:

a) livestock, including animal feed. which makes up 22% of value added in the sector.

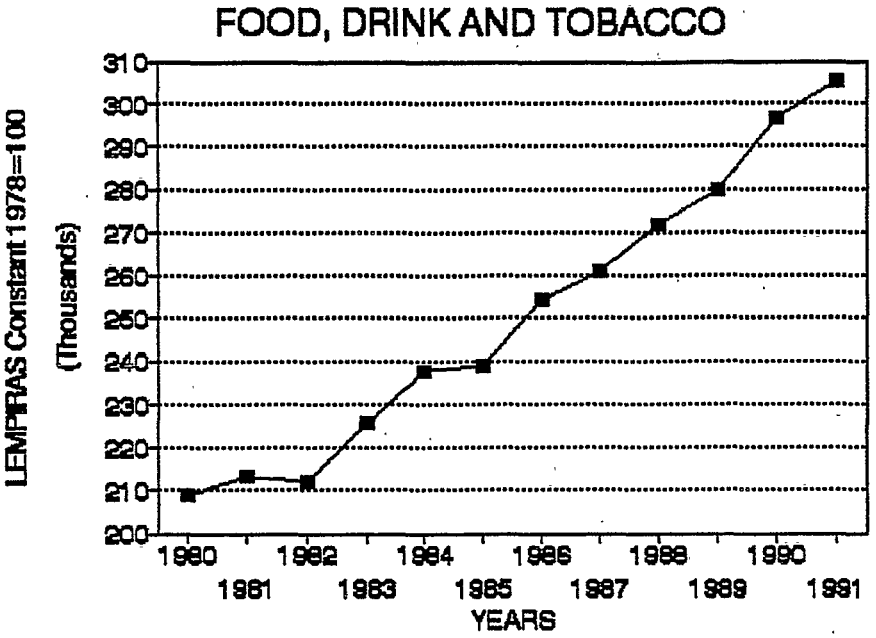
b) fruit and vegetable processing, together with the refining and manufacture of sugar and vegetable oil, which is now almost half the sector (49%)

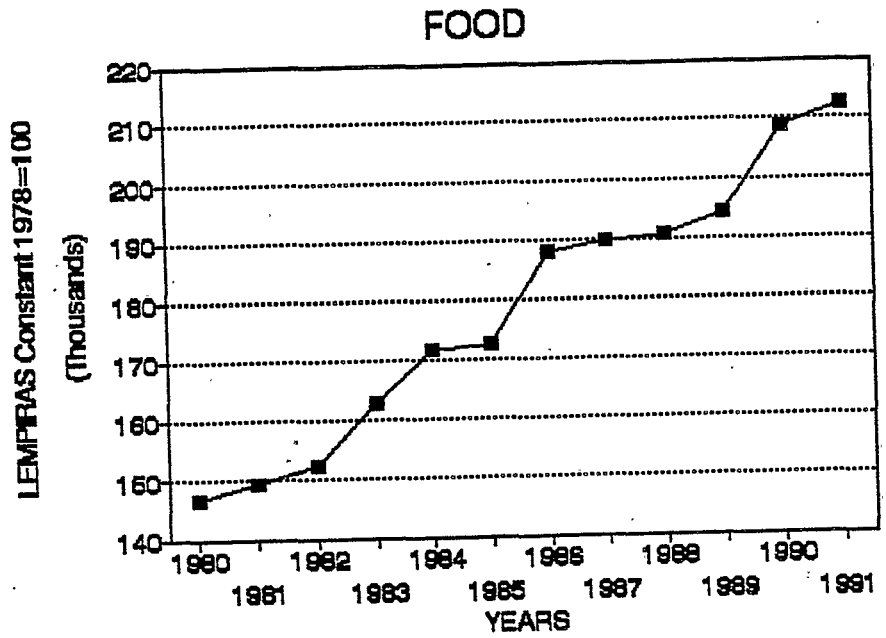
c) flour milling and baking, which contributes 22%.

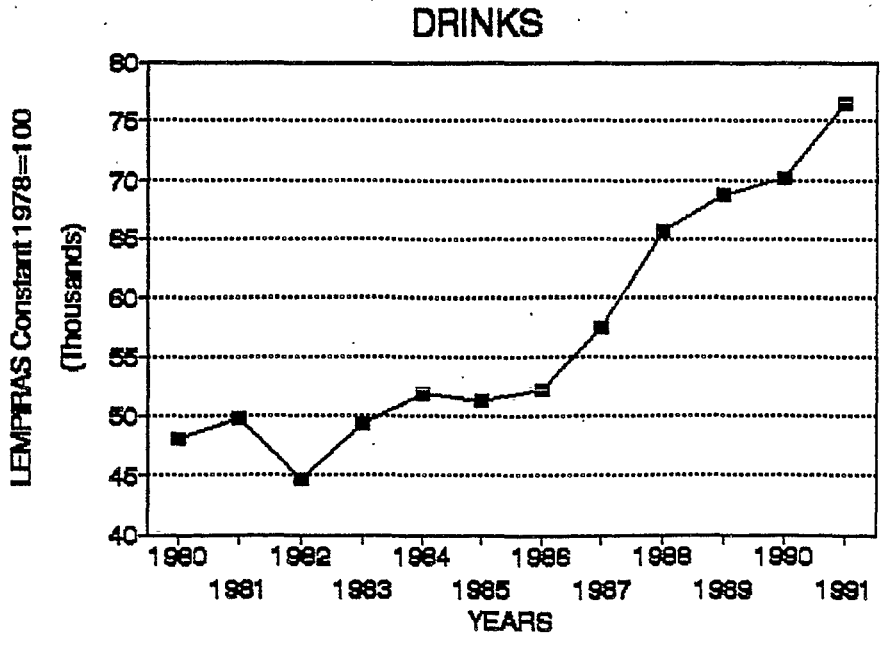
Table 1 also shows the change in each of these three sub-sectors, with a break-down of the second to distinguish fruit and vegetables and sugar/palm oil. The graphs which follow present a more detailed picture of the changes by product.

THE HONDURAN FOOD INDUSTRY

GROWTH OF VALUE ADDED 1980-91

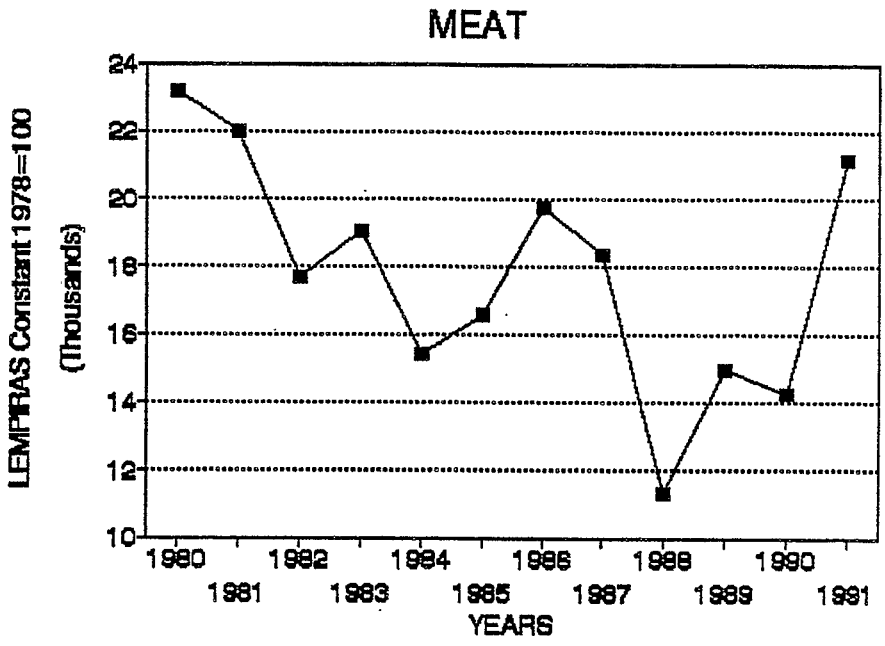


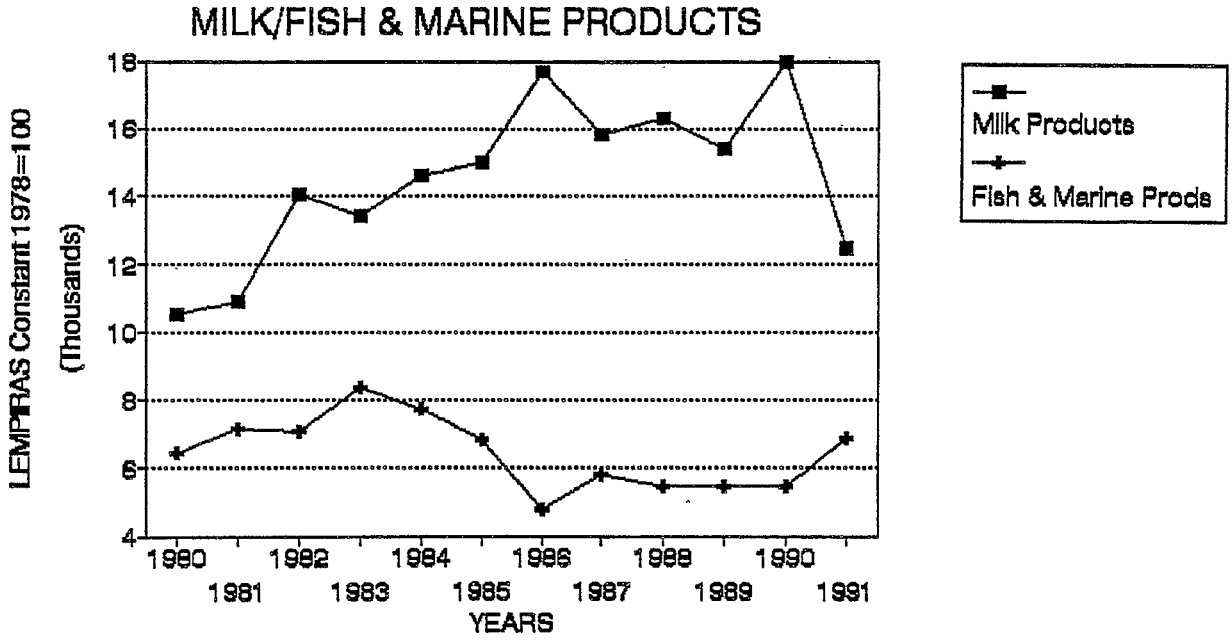


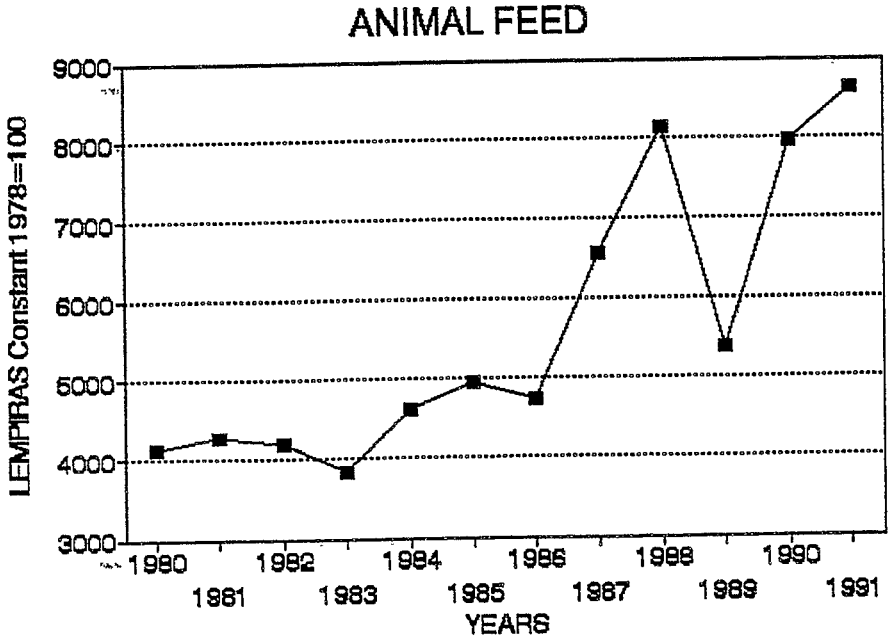


GROWTH OF VALUE ADDED 1980-91

MEAT, MILK/MARINE PRODUCTS, ANIMAL FEED

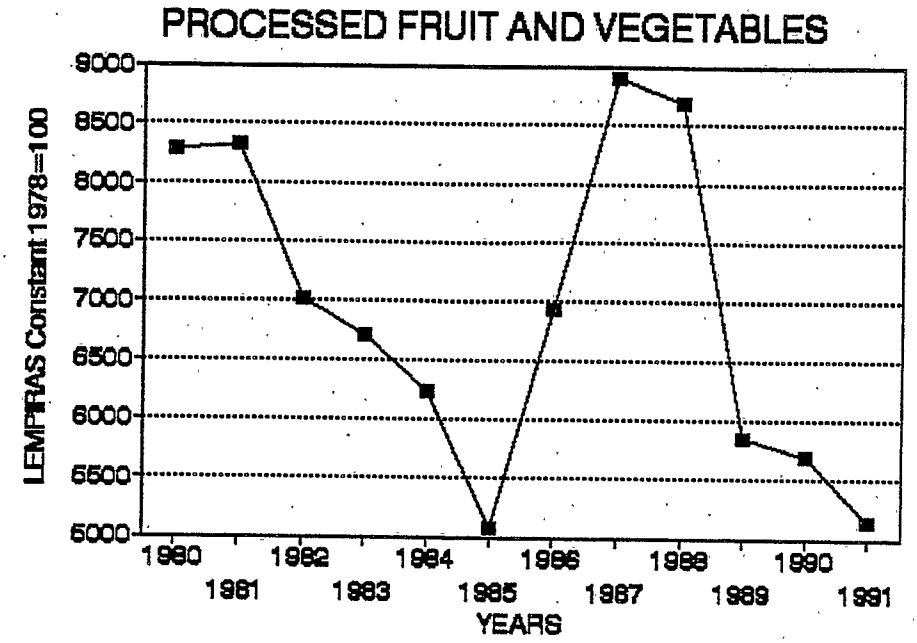


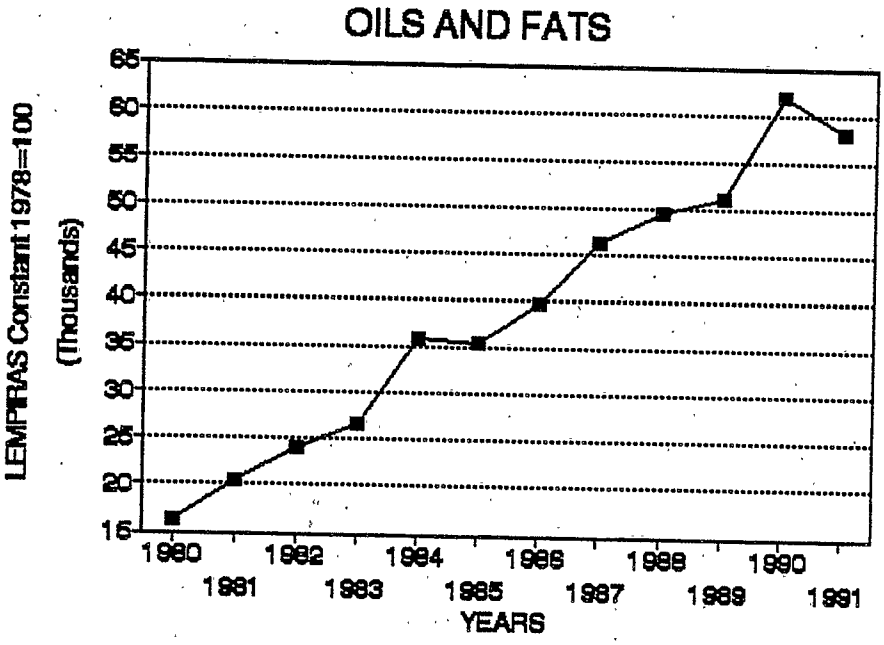


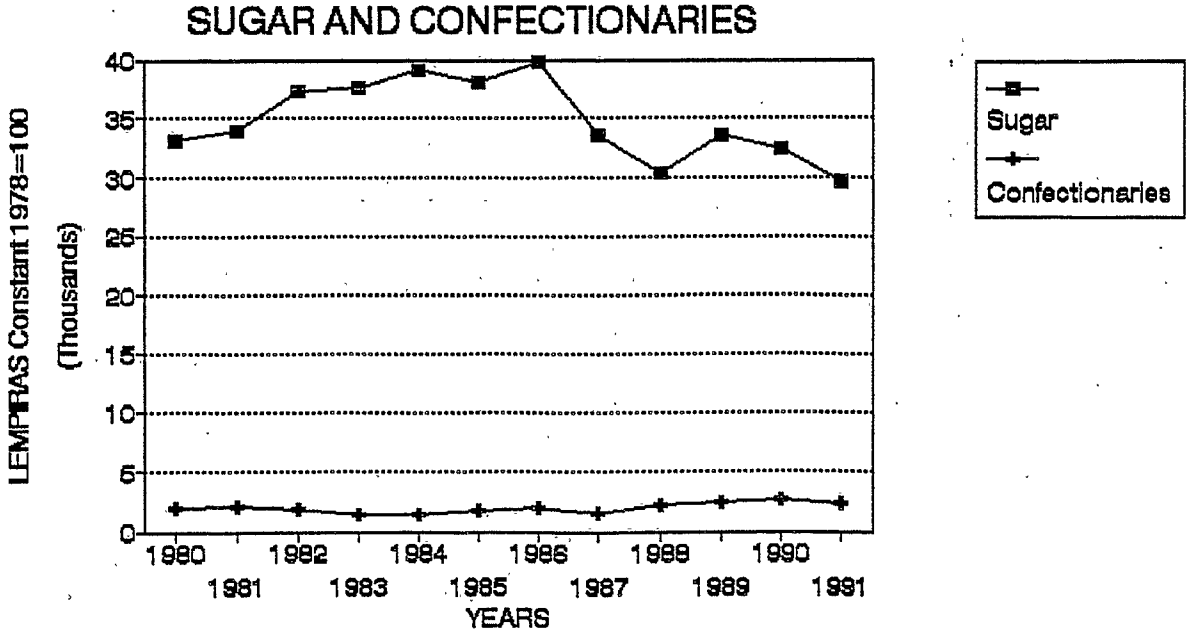


GROWTH OF VALUE ADDED 1980-91

FRUITS, VEGETABLES, OILS AND SUGAR



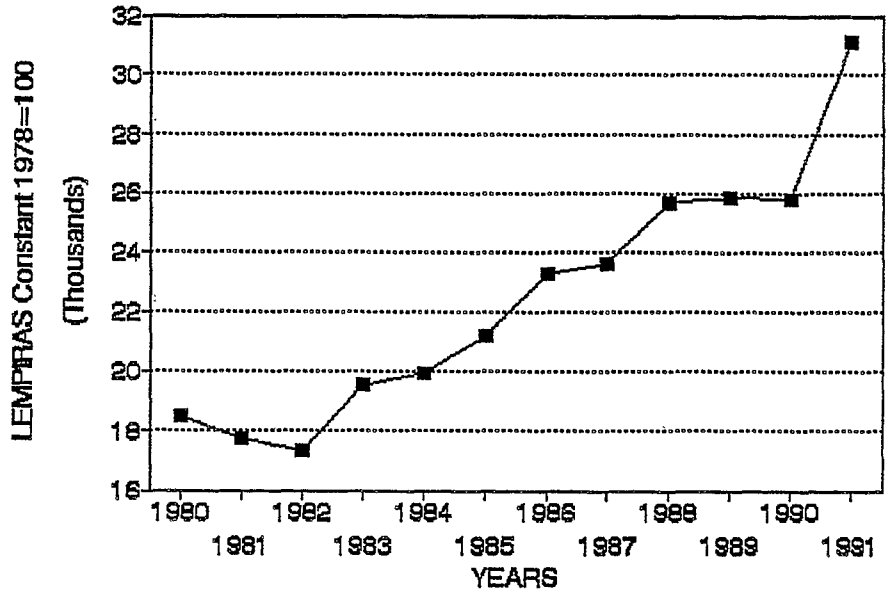




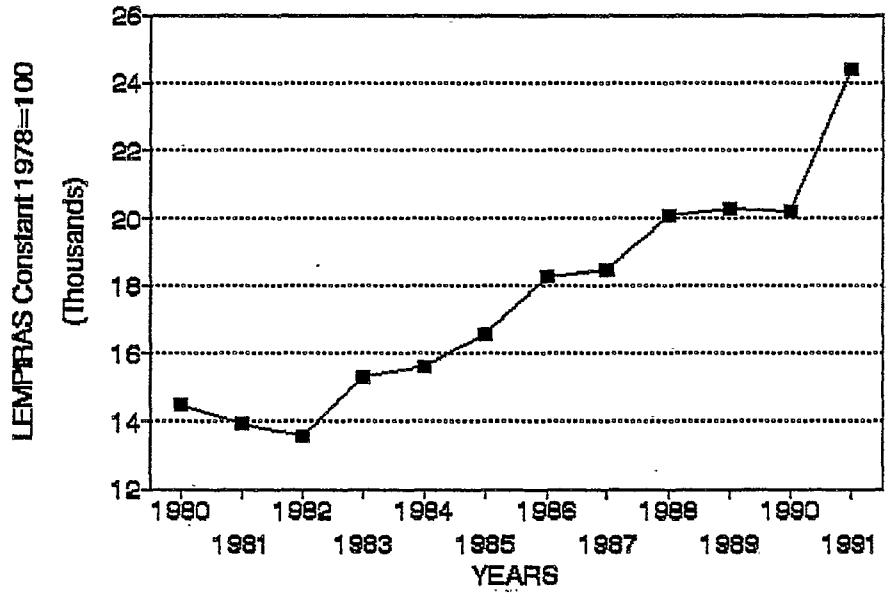
GROWTH OF VALUE ADDED 1980-91

GRAIN PRODUCTS

FLOUR



BAKERY



MISCELLANEOUS FOOD

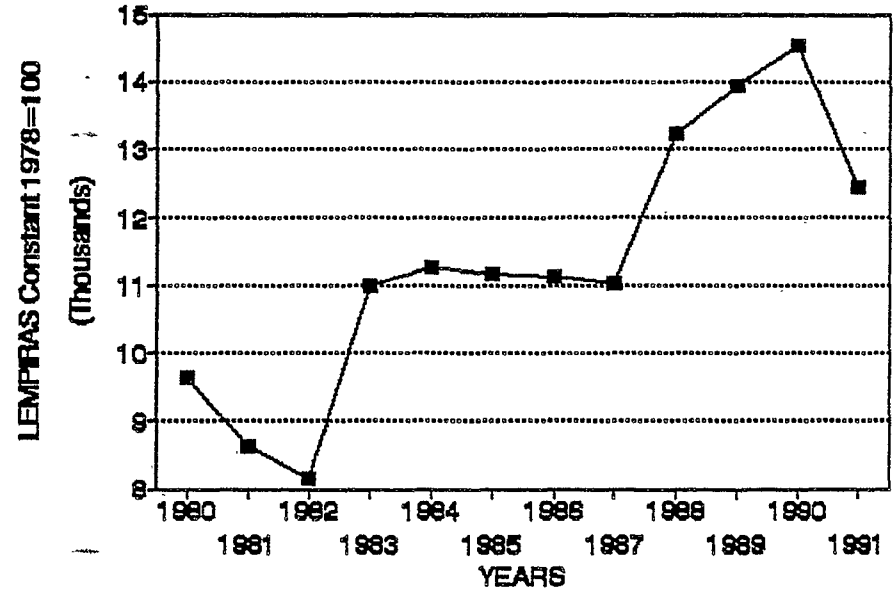


TABLE RELATING TO GRAPH FIGURES

Gross Value Added in Food Manufacturing 1980-1991
Thousands of Constant Lempiras, 1978 = 100

Grosss Value Added	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Food, Drink and Tobacco	208,604	213,075	211,858	225,423	237,513	238,920	254,145	260,890	271,700	279,718	296,641	305,427
Food	146,599	149,214	152,287	162,842	171,636	172,468	187,948	189,798	190,801	194,183	208,867	212,343
Meat	23,200	21,966	17,672	19,065	15,429	16,565	19,779	18,323	11,327	14,961	14,224	21,171
Milk Products	10,500	10,900	14,037	13,433	14,617	15,002	17,718	15,830	16,309	15,418	17,943	12,491
Procd Fruit and Vegetables	8,280	8,324	7,011	6,711	6,237	5,062	6,929	8,899	8,680	5,849	5,689	5,145
Fish and Marine Products	6,419	7,146	7,057	8,363	7,730	6,807	4,729	5,785	5,432	5,402	5,397	6,846
Oils and Fats	16,341	20,453	24,086	26,602	35,817	35,359	39,633	46,309	49,458	51,079	61,961	58,164
Flour	18,500	17,735	17,334	19,517	19,928	21,175	23,322	23,567	25,657	25,886	25,821	31,123
Bakery Products	14,484	13,887	13,574	15,283	15,605	16,582	18,263	18,454	20,091	20,271	20,219	24,371
Sugar	33,154	33,883	37,306	37,731	39,048	38,116	39,797	33,519	30,339	33,600	32,486	29,671
Cocoa, Choc and Confectionary	1,965	2,043	1,878	1,305	1,342	1,668	1,919	1,516	2,130	2,403	2,631	2,299
Miscellaneous Food	9,629	8,608	8,143	11,006	11,264	11,168	11,126	11,029	13,238	13,942	14,528	12,438
Animal Feed	4,127	4,269	4,189	3,823	4,620	4,964	4,734	6,566	8,141	5,373	7,968	8,624
Drinks	47,988	49,744	44,659	49,344	51,887	51,342	52,250	57,415	65,733	68,794	70,181	76,555
Total manufacturing excluding artisans	449,045	447,616	430,017	459,095	497,013	504,079	522,476	557,763	573,301	587,829	614,816	627,196

The overall expansion is accounted for mainly by the growth of palm oil and its products, and flour milling and bakeries. Livestock is static. Fruit and vegetable processing remains insignificant, and has fallen by nearly a third during the eighties.

I will examine what lies behind the figures for the first two of the three sub-sectors in Chapters 3 and 4. At this point it is the general features of the industry which are important, of which four stand out:

1. In contrast to primary production, food processing is predominantly geared to the home market. The export of boneless beef to the US and Puerto Rico has been of declining significance. There is some export of tomato paste, traditional cheeses and biscuits to Central America, but overall processed food exports are insignificant (see Table 2). The bulk of sugar production, vegetable oil, fruit juices, dairy and bakery products goes to the home market.

(Please see attached Table 2*)

2. There is a low level of processed food imports. In 1990, the imports of food for consumption was only 7% of the value of output from the food manufacturing sector. The closed nature of the Honduran domestic market for food was confirmed by our visits to caterers and retailers whose use of imported goods was lower than in many comparable countries.

One reason is the high tariffs. A recent UNIDO study calculated that as late as 1990 a large number of sub sectors had effective rates of protection of more than 100% - meat processing, milk products, processed fruit and vegetables, fish processing, oils and fats, flour products, bakeries, sugar refineries and chocolate and cocoa.

TABLE 2

EXPORTACIONES FOB POR PRINCIPALES PRODUCTOS
(Volumen en miles y valor en millones de dólares)

p/ Preliminar
e/ Estimación

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990p/	1991e/
BANANO												
Valor	228.0	213.3	218.3	203.1	232.2	273.5	256.8	321.8	356.4	351.7	366.3	333.4
Volumen cajas 40 lbs.	47,450	42,234	44,736	35,095	41,250	46,540	42,547	49,426	46,859	45,022	42,321	38,325
Precios	4.81	5.05	4.88	5.79	5.63	5.88	6.03	6.51	7.61	7.81	8.65	8.70
CAFE												
Valor	204.1	172.9	153.1	151.2	169.1	185.2	322.1	199.9	192.1	190.9	180.9	145.9
Volumen sacos 60 kgs.	946	1,133	956	1,238	1,130	1,192	1,324	1,451	1,263	1,420	1,736	1,444
Precio	215.76	152.57	160.15	122.1	149.63	155.37	243.26	137.77	152.10	134.47	104.25	101.00
MADERA												
Valor	36.2	43.2	44.7	40.4	34.9	34.1	32.3	34.7	29.8	25.4	16.1	14.9
Volumen P.T.	114,002	123,749	127,564	111,035	97,898	90,269	92,812	96,332	76,471	61,287	36,869	28,652
Precios	0.32	0.35	0.35	0.36	0.36	0.38	0.35	0.36	0.39	0.42	0.44	0.52
CARNE REFRIGERADA												
Valor	60.7	46.5	33.9	31.3	21.2	18.1	20.0	22.5	20.3	19.8	24.8	29.3
Volumen kilos	28,605	23,846	16,195	15,474	9,519	8,643	10,874	9,681	9,921	9,261	11,242	12,966
Precio	2.12	1.95	2.09	2.03	2.23	2.10	1.83	2.33	2.05	2.14	2.21	2.26
PLATA												
Valor	31.8	15.7	9.3	17.6	15.5	13.0	12.6	7.6	9.9	8.1	4.0	4.0
Volumen onzas troy	1,624	1,576	1,211	1,629	2,022	2,108	2,255	1,146	1,601	1,544	847	1,004
Precio	19.56	9.98	7.68	10.78	7.67	6.17	5.57	6.67	6.18	5.22	4.77	3.89
PLOMO												
Valor	10.0	8.4	4.2	4.6	6.3	5.9	6.2	3.7	7.3	6.0	3.6	2.8
Volumen libras	26,863	26,256	19,034	25,531	30,361	34,348	36,372	13,516	24,681	19,435	10,485	10,587
Precio	0.37	0.32	0.22	0.18	0.21	0.17	0.17	0.27	0.30	0.31	0.36	0.26
ZINC												
Valor	10.0	12.3	12.0	20.2	31.7	29.9	26.3	15.3	29.8	60.5	34.3	30.8
Volumen libras	32,347	33,177	32,390	51,114	68,902	77,022	81,276	39,967	56,194	85,360	53,522	63,563
Precio	0.31	0.37	0.37	0.39	0.46	0.39	0.32	0.38	0.53	0.71	0.65	0.48
Valor	29.3	46.5	21.6	27.8	25.7	21.5	12.5	18.6	14.4	10.2	11.4	8.8
Volumen kilos	81,473	83,053	87,479	106,165	89,632	119,292	63,133	95,577	68,662	20,763	25,771	20,053
Precio	0.36	0.56	0.25	0.26	0.29	0.18	0.20	0.19	0.21	0.49	0.44	0.44
CAMARONES												
Valor	14.6	16.6	15.3	20.0	24.2	19.4	25.7	34.7	49.4	40.0	45.9	72.8
Volumen kilos	2,422	2,906	2,749	3,132	2,296	1,932	2,050	3,150	4,103	3,810	4,350	5,724
Precio	6.03	5.73	5.55	6.4	10.56	10.0	12.53	11.00	12.04	10.50	10.56	12.72
LANGOSTAS												
Valor	8.8	9.6	12.7	16.0	25.5	21.6	45.4	23.8	32.6	32.4	26.9	31.8
Volumen kilos	851	739	851	1,134	1,648	1,541	1,406	1,350	2,005	2,024	1,724	1,977
Precio	10.36	12.98	14.93	14.11	15.50	14.00	32.27	17.60	16.25	16.00	15.62	16.08
TABACO												
Valor	13.7	13.3	10.8	10.8	8.3	8.7	5.3	4.2	3.1	3.8	1.9	2.4
Volumen kilos	4,566	4,488	3,170	3,125	2,506	2,319	1,498	1,260	1,024	1,008	649	930
Precio	3.00	2.97	3.40	3.46	3.33	3.73	3.55	3.30	3.02	3.83	2.85	3.66
SUB-TOTAL	647.2	598.3	535.9	543.0	594.6	630.9	765.2	686.8	745.1	748.8	716.1	676.9
OTROS PRODUCTOS	174.9	155.3	118.7	128.8	130.7	133.7	89.0	104.6	93.9	102.2	96.3	103.0
TOTAL BIENES	822.1	753.6	654.6	671.8	725.3	764.6	854.2	791.4	839.0	851.0	812.4	779.9

The introduction of the Central American Common Market and the liberalisation of trade will open up the industry, and threaten parts of it. The UNIDO study identified chocolate and cocoa as likely to be severely hit, but there are others, like jams , which are already facing price and quality competition from Guatemala and Costa Rica in spite of present tariff levels.

3. With the exception of basic grains, and some of the beef cattle, the bulk of the primary products used in processing are from Honduras. Figures for 1990 suggest that the total value of imported primary materials and intermediate products used in the food sector was no more than one sixth of the output of food manufacturing, and this includes inputs for primary production. The food sector as a whole looks to imports for pharmaceuticals, fertilisers, insecticides, seeds, machinery, and know how more generally, rather than materials.

Another way of putting this is that processing has developed as a means of packing, preserving and preparing indigenous raw materials, and that the industry is therefore particularly dependent on the continuing supply of these materials for its growth. There are currently significant supply constraints, notably of live cattle for slaughter, and fruit for jams and juices. Most of the non traditional crops currently being developed are geared to the fresh export and domestic markets. Melons could contribute to fruit salad exporting (which has been a successful line in other countries in the region), and blackberries (mora) are a potential fruit base for jam. But the existing citrus and pineapple areas are largely accounted for by sales of the fresh fruit or of supplies to existing processing plants.

4. The level of value added in processing is relatively low, as can be seen in Table 3:

Table 3

Value added as a proportion of the total value of output

	1980	1990
Livestock	15.7	15.4
Fruit and Veg processing	25.0	22.9
Sugar, oils and fats	23.0	26.1
Flour and bakery products	21.7	21.7
Other products	22.3	21.2
All food products	21.1	21.5

Source: National Accounts

Livestock is the sector with the 'shallowest' portion of processing, reflecting the predominance of slaughtering. The point to note is that palm oil and its products were the only sub sector to show an increase in the share of processing in the value of the final product during the 1980's. All others were static or fell. In our visits to hotels, caterers and retailers we saw little evidence, apart from the fast food chains, of locally produced higher value added speciality or convenience foods which have shown such strong growth in northern markets.

These characteristics are important determinants for the prospects of the food industry in the 1990's. It is clear to begin with that trade liberalisation will open up the Honduran economy. Not only will Honduran producers be under greater competitive pressure at home, they will have wider opportunities abroad which are particularly important for those sectors like palm oil products which are facing a

saturated domestic market. The issue of international competition will necessarily be posed in an immediate way.

One critical question will be the availability of good quality raw material supplies. This depends on the impact of policy in the primary sector, where a process of market liberalisation is taking place in parallel with trade liberalisation. The following section provides a brief summary of the key issues facing the primary sector.

Agriculture.

It is not surprising that the focus of political and economic debate on the Honduran food industry over the past 20 years should have been on the politics and economics of primary production, how it is produced, by whom, at what price, with what returns. The fact that three fifths of the Honduran population still live in the countryside and largely depend on food production, that the urban population has increased by 62% in the 1980's to 1.9 million in 1990, and that the population as a whole has risen by 1.33 million and needs to be fed - all this has put increasing pressure on primary food production, and from thence on to land. Cultivation has been pushed up the hillsides. It has led to the destruction of forests. Even then the rate of agricultural growth has failed to match the growth in population and the number of rural landless families has increased.

Honduras has faced the problem common to all early periods of industrialisation namely how to generate enough surplus food to provide for the growing towns. Given the shortage of cultivatable land it has sought to do this by intensifying agriculture. This was one of the purposes of the land reform in 1974, which aimed to move cultivatable land from extensive ranching or scrub to intensive campesino production. Land producing corn using traditional techniques yields 2-3 times more value added per hectare than cattle, and 10 times more employment. Small farmers (with under 2.5 hectares) were still

devoting 89% of their land to crops in 1988, as against 18% by the farmers of fincas of more than 50 hectares. Quite apart from its distributional effects, land reform promised an expansion of agricultural output and food for the towns.

Around 400,000 hectares were distributed from the total of 1.9 million - 2.5 million hectares of crop land and 1-2 million hectares of pasture, or between 10 and 15% of farming land. We have no detailed study of the effects on production of the reform. Pasturage, and the stock of cattle, actually increased over this period, for much of the land distributed was from the state rather than ranchers. At the same time the size of the distribution was such that the number of fincas grew by two thirds (69%) from 195,341 in 1974 to 329,710 in 1988, many of them being farmed by small producers of crops rather than cattle. In some cases the smallholders produced cash crops like coffee and oil palm. Table 4 shows how these expanded relative to traditional estate crops like sugar and bananas.

Expansion of basic grains was slower. Between 1975 and 1987 production rose by only 9%, and because population was growing at over 3% p.a. This represented a fall of 20% in per capita grain production. Only in the late 1980's did expansion take hold, production increasing by 39% between 1987 and 1990.

Table 4

Selected Agricultural Honduran Production
1970 - 91

(En miles de quintales)

Año	Maíz	Maicillo o Sorgo	Arroz en Granza	Frijol	Café en oro 1/	Banano	Plátano	Caña de Azúcar	Algodón en Rama	Palma Africana	Tabaco en Rama
1970	7,772	1,014	334	1,057	743	21,082	1,827	30,303	126	723	87
1971	7,918	1,052	647	1,204	794	26,206	1,930	31,021	142	954	65
1972	7,979	1,117	803	1,097	802	23,596	2,080	32,734	268	1,056	67
1973	7,726	1,088	696	923	1,059	23,017	2,254	25,514	328	1,143	79
1974	7,902	1,151	674	1,141	1,002	19,005	2,108	34,639	321	1,120	102
1975	7,563	1,074	749	1,048	1,124	12,833	1,830	34,328	193	1,126	114
1976	8,332	1,156	772	948	1,104	17,926	2,094	36,268	437	1,091	129
1977	7,576	1,088	643	950	1,065	20,726	2,066	43,945	699	1,251	149
1978	8,150	1,118	825	980	1,470	20,944	2,023	46,330	466	1,364	139
1979	7,983	860	907	968	1,598	24,759	2,128	56,337	545	1,343	150
1980	7,354	1,149	995	991	1,538	24,177	2,436	63,168	467	1,889	157
1981	9,227	927	992	1,195	1,773	22,105	2,474	63,499	410	2,375	161
1982	8,908	935	1,097	1,199	1,698	23,163	2,557	67,295	180	3,511	136
1983	8,557	980	1,404	988	1,991	19,292	2,605	69,448	283	4,411	123
1984	9,481	1,081	1,293	1,098	1,525	21,838	2,708	67,195	395	5,725	106
1985	9,405	852	1,151	1,115	1,948	24,014	2,951	65,894	321	6,871	120
1986	8,943	707	1,364	1,114	1,677	22,448	3,240	65,888	197	7,172	102
1987	8,798	800	1,256	992	1,761	25,362	3,475	58,620	177	6,769	100
1988	9,522	1,019	1,046	511	2,069	24,399	3,395	55,201	187	7,476	82
1989	10,980	1,221	1,450	1,306	2,179	23,738	3,396	59,944	96	7,288	104
1990	12,381	1,532	1,418	1,366	2,604	22,733	3,577	63,753	100	7,482	113
1991 p/	12,293	1,848	1,905	1,741	2,215	21,142	3,713	64,162	30	7,552	110

1/ Año cosecha
p/ Preliminar

Source: Central Bank

The new competition

A second critical factor determining the prospects for the Honduran food industry in 1990's is the competitive strategy adopted by firms in the industry and by the industry as a whole. One response to the coming trade liberalisation has been to increase the scale of production in order to lower costs through higher volumes of standard commodities. This has been the predominant strategy adopted by North American firms in the world market, and by British and French manufacturers in the face of European integration. It has been supported by their respective governments who have encouraged rationalisation, and provided incentives for fixed investment in large scale modern machinery.

The success of the Japanese, the Germans and the Italians in manufacturing world markets has been based on an alternative strategy. The Japanese have shifted the focus of industrial strategy from the production of long runs of a narrow range of standardised products, to a concern for quality, cutting defect rates, reducing stocks, and customising products. The decisive changes have been to make production lines more flexible so that they can produce multiple products without losing the economies of flow, at the same time economising on working capital and materials use. The keywords of Japanese production management reflect these priorities - Just in Time, Zero Defects, Total Quality Management, and Continuous Improvement.

One of the interesting things about the history of the Japanese pursuit of these practises is how the drive for cutting stocks or minimising defects has led to profound changes in policies towards labour, technology, management information and organisation. Labour came to be seen as an asset not a cost, with front line workers playing a key role in quality control and innovation. This meant a move away from Taylorian ideas of deskilling, substitutability,

individualised tasks and related payments, to a new concern for training, group work and low labour turnover.

Innovation was no longer seen to stem solely from the R&D department, but from all the workers in a firm, as well as from suppliers, and customers. It was a continuous as well as a discontinuous process, multi-faceted, policentred, demanding a delicate blend of order and chaos.

New structures of organisation were developed to encourage these processes, decentralising responsibility to those who had direct knowledge (front line producers), strengthening horizontal relations within firms and between them, and introducing new types information system for the producers and the managers who had the responsibility for guidance and control.

It is also interesting to note that the Japanese have developed systems of banking, sectoral organisation and management accounting which ensure that markets support rather than dominate this productive strategy. I have been struck when talking to Japanese managers to find them suggesting that if they get their production and organisational strategies right, the financial bottom line will look after itself, and they demand the same attention to issues of production from bankers and the state.

In the case of the Italians who have been particularly successful in light industries like furniture, clothing, footwear, food and associated engineering, one of the key sources of their competitive advantage has been design and the capacity to develop new and ever higher quality products. The same is true of the German engineering industry, which like the Italians, has focussed on the production of speciality equipment, customised to the needs of the client, and though

higher in price has outcompeted the volume machine producers of standardised machines from Britain and the US.[1]

The main body of this report is an assessment of the current practises and organisation of the Honduran food industry from the viewpoint of these new strategies. How far are they already followed? What is their relevance and potential? What would be required to strengthen the Honduran food system to meet the new competition?

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1 For an excellent recent analysis of the new forms of production and a discussion of the Japanese and Italian systems see: Michael Best, The New Competition, Harvard University Press, 1991. On Germany see, G. Herrigel, "Mechanical engineering in the Federal Republic of Germany" in: P. Katzenstein, (ed) Industry and Political Change in West Germany: towards a Third Republic?, Cornell University Press, 1989.

FIRMS

Chapter 2

Production issues in Honduran food manufacturing

The sample

Size

The size of the firms in the sample is shown in Table 1

Table 1

Firm size

Sales in millions of Lempiras

	0-10	11-49	50 & over
No of firms	12	5	13

	Employment (no. of workers)		
	0-20	20-99	100 & over
No of firms	9	7	13

Source: company interviews

There were an approximately equal number of large and small plants. The medium sized firms made up a fifth of the sample.

Ownership

Of the large, 7 were Honduran owned, 5 were affiliates of transnationals, and one was a joint venture. One of the medium sized firms was a subsidiary of a transnational, one of the small plants was US owned, and the rest were Honduran.

Table 2

Ownership

	Honduran	Foreign	Joint Venture	Total
Private	14	6	1	21
State	3	-	-	3
Co-op	3	-	-	3
Not for Profit	2	1	-	3
Total	22	7	1	30

Of the whole sample, twenty one were private firms, three were state owned firms in the process of being privatised, three were co-operatives, and three were part of not for profit organisations, one of which was from the US. This meant that overall, 14 were owned by private Hondurans, 8 were fully or partly foreign and 9 were under some form of social ownership.

Sectoral composition

Table 3 presents the sectoral composition:

Table 3

Sectors represented in sample

	Livestock	Fruit & Veg	Oil & Sugar	Flour & Baking
No of firms	15	6	4	5

Half the sample were from the livestock sector, three being meat exporters, five meat processors, three dairies, and four animal feed mills. Of the fruit and vegetable processors, one made crisps, two produced tomato products and nectars, and three made jams and pickles, though a number of other firms interviewed also produced jams. The palm oil firms produced both crude and refined oil and oil products, while four of the grain, flour and baking firms were involved in one or other of the stages of maize production.

Production

The main focus of the interviews was on the problem of flows, waste, quality, innovation and organisational and labour issues within and outside the firms.

Stocks and Flows

Inputs

We found a remarkably high level of inventory in many branches of the industry. Partly this is due to the seasonality of primary production. Many of the smaller animal feed mills we visited had an average of 4 - 5 months maize stocks (maize accounting for 50% of their input costs) or bought from intermediary stockholders. The flour mill similarly carried an average of 5 months grain stock. The vegetable oil extractors and the refineries each had 10 weeks stock of crude oil, in part because of seasonality (see case study 1). In these instances, as in fruit and vegetable processing, the task is either to schedule a range of products with complementary seasonality or to use imported supplies when primary products are not available domestically. It was significant that one of the large animal feed mills had only 60 days inventory because it imported 70% of its inputs and could therefore draw on grains from areas with different seasons to those in Honduras.

Another area of high stocks was packaging. Six of the large firms we inter-viewed kept 3 months stock of packaging, four of them using imported vacuum packing, the other two relying on Honduran production. Smaller firms tended to shift the stockholding problem to wholesalers, because their scale of operation did not warrant the purchase of the minimum economic load for imports.

In industries where inputs and products were subject to deterioration, inventories were low, as in the livestock

industry. Chickens for example are strictly timed from the hatcheries, their growth monitored, and the birds slaughtered and processed on the 42nd-46th day. In the beef exporting industry on the other hand, there were delays in the sale of finished products because of the problems of quality testing, transport and shipping,(see case study 2).

The greatest consistent mass of stocks was in the retail sector. The largest supermarket chain in Honduras had taken measures to reduce its stocks by investing in an Electronic Point of Sale system (EPOS). Each night it receives a read out of sales and stock level from each one of its 25 shops, and is able to adjust orders, and transfer stock from those with surplus stocks to those with a shortage. Even so the chain still had stocks valued at 10% of sales, which suggests that in other parts of the retail and wholesale system the figure is considerably higher.

Work in process

In some cases the level of stocks and work in process can be reduced by action within the firm itself, particularly by improving line flexibility and the organisation of work. This is certainly the case in many assembly industries. In the Honduran food industry, however, we found this was a minor issue. Production generally involved successive processes connected by pipes, conveyor belts or gantries, or by hand. A limited number of ingredients were combined in this way to produce a narrow range of standard outputs. Most of the plants had the bulk of their production in five products or less. Only six had more than 10 products and in many cases there were dedicated product lines for particular products, milk and fruit juice for example, sugar and palm oil, deboned meat, flour milling, and banana crisps. We rarely saw any significant stock of semi finished goods.

For plants producing a range of products such as the meat processors, the jam and pickle producers or the animal feed mills, there was little problem of changeover time as the

machinery was general purpose, and a change of product line would at the most involve cleaning the equipment. For the single shift producers this was done at the end of the day. In the meat processing factories there were containers of material, such as minced beef waiting to be put through the sausage machine or the cooker, but they would rarely be there for more than an hour. The cleaning of equipment required by a change of product was generally done in less than ten minutes. In the large animal feed mill a change similarly took a maximum of 10 minutes, and involved resetting the computer that regulated production. The only plants which had substantial changeover times were the biscuit factory (three and a half hours), a palm oil refining plant (3 hours - 1 day) and the can making lines in one of the fruit and vegetable processors,(2 days). In each of these cases, cutting these times would increase the flexibility of production and contribute to the reduction of final goods inventory.

Stocks and Flows. Case Study 1. Margarine and Refined Vegetable Oil

The three refineries of vegetable oils use palm oil as a feedstock. The refinery holds stocks of crude oil in storage tanks, from where it is transferred to a bleacher, and flows in a continuous process through a deodoriser, to a fractioner (which separates the saturated from the unsaturated oil), and from thence to an intermediate storage tank. From here it is piped to a crystalliser, it is allowed to set for a day, and is then packaged and stored before dispatch to the distributor. The refinery we visited normally held crude oil stocks for 3 weeks, but they had recently risen to 10 weeks, or a stock turn of 5 times a year. Intermediate storage is short, and stocks of finished goods are normally only one day, but this too has been increasing.

If we follow the flow through the whole chain of production then the stock problem is even more marked. We visited one of the suppliers of the crude oil. That day it has been forced to delay production until the refiner's lorry arrived because its tanks were also full with another 10 weeks production. At the other end of the chain the distributor held stocks of finished goods, as did the retailers. One of the retailers we talked to had an average stock level of a month. The manteca itself had a shelf life of four months. Even if it was held on average for 6 weeks in the wholesale and retail distribution system, this would mean that the total time of production from the cutting of fruit to final purchase ran from 13 to 30 weeks, of which as much as 95% would be the time the product was held in stock.

At the moment the industry is suffering from over production which explains the high level of crude oil stocks currently held. The cause of this overproduction, and possible strategies to deal with it are discussed in Chapter 4. But even without this temporary glut the stock problem remains. Within the refining process, the normal batch run is two days

because of changeover times of 3 hours in the bleacher and deodoriser. A reduction in the time for these changeovers would permit smaller batches and greater flexibility to respond to any changes in demand, and this flexibility could be used to tune production more finely to demand in the final market where electronic point of sale systems operated at the retail level.

If the total volume of sales of vegetable oil products is 185 million lemps a year,(ex factory) each week of stock is costing the industry 3.5 million lemps in working capital, and interest (at 24%) of 850,000 lemps. If the total stock in the sector represents 26 weeks of production, then working capital required is more than 90 million lemps involving an annual capital cost of 20 million lemps. These figures are broad estimates derived from figures discussed in firm interviews. They are intended to suggest orders of magnitude, and the economic significance of stocks.

Stocks and Flows. Case study 2. The processing of meat for export

In the meat industry, the main input stocks are the live beasts. They are brought in for killing, usually the night before, and processing for export takes place either the same day or the day after, (some of the plants kept carcasses for processing overnight to ensure work for the deboners in the early part of the following day). There is, therefore, little inventory, either of live stock or dead carcasses. The problem comes from the fact that the bulk of the stock is being held on fincas for fattening. so that inventory is growing even while it is serving as inventory. In an economic as well as a physical sense, it is not dead capital. It is work in process.

The flow problem in the meat industry therefore is what is the optimum point of slaughter. In principle it should be when the marginal gain in net revenue from slaughter exceeds the marginal net value of the gain in weight. In Honduras this is usually when the beast weighs between 800 and 1,000 lbs. The high returns currently being earned on exporting have shifted the balance between the two, encouraging earlier killing as well as the killing of breeding cows. We observed considerable variations in the weight of beasts killed in the three exporters we visited, some carcasses coming from cattle whose live weight was between 600 and 700 lbs. The number of cows killed ranged from 25-40% as against the government norm of 5%. We can see this as the slaughterhouses keeping negative stocks, and of running down assets on which the long term supply of fat cattle depends. (see also Chapter 3).

Slaughtering itself operates as a flow process. The beast and its carcass pass through a succession of stages, killing, hanging, skinning, disembowelling, halving and so on. These are commonly connected through an overhead gantry which takes the carcass from process to process. It should be remembered that Henry Ford got his idea of a production line from the stockyards of Chicago. In one of the abattoirs we visited the

slaughter room could handle forty beasts an hour. In all cases the slaughterhouse operated for 4-6 hours per day to supply meat to the deboners. The deboning process used almost no machinery but was dependent on highly skilled workers. It takes an estimated 6 months to 2 years to reach a high level of deboning. Production is organised as a series of small cells, each working on part of the carcass. They pass the different categories of separated meat to the packing line which vacuum packs or boxes the meat for freezing or chilling.

The main interruption to flow was in the stock of finished goods. Freezing industrial meat takes between 1 and 3 days, and chilling takes at least a day. Samples from each carcass are sent to the testing laboratory in Tegucigalpa which the exporters have financed as a means of meeting US FDA requirements. Tests there normally take 4-6 days. The meat then has to be taken to the nearest port where boats usually run North twice a week. The result is that the sample firms visited had stocks of finished goods of between 4 and 9 days, with an average of 7, representing working capital of more than 3 million lempiras. For each of the producers, every day cut from this inventory would equal some 150,000 lempiras, considerably more than their annual contribution to the Tegucigalpa laboratory. This suggests that the exporters have a common interest in cutting testing time, through an expansion of the laboratory, the installation of new equipment, and/or a restructuring of the process of testing itself.

Final goods

For the most part, there were limited stocks of finished goods held within the production plants. In only 6 of the 30 firms visited did we find final products held for more than a week, and in 9 of the 30 stock levels were a day or less (milk, meat, flour, some animal feed). In some instances like milk and meat, there had to be a rapid turnover to avoid deterioration. For most products the level of demand was

stable, and easy to forecast, and at least six of the firms made to order. The norm among the sample firms was to respond to changes in demand by cutting back production rather than producing for stock.

Looking at vertical chains of production, where large stocks were held it was mainly due to uncertainty about other parts of the chain. That is to say producers were acting rationally as far as their own stage of production was concerned, but, as case study 1 shows, this could produce overstocking in the chain as a whole. Stocks thus reflect a failure of effective co-ordination within the chain rather than any necessary technical attribute of production.

Waste in process capacity

Of the other forms of waste in production, the most notable was the waste of productive capacity. Two thirds of the firms in the sample operated a single shift, and of these half were operating at or below 50% of capacity. In some cases the issue was one of overall demand. In others it was a question of machine breakdowns, bottle-necks, or in one case of a modern factory the problem was the absence of key workers.

Yet because of the level of slack in the production chains - reflected in the quantity of stocks - these problems were rarely felt as critical. Meat processors, for example, set their production schedules on the basis of a weekly order or forecast. Any temporary breakdown meant switching to another product not dependent on that machine, and/or working longer hours once the machine was mended in order to catch up.

Waste in product

Such waste in process exceeded in significance waste in product. We collected data on 20 firms, only 4 of which reported defect or rework rates exceeding 3%. For the meat exporters, the defects were in the cattle slaughtered and only

came to light through post slaughter veterinary inspection. For the producers of nectars and tomato purees the only problems were in canning and packaging, and both estimated them at less than 2%. For the meat processors and producers of margarine (manteca) reworks were usually the result of post factory conditions, poor handling or products being held in stock beyond the sell by date.

Quality

The problem of product waste is closely connected to that of quality. Low levels of waste may be achieved at the expense of quality, or put the other way round, more demanding standards of quality would raise the percentage of defects.

Further, because of the perishability of many foodstuffs, both waste and quality are intimately linked to the issue of flow. The greater the problems of flow, from the primary producer right through to the point of consumption, the more likely it is for wastage rates to climb and quality to fall.

One example is that of milk. Most small dairy farmers in Honduras have no access to cooling facilities. In the areas round the large milk processors there is a milk collection once a day, so that the custom is to milk cows daily in the morning,(rather than twice a day) with a resulting loss of yield. In outlying areas we came across milk being collected once ever two days, sometimes in unrefrigerated lorries, travelling as much as 200 kilometres to the milk processing plant. Processors we were informed not only had to put the milk through a double pasteurisation process, but some even added preservatives. Thus the absence of a system to ensure a timely flow of milk to the processor affects both primary productivity and product quality.

A similar problem occurs with fresh fruit and vegetables. Whether sold fresh or processed, they are subject to high wastage rates, one jam maker for example, estimating that 22%

of his pineapple fruit had to be discarded because it was unfit even for use as a jam base. With processed meat the problem comes primarily at the marketing and consumption end. Four of the five meat processors we visited had slaughterhouses attached, together with cold rooms, and processed the meat shortly after killing. But the finished products were commonly delivered in unrefrigerated trucks, to retail outlets without proper cooling facilities, and then sold to people without fridges, (only 35% of the Honduran population have access to fridges). The temptation for the producer is to raise the amount of preservative added.

The reduction of waste

There are two potential responses to this problem of deterioration and waste. The first is to focus on the technology of preservation. Canning, or the addition of salt (in meat and fish) of sugar (in jams and fruit) or artificial preservatives are traditional means of preserving, all of which have been questioned because of their effects on health. Vacuum packaging is a recent innovation which we found being used in the meat export industry, and in fruit processing. In the latter case, the product was sterile at 92 degrees and had a shelf life of 2 years without any preservatives. Bio technology is now being used to neutralise the enzymes that lead to rotting (it is most developed with tomatoes). Irradiation is another contemporary technology aimed at extending shelf life. In all these cases the question is how far the techniques will affect health and quality. Irradiation, for example, has been restricted in Western Europe because of fears about its effects on consumer health. In general there has been a shift in consumption patterns in the North towards fresh or lightly processed foods. Chilled foods have grown relative to frozen foods, fresh fruit and vegetables relative to those in tins and bottles.

The concern with health has given rise to a second approach, which is to improve product flow and increase the rate of

turnover. Deliveries have to be more regular. The production of the primary product has to be geared more closely to the daily changes in demand for the final product, in order to avoid waste or mark downs. There is an added urgency to develop a chain of production and distribution which minimises stocks and operates according to the principles of Just in Time.

One way of doing this is to strengthen local food economies, which cut the distance and co-ordination time between producer, processor and consumer. In the case of milk this would mean focussing strategy on decentralising production to high quality sub-regional processing centres. The same would apply to the bakery industry, and to meat processing. Such descaling has been a trend in a number of modern industries in the North - steel, chemicals, furniture and clothing. It carries with it implications for technology, transport systems, buyer-supplier relations, and product strategy. In a country like Honduras, where the cost of transport to the main centres is high, and problems of deterioration acute, a strategy of descaling needs to be considered.

There is a more general point. The policy of zero stocks has, as one of its purposes, to reveal problems which are otherwise hidden by stocks. The same is true in the food industry with preservation. Moving from frozen to chill food for example, means that there is a premium on ensuring that there are no breaks in the chill food chain. That means addressing the problem of chilling standards among processors, in the transport industry, in retailing or catering, and finally among households themselves.

A common reaction is that such concern with quality is a luxury that cannot be afforded in a developing country. The lesson from the new production philosophy is that the pursuit of quality is a means of reducing cost - by cutting stocks, and waste,- as well as improving productivity. As one Honduran manufacturer put it to us, quality is a new way into the

problem of economy. His strategy is to cut costs through improving quality.

Total Quality Management

One of the striking results of our research was that of the thirty manufacturers we visited, 10 had instituted some form of total quality management. One firm, whose manager had been trained abroad on a management programme that emphasised total quality, had already adopted total quality as the company's slogan. There were T shirts printed with 'Calidad Total' on them, there had been total quality days of entertainments and sports for the workers and their families. For most of the firms, however, the programmes were less than a year old, and most were at the preliminary stage of sending managers and quality controllers on special training courses.

As a consequence of these programmes there was a strong interest in new forms of production information. One manager had on his desk a Spanish translation of a book on W.R.Demming and his techniques of statistical quality control. Others were analysing the fluctuations in output figures and discussing the causes of them. One firm was taking the results of the quality control laboratory and analysing them in conjunction with the shop floor workers. As Demming himself has argued, such figures are windows into the deeper problems of production, of flow, of waste, and of quality.

There are two important things about these total quality programmes. First means should be found of spreading their principles throughout the food industry. The 10 firms which had started these programmes were all large, and the programmes were being developed internally with little reference to other firms following similar paths. Some drew on Honduran consultants, others on written material and consultants from abroad. There is clearly scope for a wider discussion of this approach as it applies to Honduras in

industry associations, and professional or trade unions groups.

One successful attempt to widen the discussion has been taken by the organisers of the milk project at the Central Bank of Honduras, now shifted to Unitec. They have run two courses, one a general one, the other directed at small milk producers, which aroused so much interest that it was doubly subscribed. It is important that such seminars are more regular, and run for other sectors, like meat processing, jam making, and animal feed production.

The second point about the quality programmes is that they should be encouraged to go beyond improvements in the mass production model. One reading of Japanese experience by North American and British companies has been to try and graft some of the Japanese techniques on to their traditional approach to production. Zero stocks has meant shifting the costs of production back on to the primary producer. Firms like Ford have sought to involve workers in quality circles while retaining old forms of employment and payment, as well as a strict division between the design of work and its execution. Semi- skilled workers, paid an individual bonus, with no security of employment, will not be willing or able to engage in the problem solving that characterises the best of the new quality philosophy. The same is true of technicians and junior managers, of suppliers and customers. The implications of total quality go well beyond the tidying of stock rooms, and the mending of broken apparatus. It involves a quite new philosophy of production and organisation.

Product Strategy

One starting point is the firm's strategy of production. The majority of the firms with whom we discussed this issue, both producers and distributors, indicated that the determinant of competition in the Honduran market was price not quality, and that the key to lower prices was a reduction in the quality of

ingredients (in processed meats or fruit juices for example) and/or longer runs. We can even speak of a culture of low price economy, which because it saw price as inversely related to quality, did not pose the problems which the pursuit of quality necessarily entails.

On the other hand eight of the producers, and three of the caterers did have a focus on quality. In the case of the caterers this showed itself in their emphasis on innovations in dishes, and on the quality of ingredients. Each of them complained about the quality of the processed food in Honduras, and of the handling of fresh food. Each identified purchasing as the key activity in catering and showed a strong interest in discovering new high quality suppliers. We can contrast the smallest of these three, who drew his supplies directly from small farmers and processors whom he had sought out, and a number of the larger caterers who expressed themselves satisfied with the quality of processed inputs, and purchased principally on the basis of price and convenience of supply. It was a contrast of an active as against a passive approach to ingredients.

In the case of the processors, we found a similar contrast. A small number of firms were clearly preoccupied with innovation and improvement. One of the medium sized meat processors for example had a stock list of more than 50 products and prided themselves on their new products and the fact that they used the whole beast in their processed foods rather than just the industrial meat. They also successfully promoted their sausages as containing a high meat content and no soya. Another producer saw product innovation and quality as the key to competitivity, particularly the development of specialist products geared to particular segments of the market. Two others, producing intermediate goods, saw their task as constant improvement of the properties of what were essentially commodity products. My conclusion from all eight of the producers as well as the caterers, was that the pursuit of new and high quality products was a habit of mind and was

not constrained by the need for low prices. For most those pursuing quality, prices were not out of line with competitors. For two they were higher because of the market response to the product not higher costs.

Innovation

It is also important to underline the close link between the quality strategy and innovation. In general I was struck by the absence of the systematic organisation of innovations in the firms I saw. Only one had a regular product innovation group. Another - who said that they emphasised quality - had just closed its product development department. The biscuit manufacturer on the other hand had just set one up, and had introduced 12 new types of biscuit in the last 12 months. For the small and medium firms innovation depend on the intuition and market observation of the general managers.

Testing Laboratories

Another critical condition for a quality strategy is good testing facilities. Table 4 shows the distribution of laboratories by sector.

Table 4

Food Testing Laboratories

	Number of plants		
	With labs	Without Labs	All plants
Meat exporters	3	0	3
Meat Processors	2	3	5
Dairies	3	0	3
Animal feed mills	1	3	4
Fruit and Veg processors	4	2	6
Sugar and oils	4	0	4
Flour and bakeries	1	4	5
Total	18	12	30

60% of the sample thus had laboratory facilities. This was one area where small firms were at a disadvantage with respect to the large. All large plants had laboratories, but only two of the small ones. Those with the facilities used them to test batches and in some cases to test inputs. A few made more active use of them as part of a policy of 'continuous improvement'. The results would be used as key inputs to quality improvement discussions both within the firm and with suppliers.

One of the most rigourous of the facilities was that jointly funded by the meat exporters and managed by the government, which had been established in order to gain approval by the USF. There is no equivalent pressure from the Honduran regulatory bodies. The system of food standards are based on the Pan American norms of 1963 which have not been updated, and testing is done on a random basis by the Ministry of Natural Resources and the Ministry of Health. The latter has a system of regional inspection, which takes samples from the market and follows them up with visits to plants where required. There are also periodic visits to plants. On average the plants in the sample said they would be visited

every six months, with the exception of the abattoirs (of all kinds) where vets and/or inspectors were present at each session.

Food testing has been one of the areas of most rapid advance in recent years as has the increasingly stringent demands made on the industry through food regulations. I will take up the question of how to strengthen food standards and the testing infrastructure in Chapter 7.

Packaging and design

An often underrated aspect of quality is the appearance of the product and its packaging. Again producers and analysts tend to see this as a luxury concern, a matter for rich country markets, but not relevant for providing cheap food in the developing world. There is some truth in this and not only for developing countries. One of the most striking recent developments in the food industry in the North is a pressure for reduced and recyclable packaging. The recent legislation in Germany and the Netherlands and moves towards control of packaging at the EEC level has led the packaging industry to refocus its strategy around reduced, lighter and environmentally friendly packaging.

In the food industry, the issue of packaging has the further importance of being key to the preservation and safety of food. For this reason, and for reasons of competitivity, packaging and food appearance need to be a key part of a quality strategy. For the firms in the survey packaging remained a continuing problem. Partly it was a question of price, because of the absence of glass and tin can making plants in Honduras. But it was also a matter of design, since the firms using glass could not afford the dies or purchase the quantity necessary to produce a distinct and well designed jar. Those using plastic containers also had problems with the quality and reliability of supplies, and with the quality of printing on the plastic or adhesive labels.

Some firms had sought out foreign suppliers and were using modern forms of vacuum packaging, but in general packaging and the presentation of food remains one of the common problems for the industry as a whole.

Labour

A final feature of production which has been central to quality strategies is the organisation of work, the tasks assigned to shop floor workers, their training, condition of work and terms of employment. This area of management was one of the most challenging to those firms explicitly embarking on total quality programmes. The flour mill recognised that it was the mill operators who were the key to the quality of the product. This was also evident in one of the palm oil plants, in one of the dairies and in one of the caterers. But these were exceptions.

One indication of lack of development in this field is in the limited importance given to training. It is sometimes said that the test of a firm in terms of its capacity for quality production is the percent of costs spent on training. On this criteria, the sample performed poorly. Only three of the thirty firms we visited had any training programmes beyond that provided on the job. Of the three, one had established a training budget of 1% of sales. Another ran courses for its process operators. The third had gone farthest because of the peculiar nature of its purpose. It was one of the plants linked to a college of education. The managers therefore saw the task of production as first and foremost to educate the students who worked in the factory. The factory day started at 6.30 with a lecture on an aspect of the production process. The students then worked alongside regular workers, who, because they were the effective on the job trainers, themselves received regular training. This educational role, as it was carried out, necessarily involved some limits to productivity. But set against this it encouraged a more active involvement of the workforce in quality improvement and

innovation than in any other of the plants we saw. Indeed on the day we visited the plant foreman was in the process of making a new product he had learnt about while on a training course in Chile, and which, on his return, he suggested should be tried out in Honduras.

One area of training whose absence was particularly notable was the provision of basic skills. Experience in North America, Europe and Japan has shown that training in such skills as reading, writing, numeracy, the ability to work in groups and express oneself, are not only necessary but show high returns in terms of productivity and the capacity to play an active part in the new production systems. With the exception of the educational plant there was very little awareness of this point. Taking only the question of literacy, in spite of a 45% level of illiteracy in the population as a whole, we were assured in all but one factory that there was no illiteracy. The exception had set up a literacy course as part of its programme of total quality management. We talked to the first group of workers on the course, who were enthusiastic about it, both in terms of their needs, and the quality of the teaching and the materials provided.

Conclusion

The overall conclusion of our survey is that there were substantial problems in the industry in terms of stocks, and in quality. On the other hand, there was a significant awareness that these were problems, and some firms had begun to take steps to do something about them.

It was also clear that a number of the problems lead outside the individual firms. The reduction of stocks depends on relations with clients and suppliers. Concerns about product quality raise questions about the quality of raw materials. Some of the equipment and materials needed to support a

quality strategy are such that few firms can afford them on their own, or require specialist suppliers.

It has been one of the lessons of the new production systems that they are critical dependent on inter firm networks. Larger firms might be thought more self sufficient but the most successful have also actively organised external networks and re-organised themselves internally to resemble a network of decentralised yet co-ordinated units. What this implies is that firms need to move from being closed to open systems. We can go so far as to say that in the new forms of production the key concept is no longer the firm but the system.

This has implications for industrial policy. Rather than being directed solely at services and incentives for individual firms , it should be concerned to shape the qualitative characteristics of the productive system. In the food industry this is particularly important because of the sharp separation there has been in policy and practise between different stages of the food process. There have been different strategies adopted by firms and by governments towards the links between these stages and between firms in all parts of the chain. These strategies have led to different systems emerging which have contrasting implications for the capacity of firms to pursue the new production philosophy and for primary producers and consumers in a country like Honduras,

Each sector also has problems peculiar to itself. One of the capacities it is necessary for firms to develop among themselves is that of assessing the problems of a sector and the strategies necessary to deal with them. The following two chapters briefly discuss the sectoral issues that we observed in two of the principal sub systems of the food economy, livestock and fruit and vegetables.

SECTORS

Chapter 3

The livestock economy

I

The Context →

The post-war period in the North has seen a transformation in livestock production, characterised by a shift from extensive to intensive rearing. One feature of the change is the growth of chicken and pork relative to red meat in northern diets, in part because of the suggested impact of red meat on health, in part for reasons of price. Both chickens and pigs have shorter gestation periods than cows, their supply can respond more rapidly to increases in demand, and both are susceptible to intensive rearing. The US also saw the growth of intensive cattle production on feedlots, large factory farms where bullocks were fattened next to processing facilities.

What was happening was the use of low price grains - maize, soya - together with agro processing by products, to substitute for pasture and the free ranging of traditional livestock rearing. This went hand in hand with improved technology in breeding, in the science of feeding, and in disease control (since intensive rearing increased the animals' vulnerability to illness). It applied to dairy products as much as to meat, with milking productivity rising six times in three decades, as well as to eggs which were mass produced using the battery method.

From the viewpoint of agro-industrial production, the critical change was in the locus of control from land to grain supply, genetic breeding stock, and pharmaceuticals. It was no longer the landlord and the herdsman who were the key figures, but the research scientist, the nutritionist, and the grain trader. Economists have come to speak of the new agro-chemical complex.

The main outlines of the system were in place in the United States by the early 1960's. In Europe the process was more gradual, where the existence of strong regional economies of small farmers led to intensive methods being adopted in a different way than in North America. Britain followed the North American path with a time-lag. UK poultry production finally overtook beef and veal in 1988 (having doubled in output over two decades), butter and cheese more than doubled over the same period,(although the number of dairy cows fell by 8%) and the output of pork went up by a third(with a 4% rise in the number of pigs). With consumer spending on meat and bacon, dairy products, and oils and fats all peaking in the late 70's there emerged in the UK as in North West Europe as a whole the food mountains and the pressure for exports which characterised the eighties.[1]

For developing countries there were three consequences. First the OECD countries became more self sufficient in meat. From 1900 until the 1950's, the developing countries, particularly those of the southern cone of Latin America, had supplied 50-80% of beef carcasses in world trade. By the late 1960's their share had fallen to 15-20%.

Second, as first world surpluses emerged as the result of their policies of price and income support, so ways were found to transfer some of these surpluses to the developing world at low or zero prices. In the mid 1950's the US established PL 480 aid for this purpose, which had its great impact in Honduras on the market for basic grains. From Europe it is the aid transfers of powdered milk which were most significant for Honduras and its local dairy industry.

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1 For UK and continental European data see A. Burrell, B. Hill abd J. Medland, Agrifacts, Harvester Wheatsheaf, 1990. In the case of butter, Britain had, until the 1970's imported 90% of its needs. Over the past two decades it has expaneded its production by 140%, cut imports by 75%, and is now exporting as much as it is importing for the first time in its history.

Third, as first world markets became saturated, the major firms in the industry looked elsewhere. In meat they moved out of fresh meat into branded higher value added products. In poultry and dairy it was the animal feed companies who were key. Ralston Purina was one of the first of the large US firms to invest in developing countries, buying a feed firm in Venezuela in 1957, and expanding there so that by the mid 1970's it owned two feed mills, two poultry breeding farms, three hatcheries, one broiler farm and two poultry processing plants. They also went into Mexico, as did Anderson Clayton, with combined feed and poultry operations. By 1980 eight leading feed and poultry firms in the US had 18 poultry processing affiliates in developing countries. In dairy production and processing, there was a parallel development, with the 34 top Northern firms having over 100 affiliates in developing countries in 1976.[2]

In each developing country the timing and form of the introduction of intensive livestock production has been different. In Jamaica, for example, broiler production grew in the 1980's, undertaken by two Jamaican companies, one of them combining poultry with a feedmill, fish farming and feedlot beef. The latter uses a high proportion of local material for its feed plant, and services the dairy industry with cattle cake at the same time. As in all such economies the industry is geared to meeting a rising demand for meat and dairy products from a growing urban population. The question in each case is how the intensive production is introduced, how closely it is tied into the local economy, and to the extensive system of livestock rearing which preceded it.

Honduras is still in the early stages of this transition. In spite of its small size and low level of national income, population growth (up 48% between 1978 and 1990) and urbanisation (the urban population grew by 78% over the same

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2 For details of the internationalising of the food companies see United Nations Centre on Transnational Corporations, Transnational Corporations in Food and Beverage Processing, New York, 1981

period) has increased the demand for marketed food. The response has been mixed. On the one hand there has been a growth of extensive beef and dairy farming. On the other there has been the emergence over the decade of Northern methods of intensive livestock production.

This latter process of industrialising livestock is clearest in the case of chickens. The majority of the supply of fresh chickens to the market used to come from small farmers. Industrial broiler production began in the seventies and expanded rapidly in the eighties so that now so called backyard chickens account for only 2% of the market. 85% of production comes from two firms, each of which integrates breeding, hatching, rearing, feeding, and slaughtering in their operations. With a fall in the relative price of chickens, demand has expanded by 8% a year during the 1980's, with the result that the tonnage produced doubled during this period, and chickens rose from being one sixth of beef production in 1980 (by weight) to being one third by 1990.

Egg production has also expanded, with a growing proportion of layers being artificially fed. Available volume figures between 1982 and 1987 show a growth in tonnage of 17.5% during this period. There is no widespread battery rearing however. If this was to come in, as in El Salvador, the shift to artificial feeding and concentration in the industry would be likely to follow the pattern of broiler production.

Pork has grown at a similar rate to eggs, (21% up in volume between 1982 and 1987). The pigs are still primarily raised by small farmers, but there are also intensive herds tied to the meat processors. Of the four pork processors we visited, all either had their own herd of pigs or had close relations with volume producing suppliers.

Another growth sector has been shrimps where the larvae are imported from the United States and then fed in confined waters, principally in Choluteca. The rate of growth has been

even faster than that of poultry, with real value added rising by 123% between 1978 and 1990 as against 93% for poultry. The two sectors together now account for more than two thirds of the value of the cattle industry, and contributed to 80% of the growth of primary livestock over this period,(see Table 1).

Table 1

Growth of the primary livestock sectors in Honduras 1978-90

millions of constant lempiras 1978=100

	1978	1990	Percentage Change
Cattle	151	167	6
Poultry	29	56	93
Fish	26	58	123
Bees	1	1	-
Total	207	282	36

Source: National Accounts

The difference between fish and poultry, however, is that the fish are primarily for overseas markets. Just as poultry has come to challenge beef as a source of protein in the domestic market, so intensively reared sea food has overtaken beef in the export market. In 1980 shrimps and lobster exports were less than two thirds of the value of meat exports. By 1989 they were four times as large, having grown from $23 million in 1980 to $79 million in 1989, a rise from 3% to 8% of total Honduras exports.

At the hub of these developments are the animal feed mills. Intensive rearing depends on their products both for feed and disease control. In broiler production 80% of total cost is feed. Feedmills are commonly integrated into livestock

production, and in the larger firms are linked into breeding and rearing expertise. At the same time by products from slaughtering are fed back to the mills as ingredients of the feed.

The way the animal feed sector is organised will shape the direction of development of the livestock sector as a whole, and in particular the way in which intensive methods are introduced. In this chapter I shall look first at animal feed, and then at the two sectors where extensive production still prevails, beef and dairy.

II

Animal Feed ⟶

The output and value added of the animal feed sector nearly doubled in the decade between 1980 and 1990. The gross value of its output, having been only 15% of that of meat in 1980, had risen to 40% by 1990. The total market in Honduras is now estimated at 600 million lempiras a year.

The industry is in two parts. About 50% of output is transferred within large vertically integrated companies, who use the feed to supply intensive rearing operations. The large mills also supply the bulk of the independent market, although there are some 12-15 small mills serving primarily local markets.

The key firm around which much of the industry revolves is Alcon. It is a subsidiary of Cargill, the largest feed grain company in the world, centred in Minnesota. Cargill, whose turnover of $49.1 billion in 1991 made them the second largest diversified company in the US after AT&T, accounts for 25% of US grain exports, as well as being strong in many branches of the food economy relevant to Honduras: seed production, fertilisers, flour milling, poultry, and beef rearing, packing and processing (its new beef packing plant in Canada processes 1,700 beasts a day, more than 8 times as many as the largest of the packers in Honduras).

Cargill's policy in developing countries has been to start small and expand in their specialist areas through re-investment. In Brazil, for example, it started with a $9 million investment in hybrid seeds in the mid 1960's. Through re-investment it has now built up ten major product lines, including oranges, corn milling, soya beans and cocoa, with a total net worth of $250 million.

In Honduras, Alcon's animal feed plant accounts for 50% of the Honduran market. Their key associated operation is broiler production which in they integrate each stage of production from the breeding of parents by grandparents, the breeding of the broilers themselves, their hatching, slaughter, processing and distribution. It also accounts for 10% of egg production. It has 3,500 head of its own pigs, which provide the bulk of the raw material for its meat processing factory, that in turn supplies 65% of the processed meat market, and 70% of pet foods. It has not so far invested in shrimps, but provides 95% of bought in feed for shrimp production in Honduras. The only fields it has not yet touched are cattle, but it is considering the development of feed lot beef, an activity in which its parent is strong, providing for 25% of all feed lot beef in the US.

Alcon sets the standards in animal feed production, and in the sectors which are intensive users of cake and meal. The other large producers are also integrated. Cadeca, the second largest broiler producer with 25% of the market has its own feed mill as well as facilities for the breeding of poultry, hatching, slaughtering and deboning. Many of the larger poultry producers have their own feedmills.

On the other hand, the smaller feed mills without their own livestock concerns are finding it difficult to remain competitive. Some have gone out of business. Others are operating on very thin margins. For them the strategic question is whether there is any way in which they can hope to survive in the face of competition from the integrated majors.

To answer this requires an assessment of their advantages and disadvantages vis a vis the large companies. In terms of advantages they tend to have close ties with farmers and other producers who supply the inputs. The same is true for the outputs. One firm we visited was able to gear his production to the requirements of a particular customer. We can call

these economies of local knowledge. They are open to large firms, but they have found them more difficult to realise.

The large firms, however, have their own economies of knowledge and flow which smaller mills will have to be able to match if they are to remain competitive. They include the following:

i) an economy of information about input markets. Competitivity in this sector is critically dependent on the purchasing of raw materials since materials constitute 80% of the cost of feed. Larger firms have better information about world markets than small ones. For example one of the large firms in the sector has access to regular price quotations from all over the world, and prior to concluding a deal on this basis, checks with its head office to see if the proposed price can be bettered on the evidence of other deals made within the wider company.

ii) economies of technical know how. Larger firms can afford to develop in house expertise on feeding science, employ specialists to advise clients, and run laboratories. Both Alcon and Cadeca can call on the knowledge of their parent companies. Alcon employs specialists in feeding science on its own books, and has a laboratory to test raw materials and outputs. It also has the resources to put on courses for dairy farmers and broiler producers.

Through the integration of its operations it is able to circulate this know how rapidly, and to collaborate on developing it. The in house livestock managers and the animal feed manager work together on formulas. The manager of the broiler company, for example, is a nutritionist and makes up his own feed formulas for the feed subsidiary to manufacture, but he discusses these with the feed manager who is by training a vet and a nutritionist.

iii) economies of flow. With access to international markets and the capacity to turn over substantial quantities of material in a short time, large firms do not have to hold high levels of stock or be bound by the local producing seasons. Smaller mills kept an average of 4-5 months stocks of maize for example, bought during the harvest at low prices, while the average holding of stock by the large mill was 45 days. Similarly the large mill can employ its own distribution network which is linked into the plant's production schedules and helps keep finished goods inventory down to one day. By contrast, one of the smaller companies we interviewed had no lorry of its own and had to wait until the customers came and picked up the load.

iv) economies of preferential purchase and sale. Where the firm is part of a vertically integrated group, it not only has secure markets, it also has privileged access to certain raw materials. Thus feedmills linked into livestock production use many of the by products as ingredients for the feed - bone meal and chicken remnants from the slaughterhouse, used bedding from chickens and pigs, or the bran husks from associated flour mills.

v) economies of finance. Large firms have greater access to capital, allowing them to purchase inputs when prices are most favourable.

Many of these economies have been described in the past as economies of scale, in the sense that size clearly matters. It may be indivisibilities in transport, the size of a minimum load for example. Or the minimum size of operations which would justify a laboratory, or bulk purchase or finance. But I am suggesting looking at what appear to be economies of scale as economies of knowledge and flow, since it is the effects which are important not the size and there may be ways of obtaining these effects which do not depend on size, or where the minimum size can be achieved in other ways.

High quality laboratory facilities for example could be developed through inter firm specialisation or through establishing joint facilities. Economies of finance have much to do with asset backing, but they also reflect the lack of knowledge a bank has about a small firm. There are many cases where local banks have been able to lend to small firms at low rates because of structures of mutual assessment and local knowledge which by removing uncertainty have reduced the risk.

From this perspective there are two potential strategies open to smaller feed mills. The first is to co-operate laterally among themselves to achieve some of these economies: of world market information, of order size, of technical know how, and distribution. We estimate that there are up to 20 firms who might potentially gain from such joint action, some of them small feed mills, others who raise poultry or pigs and mix their own feed. The difficulty is that where they compete with one another, it is the management of purchasing which is critical to their competitivity against other smaller firms. For this reason they may initially be reluctant to collaborate on purchasing. But as one of them said to us, unless they begin to discuss some such form of co-operation, before long there are unlikely to be any small mills left.

A second strategy, with or without horizontal collaboration, is to develop vertical collaboration. This may make most sense on a regional basis, particularly those regions which are some distance from Tegucigalpa and San Pedro Sula. At the moment local economies tend to be integrated with one of the two major commercial centres rather than within themselves. We came across one mill which had to pay 80 lemps a quintal for its maize at a time when large mills were paying 38-45, yet two kilometres away there were farmers selling maize through Tegucigalpa for 30 limps, and buying feed grain for their pigs from Tegucigalpa. Were some form of co-operation established, at least part of the maize crop could be sold at a premium, at the same time halving the cost of maize to the mill, which is 50% of the cost of the product. There is also the additional

advantage of reducing transport costs both on inputs and outputs which in this case amounted to 7% of the cost of the feed.

Other areas of potential integration include by products of existing production facilities in Honduras. For example oil palm husks, sugar by products, maize bran, bone meal from neighbouring abattoirs, and waste from fruit and vegetable processing. Some mills may be in areas where sorghum and soya are or could be grown. Similarly, mills could be integrated with local livestock projects, as has been the case with small mills linked to poultry rearing. There are reports of an association of chicken farmers who got together to have their own feedmill, but we were unable to assess how this project was going.

One of the benefits of linking these two strategies would be for small mills to have access to testing facilities which would permit them to study the effect of different formula on particular farms and types of animal so that they could customise feed for the farmer. At the moment capacity utilisation in the small mills was low (between 35 and 40% on a one shift basis). Changeover times were no more than 10 minutes, so that they have the production flexibility to undertake short runs. What is lacking is the technical facilities to allow the producer and the user to collaborate on designing the feedstuffs.

III

Meat Processing

The consumption of meat in Honduras has almost doubled in the twenty years since 1970, rising continuously as shown in Table 2:

Table 2

Consumption of Carne de Vacuno 1970-89

quintals (000's)

1970	499
1975	611
1980	730
1985	857
1989	961

Source Central Bank

In addition there was from the late 1960's - in spite of the trend away from developing country beef - a growing demand by US hamburger and processing companies for pasture raised meat in Central America. This led to the expansion of meat packing in Honduras and throughout the isthmus, so that by the mid 1970's the US was taking 21% of Guatemala's beef production, 33% of Nicaragua's, 43% from Honduras (a total of 17,000 tons of exports) and 52% from Costa Rica. This demand peaked in 1979, but still accounted for 40% of Honduran beef production in the late 1980's.

Yet the meat processing industry, while expanding in the 1970's has shown a marked decline in the 1980's, far larger than any other of the sub sectors of the Honduran food sector.

According to the national accounts, value added in meat processing fell by a quarter (26%) during the decade, and if we take 1979 as the base year it more than halved (down 55%) by 1990. These figures include pork and chicken both of which were expanding so the figure for beef production is even lower.

Table 3 suggests that the decline was more the result of a decline in volume than a slump in prices:

Table 3

Quantity of meat processed and exported 1975-90

Year	Number of cattle killed (000's)	Exports in 000's of kilos
1975	263	17,309
1980	466	28,605
1981	438	23,846
1982	362	16,195
1983	379	15,474
1984	360	9,519
1985	345	8,643
1986	345	10,874
1987	347	9,681
1988	350	9,921
1989	389	9,261
1990	n.a.	11,242

Source: Central Bank, FENAGH, Garcia & Torres

The number of cattle killed fell by 17% during the eighties, though this understates the decline because beasts were being killed earlier (see Table 4 below). It was exports where the slump was most marked. In volume terms, they fell by two thirds between 1980 and 1984, and apart from 1986, showed no signs of recovery until 1990. The decline of the dollar price meant that the fall in values was even steeper. In 1980 meat exports reached $61 million, 10% of traditional agricultural

exports and 7.4% of total exports. By 1989 they had fallen to $19.1 million, a fall of more than two thirds in current dollar values, and of 75% in constant lempiras. This left beef constituting only 3% of traditional agricultural exports and 2% of total exports.

What explains the disparity between an evident growth in beef consumption, and what can only be described as a collapse in the meat processing industry? In the mid 1970's exports accounted for 50% of beef production and increased significantly in 1979 as the result of large imports of live cattle from Nicaragua as the result of the Sandinista revolution. This was also the year at which US demand peaked. The decline of the US market in the 1980's hit not only Honduras but all Central America, whose beef exports are recorded as falling from 120,000 tons in 1978, to 88,000 in 1980 , 49,000 in 1985, and 55,000 in 1988.[3]

The impact this had on Honduras is enough to explain the great part of the fall off in processing. The figures for the second half of the eighties show slaughtering for internal demand being relatively stable. The changes in overall beef output were caused by the fluctuations in exports. Only in the past two years has the progressive devaluation of the lempira reversed the downward trend of the eighties. Exports have risen sharply with the packers slaughter numbers up in 1991 and the first half of 1992 by 80% on 1989, and by 160% on 1987. As a result the sector's value added rose by 49% in 1991.

This sudden expansion has highlighted a second problem, namely the supply of fat cattle. Seven of the eight meat processors we visited said that the major constraint on growth was the availability of cattle for slaughter. It is the strategic issue with which they were most concerned.

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3 E Stein and S Arias Penate (eds) Democracia sin Pobreza, Cadesea 1992 p396.

Our best estimate of the size of the shortfall is as follows. A herd of breeding cows of between 1.5 and 1.8 million implies a flow of 250,000-300,000 live bull calves a year. To this should be added up to 20,000 steers driven in from Nicaragua. The industry figures for total numbers slaughtered in Table 3 are currently running at about 400,000, though our visits suggested that this may be an overestimate as far as the main official slaughterhouses are concerned. For them the numbers are closer to 250,000, roughly in line with the level of bull calves produced. However, all to whom we spoke were clear that there was a substantial unofficial leakage of beef steers to El Salvador and Guatemala, some for slaughter there, or in the case of Guatemala for driving onwards into Mexico. A 1989 industry estimate put this outflow at 13% of beef output, or some 50,000 a year. A more recent estimate put the number at between 60,000 to 90,000.

It is clear that this outflow is posing a real problem to the processors. They have responded in three ways:

- they have increased the number of cows killed. One processor reported that 15% of his slaughter numbers were cows, another that they were running at between 25% and 30%, a third said his plant was currently up to 40%. For a total slaughter of 250,000 in the formal economy, this would amount to say 50,000-70,000 cows or roughly the same as the shortfall caused by the unofficial exports 'en pie'.

- they have lowered the weight at which cattle are slaughtered. Table 4 shows the average weight of meat per beast slaughtered by the major packers between 1988 and 1991.

Table 4

Yield from average cow slaughtered by packers (in kilos) 1988-1991

1988	146.3
1989	134.1
1990	129.2
1991	117.2

source: SECPLAN

- they have sought to strengthen control of supplies by integrating backwards. This has not by and large meant controlling the breeding stock. Although some packers have their own breeding cows - one had 10,000 until recently - 80% of breeding and suckling is done by campesinos and small farmers. Rather the packers enter the market at the fattening stage, (which is where the money is to be made) buying stirks at about 400 lbs and bringing them on to slaughtering weight (600-800 lbs) either on their own ranches or by grazing them on the fincas of independent ranchers.

One of the packers we talked to had 7,000 steers of his own, and a further 10,000 pastured out at fincas, giving him a total steer inventory of 18-20m lemps. He got 80% of his cattle supply from the finca system. A second packer had 10,000 steers of his own, and supplied well over half his needs in this way. A third had 6,500 steers, and 24,000 put out to fincas. Though there are some independent ranchers who invest their own capital in fattening, and though there is always some stock sold directly for slaughter by the smaller farmers, the bulk of the supply is now directly controlled by the packers themselves.

The same pattern can be seen among the processors. Of the five surveyed, four had their own slaughterhouses, two of them linked in to their ranches and 'putting out' fincas. In their

case, they also sourced pigs. Four of them had their own herds of pigs, the largest supplying half its industrial needs in this way. The processor without stock or a slaughterhouse complained about the price and the quality of meat received through the normal market, and was considering investing in his own livestock.

Of the three responses to shortages by the processors the first two only worsen the problem. If 50% of the 250,000-300,00 heifer calves born each year are needed to replace the existing herd, slaughtering cows at the present rate is likely to cut into the breeding stock before long. If beasts are being slaughtered early (and we certainly saw considerable variation in the size of carcasses in the abattoirs we visited) then this reduces the poundage of meat produced.

The third response - of vertical integration - at least partially secures fat beasts from being driven over the border. But it has also created a sharp division within the industry. There is a vertically integrated sector responsible for about 160,000 head of beef a year, and an unintegrated sector of some 90,000 head per year processed through the municipal abattoirs. Yet there are signs that even the latter may be tightening. We were told of a group of independent butchers who are considering forming a consortium to produce their own fat cattle because of the difficulties they have faced buying fresh meat on the market.

The backward integration into fattening does not directly address the problem of breeding, nor of the quality of the beef supplied. Nor has it provided sufficient quantities for the processors were complaining of a shortage of stock, and suggesting that they could expand by between 33% and 50% with their existing plant if supplies were available. Even the current quantity of supply is now in question since agricultural policy is being redefined to shift land use from extensive pasture to intensive cultivation.

We found two processors who directly addressed the quality of supply. One was a firm which was in the process of adopting a total quality programme, and it led the general manager to consider the quality and security of supplies. Both were unsatisfactory as currently organised, so he was in the process of establishing an extension service to work with suppliers - not only the fincas to whom fattening was sub contracted but the small scale breeders of the calves.

A second of the exporters already has such a scheme in place, employing three agronomists to work with breeders on pasture management, and pesticides. He shows small producers round his own farms and exchanges bulls and the use of bulls for the promise of the resultant stock.

These were individual responses. They need to be generalised if a restored meat processing industry is to secure its sources of supply. Furthermore, the quality and cost of the supply bears on the problem of demand, for it is on both quality and cost that international competitivity depends. A strategy for the meat processing industry in contemporary Honduras necessarily leads back to the conditions of the breeding and rearing of the beasts themselves.

The supply of cattle

Cattle have traditionally been bred and fattened using extensive pasture. There are an estimated 91,000 fincas occupied in cattle raising, with three quarters (76%) of them being farms having dual purpose cattle, 14% specialising on rearing, 5% on fattening, and 5% on milk. Those specialising on fattening have tended to be the larger fincas, those over 200 manzanas accounting for 7% of the fincas and 40% of the national herd (see Table 5). The breeding of calves has increasingly been the task of campesinos.

The problem has been that as the demand rose on the internal and external markets in the 1970's, and continued to rise more

slowly during the 1980's, so supply was expanded through the extension of pasture. The economic and environmental impact of this expansion has been such that the main direction of policy is stop the expansion and return existing pasture to crops.

Table 5

Structure of cattle production

Size of holding (manzanas)	% of fincas	% of area in pasture	% of herd
0-5	23.1	1.0	4.9
5-10	18.1	2,9	5.9
10-20	21.8	7.5	11.6
20-50	21.1	18.7	20.3
50-100	8.8	18.2	17.5
100-200	4.4	18.0	15.6
200-400	1.7	14.4	12.2
400-600	0.5	6.9	5.2
over 600	0.4	12.2	6.7

Source: Encuesta Ganadera 1982, cited in Ruben, 1991 p.65

Table 6 shows the official estimates of the growth of the cattle population. There was already strong growth by the first half of the seventies with a further 50% increase in the cattle population during the 1980's. There is some doubt over recent figures. Industry representatives thought them too high. The FAO cite a figure of 2.6 million in 1989 as against 2.0 million in 1980, but this still makes the Honduran herd the largest in Central America.[4]

More cattle have meant more land, and because of the limited area for agriculture, the pressure of expansion has shifted to the forests. A recent World Bank report noted that the expansion of cattle grazing areas from the 1970's had taken

4 E.Stein and S. Arias Penate, op cit.

place through the destruction of forests, and the establishment of pasture on 'fragile lands, steep hills, and already degraded areas.' Forest output in 1988 was 27% down on corresponding production a decade earlier, while the overall areas of forests which had been 6.8 million hectares in the mid 1960's, had fallen to 5 million hectares by 1988.[5] This is most serious in the case of broad leaf forests whose 2.5 million hectares are being depleted at a rate of 65,000 hectares a year, largely because of the expansion of cattle raising and slash and burn agriculture.

Table 6

Cattle population in Honduras 1952-1989

	millions
1952	0.71
1974	1.80
1979	2.22
1984	2.47
1989	3.21

Source: Diagnostico de la Ganaderia en Honduras anos 1966-1984 and Central Bank of Honduras

One consequence of the deforestation is an increase in erosion. Eroded areas increased from 0.4 million hectares in 1972 to 2.3 million in 1987, with the annual loss being twice as high as in the previous decade. This not only threatens the productivity of the land, but increases the likelihood of flooding and the cost of providing urban water supplies. Again, for the World Bank, the key question is land use. It cites 1986 data which estimates that the potential area for

5 World Bank, Report on Honduras, Washington, 1991, Annex 1, p1.

crops was only 1.9 million hectares, of which 1.0 million were suitable for annual crops and the remainder for perennial crops or cultivated pasture. In fact crops and pasture covered 2.8 million hectares of which 1.5 million were on land classified as forests.[6]

Quite apart from the assaulting of the forests, the need for more of the alluvial land for the expansion of crops for the home and overseas markets, and for a growing rural population has meant that existing pastureland is already under growing pressure. With only 1.9 - 2.5 million hectares suitable for cropping, nearly half were still being used for pasturage or forest in 1987.[7]

As far as Honduras is concerned it is clear from the trends in demand, in prices and most recently in policy, that further expansion of extensive cattle raising is no longer an option. Shortage of stock can only be addressed by a move towards more intensive agriculture, and this can be of two kinds, either cattle raising with a higher land productivity, or the development of alternative sources of protein which require lower inputs of land.

Intensive beef production

There is considerable scope for improving the yield of fat cattle from a hectare of land. The starting point is to improve the calf yield per cow. According to industry sources the percent of cows in calf in any one year is 40-45%; the average age of first calving is 42-48 months; the intervals between calvings is 18-24 months; the mortality rate of calves

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6 ibid, Annex 7 , pp 1, 2.

7 World Bank, Honduras, Country Economic Memorandum, Report no 6332-HO, Washington 1987. This intense pressure is common to other Central American countries. One recent study of the region's agriculture estimated that cattle took up three quarters of the land area of fincas in the isthmus, and that the resulting conflict over land made the livestock question 'uno de los aspectos centrales de la tematica agraria centroamericana.' Stein and Penate op. cit. p386.

is 14-18% or one in six; and the mortality rate for adult cows is 5-8%. This means that the live calf yield is only 33% compared to 80% in developed countries. Raising this by even 10 percentage points to 43% would increase the number of calves per year by 145,000-175,000, or for the same number of calves, cut the number of cows required by one quarter.

The government has for some time been trying to address the problem. I understand that there has been an extension programme targeted to improve livestock care, that there is an artificial insemination service to help upgrade the breeding stock, and a subsidised loan programme to finance the irrigation of pasture land. I am not in a position to assess these programmes, only to underscore their importance from the viewpoint of the producers and the meat processors.

Strategic issues for the sector

There are three main issues for the meat processors:

First, their future is critically dependent on the development of a more productive and higher quality cattle industry. Among the actions which could be considered for sectorwide adoption are:

1. re-assessing the decision to specialise on fattening to the exclusion of breeding by some of the large processors,

2. establishing extension services for small breeders.

3. providing good quality bulls, either through sale or rent, for small scale farmers to use.[8] As with extension services this would entail the processing plants developing direct relations with the small farmers, rather than relying on intermediaries for the buying of suckler calves.

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8 This was done by one of the meat processors for pig breeding. He would either sell or lend good boars cheaply to his regular suppliers.

Second, there is a need to improve quality and flow within the processing sector itself. Some of the issues have been discussed in Chapter 2. A policy of upgrading will involve the establishment of common standards for meat products, of testing facilities of the level currently employed by the meat exporters, and of transport and distribution chains which can ensure that products are kept fresh without the need for high levels of preservatives.

Vertical integration has been primarily used in the industry as a way of securing stocks and controlling market outlets. But it is the potential for raising the standard of production and distribution which should be stressed in any strategy of vertical integration.

Third, there is a need to raise the level of value added in the meat processing industry. The expansion of tourism, fast foods and air transport offer opportunities in this respect, and there will be a premium on establishing closing working relations between processors and those involved in final food services, to allow for experimentation and the development of new products.

IV

The Dairy Industry →

The dairy industry has been closely linked to beef because of the preponderance of fincas devoted to dual purpose cattle. Like meat, there has been a steadily growing demand for milk and dairy products, and like meat it has been principally been met by extensive rather than intensive farming. The figures for production and consumption in litres are given in Table 7.

Table 7

Consumption and Production of Milk

Millions of litres

Year	Consumption		Production	Imports
	Total	Per capita		
1978	281.8	83	229.0	52.8
1983	318.7	78	244.5	74.2
1988	335.3	73	275.3	60.0

Source: Central Bank

Between 1978 and 1988 consumption is recorded as having grown by 19% and production (in volume terms) by 20%. The national accounts on the other hand show the dairy industry as doubling in real terms between 1980 and 1990, and in doing so, it rapidly approached beef in importance in the cattle industry and overtook it in manufacturing (see Table 8)

Table 8

Meat and Milk 1980-1991

in constant lempiras (1978=100)

	1980	1990	1991
Gross value of meat products	158,793	117,071	n.a.
Gross value of milk products	41,486	83,086	n.a.
Milk as % of meat	26%	71%	-
Value added in meat processing	23,200	14,244	21,171
Value added in milk processing	10,500	17,943	12,491
Milk as % of meat	45%	126%	59%

Source: National Accounts

The figures suggest an interdependence of milk and beef. In 1991, the upturn in the export demand for beef takes place at the same time as a 30% fall in output of the dairy industry. The increased proportion of cows slaughtered that we noted in our interviews with meat processors, may well not only be threatening the beef breeding stock but the milking herd as well.

The industry is in two parts, with only limited links between them. On the one hand is the modern sector, which has two large diaries, Leche Sula and Leche Leyde, and one medium sized one, Delta. There are then another 6-8 modern dairies operating on a much smaller scale. These dairies draw 50% of their supplies from specialist dairy farmers, and 50% from the dual purpose herds, many of them small and medium campesinos. Their key problem is the quality and logistics of supplies. What was striking from our interviews, given the decline in sector output, was the evident lack of concern about the quantity of milk supplies. This may be because of the large number of specialist dairy farmers among their suppliers, and because many of the smaller suppliers in the neighbourhood of

the large plants and their collection points remained in milk because they are able to realise higher levels of productivity (daily or twice daily milkings) and have a secure output for their supplies.

The milk industry also has an option, not open to the meat processors, of using imported powered milk. In 1980 this accounted for 33% of the quantity produced locally (or 25% of total consumption). The fact that part of it came into the country as a donation from the EEC and was sold on at reduced prices acted as a disincentive to local milk production. But legal changes in 1987 and 1988 encouraged dairy processors to use at least 50% local production, and price adjustments have provided a further incentive for Honduran milk producers. By 1988 the proportion of powdered to local milk was down to 21% and by 1990 to 7%. It was not clear how far this option had been used by any of the modern dairies or ice cream makers to substitute for shortages of local milk.

As far as quality is concerned, each of the dairies we visited tested the batch received. One tested each of its suppliers daily, another could only do daily tests on 50 of its 2000 suppliers. In each case the purchasing dairy fed the results of the tests back to the farmers, and operated what was in effect an extension service to advise on feeding, hygiene, and farm management.

The key problems lie in the traditional section of the industry, which accounts for 75% of all milk produced. An estimated 28% of this is consumed by the producing households, and the remainder is largely sold locally or made into cheese in artisan cheese plants. There are some 150 of these plants, producing traditional Honduran cheeses. Many of the milk and cheese producers are outside the catchment areas of the modern dairies, and produce a distinct product for which there is substantial domestic and foreign demand (in El Salvador and the United States).

The two main issues for this sector are first the low productivity of the milk cows themselves. Given the pressure on land and extensive cattle farming, then it is important that the small and medium producers are able to raise their milk yields from a given acreage. One aspect - the rate of reproduction - we have already touched on in relation to beef, but there is also the question of the length of lactation and the amount of milk produced. We were quoted figures for the milk yield per cow of between 1.6 and 2.5 litres a day, with a lactation of 210 days, occurring every 18-24 months. This would give an annual average for each milking cow of 240 litres a year during its milking life, approximately one tenth of the yield from the average dairy cow in the UK (2433 litres a year in 1987).

The second problem is the quality of the cheese produced by the artisanal processors and their methods of distribution. At the moment a significant amount of this cheese has a high bacteriological content. Lowering these levels requires improvements in the methods of milking, collecting and in the methods of cheese production itself.

The Feed Standards Division of the Ministry of Health has begun a programme to help the cheese makers improve their methods, and this has run alongside the initiative from the Food Standards Department of the Central Bank (now at Unitec) to the same end. Over the past year the team involved have taken two sample pilot artisanal plants, one in Choluteca, and the other jointly run by 30 milk producers in Olancho, to illustrate the methods and benefits of a quality strategy. The former project is in a plant with 35 workers, whose owner has bought new equipment, and improved methods with immediate results, and is now considering the question of packaging and launching a brand name for the sale of the upgraded cheese in the Tegucigalpa market.

Chapter 4

Fruit and Vegetable Processing

I

The Sector as a Whole →

The fruit and vegetable sub system has traditionally been of three kinds: intensive plantation agriculture, focussed above all on bananas and pineapples; standard crops produced by small holders for export (coffee) or the internal industrial market (oil palm and tomatoes); and campesino production for self consumption and the domestic market. Among the latter the main crops have been citrus, avocados, potatoes, plantains, papaya, and a number of exotic fruits.

Processing reflects these divisions, and the balance between them. Because the traditional exports - bananas and coffee - are exported unprocessed (save for packaging) fruit and vegetable processing is relatively underdeveloped. That which there is partly represents diversification by the large banana companies. Standard Fruit has one of the two citrus concentrate plants which it uses to process oranges and second quality grapefruit (which in the early 1980's was reported as accounting for 60% of the crop). The concentrates in turn are used by the large milk plants for pasteurising into juice. The two plants take most of the available oranges which are produced by small holders, and the substandard grapefruits.

United Fruit had a plant which processed second quality bananas, and both United and Standard have African palm estates, extractors and refineries which produce a range of products from margarine, to cooking oil and soap.

The only other large plants are two in Comayagua which process tomatoes and can nectares. The two are both Honduran, one a

state concern shortly to be privatised, the other owned by a Honduran national. The former, however, is working at less than 10% capacity.

Thus the bulk of volume fruit and vegetables have not required processing, while campesino production has been primarily consumed fresh. There exist a significant number of artisan processors (with under 25 workers) producing jam, pickles, and pepper sauces, but these remain undeveloped.

The number of plants in the industry is shown in Table 1.

Table 1

Fruit and Vegetable Processing plants

	No. of plants
Manufacture of juices, processing and concentration of fruits	15
Manufacture of jellies	5
Pickles and sauces	14
Oil and vinegar	12
Packing of fruit, jellies, jams, vegetables	7
Bananas	79
Total	132

Source: "Desarrollo de productos agroindustriales" Maria Cristina Cifuentes, 1987. Inventario Nacional de Proyectos Agroindustriales 1985.

Of the 132 plants listed, 60% are concerned with packing bananas, and a further 36% are artisanal plants. We do not have evidence of how many of these small plants are still running. We visited four firms that were involved in making jam and there are at least another four small concerns currently running. We were told of attempts that had been made to manufacture citrus juice directly, but only came across evidence of one or two small juicing plants still operating, other than the nectar producers who use imported juice.

Performance

Taken as a whole, the industry has played only a minor part in Honduran food manufacture and it has been progressively declining. In 1980 it accounted for less than 6% of the food industry value added, and by 1991 it had fallen to 2.4%, a decline in its own output of 38%(see Table 2).

Table 2

Fruit and Vegetable Processing

Constant lempiras (1978=100)

	1980	1985	1990	1991	Change 80/90
Gross Value of output	33,133	19,285	24,870	n.a.	- 25%
Value added	8,280	5,062	5,689	5,145	- 31%
% of value added in all food manufacturing	5.6	2.9	2.7	2.4	

Source National Accounts

Does this matter? Is it not fresh fruits and vegetables which should be the main strategic concern? In North America and Europe there has been a move away from processed foods, and particularly canned foods, as well as from sugar rich products such as jams. In Honduras itself the demand for jam or preserved fruits and vegetables has never been high, because they are so readily available fresh.

Scope

There are reasons both of demand and supply for giving greater attention to this sector. First, the shift in northern diets towards fresh products has gone side by side with expansion of convenience foods. Instead of canned fruit northern consumers are now buying fresh fruit salad, prepared industrially and chilled. Instead of orange squash they are buying orange and other fruit juices. Hotels, caterers and final consumers are buying prepared fresh vegetables, as well as prepared meals using fresh ingredients. What this means is not a decline in the need for food processing but a change towards food preparation - an industrialisation of domestic production - away from food preservation, as new means of transporting and preserving food have come into play.

There is also a case for a strong processing sector from the supply side. On the one hand it is a complement to fresh fruit and vegetable production. The citrus and banana puree plants were both ways of using sub standard fresh fruit. This is a problem extending well beyond grapefruit and bananas. The melon growers have experienced a reject rate of 30-40% for their fresh fruit for export, and have been considering how these rejects could be used in processing.

A strong processing industry can also stimulate primary production. This has been the case with tomatoes, but it would also apply to juicing plants. Reports on the sector in the early eighties commented on the poor quality of the supply of citrus to processors. But seen from another point of view,

this provides the opportunity for the plants themselves to help growers upgrade their produce.

For small producers, particularly those far away from electricity and urban markets, there is also the factor that large quantities of traditional fruit are wasted. In the world as a whole one quarter of all fruit harvested is lost to storage or rotting diseases, and post harvest losses of 40% are common through over-ripeness, softening, poor handling, water loss, disease infection, and pest damage. Figures are higher for outby areas. Our visit coincided with the mango season, and it was common to see mango trees with a carpet of ripe fruit underneath them going to waste because their supply exceeded immediate demand. Just as cheese was traditionally a way for distant communities to preserve milk, so the traditional forms of fruit and vegetable processing - jam making, pickling or canning and bottling - are ways of preserving fruit and vegetables.

There is too a market for high quality products of this kind. Much campesino production is what would now be classed as organic. They either use organic means of fertilisation like the practise of growing beans which are then ploughed back into the ground. Or in the case of tree crops they may use no fertiliser, pesticide, or fungicide at all. Jams and purees using these ingredients now command a 30-100% premium in northern markets, and have the additional advantage of using tropical fruits unavailable in the north.

What needs to be investigated is how those small local processing plants which do exist in this sector and are closely linked into small farmer production, can be improved so that they can achieve what similar small local plants have done elsewhere namely a supply of high quality products to the domestic and export markets.

Packaging

One of the main barriers to developing the sector has been the nature of the packaging industry. The banana companies both have packaging plants, one producing cardboard boxes the other plastic bags and jars. But there is no glass bottling plant, and only two canning lines which have up to now been largely used by the tomato/nectar processing company which owns them.

As a result all fruit and vegetable processing that would normally use cans and jars, starts at a disadvantage. The jam makers for example find that 40-60% of the cost of a jar of jam is the cost of the jar, its top and its label. In the case of vinegar, the figure rises to 80%. Jars are imported from Guatemala, Panama, Costa Rica and Mexico, and carry not only the transport costs but the burden of wholesaling costs since most of the jam makers are too small to justify taking loads of their own. We visited one manufacturer who had recently developed a number of prototype jams, but withdrew from production because the cost of jars made the project uneconomic.

Similarly the lack of domestic canning has meant the import of cans, and the cost of doing so has discouraged fruit and vegetable canning. Significantly the concentrate plants package their output in drums, while the milk companies use tetrapak type packages.

Some companies have experimented with plastic or laminated packages. Plastic bags have been used to pack jam and milk, while nectares can be found in supermarkets packed in imported Swiss laminates. The rapid developments in modern packaging may mean that Honduras can by-pass the tin can, which is in any case on the decline, but there is no doubt that with freezing technology out of the economic or geographical reach of many of the producing areas, the absence of economic glass jar and canning facilities has been the single major blockage to expanding fruit and vegetable processing. The advent of

the Central American common market is likely to put existing producers under further pressure from Costa Rica and Guatemala where there is access to cheaper packaging.

Quality

The Central American common market will also sharpen the issue of quality. It is liable to be particularly acute for the makers of jams and jellies, but also for some fruit drinks. In the former case, the problems are ones of appearance as much as taste. In the case of fruit drinks there is a disjuncture: on the one hand some hotels and street stall holders produce freshly squeezed orange juice , on the other some drinks are produced with high levels of artificial flavours, colourings and additives. One of the concerns expressed about the freshly prepared juices is the danger of contamination, and this has led some hotels to stick with inferior reconstituted juices. But there is no necessity in this, and there is space for the expansion of high quality juices, with strict controls on hygiene.

The second issue of quality concerns the inputs. It is often said that 90% of the secret of good cooking is having good ingredients and the same is true for food processing. In this respect the potential contamination of inputs by agricultural chemicals has become a major concern in the Honduran food economy, partly because of an increasingly demanding export market, but also because of food scares within the country.

Among the recent issues to have emerged are the following:

- chlordane, which is a moderately toxic insecticide, has been found in milk and tobacco, and is likely to stay in the soil for at least 20-30 years.

- there is evidence of widespread atrazine contamination. Atrazine has a low toxicity for humans, but there is evidence that it may be transformed metabolically by plants to form a substance which is mutagenic. There are also claims that it can be transformed in the human stomach to its N-nitroso derivative which is carcegenic. This is a popular herbicide in Honduras for maize and chilli tabasco, and residues have been found in samples of both. Even if stopped, it will remain in valleys for at least 10-20 years, as well as contaminating water supplies.

- the highly toxic aldicarb nematicide was detected in banana plants which had been treated with this chemical, and came near to causing a catastrophe to banana exports in 1991

- two years ago it became public that 15% of eating apples had been sprayed with the Alar growth regulator which could cause cancer. Sales slumped and many growers went bankrupt.

- large residues of pesticide have recently been found in celery.

The problem in this area is that the potential ill effects of particular chemicals are often not discovered until they have been in use for some years, and by then it may be a long time before they can be eliminated from the soil and water tables. Furthermore, many of the problems in this field have come from over-use of these chemicals, which it is difficult to control when they are used by so many, widely dispersed farmers.[1]

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1 A comprehensive recent survey of the impact of agricultural chemicals on the environment, and food is that by Gordon Conway and Jules Pretty, Unwelcome Harvest, Earthscan, 1991.

In recent years there has been a much tighter regulation of agricultural chemicals in the North, and a shift among consumers towards organic and 'natural products'. For the Honduran food sector, it is therefore of the first importance for a strategy of quality that there are both tight regulations and the means for regular testing of soil and products.

The key institution in this field is FHIA, the agricultural research and testing laboratory, originally established by United Fruit, but since 1984 run as an independent not for profit organisation serving the food industry as a whole. It runs an agricultural chemical laboratory which analyses soils and plant samples and a pesticides residue laboratory, which has helped identify many of the cases of chemical contamination.

A complementary part of FHIA's work is the development of disease resistant strains and organic pesticides, They have been working to produce a pesticide free banana, virus resistant cucumbers, and an organic bacteria to control anthrocnose rot in mangos.

At the moment FHIA's pesticide laboratory is under-used. Partly the prices they are required to charge are beyond the reach of many smaller farmers and processors. More decisive is the fact that only in the major export crops (particularly tobacco) is there pressure on the producers to ensure the non contamination of products. We found only one small processor who occasionally used FHIA's facilities, principally to challenge the findings of Government laboratories.

It is a matter of some urgency that ways are found of strengthening the demands on all Honduran agriculturalists in this respect, and using FHIA's facilities to help monitor the current state of contamination of the soil and water courses, as well as testing produce. It is only by publicly accessible,

widespread testing that a strong enough pressure will be built up to make all farmers more circumspect about the way in which they use pesticides and herbicides.

FHIA has played an active role in improving primary product quality in other ways. In some cases such as plantains, the improvements involve significant capital costs. Plantains improved through an infusion of modern agricultural technology showed a profit of $1,985 per hectare a year, nearly 50% higher than returns on traditional growing methods. But the cost of the improved technology was $664 a hectare as against $190 using traditional practises, demanding considerably more capital for a lower return. On the other hand its cocoa programme focussed on improving the methods of fermentation and handling by small cocoa producers. This has led to significant improvements in the quality of cocoa at minimal extra cost; and it is on the quality of the cocoa that the quality of chocolate primarily depends.

Product and process innovation

As with quality, product innovation in this field is closely linked to primary materials. In the past ten years there has been an increasing emphasis on using the techniques of traditional mass cultivation - centred on plant genetics, irrigation, fertilisers and pesticides to produce a range of non traditional crops. Among the fastest growing have been melons , and squashes, which are produced by small growers co-ordinated by two large exporters, as well as cashews (also small growers), mangos, hearts of palm, black pepper, and blackberries.

Once more FHIA has played a pivotal role in these innovations, developing and piloting new varieties for commercial production. The hearts of palm, black peppers and blackberries are all FHIA innovations.

If a processing industry existed - with all its necessary specialisms - some of these crops might be drawn into it. Mangoes are a base for juices, jams, and canned or bottled fruit, and blackberries (mora) too have been used for jams and canning. But neither of these on their own are likely to provide the stimulus to make up for the gaps.

II

Palm oil

Of all the processed crops in Honduras, palm oil has shown the fastest growth. Between 1980 and 1990 the real value of its output grew by 268%, and its value added by 279%. This is compound rate of growth of 14% per year. Indeed the growth of palm oil accounted for 73% of all growth in the food industry, and 27.5% of growth in the manufacturing sector as a whole. In 1980 palm oil was 11% of all food processing in Honduras. By 1990 it was 30%, or one sixth of the food sector. It was by far the largest sub sector, twice as large as sugar, and four times the size of meat processing. This is a measure of the importance of palm oil to food manufacturing.

The cause of the growth has been the coming on stream of a greatly increased area of African palm, planted in the late 1970's, and the expansion of associated extracting and refining facilities. From 7,680 hectares under palm in 1976, the figure rose to 20,155 in 1981, and to 24,472 in 1990. Production of fresh fruit and of crude oil trebled between 1980 and 1985, and both have continued to rise since then,(see Table 3).

Table 3

Production of palm oil 1980-90

	miles de TM					
	1980	1985	1990	1991	% change 80/90	85/90
Fresh fruit	99	308	369	na	273	20
Crude palm oil	20	62	72	na	264	16
Refined vegetable oil	n.a.	2	11	9		440
Vegetable margarine	n.a.	29	44	42		52

Source: Central Bank

The industry is highly concentrated with 89% of the area planted to palm and of crude oil extracted under the control of three firms, United Fruit (with 22% of the area) and two federations of co-operatives who between them account for two thirds of the acreage (see Table 4). The federations contain respectively 52 and 32 co-ops.

Table 4

Main Palm Oil Producers 1991

Products	African Palm (hectares)	Crude Oil (000 TM)	Refined (000 TM)
Coapalma (co-operative)	11,511	33,000	-
Hondupalma (co-operative)	4,700	10,934	-
Numar (United Brands)	5,483	20,000	24,588
Blanquita (Standard Fruit)	1,778	7,564	14,584
Inhalsa	-	-	11,887
Independent growers	1,000	-	-
Total	24,472	71.498	51,059

Source SECPLAN

The refining is similarly controlled by three firms, United Fruit's oil and margarine company Numar, with a third of production in 1990, Standard Fruit with 30% and a Honduran company Inhalsa which is also in animal feed. These three account for all margarine and edible oil production. A sixth of the crude oil goes to three soap factories, two of them within the United Fruit and Standard Fruit groups.

After a decade of such rapid growth the industry is now in difficulties. In 1991, for the first time in a decade processing value added fell, by 6%. The latest figures for the first five months of 1992 show an even sharper decline of 26% compared to the same period in 1991, or a fall over a third since 1990.

The problem is not one of supply. Planted acreage has continued to expand, as has the supply of fruit (for 1991 at least). Rather for an industry that has always been largely focussed on the home market, it appears that there has been a saturation of domestic demand, revealing an over-capacity in the industry. This over-capacity has led to a sharpening of competition and a split in the industry as each of the five major players seeks to secure its position.

The company in the strongest position is Numar, which is integrated from raw materials supplies, through extraction, refining to final distribution. Its palm acreage supplies two thirds of its needs, the remainder being taken from the two co-operatives. Its strategy in relation to market saturation is product differentiation and new product development. This was the one firm we talked to in the food industry which saw the market explicitly in these terms, with the scope for products aimed at those with dietary needs, one for biscuit cooking, others with different colours and flavours, soft and hard, bowls and sticks. The firm had a new product development committee and spent six months on new product preparation and launch.

The two co-ops have faced a decline in their market, and the one whose plant we visited had ten weeks stock of crude oil in its tanks. The other has responded by integrating forward, commissioning a refinery from Malaysia which is due to open in May 1993. The response from at least one of the refiners has been dramatic. Short of crude oil supplies of its own, it has stopped purchasing from the main co-op and has gone over the

head of the Federation by offering to buy out the Federation's individual co-operatives.

What is happening - and it is a common occurrence in such situations - is destructive competition. Prices have been driven down, costs are up as stocks rise, and strategic time is spent on acute competitive warfare.

A feature of industries organised around flexible specialisation is that they seek to approach general crises collectively. Indeed it has been one of the long term advantages of such industries that they have been more flexible and adaptive to crises. In the Italian town of Prato for example, a cloth making centre with a population of 160,000 and 14,500 clothing firms, the recent fall in their market led to the establishment of a working group of industrialists, unions and municipal officials and councillors to identify a diversification strategy which the whole town could follow. It involved building on the specific skills of design and product in reconstituted cloth and applying them to software.

In the case of oil palm, there are two problems which need to be tackled by the industry as a whole. The first is how to export. The industry's growth has been almost entirely one of the domestic market. The world market is dominated by Malaysia, and world prices in Rotterdam are 25-30% below those ruling in Honduras. There was some suggestion that Honduran oil was not of sufficient quality to compete, but one knowledgable member of the industry thought Honduran oil was better than Malaysian because it had been developed for a consumer market, while the Malaysians had focussed on commodity markets.

There are transport factors which narrow the margin between domestic and export prices, but the margin remains, and present difficulties at least for one of the co-ops whose own profitability has been dependent on the domestic premium. In

spite of this - and because of the blockage in the domestic market - Coapalma is currently making its first major export through a US broker.

The tightness of the export market raises the second issue, which is how, if at all, the cost of Honduran palm oil can be reduced and its quality improved so that exporting is profitable. One issue stands out, which is the size of stocks within the industry as a whole. I have discussed the details of this sectoral stock problem in Chapter 2. All that needs to be noted here is that a co-ordinated policy of stock reduction throughout the industry could both save large working capital costs and free up the costs of warehousing. But it requires the development of a system of flow from the palm fruit producer to the retailer.

The problem is that the industry itself is divided at the very time when co-operation is most needed. The divisions are not merely between Coapalma and those who are trying to split it, but between the two co-operatives themselves. They are historically the result of a split, and their only substantive form of mutual working is the setting of a common price vis a vis the refiners. It would be paradoxical if two organisations who have been so successful in building internal co-operative relations, were unable to find means of working on productive issues with each other and with others in the sector.

Only those within the industry will be able to judge how these tensions could be overcome. Clearly the export issue is key, and some way should be find to discuss how the industry as a whole could benefit from the strength of a decade's growth to expand exports of crude and refined products. What an outsider can do is to point to the dangers of destructive strategies at a time of market decline, when there are issues which can only be adequately resolved through some measure of associated action.

SYSTEMS

Chapter 5

Types of Food System

With the shift in interest from firms to systems, there has been a growing body of research on the inter country differences that can be found in organisational traditions. This applies to forms of organisation both within firms and between them. As the parts of an industrial economy become increasingly independent, so the way they are linked is recognised as a critical variable.

Much of the discussion of these issues has focussed on manufacturing production, and within manufacturing on assembly industries. Much less attention has been paid to process industries or to industrial sub systems which include primary, manufacturing and tertiary activities.

Nor until recently has much attention been paid to the question of industrial organisation as applied to developing economies. The research that has been conducted on these issues has suggested that developing countries have open to them a wider range of organisational options than earlier industrialisers where particular types of industrial organisation and culture are more firmly set.

As far as the food system is concerned we can distinguish four main types. The first has its main links established through the market. Farmers sell their output either directly through public auctions and markets, or through middlemen. Processors are supplied by the middlemen and usually distribute through wholesalers, who in turn supply independent retailers. Though the farmers may be important as a group influencing government economic policy, the key organisers in this system are the middlemen and wholesalers. The middlemen have the advantage vis a vis small farmers of better access to market information

and to transport, as can be seen from the wide divergence of price recorded in nominally competitive markets for agricultural produce in developing countries. The wholesalers in developing countries tend to be most concentrated, because of their historic association with import and exports, and have informational and market power with respect both to processors and retailers.

In this system there are not only wide ranges of prices but also of quality, and there is particular weight attached to the skills of buying and selling, of comparing alternatives., judging quality, and bargaining. The system is subject to some state regulation designed to restrict the practices and ingredients which are an immediate threat to health. Other than this the ruling principle is 'caveat emptor' or 'buyer beware'.

The second system characterises the food industry in North America and the UK. Its emphasis is on vertical integration and the shift of influence from the intermediary merchants and wholesalers to the processors, retailers and large primary producers. In the first half of the twentieth century the main force for re-organisation came from the processors.

The revolution in production introduced by Ford in motor assembly was also to be seen in food processing, with the rise of large companies producing a limited range of standardised branded products: Heinz, Nestle, Kelloggs, Unilever and so on. Competitive strategy was centred on lowering costs through long runs, high levels of mechanisation, and the achievement of process flow from primary product to final retail. In some cases this meant the processors owning their own farms, in others employing farmers to produce a standard variety on contract. One of the innovations was to co-ordinate primary production, transportation, storage, and processing to ensure an all year round supply of raw material. The processors also controlled the distribution of finished products to the retailer.

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SYSTEMS

Under this system the brand name became the guarantee of the product's 'sameness' and its quality. Each tin of Heinz baked beans would be the same as any other, and Heinz adjusted sugar content to variations in tomatoes to ensure that this was so. The consumer was no longer called on to judge quality, or even price as manufacturers set prices, and focussed their competition on product differentiation. The firms developed large research and development departments. The marketing agency Nielson recorded upto 7,000 new food products a year during the 1970's, most of them small changes in packaging, or composition. They also had large marketing budgets, with food accounting for one third of all manufacturing advertising in the US in the 1980's.

In the post war period, retail chains rose to prominence. They sought economies of scope as well as economies of scale, and by promoting themselves as a generic brand name, carrying cut price 'own label' goods to compete against the established brand names, they shifted market power away from the processors. By revolutionising flow through the phase of distribution and retail, cutting stocks, and expanding sales per square foot they were able to compete with established brands on price.

In the UK the processors have responded by diversifying forward into catering and hotels, just as brewers have integrated forward into the control of retail outlets. The result is a food industry which has been increasingly concentrated vertically and horizontally. In Britain the top four retail grocery chains have 75% of the market. In the US the share of the top four retailers in metropolitan areas (which is the relevant area for retail competition) rose from 49% in 1958 to 58% in 1982, while the share of the top four firms in the sectors producing branded goods went up from 40% in 1963 to 50% in the mid 1980's.

The key point is that the focus on the flow of mass produced standardised products puts a premium on the co-ordination of each stage of the food system. This could be achieved through ownership or by contract for the delivery of a specified type and standard of input. New products came primarily from the laboratories and marketing departments of the processors and the rest of the system adjusted accordingly.

From the viewpoint of production, most of the new products could be introduced with little alteration in the production process, since machines consisted of general purpose choppers, mixers, cookers, and packers . Unlike the assembly industries, changeover times were low, determined by the speed of cleaning, particularly where production lines were organised around families of products. There was therefore a flexibility in production which allowed for multi product flow. Most food firms, however, concentrated on expanding existing brands geographically, securing supply lines, and sectoral diversification. They were among the leaders in the internationalisation of corporations in the pre war as in the post war period.

The strength and weakness of this system is its standardisation. It is a strength in that it guarantees a certain level of food safety and taste. It is a weakness in that it leads to a loss of diversity of foods, to an inflexibility with respect to inputs, and to a food economy which is unrooted in relation to local products or culinary traditions. Put another way, the demands of a standard product mean that the conditions at every point of the food chain have to be similarly standardised, from the seed or species of raw material to consumer tastes. It is a closed rather than an open system, relatively weak in substantive innovation.

These limitations have led to the emergence of a third system. In this case the overall co-ordination of the system is lodged in a major firm, but each part has more independence than in

the vertically integrated model, with scope for the introduction of new products. The driving force are the large retailers. While some chains are remain mass retailers, offering branded goods at low prices, others have followed a strategy of wide product range and quality which, in Britain at least, has led to their market dominance.

One example is the largest British food retailer, J. Sainsbury. Their major stores stock 12,000 items, almost all of them produced by independent suppliers. Sainsbury's provides technical advice to help the suppliers reach its quality standards, as well as running laboratories to ensure that those standards have been met. Whereas some mass retailers use electronic point of sales systems primarily as a means of cutting stock by adjusting orders of standard items, Sainsbury's uses it to test responses to new products. It acts as the editor between the market and new product ideas, some of which come from its own staff, but many from its suppliers.

Marks and Spencer, originally a clothing store, has diversified into food retailing with a similar system. Their market strategy has been to emphasise quality and freshness before price, and this has led them into close monitoring and advisory relations not only with their suppliers, but with the suppliers of the suppliers, so that they can guarantee low additive and contamination levels in their products.

The critical distinction between the second and third systems is not one of ownership. Many of the mass food processors and retailers do not own their suppliers. It is rather the broader competitive strategy, the method of generating new products, and the co-operative character of the relations between retailer (or processor) and supplier.

The third food system has similarities to those that have proved so successful in manufacturing assembly in Germany and Japan. In Germany firms like Bosch in electrical instruments

insist that no supplier is more than 20% dependent on their orders. This is partly to ensure that a cut back of Bosch's production does not lead to the destruction of the supplier base, and partly because it believes that suppliers working for a range of customers are stimulated to innovate in a way which will benefit Bosch. Large Japanese firms also lay stress on the need to develop product specifications with their suppliers and indeed choose their suppliers on the basis of their capacity to work with the anchor firm to improve products and generate new ones. This is in contrast to the mass production procedures of drawing up detailed specifications and putting them out to tender.[1]

What has been found common to all successful systems of this sort is a strong regional network of suppliers and specialist service companies with whom co-operative relations can be built. When Toyota moved to Canada three years ago they said that their greatest problem was the quality of local suppliers, so that initially they had to import many components from Japan. They made the development of a local supplier network one of their two major priorities (the other was skilled labour). If this is the case for auto assembly it is doubly so for food, with its greater perishability, and higher transport cost to value ratio. The large 'post Fordist' retailers are deeply rooted to their local supplier networks, which is one of the reasons why such retailers have been slow to internationalise.

The fourth system has many of the same characteristics as the third, but a different institutional structure. It is based on networks of small and medium sized firms which have developed joint institutions to provide the services that, in a large firm, would be provided by the head office.

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1. For an interesting comparison of the approach to suppliers by US and Japanese firms in the American electronics industry see Michael Best, Robert Hopley and Dean Schroeder, "Supplier Bridging for the New Competition where 'Blueprints do not work anymore'" paper to the 10th Annual International Conference of the Strategic Management, Stockholm September 1990.

The region most noted for such a system is the middle region of Italy, in the area stretching from Veneto in the North East down through Emilia Romagna to Umbria and Tuscany. Until the early 1960's this was an area of sharecropping. Modernisation in the food sector has taken the form of associations of small farmers being established to process and distribute agricultural output, as well as associations of processors, which are closely involved in the wholesale and retail chains. In Emilia Romagna for example the production of parma ham is concentrated in small towns in the region of Parma. An association of 200 producers, The Consortium for the Protection of Prosciutto di Parma, controls quality and administers the trademark. For Parmesan cheese there is a consortium of 900 factories, 85% of them co-operatives, and a similar proportion holds for other parts of the milk sector. There are similar arrangements for wine, fruit and vegetable processing, as well as branded fresh fruits.

Three things stand out. First, these products - many of them oriented to world markets - come from industrial districts, where you can find specialised services, mechanics, and training and education all geared to the needs of the particular product. Proximity means that producers know each other socially as well as economically, an important condition for the establishment of trust on which these decentralised industrial systems so much depend.

Second, each product has established specialist quality and research centres in their zone. The centres ensure that each firm has access to advanced quality control equipment, and they themselves conduct 'supertests' to ensure that the testing is being done properly. At the same time their research staff scan the world for developments in product and technology, and relay the result to each member of the consortium. They hold seminars, briefing sessions, and contribute to a newspaper produced by the food department of the regional government for the food industry as a whole.

These structures have allowed Emilian food producers to follow a policy of `continuous improvement' in the quality of their products, regularly raising standards to take on board the new concerns about health and the environment.

Third, this system starts not from decisions about which of a range of standard primary commodities to produce according to market prices, nor from the problem of how to expand market shares for a standard processed commodity, but how to improve the quality and value added of commodities which have long been associated with the region. In this sense it is a system which is heavily rooted in localities and the inherited structures and traditions of production.[2]

What emerges from a comparison of food systems is that although there is a long run tendency for some form of co-ordination to replace early forms of the market model, there is no one model of co-ordination to which all others are tending. Standardised volume production organised through vertically integrated, transnational food firms is strongest in North America and Canada in part because of the historical absence of an old order of production and consumption to which modern mass production had to adapt. The existence of such an old order in Europe - associated with widespread peasant agriculture and local food processing - helps explain the different food economies to be found there. French wine, bread, and cheeses are all to be understood as the outcome of strong local and regional food economies which have resisted the trends to massification, either from processors, or mass retailers. Britain has been closer to the North American model, in part because of its earlier destruction of small farmer agriculture, though there has recently been a consumer led reaction against standardisation, reflected in the growth

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2. The primary material on the Italian food system is in Italian. See for example, Entre Regionale di Sviluppo Agricolo per l'Emilia Romagna, L'Agro-Industria in Emilia Romagna: Situazione e Prospettive, Rapporto 1990, Bologna June 1991. For a broader discussion of the the Third Italian model in manufacturing see Michael Best, The New Competition, op.cit. Chapters 7 and 8.

of local 'real' beer, cheeses, and ethnic, natural and speciality products. This helps explain the success of the new retailers like Sainsbury and Marks and Spencer who have been able to adapt modern retailing systems to this increasingly demanding and rapidly changing market.

Developing countries find themselves facing a number of contending forces as they modernise their food systems. There is a strong pressure for the production of standardised primary commodities (some of them with an element of processing) for consumption in Northern markets. There is an equally clear tendency to expand standardised products in domestic markets - whether they be branded goods such as those found in the North - or outputs produced with standardised technology developed in the North (like broiler chickens, battery eggs, large factory bread and cheese and so on). The tension is between these pressures for standardisation and the traditional food system, of farmers, small processors, distributors and consumers. The modernisation of food production and distribution through intensive methods and standard technologies can become separated from the traditional producers, stranding them as market prices fall, and urban tastes adjust. In earlier industrialisation experiences in the North, those displaced from agriculture, artisan processing and small scale distribution had the opportunities of jobs in the expanding industrial and service economy. But in the developing world , particularly in Latin America and Africa, these opportunities have been restricted and unemployment levels have climbed.

One of the challenges for food policy is how to prevent this disjunction occurring, how to upgrade the traditional food system, building on its strengths and addressing its weaknesses, gearing it to the new markets, internal and external which are emerging. It is here that the third and fourth systems are suggestive because of their capacity to relate to and strengthen non standardised producers.

Chapter 6

Food Systems in Honduras

The food system in Honduras has traditionally been of the first model. With the exception of the large export companies, like United Fruit and Standard Fruit, the predominant pattern has been for primary producers to sell their produce through middlemen (coyotes), who in turn supply the final market. Processors usually buy from local producers, from coyotes or from the market, and sell through distributors. One of the large distributors we spoke to had started as the distributor of the products of transnational companies and then added local products to its range. Retailing is done either through public markets (for fresh food) and/or through small retail outlets.

Over the past fifteen years this system has begun to be replaced by the second model. The strong trend through the Honduran food industry is for vertical integration. In the case of the food wholesaler in our sample. We found that the transnationals importers were moving to establish their own distribution network, as were the large processing firms. Of the twenty five large and medium processors on whom we were able to gather data, fourteen had their own distributors, while the majority of the remainder were producers of intermediate products and had direct sales relations with their customers. It was the small processors who were dependent on the independent wholesalers and they accounted for only a minor share part of the market.

Pressure was therefore put on wholesalers. One to whom we talked had integrated backwards into the processing of food and household goods, starting in the late 70's and early 80's. His own production now made up 60-70% of his distribution business. Another had integrated forward into retailing, which now accounted for 90% of his business, and was part of an informal network that also included a large food processor.

In processing the move to vertical integration is even more marked. Not only have the medium and large firms moved to control their own distribution system, including their own retail chain in one case, but many of the firms in meat exporting, meat processing, and the processing of fruit and vegetables have integrated backwards to provide their own supply of primary products. As the study of the meat industry in Chapter 3 makes clear, the control of supplies of livestock has become a critical point of competition in this sector. In the intensive sector of the industry the integration has derived from the feedstuff plants, particularly with respect to chickens whose production is also integrated from breeding to slaughter. In fruit and vegetables, the concentrate and puree plants were established to use up second quality fruits, while the tomato puree plants produced some of their own raw material.

The summary data is presented in Table 1

Table 1

Vertical Integration in Food Processing

	Number of firms with:					
	Own primary supplies		Own distribution		Own seeds/ breeding stock	
	Yes	No	Yes	No	Yes	No
Branch						
Meat exporters	3	0	1	2	1	2
Meat processors	4	1	5	0	3	2
Fruit & Veg	4	0	1	3	2	2
Palm Oil	5	0	2	3	0	5
Animal feed	1	0	1	0	1	0
Milk	1	2	3	0	0	3
Flour	0	2	1	1	0	2
Sugar	1	0	0	1	0	1
Biscuits	0	1	0	1	0	1
All	19	6	14	11	7	18

Source: Company Interviews

What emerges from this table is the importance of integrated supplies, the fact that at least half the firms do their own distribution, (of the rest few use wholesalers), and that in some sectors control of seeds/breeding stock is significant. We should also note the only sectors in which vertical integration does not play a major part are the milk industry, biscuits, and maize flour.

As far as the third type of food system is concerned, the retail sector in Honduras is still predominantly small scale. Supermarkets account for only 10% of sales and have not yet established the influence within the food sector that the majors have in North America and Europe. Nor have they yet adopted a 'Sainsbury' type of relationship with their suppliers. The nearest thing we found to this was the packers/exporters of some non traditional crops, who have played a central role in organising the smaller growers, establishing standards, cropping patterns and so on.

It is the food processors who have taken the lead in establishing networked relations with small suppliers and clients. The large chicken producers for example contract out the rearing of broilers, as do the meat processors with their young steers. The tomato puree plants get some of their supplies in this way. The animal feed producers have a similar client network, which they service with technical and managerial advice.

These forms of sub contracting can be various kinds. They may be little more than ways of organising small farmers to carry out specified, semi skilled tasks in the traditions of Scientific Management. Or they can be interactive networks of the kind established in Germany and Japan. A quality programme for the food industry in Honduras is heavily dependent on the successful establishment of the latter. I was not able to assess sub contract relations as they currently exist. Some firms were aware of the significance of

the issue and had been trying to collaborate with suppliers on quality and products. It would be useful to have a follow up study specifically focussing on supplier relations, and to organise a workshop for lead firms and suppliers as part of the study

The fourth model is likewise relatively weak in Honduras. Most of the collaboration that has taken place has been in the primary sector, although both Hondu Palma and Coa Palma are examples of primary co-operation successfully extending forward into processing. We were informed of five separate groups of milk producers who are running their own small scale processing plants, most of them producing in the range of 4,000-5,000 litres a day. Another 6 associations are wanting to do likewise. There are some women's jam making co-operatives, and a number of similar projects are at the feasibility study stage, involving butchers and bakers. So there is some tradition of association in the country, as well as a stratum of family firms which have been key elements of the Italian system.

But, other than in the palm oil sector, the extent of this type of network has been limited. While there are these individual instances, the critical issue of small and medium firms in the sectors we have studied is how to establish links between themselves to gain the economies enjoyed by the larger firms. I discussed this in chapter 3 in relation to feed mills. The same point is relevant to the cheese-makers, the jam producers, and the small juicing and bottling plants.

In a world of increasing interdependence, the concept of the firm needs to be replaced by the concept of the system. This is true for the large firm as well as for the small, but for the small it is particularly urgent. If they are not part of a wider network they have little chance of survival at a time when food production, processing, and distribution are all undergoing a major transformation. We were told, for example, of three different women's projects to raise chickens, all of

which have failed. The reason for the failure was the same in each case: the cost of feed, and problems with the day old chicks. If small projects of this kind are to compete with the large integrated poultry operations they must have access to their own economic sources of chicks, and their own feed, and they can only achieve this through collaboration. Small firms have, in short, to have their own circuits of integration, which elsewhere have led primary producers not only into processing but into distribution and retailing as well.

In some cases - chickens would be one, cheese another - a source of competitivity is the distinction of the product from those of the large industrial producers. There is a growing market for naturally raised chickens in northern countries, as there is for distinctive local cheeses. This provides a potential advantage for smaller producers if they can together secure the levels of plant hygiene, the quality control facilities and the brand names that are required.

Another source of competitivity comes when such circuits are established within local and regional economies. There are two elements of importance. First the development of product specialisation which permits a division of labour amongst producers. Specialisation of this kind is a form of collective efficiency, characteristic of industrial districts. Second, the growing, processing, and distribution of food within a locality may face some disadvantages of smaller runs, but it has the advantage of lower transport costs. It also allows a close link to be established between retailers and producers. Instead of producers selling to and retailers buying from urban wholesalers, their interaction can provide a mutual stimulus. Retail outlets become the shop window for local production, as do hotels and restaurants in areas of expanding tourism.

I had limited opportunity to examine the degree to which local food economies have survived in Honduras. The impression I got was of the weakness of integration as shops, caterers and

hotels sought to buy standard commodities distributed through national wholesalers, rather than local produce. In the tourist areas in the North for example we found hotels importing green beans and potatoes from Miami, and buying standardised fruits rather than distinctive local produce. In one instance a meat processor found his market to the tourist islands seriously affected because of the unreliability of the boats which had caused shipments to deteriorate. So the problems were those of transport systems as well as buyer purchasing policy. This is an area which merits further work, in the sense that a policy for the food industry in Honduras must in part be a policy for the food industry in particular localities.

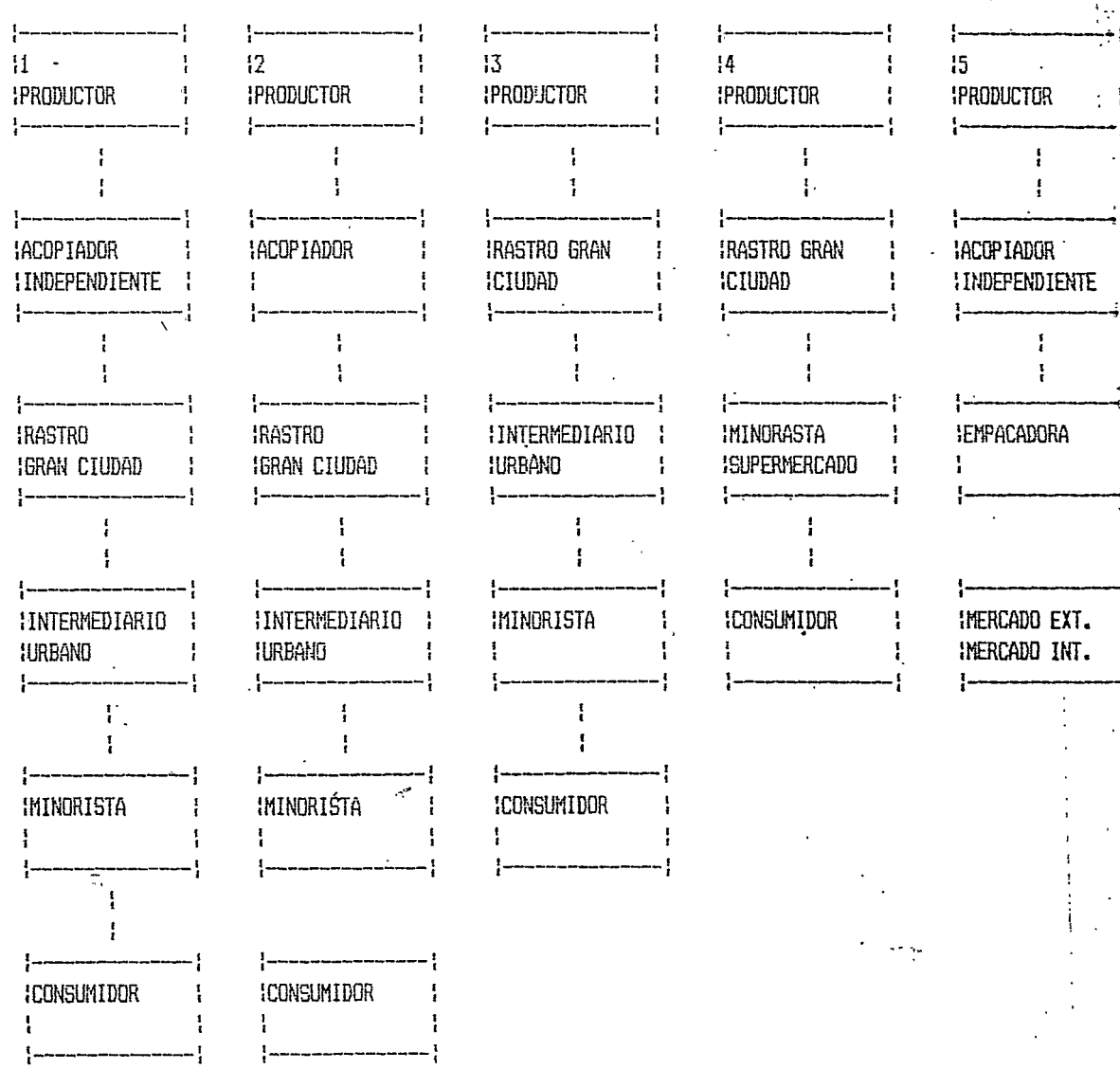
The overall picture that emerges is that the Honduran food economy is currently a hybrid of systems, each with their own logic. We can illustrate this with regard to meat. Figure 1* (see attached) shows the alternative systems now in operation. Chains 1-3 exemplify the first system described above, where a major role is played by intermediaries, cattle dealers, and wholesalers. In chain 4 the farmer goes straight to the slaughterhouse, and sells to the supermarket, the slaughterhouse commonly acting for a fee rather than as a buyer and seller of the stock which it handles. In chain 5 the key position has shifted to the packer and processor, who controls the bulk of supply, distribution, and in some cases retailing. In Honduras there has been a gradual trend towards this system.

The main strategic point, however, is that while the traditional system no longer provides the degree of co-ordination and guarantees now required, there is no inevitability about what type of system will replace it. In chain 5 the integration is centred round the packers. It could be organised by the supermarkets (meat is one of the areas where British supermarkerts have had their own facilities because of the problems of quality). It could be organised by groups of cattle farmers integrating forward, or

Figure 1

FIGURA No.2

ESTRUCTURA DE DISTRIBUCION DE CONSUMO INTERNO



by urban butchers integrating backwards. There is a range of alternative precisely because of the transitional point which the food system in Honduras has reached. In this sense the organisational question is open.

This is important if I am right in suggesting that versions of the third and fourth system are necessary if small and medium farmers and processors are to have a place in a transformed food economy. They will find it difficult to modernise within the framework of the first model, and difficult to survive in the framework of the second. The third and fourth are more difficult to develop from a policy point of view since so much depends on qualitative relations between firms rather than the adjustment of regulations, price, and foreign trade arrangements. But what we know from other developing economies is that the traditional forms of industrial policy have found it difficult to generate the kind of industrial growth with which this report is concerned. We are also learning from other experiences the types policy approaches that have been successful.

In the final chapter I discuss some of the ways in which this strategic perspective can be taken forward. What emerges is that many of the key agents - the firms themselves, the consumer movement, standards institutions, the relevant sections of the state - are not at the moment geared upto a policy direction of this sort. With the exception of parts of the Central Bank we found little evidence of a capacity for the formulation of long term sector strategy. There were few institutions - even amongst the industrialists - which could provide the context and stimulus to develop forms of collaboration on sector issues. The means of regulating and encouraging food quality within Honduras were notably weak in comparison with those operating on exporters.

Steps need to be taken on all these fronts, but the most important is the development of a shared perspective. For collaboration to be possible, the parties to it need to have a common reading of the problems which they face. This applies to government departments as much as individual firms, to banks as much as to farmers and research institutes.

The present report, including the recommendations which follow, are intended as an input to the process of developing a common perspective, not as a set of proposals to be mechanically carried out. Just as the limits of Taylorism have been recognised in industrial production, so they are also becoming apparent in the process of industrial policy. For successful policy requires that those who implement it share in its formulation and understand its purposes. When policy relied on regulations and the adjustment of macro variables, it was enough that the politicians and their advisers shared an understanding. But if the shaping of new industrial strategies is recognised to depend on a change in perspectives of the producers themselves, then strategic discussion must take place there rather than be confined to the central organs of the state. From this point of view the process of formulation through the widespread discussion of a strategy is itself the first step in implementation.

RECOMMENDATIONS

Chapter 7

A Ten Point Plan

I. Quality from within

Some of the actions necessary to further the ideas of the new production lie within the competence of each firm. Others need joint action and the first set of recommendations concentrates on these. They may be either at the level of the food industry as a whole, at the level of sectors, of networks of firms, and of local industrial groupings.

1. Industry issues

There are some issues which concerns the whole industry. It is suggested that in each of these, working groups are set up, supported by a co-ordinator, to consider a strategy which can be put into effect by the food industry jointly.

a) packaging

For some branches, packaging is the critical component of costs and of presentational quality. Among the questions to consider are:

- the absence of glass bottlemaking, and of suppliers who can cater for small quantities of customised glass.

The two alternatives are either to work with one of the Central American suppliers to flexibilise the line, or to set up a facility to make cheap bottles available within Honduras.

- the existence of only one canning facility in the country, currently in a factory undergoing privatisation.

This is a facility which is of the first importance for any project to expand fruit and vegetable processing. It is recommended that it is sold in a way that will ensure that it serves the sub sector as a whole. It will also be necessary to reduce its changeover times to allow it to produce low cost short runs of varying sizes of can. This is something on which immediate action can be taken.

The structural problem is that the facility is the only one in Honduras. The only constraint on its monopoly power is from imported cans from elsewhere in Central America. There are two possibilities:

* that the facility is owned and managed by a consortium of users, with provision that new users can join the consortium, once they are purchasers.

* that an individual firm, separate from the users, operates the plant, with minority shares for the users.

The most appropriate form is one that ensures that the users are served by the plant and are not held hostage by it.

- issues on the flexibility, reliability, and quality of the plastic packaging suppliers to the food industry.

The absence of local cans and bottles has meant that a number of manufacturers have adopted plastic packaging for such things as jams, fruit drinks, and milk. There is thus a premium on a packaging sector that caters for non customary needs, and provide a service that is able to design plastic containers for particular uses.

Joint discussions need to be held between packaging users and suppliers with a view to identifying the key needs for upgraded packaging, and the constraints on supplying firms to meet them.

- new packaging techniques.

A number of Honduran firms are experimenting with new techniques, using materials imported from North America and Europe. What is required is a common facility that provide up to date information of new packaging technology, its sources of supply and costs, to all parts of the food industry,

- environmental packaging.

One of the main forces for innovation in packaging has been the environmental movement. It has raised concerns about the impact of various forms of food packaging on health, and of non degradable packaging on the environment. As a result The Netherlands and Germany have introduced radical new packaging laws, whose aim is to reduce the quantity of packaging progressively by the year 2,000, and to increase the proportion of it which is recyclable. Pressures are now on the European Commission to follow suit, and there are similar demands being raised in the United States.

One of the responses from the industry has been the development of bio degradable plastic packaging. Lighter plastics have been produced , as well as customised materials. A number of governments have also introduced charges for recycable packaging, including glass bottles and jars, tin cans, and certain types of plastics.

b) transport

We received many comments on the problems of transporting food. There is the unreliability of freight transport to the Bahia Islands. There is the lack of refrigerated lorries in the processed meat and dairy industries, which is an important contributor to the problems of quality in those sectors. There is also the question of airfreight of food exports, and the effective use of return loads nationally and internationally.

This should be the subject of a working group of the food industry, which should consider how many of the issues can be resolved through inter-industry discussion, and where wider programmes are needed for industry and public sector action.

c) food education and training

In most of the firms visited the level of formal training was low, in relation both to occupational skills, and basic skills needed for active participation in the new forms of production. One notable exception discussed in Chapter 2 is the El Zamurano Agricultural College,, which, because it is a college, sees its production as a process of continuous learning. It provides regular training for its manual workers who in turn are required to teach the students on the shop floor. The extension of this philosophy of training, together with training techniques and materials, is necessary throughout the industry, for large firms as well as small.

A number of public and private institutions have developed useful programmes of training and education for the sector, but it is important for the industry to meet with these institutions to discuss:

* a strategy for the upgrading of training, on and off the job,

* the incorporation of the new production and organisational approaches into existing food sector education.

d) purchasing

Strong supplier relations are a central feature of flexible specialisation. It is recommended that:

- a workshop be organised on modern purchasing practise and supplier relations, both for food manufacturers and those in the catering and retail sector.

- a study be undertaken of the experience of sub-contracting in the Honduran food industry, from the viewpoint of the lead firm and the sub contractor. This study would be an input into the purchasing workshop.

2. Sector programmes

Intra industry collaboration

There will always be a tendency for individual industrialists to treat their ability to respond to a common problem in the industry as a source of competitive advantage . This was the case with the purchase of ingredients in animal feed processing. For smaller mills where raw materials were 80% of the cost of the product, purchasing skill was one of the keys to competitive advantage. Yet seen from the viewpoint of the industry, all the small mills suffered from the same problem, and even those who were successful relative to their competitors, remained at a decisive disadvantage in relation to the large mills. They had a common interest which stood above particular interests.

One of the most difficult tasks in the adoption of flexible specialisation is for industrialists to be able to move beyond destructive to creative competition. A condition for this to happen is that there are places and occasions at which manufacturers can meet. Some sectors have their own economic meeting places: cattle markets, trade fairs, overseas trade missions are all examples. But the impression we got from our discussions was that in many sub sectors there was little formal or informal interaction of the industrialists as a group.

Sector associations

One way in which this problem has been addressed in other countries is through industry associations. In Cyprus for example, the Federation of Industrialists was organised into sub sectoral branches, which met to discuss common problems, to run seminars, and discuss general policy from the viewpoint of their industry. They also played an important role in the development of an industrial strategy of flexible specialisation, holding meetings to discuss strategy documents for their sector, forming working groups, visiting overseas experiences of flexible specialisation in their industry, and arranging seminars where specialists talked about the new production systems as applied to specific industries.

Such associations have been an important feature of Japanese industry, where an industrialist may be a member of a range of associations, one for the specialist industry, (sugar for example) another for a group of suppliers to a large firm, (for instance those supplying materials to feed mills) another between a group of local industrialists and the local banks, and so on. Industrialists consider active membership of such associations a necessary part of running their business not as a distraction from it.

In Italy the associations run joint facilities - such as skill centres, and what the Italians call 'real services centres', centres for the provision of market, technological and design information. They may operate joint facilities, like an updated record of supply capacity, and products for potential purchasers. Some organise a common showroom. This is easier where industry is locationally concentrated, but some of these services -particularly those concerned with information services - can also operate effectively even if industry is dispersed.

With the exception of the meat packers, we came across few associations of this kind. AMPHI, the association of small industrialists, has recently began to establish sector groupings. ANDI, the principal employers' organisation has not been organised on a sector basis, nor we understand have other business and industrial managers' groupings. The Honduran food industry could not but be strengthened by strong sectoral and sub sectoral industrial groups.

Sector quality workshops

One way in which they might be encouraged is through strategic discussions, and workshops on the application of the new production systems and total quality control to particular sectors. This is a format which has worked well in the milk industry. The initiative would best come from the organisations of industrialists themselves, working in conjunction with training and technical institutions. Unitec, and the Agricultural College in El Zamurano have both expressed their readiness to work on such a programme, and it should also be seen as an important part of the UNDP/UNIDO project.

3. Dossiers and books

The new production systems require a different way of looking at the problem of management both within firms and between them. Along with seminars and courses, it is important to have readily available in Spanish a range of books and articles to this end. We found books on total quality management in the offices of managers in six of the firms visited, some of which had come from courses attended, others which had been tracked down by the manager concerned. These were all managers in large firms however. What is need is for such material to be more widely available.

It is recommended that the UNDP/UNIDO project include provision not only for a seminar programme but for the

gathering of material on each industry, with translation into Spanish where necessary, to be used as a resource throughout the sector.

4. Case Studies of Flexible Specialisation

Equally important are actual cases where firms or groups of firms have put the new production systems into practise. The idea of model farms is one of long standing in agricultural policy, but it has proved equally effective in industry.

The UNDP/UNIDO programme should consider providing technical assistance to at least two firms attempting to adopt flexible specialisation, with their agreement that the process be carefully recorded, both on paper and through video, and that the factory or factories be open for visitors interested in adopting a similar approach.

5. Networks of small and medium enterprises

Small and medium sized firms face a double disadvantage in establishing systems of quality production. On the one hand they cannot afford many of the facilities needed for quality. On the other they are forced to rely on coyotes and wholesalers for the purchase of raw materials and for the sale of their product, and therefore lack a direct relation with final users and suppliers. They also commonly find themselves dependent on monopoly suppliers of key inputs, and of cartels of purchasers. They face in short problems of horizontal and vertical fragmentation.

Because of the trends to scale and vertical integration throughout the food system, there is a real danger of SME's being left on the outside of the core economy, or dependent on a particular chain for their survival. In other parts of the world SME's have been able to preserve their autonomy and compete on national and international markets by establishing

associations and chains of co-ordination between themselves. The UNDP/UNIDO project should seek to support initiatives of this kind among SMEs in the Honduran food industry.

For the first stage of the project it is proposed that assistance should be focussed on the following:

*** the dairy industry**

In conjunction with existing programmes in this field, the UNDP/UNIDO project should seek to:

- strengthen existing milk processors by considering how they can develop joint quality control facilities.

- consider the potential for the development of a number of regional packaging units managed by the cheese producers.

- review the feasibility of establishing a marketing consortia for domestic and export markets, linked to the establishment of a branded Honduran cheese.

- undertake an assessment of appropriate small and medium scale technology for milk processing, for areas with and without electricity, and request the metal machining section of the project to investigate ways in which the appropriate equipment could be produced in Honduras at low cost and with access to the necessary maintenance and servicing facilities.

- work with the dairy division in the El Zamorano agricultural college to develop new types of cheese and dairy product appropriate for artisanal producers in the dairy regions of Honduras.

*** the bread industry**

Although there are scale economies in bread making, experience elsewhere has indicated considerable scope for speciality breads and for small specialised bakeries , particularly where they co-operate in areas such as joint purchasing , marketing, and distribution.

It is proposed that the UNDP/UNIDO project undertakes an initial study of the bread industry in Honduras, which would consider strategy for the small and medium sized bakers.

*** fruit and vegetable processing**

In the initial stage of the UNDP/UNIDO project, there needs to be a detailed review of existing primary and processing capacity, and of the potential for the expansion of both. This is particularly timely with the growth of non traditional crops like blackberries (moras), cultivated mangos, hearts of palm (palmitos) and cashews, together with the extensions of grapefruit cultivation.

A second form of processing where there is scope for upgrading is the jam industry. Here the problems are threefold: the technology of production; packaging; and marketing.

It is proposed that a section of the UNDp/UNIDO project focus on this area by inviting a specialist in the field to work with existing producers, and with fruit and vegetable growers interested in establishing their own facilities. This should be done in conjunction with the packaging project (see below).

*** animal feed**

There is considerable scope for co-operation in this field and for the integration of feed facilities into the supply of materials and the rearing of stock. Because of the importance

of animal feed for the livestock economy, it is proposed that UNDP/UNIDO make this one of its priority sub sectors. What is required is:

- a consultant with specialist knowledge of animal feed technology, who could advise on low cost local materials that could be used for animal feed (particularly waste and by products from existing operations).

- a specialist in machining to consider how the needs of small feed mills could be integrated in the UNDP/UNIDO metal machining project, particularly with respect to preventative maintenance and machine adaptation.

- a co-ordinator to work with the small feedmills on areas where joint action would improve their current economic performance.

*** livestock breeding and food processing**

Alongside the animal feed sub-project, it is recommended that a strategy be developed for upgrading the quality of breeding stock with respect to small and medium size livestock processors. This would involve a review of existing market availability, and ways in which groups of small producers could develop access to their own upgraded breeding facilities.

6. Local and Regional networks

There is a strong case to be made for encouraging local food sub systems in outlying regions. There are significant areas of regional food specialisation - areas which have growing dairy industries, citrus regions, and localities dependent on fishing, or non traditional crops. Some of these are already organised - in the case of melons and shrimps for example - but there is a need for support in other sectors where small

producers predominate and need to be closely linked to local processing facilities.

It is recommended that the UNDP/UNIDO project initially focus on two localities where local food subsystems could be developed through the organising of small producers for quality production.

II. Quality from without

A second complementary part of the strategy should be to increase the demand for food quality and food economy from outside the industry. It is the consumer movement which has been the decisive force for transforming the food industry in Europe, channelled through the institutional power of the retailers, and more slowly through public regulation.

In each of these areas there is now considerable international activity. Producers and caterers in developing countries are finding they are having to take quality issues on board, where they export food products to increasingly demanding first world markets, or supply food to a growing tourist market. Equally there are attempts to establish international agreements on higher food standards.

At the moment the extra industry pressures for quality are weak in Honduras, and part of the UNDP/UNIDO programme of restructuring should be to strengthen them.

7. The consumer movement

The first area that need strengthening is the independent consumer movement in Honduras. To this end the project should::

- arrange for a discussion of food consumer issues among concerned groups, including:

natural food retailers

natural food caterers

public health professionals

doctors and health workers.

research scientists

- invite a food consumer practitioner to visit Honduras to:

  - hold discussions in different parts of the country on the experience of the food consumer movement internationally.

  - make an assessment of food safety and hygiene practises and regulations in Honduras.

  - work with the Food Departments of the Ministries of Public Health and Natural Resources.

  - outline a programme for the study and upgrading of food safety.

- assess appropriate mechanisms to further awareness of food safety and health, including:

  - a regular publication by the food consumer movement

  - press and TV programmes on food quality

  - educational packs for use on health awareness programmes

  - sectoral studies assessing food quality

- international reports on food safety issues through the network of the international food consumer movement

- a one day conference on food quality with workshops and research papers, on scientific, technical, legal and social aspects of the subject.

- collaborate with other concerned bodies to promote an effective domestic economy, including improved methods of food preservation and preparation.

8. The catering industry

The catering industry is expanding, both through street vending and the growth of hotels and restaurants. This expansion is likely to continue, particularly with the growth of tourism. Caterers are one of the professional buyers of food and drink, and are a key instrument for promoting good quality ingredients, as well as good quality preparation. It is important that the consumer movement include catering within their range of concerns and that the catering trade promotes food awareness, quality production practises, and interactive work with suppliers, designed to upgrade and diversify the range of available food and drink. The following should be considered as means of promoting such a strategy:

a) the publishing of a Good Food Guide, to be aimed in part at tourists, and other visitors. Elsewhere such guides have acted as a stimulus to improving food quality and variety, and thus the demands made by the caterers on their suppliers. They can also contribute to raising food awareness, particularly about the range of indigenous foods which it would be the object of the Guide to promote, the distinctive Honduran and Latin American cuisine, and issues of food safety - lack of knowledge of which often prompts tourists to demand imported and/or standardised food and drink.

b) the assessment of education and training of chefs. catering managers and purchasers from the viewpoint of food quality, variety, indigenous cuisine and production purchasing skills. The aim of the assessment would be to:

- strengthen existing catering education.

- assess the feasibility of new projects. One suggestion is the establishment of a Latin American catering degree structured to Central and South American conditions as regards cooking tradition, and ingredients.

- improve the level of on the job training of chefs and catering staff, together with complementary courses in educational institutes. Particular attention should be paid to the establishment of such courses in the main centres of commodity catering, notably the major cities and the tourists resorts.

- support the programme for improving the hygiene of food sold by street vendors.

c) arranging meetings with chefs, purchasing officers and managers of hotels, restaurants and institutional caterers, to discuss ways, through purchasing, of encouraging improvements in food quality, and ways of promoting the use of indigenous food and fruits.

d) organising a course on flexible specialisation in tourism, with a particular consideration of eco tourism. There is a growing interest in eco tourism in Honduras, as part of an attempt to manage the expansion of tourism, and make it consistent with environmental and social sustainability. Such carefully arranged tourism can be used to support local economies, by arranging for places in the interior that receive visitors. (during a trek for example,) to provide food grown, processed and cooked in that place. This requires training and monitoring of standards, but where it can be

achieved, it offers ways of spreading tourist spending into communities which have too often been marginalised and depleted by the development of mass tourism and the mass processing and catering that goes with it.

More generally the growing trend in tourism is against mass tourism towards specialised, activity, and differentiated tourism, what some writers now refer to as post tourism. A conference on tourism and the food industry would be one way of opening up the issue of food quality amongst caterers.

9. A Food Fair

A project that would be worth considering is the establishment of a Honduran Food Fair. Annual fairs have played an important role historically in raising standards in agriculture. Small farmers have brought their stock and produce to the fair, where it is judged, and new methods of production are shown and discussed.

A Honduran Food Fair would have this purpose. It would be an event where food producers would assemble to show their products, to be tasted and judged. Consumers would be encouraged to try out the different products, and become aware of the processes of production and the features of quality. In Food Fairs I have attended there is a good deal of educational material which is used by visiting school children, together with videos, and displays. The awards are gaining increasing prestige, and the explanations of the judges are a guide for other producers. It should also be an occasion for the display and discussion of new processing, distribution and domestic food practises and technology

Its arrangement should involve the various parties in the food system, for the discussions entailed in the preparation of the Fair would be an important way of raising the awareness of food quality issues and how they relate to production.

10. Food standards

The next four months will be critical in preparing new food standards based on the Codex Alimentaris to be agreed for all Central American economies. These are to replace the outdated 1964 Pan American norms.

- It is important that the new revision should not set rigid standards, but allow for continuous improvement in standards as a stimulus to industry throughout the Central American market. Improved food standards should not be considered as a non tariff barrier to free trade but as a stimulus to higher quality throughout Central America.

One way in which this could be incorporated would be for levels to be staged over a five year period, with a built in review at the end of that period, to allow for a revised staging for a further five years.

The Codex Alimentaris has already been criticised in Europe and North America as having set standards too low as the result of a process of compromise between high standard and low standard nations. For Honduras it should be seen as a first staging post in its upgrading of food standards not as a final goal.

- The preparation of new food standards provides an opportunity for the widespread discussion of food standards within the industry, among consumers and environmentalists, as well as farmers and industrial suppliers. The adoption and enforcement of standards will always be most effective when they have been widely discussed and their purpose accepted.

Early discussions should be undertaken with the Food Department of the Health Ministry and that of the Ministry of Natural Resources to consider such a programme of discussions and what organising time and resources would be needed to make it effective.

- One of the areas of food packaging which has been advancing rapidly in the past few years has been the labelling of products. At the moment there are relatively few regulatory requirements. Not only do these need to be introduced alongside the raising of standards through the Codex Alimentaris, - again on a Central American basis - but supermarkets should be encouraged to put comparative prices using a common measurement of weight to ensure that customers can more effectively compare alternatives. Exhibiting prices per lb has been one of the contributions of food supermarkets in Europe in recent years.

- Another complement to any improved system of food standards is an adequate infrastructure of testing laboratories. Given the importance of quality in the food industry it should be a requirement of registration of food products that producing firms have access to a food laboratory for regular testing of raw material supplies and finished product. For the larger firms, it is likely that the laboratory would be in the firm. For smaller firms it would be more effective to share test equipment with neighbouring food producers. In these cases it would be appropriate for the government to contribute part of the costs of running these laboratories.

- There is also a need for a network of sectoral laboratories some with specialist equipment, others for the function of supertesting and research. A number of such laboratories already exist - those of the two lead Ministries, the research centre at FHIA, and the former Central Bank Food Laboratory, now situated at UNITEC. A number of countries have made effective use of university science laboratories for food testing, and this is something which should be explored with the Universities in Honduras. Another effective model is the joint sectoral testing and research centres used by branches of the food sector in central Italy.

- The function of the two main food control sections in the Ministries of Health and Natural Resources would be to advise on the establishment and operation of laboratories, inspect the laboratories to ensure that they are being properly managed and their records kept, continue to provide educational courses for those working in the field of food testing, and for managers and workforces from food factories. They would also administer the government contributions to the laboratories, and withdraw funds where proper quality testing was not taking place. Finally they would continue sample testing as they do at the moment, but for the purpose of 'supertesting' to assess the reliability of individual company laboratory practises.

- One of the requirements of an effective food testing system is that the testing process on product batches should be organised in such a way as not to delay batches from being dispatched to the market. Slow testing can cause large build up of stocks in finished goods. In Jamaica for example, food firms subject to batch testing had four weeks of stock of finished goods because of the testing cycle. Their Bureau of Standards has been able to cut the testing period down to 14 days by reorganising the testing process according to the principles of cellular production, to ensure it was the flow of the sample through the tests that was maximised rather than the utilisation of individual pieces of equipment.

- This programme of upgrading and extending testing facilities also requires the understanding and support of those involved. Strategies could be developed for each sector by the groups established to consider the new norms from the Codex Alemntaris. But there is also a case for employing a consultant with working experience of the field who would review the existing laboratory infrastructure, and structures for testing and make recommendations about the organisation, economy and technology of food testing systems both in the private and public sectors.

- As an immediate step it would be useful to call a meeting of those concerned with food testing to consider a strategy for upgrading facilities and methods in Honduras, as a complement to the revision of the food standards themselves.

Appendix 1

ORGANIZACION DE LAS NACIONES UNIDAS PARA EL DESARROLLO INDUSTSRIAL

ONUDI

DESCRIPCION DEL PUESTO
DP/HON/91/018/11-05 (REV.I)

TITULO DEL PUESTO	EXPERTO INTERNACIONAL EN AGRO-INDUSTRIA
Duración	1.0 M/H
Fecha	Lo antes posible
Lugar	Tegucigalpa con viajes al interior del país
Propósito del Proyecto:	Establecimiento de una estrategia del sector industrial en el marco de las nuevas formas de competencia a nivel mundial.
Funciones:	El experto internacional formará parte de un equipo interdisciplinario de consultores internacionales, quienes trabajarán en estrecha coordinación con la Secretaría de Planificación, Coordinación y Presupuesto, Ministerio de Economía y Comercio y el sector privado. El experto tendrá la responsabilidad de preparar un informe técnico sobre la situación y perspectivas del sector industrial hondureño, fundamentalmente en lo que se refiere al procesamiento de frutas y legumbres, aceites y grasas y procesamiento de leche y carne, en el marco de un Programa de Modernización Industrial, considerando los siguientes puntos:

Solicitudes y comunicaciones concernientes a esta descripción de puesto deberán ser enviadas a:
Sección de Contratación de Personal para Proyectos, División de Operaciones Industriales
ONUDI, Centro Internacional de Viena, P.O. Box 300 - A-1400 Viena (Austria)

1. Determinar los problemas principales y perspectivas en 15 empresas seleccionadas en lo que se refiere a:

   a) Diversificación de la producción
   b) Diseño, formulación e ingenieria del producto.
   c) Flujo del Proceso Productivo
      - Estandarización
      - Ajuste de la maquinaria para cambio de producción.
      - Adaptabilidad de la mano de obra desde la perspectiva de la flexibilidad productiva.
      - Inventarios en proceso.
   d) Calidad de la producción
   e) Sistemas de remuneración
   f) Embalaje
   g) Otros

2. Identificar las principales relaciones en cuanto a provisión de insumos, servicios (información, mantenimiento, etc.) y financiamiento de la rama bajo estudio con otras ramas, sectores e instituciones, así como con el exterior principalmente con Centroamérica, Estados Unidos, Europa y el Sudeste Asiático. Señalar los principales problemas y perspectivas en las relaciones identificadas.

3. Determinar políticas, incentivos y servicios comunes para impulsar el desarrollo de la rama en el contexto de una relación inteligente de cooperación/competencia.

4. Plantear un plan de acción para incrementar la productividad y coherencia productiva de la rama, así como de las empresas seleccionadas.

Información General

El Gobierno de Honduras viene implementando un programa económico de ajuste estructural, que ha introducido cambios importantes en las políticas arancelarias y cambiaria, lo cual obliga a las empresas industriales a adoptar estrategias que se adecúen a las nuevas formas de competencia.

En este contexto, es de vital importancia prestar asistencia técnica, coherente y efectiva a ramas y empresas seleccionadas con el fin de lograr un mayor nivel de integración productiva y de produductividad.

Appendix 2

Those with whom discussions were held:

Food Processors

Carlos Roberto Pinel	Carnilandia
Orfilio Oyuela	Carnilandia
Jannyany Rosenthal	Continental
Roy Flores	Corsa
Tibor Jablanicky	Embutidos Europea
Rolando Mosquera	Embutidos Germanos
Jose Herrero	El Marranito
Gabriela Herrera	Delicia
Octavio Quinonez	Delicia
Dr. Aurelio Revilla	Zamorano (Dairy)
Jose Angel Gonzalez	Leche Leyde
Gustavo Munoz	Leche Leyde
Dr. Richard Zablah	Delta
Dr. Ricardo Alonso	Alcon
Roberto Suazo	Alcon
Jorge Ulloa	Alcon
Modesto Vindel	Coha
Fabian Fernandez	Fafer
Juan Byers	Fabrica de Concentrados
Jose Gonzalez	Alimentos del Valle
Jose Calix	Alimentos del Valle
Jose Ramos	Alimentos del Valle
Tobias Tantalean Magan	Elite
Jose Vindel	Vinsa
Ramon Cruz	Hondu Palma
Ignacio Bautista	Hondu Palma
Walter Umania	Hondu Palma
Gilberto Turcios	Hondu Palma
Fernando Ferrera	Numar
Marco Medina	Numar
Roger Bellino	Capser
Orlando Lara	Fruve
Mario Mercadal	Productos del Pinar
Alma Gloria Zea	Productos Almita
Arnaldo Castellanos	IHMA
Omar Enrique Hernandes	Maseca
Daniela Paredes Lardizabal	Lido
Oscar Montealegre	Lido
Carlos Siercke	Lido

Retailing and Distribution

Mario Facusse	Gigante
Augusto Tentori	Schmid and Tentori

Hotels and Caterers

John Alexander Mackey	Chef del Aire
Jorge Coello	Ingesa
Daniel O'Connor	Hotel Maya
Helmut Seidel	Hotel Plaza San Martin
Israel Breve	Hotel El Prado
Rene Barahona	Hotel El Prado
Marcos Bonilla Santos	Gran Hotel Sula
Carla Clare	Al Natura

Banks

Carlos Quiroz	Central Bank of Honduras
Cristina Mejia de Aviles	Central Bank of Honduras
Daniel Figueroa	Central Bank of Honduras
Carlos Mondragon	Banadesa
Jaime Salinas	Banadesa
Miguel Rafael Aguilar	Banco de Occidente

Food Safety and Research

Dra Vilma Estrada de Aviles	Food Control Division, Ministry of Health
Dra Georgina Nazar	Food Control Division, Ministry of Health
Lucy de Hueso	Unitec
Adolfo Martinez	FHIA

Industry Associations

Adolfo Facusse	ANDI
Pedro Arturo Sevilla	FENAGH
Oscar Rolando Matute	FENAGH

Co-operative Associations

Ismalia Acosta Schrunder	FECORAH
Daniel Carvajal	FACACH
Hector Madrid	FEHCIL

University and Economic Research and Consultancy

Hugo Noe Pino	University of Honduras
Andy Thorpe	University of Honduras
Ian Walker	University of Honduras
Luis Flores	Collegio de Economistas
Alfredo del Campo	Unitec
Roger Norton	Analisis Politico Agricola para Honduras

Government

Orlando Funez Cruz	Minister of SECPLAN
Ramon Sarmiento	Vice Minister of Economy and Commerce