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FOOD PROCESSING AND MANUFACTURING

INTRODUCTION

In this chapter we explore in more empirical detail the food processing and manufacturing industry that lies ‘downstream’ from the farm sector in the food supply system. Whereas many writers use the terms interchangeably, here we use ‘food processing’ to imply the manipulation of agricultural raw materials into food products which retain many of the characteristics of the original materials. The freezing and canning of vegetables, the slaughter, evisceration, deboning and packaging of poultry, and the pasteurisation and bottling of milk are illustrative of food processing. By ‘food manufacturing’ we imply the transformation of agricultural raw materials into food products that have lost many of the characteristics of the original materials. The production of bread, cakes and biscuits from flour, of meat pies from pork, beef and poultrymeat, and of butter, cheese and yoghurt from milk provide examples of food manufacturing. The term ‘agribusiness’ is also employed by some writers to describe the totality of food processing and manufacturing, but here we use the term ‘food industry’ (Burns et al. 1983).

INDUSTRIAL CAPITAL AND THE MANIPULATION OF FOOD

The companies comprising the food industry are increasingly severing the traditional links between agricultural raw materials and food products through a process termed ‘substitutionism’. Summarising the argument of Goodman *et al.* (1987, 58), and as introduced in Chapter 5, substitutionism involves the progressive reduction of agricultural products to simple industrial inputs; these inputs include proteins, carbohydrates and fats derived from either food or non-food vegetable matter by biotechnologies. Such technologies are enabling the agricultural production process to be eliminated either by utilising non-agricultural raw materials or developing industrial substitutes for food. The resulting food products can be based on generic food components and an increasing technological control of food production, for instance through chemical additives. Food producers are diversifying their input sources to achieve greater interchangeability, while trends have developed in ‘product fractionating’ and the production of ‘fabricated foods’ (Goodman 1991). These methods, which allow agricultural products to be broken down into generic intermediate food ingredients, are resulting in reconstituted, or manufactured, foods with a longer shelf-life or convenience in preparation.

Mass production in flour milling, sugar refining and oilseed pressing were early influences on substitutionism by providing standardised, homogeneous inputs that included flour, edible vegetable oils, animal fats, sugar and powdered milk. Margarine was one of the first recognisably manufactured foods to be reconstituted

from cheaper intermediate ingredients, in this case as a substitute for butter. Another example has been the production of low calorie sweeteners from corn starch (high fructose corn syrups) by biocatalysis. Food manufacturers further 'downstream' have been given increased scope to differentiate the form, composition and packaging of their agricultural products, while many new foods have a physical form and appearance that disguises their industrial origins and allows them to compete with 'natural' foods.

With 'nature' in agriculture - as biological time, production space and land - placing limits on the appropriation of the agricultural production process (see Chapter 5), food processing and manufacturing capital has turned its attention to increasingly sophisticated forms of substitutionism. Mechanical skills and scientific knowledge have been applied to food production, so that food itself has become more heterogeneous with specific properties created by processing techniques, product differentiation and merchandising. Innovations in the preservation of food have also been significant, for example canning, freezing, freeze-drying, chilling and dehydration. New products have been created, including a wide range of ready-to-eat meals and 'fast' foods, with additional attributes such as ease of handling and storage and longer shelf-life. The outcome has enabled processors and manufacturers to capture a greater proportion of the 'value added' in food products at the expense of the farm sector.

However, the level of substitutionism within the food industry is uneven, and in practice a range of food products can be identified, varying in their 'natural' as compared with 'industrial' composition. At the 'natural' end of the range can be found processed foods such as frozen vegetables, including peas, beans, carrots and broccoli, graded and pre-packed beverages such as tea and coffee, and animal meats that have been butchered, packaged and frozen for consumer convenience. At the 'industrial' end of the range lie products such as reformed meats, for example chicken nuggets, meat substitute products based on soya, canned 'fruit' drinks with their high content of artificially-introduced chemicals, and soft-form ice-creams. Between these extremes lie the majority of processed and manufactured foods, such as 'ready to eat' chilled/frozen meals, milk, egg and potato powders, pastas and pizzas, each with their varying content of food preservatives and stabilisers, colour additives, flavour enhancers, and supplementary water, vegetable oils, animal fats, starch and sugar.

Substitutionism, however, does not take place just within an industrial plant; food companies can also ensure that it takes place on the farm, and a case study of this process has been provided by Baldwin (1999) for hyperimmune milk. Summarising her study, hyperimmune milk is produced by dairy cows that have been immunised with a sterile vaccine for human pathogens, which induces the formation of specific antibodies in the milk. The milk can then be processed into a milk powder, as produced by Stolle Milk Biologies International Incorporated based in Ohio (U.S.A.) but operating in New Zealand in partnership with the New Zealand Dairy Board. Health benefits for humans are claimed for the product, for example in respect to infectious bacteria, which reside in the gastrointestinal tract of rheumatoid arthritis sufferers. However, the company is careful to advertise the milk powder as a food rather than a medicine, so as to avoid having to meet more stringent medical regulations. The passive immune protection offered to humans who consume the milk on a regular basis raises issues of food safety, the meaning of 'natural' foods, the burden of scientific proof, and the blurring of the boundary between the nutritional and medical content of food.

THE VARIED NATIONAL DEVELOPMENT OF FOOD PROCESSING AND MANUFACTURING

Attention has been drawn already in Chapter 4 to the contemporary global restructuring of the food industry. Indeed that discussion identified a four-fold development sequence, namely from (1) individual national food companies, through (2) integrated national food companies, to (3) integrated multinational food corporations, and lastly to (4) integrated transnational food corporations. This four-stage sequence of development can be elaborated in the following way, with developing countries now more prevalent in the first two stages (Athukorala and Sen 1998) and developed countries more prevalent in the last two stages:

1. Food processing and manufacturing based on national capital (e.g. flour milling, oil pressing, dairy products and cheese) - usually relatively small-scale business activity with low value-added and without significant international industrial or marketing linkages.
2. Fuller development of national food processing and manufacturing, commonly including some international capital (e.g. food preserves, fruit juice, canned fruit and vegetables) - stronger links are created with non-food industries for inputs such as chemicals, glass, aluminium and paper, and marketing services to create channels for the flow of goods and a demand amongst consumers.
3. International agro-industry involved in large-scale processing and manufacturing of standardised but ever more sophisticated products - greater use of finance capital for growth and technology for efficiency and innovation.
4. Food products processed and manufactured with the most advanced machinery to supply high-income economies internationally - complex food system linkages guarantee quality and reduce the costs of inputs to a minimum; farmers are contracted to produce under conditions that are highly prescriptive, with strong links downstream to supermarket chains.

Chapter 4 has already examined the international reorganisation of the food industry through the activities of transnational corporations. Here we focus attention on national-level food processing and manufacturing, drawing on case studies in developed countries where these industrial sectors are most fully developed. Looking first at the E.U., in global terms the member states taken together have a greater value of food, drink and tobacco production than either the U.S.A. or Japan - the other two dominant producer countries. Over three quarters of agricultural production, by value, in the E.U. is transformed by the food industry before it reaches the consumer (European Commission 1983), while the sector employs approximately 2.4 million people (ranked fourth amongst industrial sectors). The relative importance of the various sub-sectors within E.U. food processing and manufacturing are shown in Table 6.1, based on partial surveys of all possible sub-sectors (European Commission 1997a, 1997b). Comparable data for individual countries across the E.U. are not available. However, the dominance of the meat and dairy products sub-sectors,

together with the significance of the baking (bread, cakes, biscuits), brewing and chocolate sectors is evident in production values, although there is more variation in terms of employment and the number of firms where data are available to show this. However, estimates of levels of employment by food sector in the E.U. are as follows: meat products 436,000, dairy products 242,000, baking 449,000, pasta manufacture 34,000, grain milling 36,000 and wine production 46,000. Amongst the branded foods and drinks with the highest sales values within the E.U. are Coca-Cola, Barilla pasta, Nescafé coffee, Langnese ice-cream, Knorr soups, Nutella spread, Kellogg's cornflakes, Mulino biscuits and Walker's crisps.

Table 6.1 *The significance of sub-sectors within food processing and manufacturing in the European Union, 1994*

Sector	Production value (m ECU)	Employment	Number of firms*
Meat	81,223	436,000	..
Dairy products	75,277	242,000	..
Baking	28,086	449,412	27,272
Brewing and malting	26,572	117,986	616
Chocolate	23,824	158,407	1,180
Soft drinks	19,564
Soft drinks	17,917	89,921	1,166
Sugar	16,622
Spirits	13,150	31,946	461
Wine	10,537	46,000	..
Pasta	7,188	33,978	317
Other foods	35,363	181,204	2,205

Notes: ECU European Currency Unit; * more than 20 employees; .. no data

Sources: adapted from European Commission (1997a and 1997b).

Table 6.2 shows the value added by the food, drink and tobacco industries in the national food processing and manufacturing sectors of the member states of the E.U.. The size of the food industry in each country is proportional to the domestic population it serves, so that Germany, the United Kingdom and France are the three most important countries in terms of value added by production. These three countries are also the most active in the formation of mergers and acquisitions (M&A) - both within their boundaries and with other countries - and the formation of alliances and joint ventures (A.J.V.). M&A activity *within* individual member states account for between 40 and 70 per cent of all E.U. merger activity in a given year, while cross border M&A *between* the member states (i.e. integration) varies from 40 to 50 per cent of all world mergers in most years. The main objective of M&A is to increase the market share of individual companies. A.J.V. activity is greatest in the alcoholic beverages and soft drinks sectors, for example by companies such as Carlsberg, Tate & Lyle, Danone, Sodiaal and United Biscuits. To summarise this complex variation in corporate strategy, four broad distinctions can be drawn: (1) continued centralisation of control by companies in commodities where local market competition is intense; (2) diversification into other sub-sectors by food companies whose origins lie in one food sub-sector; (3) diversification into food production by

companies whose origins lie in other sectors of the economy; and (4) the globalisation of capital investment by individual companies, including the building of international alliances.

Table 6.2. *The relative importance of food, drink and tobacco industries within the member states of the European Union, 1994*

Country	Value added (m ECU)	% E.U. AJVs*	% E.U. M&A#	
			National	Cross Border
Germany	23,876	14	15	13
United Kingdom	21,631	24	20	18
France	18,169	12	21	13
Spain	13,910	9	11	16
Italy	10,937	7	12	12
Netherlands	7,686	4	7	6
Denmark	4,107	12	2	6
Ireland	3,611	9	5	1
Belgium and Luxembourg	2,400	6	4	8
Greece	1,147	2	2	4
Portugal	1,137	5	1	2
E.U. total number	108,608	191	278	108

Notes: ECU European Currency Unit; * Alliances and Joint Ventures; # Mergers and Acquisitions in 1992.

Source: adapted from European Commission (1997b).

These structural changes have produced high 'concentration ratios' in the food industry of the E.U., as measured by the combined value of production of leading companies, although there are wide variations in concentration across the Member States and between products (Martin 1995). For example, in France 4-firm concentration ratios vary from over 90 per cent of the total value of output for soups and breakfast cereals, through 79 per cent for mineral waters, to 32 per cent for chocolate. Even in countries with less developed food and drinks industries, such as Portugal and Greece, 4-firm concentration ratios are commonly above 70 per cent in a majority of sub-sectors. These high concentration ratios indicate the oligopolistic market power held by food companies (Bhuyan and Lopez 1997) and the barrier against entry into the food industry for new companies. Table 6.3 lists the largest of the existing food, drink and tobacco companies in the E.U. by value of their turnover. Unilever emerges once again as the largest company on all criteria, while the importance of the United Kingdom and France is emphasised, together with the significant employment that the food companies provide in their national economies. Nestlé, a Swiss-owned company and thus not shown in Table 6.3, is the second largest company in Western Europe. Together with Unilever, Nestlé supplies markets at an international level, whereas the remaining companies tend to have less international diversification and are strongest within single national markets (Martin 1995).

Table 6.3 *The 15 largest food, drink and tobacco companies in the E.U. (mid-1990s)*

Company	Country	Turnover m ECU	Net profit m ECU	Employment '000
Unilever	Netherlands-U.K.	38,299	2,012	304
British American Tobacco	U.K.	15,062	1,555	173
Hanson	U.K.	14,069	1,383	74
Ferruzzi Finanziaria	Italy	11,955	-528	39
Groupe Danone	France	11,679	536	68
Montedison	Italy	10,723	-183	32
Grand Metropolitan	U.K.	9,054	584	64
Eridania Beghin-Say	France	7,721	184	22
ABF	U.K.	5,859	400	50
Hillsdown Holdings	U.K.	5,499	131	40
Tate & Lyle	U.K.	5,289	222	15
Cadbury Schweppes	U.K.	5,199	347	41
Bass	U.K.	5,103	453	76
Tomkins	U.K.	4,874	272	46
Société au Bon Marché	France	4,827	193	21

Note: ABF: Associated British Foods.

Source: adapted from European Commission 1997b.

So as to complete this part of the analysis, some evidence is presented on the growth of the food industry in developing countries, drawing on the work of Athukorala and Sen (1998). Their study shows the emergence of significant food processing rather than manufacturing in countries such as Bangladesh, Bolivia, Chile, Indonesia, Korea, Malaysia and Thailand. Many of these countries also have dynamic manufacturing sectors, and the common role of permissive public policy régimes is an important factor in both types of development. The main sub-sectors are in processed fish, preserved vegetables, animal oils and vegetable oils. By 1994, 41 per cent of the non-manufactured exports of all developing countries were in processed foods (developed countries 35.3 per cent), with national figures varying from 79 per cent in Senegal, through 50 per cent in Nicaragua, to 35 per cent in Peru. There is a mixture of national and international capital underpinning these developments, but both sources of capital draw developing countries into the global food processing and manufacturing sector.

THE NATIONAL ORGANISATION OF FOOD PROCESSING AND MANUFACTURING

The national organisation of food processing and manufacturing can be examined by looking at one country and one product; here the chicken filière in the U.S.A. is used to illustrate a number of characteristics of the recent restructuring of food companies. Drawing on the account by Boyd and Watts (1997), the raising of chickens to produce eggs, with meat as a by-product, has been a traditional farmyard activity; by the 1920s it was widely developed on small farms around the north-east manufacturing belt's relatively affluent, urban consumers. Over three quarters of flocks had fewer than 100 birds and less than two per cent were in flocks of over 2,500 birds. As chicken production expanded to meet growing consumer demand, so egg and meat production

By the 1960s, broiler production in the U.S.A. had fallen under the oligopolistic control of a few massive, vertically integrated corporations (e.g. Tyson Foods, Perdue, Lane Poultry and Holly Farms) and by the 1990s the top four corporations accounted for nearly 45 per cent of U.S.A. broiler output. In addition, average flock size had increased, production had been moved from the farmyard into buildings housing thousands of birds, while advances in breeding genetically uniform broilers, capable of high feed conversion ratios (i.e. feed into liveweight gain), permitted a bird to reach market weight in as little as 40 days. In addition, the location of broiler production had changed significantly and was located less widely across southern and south eastern states (especially Georgia, Alabama and Arkansas). Four factors are commonly advanced to explain this locational shift: (1) the early development of broiler production under contract in the American South, (2) the existence of small marginal farms requiring an alternative source of income to cotton, (3) a pool of surplus rural labour for the processing plants, and (4) a tradition of merchants and finance capital in extending credit to small farmers. Contracted growers in the American South now feed their raw material (live chickens) into industrial processing and manufacturing units that use every body-part of the chicken - from meat for human consumption to head, feet and offal wastes ground up and reincorporated as protein into feed for following generations of chickens. A wide array of products are created from the chicken meat, including the standardised chicken portions sold through fast-food chains, frozen and fresh whole-chickens, standardised packages of chicken breasts, legs and wings, and manufactured 'chicken nuggets', often formed from reconstituted carcass meat. Boyd and Watts (1990), for example, record 4,600 different chicken products from Tyson Foods.

The restructuring of food processing and manufacturing, however, can involve the reorganisation of existing operational and business practices rather than the relocation of investment. This theme has been developed by Burch and Pritchard (1996) for the Australian tomato processing industry and the following summary follows their account. Australia is a minor producer of tomatoes in global terms, accounting for only 0.6 per cent of world production, of which approximately half is processed rather than consumed fresh. Processed tomato production is concentrated in the Murray River basin regions of Victoria, New South Wales and South Australia, where there are nine processing plants owned by companies such as Unifoods (Unilever), Heinz, Leggo's (JR Simplot) and the Shepparton Preserving Company. 80 per cent of the processed tomatoes are converted into paste, which is then sold for use by other 'downstream' food manufacturers, such as Campbells and McCains. With the deregulation of the Australian market for processed tomatoes in the 1990s, the processing companies adopted three strategies. First, some companies, such as Unilever, expanded their Australian operations as a base for supplying the market in Asia. Research and development functions were relocated from California to Sydney and investment was made to upgrade the plant at Tatura, Victoria. Second, companies such as Heinz and Unilever began to offer more diverse pricing in their contracts with growers, including bonuses for high quality and early/late season production. These contracts favoured larger growers with the result that many smaller growers gave up production and so bore the brunt of the costs of restructuring. Third, Heinz, with production capacity in both Australia and New Zealand, allowed competition to take place between its plants, with resulting productivity and efficiency gains within the existing structure of processing plants.

THE REGIONAL INFLUENCE OF FOOD PROCESSING AND MANUFACTURING

A common theme in food processing and manufacturing is the concentration of capacity into a few companies and processing plants and the creation of agro-industrial districts or agribusiness complexes. In U.S.A. poultry production, for instance, such concentrations can be identified in north west Arkansas, north Alabama and north Georgia. Within each district can be found the full range of sub-sectors comprising the broiler industry, from egg hatcheries, through feed production units and chicken growing farms to processing plants. Their locational clustering promotes efficient integration in the movement of raw materials through the filière, where 'just-in-time' provision of materials for the chicken 'assembly line' is almost as important as in industrial manufacturing (Boyd and Watts 1997). Similar locational concentrations in national broiler industries have been identified elsewhere, for instance within southern Ontario - in five counties stretching from Huron in the west to Lincoln in the east (Bowler 1994), and in the East Midlands of the United Kingdom (White and Watts 1977). Agro-industrial districts have also been identified for a range of other products, for instance cheese and pork production within Italy (Iacoponi et al. 1995) and horticultural production under glass in the Netherlands (Maas and Cardol 1984). In the latter case, for example, the authors found that between 64 and 85 per cent of specific inputs to production originated in the local area, but through independent businesses rather than large, vertically integrated companies. In the literature on former socialist economies, agricultural districts are termed 'agro-industrial complexes' (Enyedi 1976). These complexes, under the former command economies of socialist states, were based on the production of a range of agricultural raw materials from large collective or state farms, which were themselves vertically integrated into large food processing/manufacturing, distribution and retailing organisations, sometimes called combines or 'kombinats'. Many of these agro-industrial complexes and combines are struggling to survive international competition in the post-Socialist era.

Food processing and manufacturing plants, set in their agricultural districts, are supported by farms producing raw materials under contract, as described in Chapter 4. Initially, food companies were drawn to two types of location in the supply of their raw materials. The first type was the port city where imported agricultural raw materials were landed and processed close to the quayside. The processing of sugar, grain and oilseeds, for example, has been a traditional port industry for many decades, particularly in food importing countries such as Japan, Germany and the United Kingdom. The second type of location was the farming region producing the required type of agricultural raw material, for example wheat, milk or beef cattle. Everitt (1993), for example, has examined the history of flour milling on the Canadian Prairies where, in the late nineteenth century, a large number of locally-owned, small mills were developed to process wheat from localised 'tributary areas' and serve local regional markets. Later a few larger mills, owned by interests outside the region, came to control the export of wheat from the Prairie Provinces for milling elsewhere, leading to the demise of flour milling on the Prairies. Similarly the distribution of dairies producing butter and cheese has closely matched the prior location of dairy farms (e.g. Maas and Wever 1986), while the distribution of abattoirs has reflected the distribution of cattle and sheep raising. Contracts placed by food processors and manufacturers with producers in these regions took three types of spatial distribution

(Hart 1978): clustering close to the production plant, so as to minimise transport costs - very evident for sugar beet and sugar cane refining, for instance; a random distribution reflecting the prior location of favoured larger farms in a region, as found in vegetable freezing; and clustering in localities with natural advantages for the production of the particular agricultural raw material - a particular soil type or frost-free location - for example in the production of soft fruit.

However, as food processors and manufacturers have restructured their processing and manufacturing plants, first at a national scale and more recently at an international scale, so individual abattoirs, dairies and canneries have been closed down in some agricultural districts and relocated or expanded in others. Rather than following the prior location of production of their raw materials, industrial capitals are now able to influence the location of that production through the relocation of their factories and the placing of contracts. The example of the changing location of dairying in Australia, following the relocation of dairy processing and manufacturing plant, has already been considered above.

THE 'DOWNSTREAM' INFLUENCE OF FOOD PROCESSING AND MANUFACTURING

Food processing and manufacturing firms invest heavily in advertising their brand names; the aim is to develop 'product recognition' amongst consumers when they shop for household food. Similarly, brand names or trademarks are important for marketing intermediate food products to the catering trade, where a brand name may become associated with a guarantee of product quality, taste, texture, reliability or price. Brand names, and associated copyrights, patents and logos, become 'intangible assets' of a company, and these assets, representing access to a segment of the market, rather than tangible assets such as real estate and processing plant, are often the objective of the mergers, acquisitions and joint ventures identified earlier in this chapter. Pritchard (1999) gives the example of Danone - a French-owned transnational food company - whose intangible assets comprise 86 per cent of its net asset worth. A comparable figure of 78 per cent is quoted for Grand Metropolitan, while the brand name of Coca-Cola is estimated to be worth US\$43 billion. Pritchard also cites the protracted take-over battles between the Australian-New Zealand transnational Goodman Fielder Wattie, and the British transnational Rank Hovis McDougall plc, during 1988-89, as evidence of corporate strategies to capture and trade intangible assets internationally.

All types of food business have initially sought dominance with a few branded products and then increased their product range and differentiation so as to challenge other market leaders. The new lines embody certain of the characteristics of other products without actually replicating them, and enable companies from one country to penetrate markets in other countries. Indeed many well-known brands are manufactured by subsidiaries or overseas agents of the parent company. Coca-Cola syrup, for example, is transported around the world and bulked with water and sugar and bottled locally. Table 6.4 shows how the Nestlé brand name is deployed across its numerous products to be recognisably present in international markets, but where 'local' brand names have been acquired so as to increase market penetration, often employing imported food products.

Table 6.4. The international presence of Nestlé brand names

Product	Product brand names in over 34 countries
Milk	Carnation, Coffee Mate, Nestlé, Nido
Confectionery	Crunch, Kit Kat, Nestlé, Smarties
Coffee	Nescafé, Decaf, Classic
Infant formula milk	Cerelac, Nan
Other dry goods	Libby
Petfoods	Friskies

Source: adapted from Pritchard (1999).

Increasingly, however, branded products have to compete for shelf space with the ‘own-label’ brands of large supermarket chains. It is not uncommon for the same product coming off a production line in a food manufacturing plant to be variously packaged with the advertising of competing producer-brand and own-label brands. We return to this topic in the following chapter, which deals with the retailing of food.

CONCLUSION

This chapter has shown how food processing and manufacturing capital increasingly defines the identity of food and thereby captures a rising proportion of the final monetary value of consumer food. It has also sought to give more empirical flavour to the ‘lived experience’ of restructuring in the food industry at the regional level. The resulting concentration of production capacity into fewer companies organised at the national and, increasingly, international level has had the following consequences. First, smaller producers of agricultural raw materials for the food processing and manufacturing sector have either been excluded from production contracts or have had their farming practices increasingly defined for them under tight price margins. Second, so as to remain economically competitive, food processing and manufacturing has become associated with low wage, low skill labour, while communities where plant has been closed down have suffered from the loss of employment. But, thirdly, consumers have benefited from food products that have fallen significantly in real price over the last five decades, while national economies have benefited from the growing export trade in processed and manufactured foods (see Chapter 13).

As we have shown for hyperimmune milk, the new biotechnologies developed by the food industry have the capacity to engineer the outputs from agriculture in ways more closely required by food processors and manufacturers (custom made to meet processing and nutritional requirements). The new technologies are overcoming species barriers to genetic variation allowing plant breeders to introduce genes derived from any plant, animal or micro-organism into crop varieties (Shaw 1984). Genetic engineering is also increasing the efficiency of converting different feed stocks into human food. Food processors and manufacturers have had to acquire plant genetic research firms and seed companies so as to have control over their raw

material inputs, although a social movement is developing to resist the absorption of genetically modified food into the food chain (see Chapter 17) .

Resistance has also emerged amongst agricultural producers, food retailers and food consumers against the increasing market dominance of large food processors and manufacturers. Amongst producers, alternative ways are being sought in marketing farm produce directly to consumers, including pick-your-own, farm shops, farmers' markets and vegibox schemes for organic produce. Amongst retailers, the emergence of large, financially powerful supermarket chains has brought a countervailing power into the market for food. Consumers, in their turn, are increasing their demand for 'natural' organic foods and speciality foods whose quality, content and authenticity can be guaranteed. These developments in food marketing, retailing and consumption form the focus of the next chapter.

FURTHER READING AND REFERENCES

The following references are only a small sample of the literature that is available on food processing and manufacturing. There is an especially rich vein of market research reports, many of which are publicly available (see Key Note, Mintel and other websites). Also there are thousands or perhaps tens of thousands of publications on specific industries and on particular countries, the majority of which are not in English.

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