

From Techno-Corporate Food to Alternative Agri-Food Movements

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Abstract

This paper presents a broad overview of the global agri-food system, including the sectors of agricultural production, food processing and retailing. It contrasts the practices, technologies, knowledge forms and structures of the dominant agri-food system with a range of alternative agri-food initiatives, such as organic agriculture, fair-trade and food localization movements. A number of concepts and categories are introduced to identify the character of various forms of food production and consumption, particularly with reference to technological forms.

Keywords

genetic, corporate, agriculture, globalization, supermarkets, nutritionism, organic, fair-trade, localization.

Introduction

In recent years, a number of food-related public health and environmental crises – such as mad-cow disease, bird flu and genetically-modified (GM) crop contaminations – have brought agricultural production issues into the public spotlight. At the same time, concern over the so-called ‘obesity epidemic’ has focused attention on the food processing and fast-food sectors, the advertising of junk foods to children and the quality of food served in schools.

These more recent and highly publicised issues have given new impetus to a range of agri-food movements and alternative practices that have emerged over the past few decades and that have problematized and intensely politicized many aspects of food production, distribution and consumption: from anti-McDonalds, anti-GM foods and animal rights movements, to alternative agri-food initiatives such as organic farming, fair-trade, Slow Food and school kitchen gardens. Many of these alternative agri-food

initiatives have been developed as a direct response and in opposition to particular aspects or characteristics of the dominant food system. The success of some of the alternatives has, however, also seen attempts to co-opt and reincorporate them back into the dominant or conventional food system.

The aim of this paper is to sketch a broad overview of both the dominant agri-food system and these various alternative agri-food movements and initiatives. A number of concepts and category distinctions will be introduced in order to identify and differentiate some of the main characteristics and tendencies within different sectors of the agri-food system in the contemporary era. The first section will identify some of the main characteristics and dynamics of the dominant global agri-food system, with the focus on agricultural production, food processing, retailing and consumption practices, and the various technological, environmental, health and socio-economic issues they raise. The dynamic nature of the dominant paradigms and institutions will be emphasised, such as their ability to adapt to changing circumstances as well as to respond to challenges to their legitimacy. In particular, the ways in which diet-related health problems and concerns are being used to strengthen rather than undermine the dominant food system will be examined. The second section outlines the range of oppositional and constructive responses to the dominant agri-food system. In particular, the alternative agri-food initiatives that have emerged in recent decades – and that attempt to directly create alternative practices and relations of production and exchange – will be outlined and critically examined, with a focus on the organic farming, fair-trade and food localization movements.

This dualistic contrast between dominant and alternative practices and institutions in some cases exaggerates the differences between, and tends to overly dichotomise, these respective agri-food systems.¹ The intersection and overlap between dominant and alternative forms will, however, also be examined. This includes the ambiguous character of some alternative agri-food initiatives and products, and the ways that alternative products and practices are being integrated back into and come to reflect some of the characteristics of the dominant agri-food system.

The Dominant Agri-Food System

Technologies of Agricultural Production: from the Chemical to the Genetic and Nanotech Paradigms

Industrial agriculture – and *chemical-industrial* agriculture in particular – has been the dominant form of agricultural production since World War II.² In terms of economic forms, it has been characterized by a thoroughly commercialized, capital-intensive and highly specialized form of production, involving the commodification of agricultural inputs supplied and controlled by agri-food corporations and the market exchange of produce through national and increasingly global markets. In terms of technologies

of production, the chemical-industrial paradigm has been defined by the development and use of chemical pesticides and fertilisers; hybrid and chemically-dependent seed varieties; publicly-funded breeding programs; monocultural cropping systems; mechanised farm labour and irrigation systems; and intensive animal production practices.

Over the past couple of decades, there have been distinct economic and technological developments within this chemical-industrial paradigm. Firstly, in terms of economic forms, corporations have consolidated their ownership and control of the food system, and now exercise unprecedented power over farmers and across all sectors of the agri-food system. Second, there have emerged a range of new breeding and farming technologies, including genetic engineering, nanotechnology, and information and satellite technologies. There has also been a shift from publicly-funded to privately (that is, corporately) controlled breeding programs. A way of broadly categorising and summarizing these key technological and economic characteristics is in terms of a shift from a chemical-industrial to a *genetic-corporate* paradigm of agricultural breeding and production. The forthcoming development and application of nanotechnologies across the agri-food system could similarly be characterized in terms of an emerging *nano-corporate* paradigm.³

The genetic breeding technologies that have emerged in the past couple of decades have come to frame and mediate the use of chemical inputs and other agricultural technologies and practices. GM crops have so far gained a sizeable share of global production in just four crop sectors: soy, corn, canola and cotton.⁴ In Australia, cotton is the main GM crop under cultivation, with bans on the planting of GM canola in place in most states. The overwhelming majority of GM crops under cultivation around the world are either engineered to tolerate contact with herbicides (that is, herbicide-tolerant crops) and/or are genetically engineered to produce their own insecticidal toxins.⁵ While GM crops currently entrench and may expand the use of some chemical pesticides, they have the potential to partially reduce or replace the use of some agri-chemicals in some situations. More generally, genetic engineering is being used to fine-tune and adapt crops to the requirements of chemical-industrial agricultural systems, such as enabling the more efficient use of chemical inputs, simplifying chemical application regimes or adapting industrial crop varieties to a wider range of agro-ecological conditions. At the same time, GM seeds are also facilitating the further concentration of ownership of the seed industry and enable agro-input corporations to extend their control over farmers by producing seeds that are patented, sterile and/or integrated with the use of particular proprietary chemical inputs.⁶ In this sense, genetic-corporate agriculture represents an extension and exacerbation of many of the dominant characteristics and dynamics of chemical-industrial agriculture.

In the face of strong public and farmer resistance to GM crops, the ag-biotech industry considers the development of GM foods with directly marketable benefits to consumers – such as nutritional enhancements – as an important strategy for overcoming opposition and gaining consumer acceptance. Modifying the nutritional profile of crops has been the most prominent aim to date, as in the development of vitamin-A enriched ‘Golden Rice’ and a low-GI (glycemic index) wheat developed by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) Australia.⁷ While Golden Rice has been heavily promoted as a solution to vitamin-A deficiency in the global South, low-GI wheat – like most nutritionally-engineered crops – may also be marketed to weight and health-conscious consumers in the global North. These nutrient traits are likely to be added to other production traits, such as the herbicide-tolerance trait or the ‘Terminator’ trait for rendering seeds sterile. The handful of corporations that currently control almost the entire GM seed market may use this addition of nutrient traits as a strategy to win over consumers and, thereby, convince sceptical farmers to adopt these crops.

So-called ‘precision farming’ technologies – such as the use of GPS-guided machinery for the application of chemical fertilisers – are also being developed, and these are similarly intended to improve efficiencies within large-scale operations.⁸ Beyond these genetic and information technologies, the next technological wave on the horizon is nanotechnology, which is characterized by the ability to take apart and reconstitute nature at the level of atoms and molecules.⁹ Nanotechnology will have a wide range of applications across every sector of the food system, such as the development of nano-genetically-engineered crops, nano-pesticides and nano-sensors for information gathering on the farm.¹⁰ Given that – like the new biotechnologies – the techniques and products of nanotechnology are likely to be patented and controlled by agri-food corporations, nanotechnology may also facilitate the further concentration of corporate power across the food system.

Animal production has increasingly been characterized by intensive, factory-farming operations, including the confinement of animals in cages and feedlots, and the use of grains, legumes and animal by-products for animal feed.¹¹ Such intensive production practices and inappropriate feeding practices have contributed to the outbreak of animal and human diseases, such as BSE (mad cow disease), foot-and-mouth disease in the UK and bird flu. The new biotechnologies and nanotechnologies are being used to breed animals adapted to these intensive production systems and to improve input-output efficiencies through the development of new growth stimulants and medicines.

Conventional agri-food production practices have produced a range of environmental problems, including land and soil degradation (for example, erosion, salinity and nutrient depletion); the loss of animal and plant

varieties and the reduction in wildlife diversity; the pollution of land and waterways from chemical inputs and effluent run-off from intensive animal production facilities; high demands on water, energy and oil for food production and transportation; the depletion of the oceans from industrial fishing practices; and the threat of new ecological problems, such as genetic pollution and nano-pollution. Many governments have adopted the rhetoric of agricultural sustainability, but their responses are often confined to the use of market mechanisms and high-tech solutions to these environmental problems, rather than supporting alternative farming paradigms. In the context of these escalating ecological crises and other economic pressures (such as the rising cost of oil), the new biotech, information and nano-technologies may enable the more efficient use of resources and inputs, particularly for large-scale, capital-intensive producers. The question is whether these technologically-derived efficiency gains represent a meaningful shift to more ecologically sustainable food production systems or whether they are simply a means for enabling and legitimizing the continuation and extension of these environmentally destructive agricultural paradigms.

Conventional industrial farmers have for a long while been locked into a technological treadmill, defined by the need to quickly adopt new technologies, animal breeds or seed varieties that promise greater yields, reduced costs or marginal efficiency gains, particularly as older technologies, chemicals and seeds lose their economic or ecological edge. The old chemical treadmill is being joined by genetic, info-tech and nano-tech treadmills. Farmers continue to be subjected to a cost-price squeeze characterized by rising production costs and declining commodity prices, leading to the imperative to ever increase economies of scale. This downward pressure on prices has two main sources: firstly, a large number of primary producers supplying and competing against one another in the same and increasingly globalized markets; and, secondly, the shift from open, competitive markets to oligopoly or monopoly controlled markets, whereby corporations are able to more or less directly dictate prices.

The Corporatization and Globalization of Agricultural Production

Agri-food corporations have been extending the ownership and control of agricultural production throughout the twentieth century. But it is in the last couple of decades that corporate concentration has been consolidated. Corporatization – or corporate integration – is one of the defining economic and structural characteristics of the contemporary agri-food system. Agri-food corporations have achieved integration *horizontally* (within particular sectors of the food system), *vertically* (between sectors) and *globally* (between nations).¹² In each sector of the agri-food system – genes, seeds, chemical inputs, primary processing, distribution, manufacturing and retailing – a small number of corporations have typically achieved oligopoly control within national and global markets.¹³ Vertical integration is occurring both

in the form of corporate mergers between companies operating in different sectors as well as through the emergence of a set of corporate 'clusters', whereby corporations operating in different sectors form strategic, co-operative alliances.¹⁴

Agri-food corporations have been able to extend their control over farmers, as a small number of corporations now either supply the agricultural inputs, and/or purchase the farm produce. These exchanges between farmers and agri-food corporations – including distribution, processing and retailing corporations – are increasingly mediated by contracts, patents and leasing arrangements. Contract farming is replacing the more open-market exchange of goods, whereby farmers on contracts may be paid an agreed rate for their produce, yet also bear the risks and may be directed to follow specific agricultural practices and to use specific inputs.¹⁵ Modern seed varieties are now typically patented, and farmers may be required to sign contracts specifying how these inputs are to be used, such as prohibiting the saving of seeds. In these cases, the seeds are not so much being purchased outright from the farmer, but rather the intellectual property embodied in the seed is being temporarily leased from the corporation. A similar situation occurs in the intensive broiler industry, whereby farmers may effectively 'lease' young chicks from an input supplier and receive a fee for each fully grown chicken they deliver back to the company, such that the farmer/grower never actually owns the animals that pass through its factories.¹⁶ Mary Henrickson and William Heffernan have highlighted the novel commodity-exchange and decision-making implications of such a corporatized food system:

In a food chain cluster, the food product is passed along from stage to stage, but ownership never changes and neither does the location of the decision-making. Starting with the intellectual property rights that governments give to the biotechnology firms, the food product always remains the property of a firm or cluster of firms. The farmer becomes a grower, providing the labor and often some of the capital, but never owning the product as it moves through the food system and never making the major management decisions.¹⁷

This image of a tightly-integrated and fully-corporatized system can be distinguished from the relatively more fragmented and unevenly integrated character of an earlier stage of industrial agri-food production and exchange.¹⁸

Conventional farmers in many countries of the North--particularly larger-scale operators--continue to receive large subsidies for their produce, leading to artificially deflated prices. The dumping of this heavily subsidized produce in foreign countries can undermine the market for locally-produced goods in those countries. At the same time, financial institutions such as the IMF and the World Bank have coerced the heavily indebted countries of the South to reduce subsidies and tariff protection for their own farmers, leaving small-scale and subsistence producers increasingly vulnerable. The

WTO has also reshaped trade relations in a way that enables transnational corporations to override national regulations and protections, thereby further eroding or simply abandoning the old development goal of national food self-sufficiency.¹⁹

At the farm level, the dominant trend has been towards the undermining or replacement of traditional, smaller-scale, diverse, locally-oriented, subsistence and independent forms of farming by larger-scale, specialized, monocultural and corporately owned or controlled operations that produce goods for export to regional or global markets. In the North, this has meant a decline in the number of farms and farm workers and a consequent impact on rural economies and communities.²⁰ In the South, the dumping of subsidized produce, unfair trading terms and an over-reliance on cash crops has undermined small-scale and subsistence producers and local food self-sufficiency.

Both fresh and durable agricultural products are increasingly being distributed through regional and global markets via land, sea and air transport, leading to an increase in the 'food miles' that these foods accumulate.²¹ The development of a global network of refrigerated cool-chains has enabled the year-round supply of out-of-season and exotic fruits and vegetables. This flow of fresh fruit and vegetables – such as tropical fruits and fresh greens, and including organically grown produce – is largely from the South to more affluent consumers in the North. The growing recognition of the importance of fresh fruit and vegetable consumption by health-conscious consumers tends to reinforce this trend towards the global distribution of food products.

The dominant agri-food system has mostly been defined by the large-scale industrial production of cheap, durable, standardized, uniform and undifferentiated products destined for global markets and the food manufacturing sector.²² However, there has also been a parallel development in more recent times towards a re-differentiation and diversification of production, particularly in the direction of 'quality' foods. These quality foods include organic, regionally-identified, smaller-scale, artisanal or traditional production methods and products. In a sense, there is an emerging bifurcation in the food system – with mass-produced standardized products on the one hand, and quality, artisanal and traditional products on the other.²³ Large-scale producers are also diversifying into higher-premium, quality products through their ability to develop more flexible and precise production techniques that meet certain technical criteria (such as organic or 'free-range' regulations) whilst maintaining economies of scale.²⁴ Higher-quality products tend to service the more affluent, niche, premium and often distant markets, and, in this sense, may simply complement the dominant system of mass-production and reproduce some of its characteristics, such as its long-distance distribution networks.²⁵ However, these quality products may also, to some extent, be produced in opposition to – and represent a

conscious alternative or challenge to—the dominant food economy. In this sense, quality products at present tend to occupy an ambiguous position as elite and/or alternative products.

Food Processing: Processed-Reconstituted Foods and Nutritional Marketing

The ever-growing demand for processed and convenience foods has seen the proliferation of food-processing techniques, additives and manufactured products aimed at providing mostly cheap, durable convenience foods, but also an increasing range of higher-quality, value-added products. The processed and fast-food sectors have been characterized by the dominance of transnational brand-name products and food service chains—such as Coca Cola and McDonald's—which are supported by enormous food marketing budgets.

There has been an ongoing shift from the production and consumption of unprocessed-wholefood meals to processed-wholefoods, to what I'll refer to as *processed-reconstituted* foods. Processed-reconstituted foods are here defined as products that have typically been constructed out of the deconstituted components of wholefoods, chemical additives, artificial fats and sugars, and other non-wholefood derived compounds.²⁶ Unlike processed-wholefoods, processed-reconstituted foods have little direct relationship to any particular wholefoods at all, but are, instead, constructed *from the ground up*, using these deconstituted and highly engineered ingredients. The more foods are processed in these ways, the less consumers are likely to recognise or understand the nature or source of these foods or their constituent ingredients, nor the health and weight implications of consuming them.

As a consequence of the shift from the consumption of wholefoods to processed and convenience foods (including canned, frozen, manufactured, take-away and restaurant meals), the food-processing, manufacturing and fast-food industries have become primary purchasers of many agricultural products, giving these industries—rather than consumers who purchase wholefoods—the power to control agricultural markets and, thereby, to directly set the prices paid to farmers. The food processing industry largely treats wholefoods as interchangeable sources of generic food components and nutrients, thereby facilitating direct competition between farmers who produce different crops. The development of 'artificial' substitutes for food ingredients also reduces demand and prices for some crops.²⁷ Processed foods are typically resource intensive and accumulate a high level of food miles, as each processed food product may combine a range of ingredients that are each sourced across great distances, and the final food product may then also be transported to distant markets. As the processed and fast-foods sectors have expanded and matured, there have also emerged higher-quality, premium lines of prepared meals, particularly as food manufacturers and supermarket chains attempt to differentiate their

products. This includes a range of freshly-prepared, home-replacement meals.

The processed food industry has responded to growing health concerns by developing strategies for nutritionally engineering and nutritionally marketing their products. Foods advertised as ‘low-fat’, ‘low-cal’, and vitamin-enriched, for example, have taken a large share of the convenience food market and now constitute a significant portion of new products launched. The nutritional marketing of food draws upon – and simultaneously promotes – what I call the ideology or paradigm of *nutritionism*, whereby the healthfulness of food is predominantly understood in terms of its nutrient profile, and at the expense of other ways of understanding and contextualising the relationship between food and health.²⁸ This reductive focus on the chemical-nutrient level in engaging with food is exploited by the food industry through the marketing of their foods on the basis of the quantities of particular nutrients they contain, thereby obscuring the quality of the ingredients and the level of processing that a food product has been subjected to.

In Australia, food manufacturers have until now only been legally permitted to advertise nutrient-content claims on food packaging. However, new regulations are now being finalized which would permit more far-reaching *health claims* to be advertised, such as claiming that a food may protect against particular diseases or be beneficial to particular bodily conditions. The permission to allow health claims opens the door to the development and marketing of so-called *functional foods*, which are typically processed foods with added ingredients or food components and which – it is claimed – have specific health benefits over and above ‘conventional’ foods.²⁹ A more appropriate term for such foods, I’d suggest, is *functionally-marketed foods*, since it is essentially the ability to market the health benefits of these foods that distinguishes them from other, non-functional foods – such as unmodified wholefoods – rather than any credible evidence or arguments that these foods can achieve better health outcomes than non-functionally-marketed foods.

Food Retailing: the Power of Supermarkets

Food retailing worldwide is characterized by the rise to dominance of large national and transnational supermarket chains that typically control a large fraction of the food retail dollar in the local markets they operate within. In Australia, the two dominant supermarket chains – Woolworths and Coles – account for around three-quarters of all grocery item sales.³⁰ The market dominance of these supermarket chains comes at the expense of smaller, independent and local food retailers and local shopping strips. However, the power of supermarkets extends well beyond their control of the food retail sector, for supermarkets are now recognized as the most powerful corporate players and the most powerful institutions across the entire agri-food system. This is largely because they stand as the primary intermediaries

between end-consumers on the one hand and farmers, distributors, processors and manufacturers on the other.³¹ Their buying power and large market share enables them to exercise greater and more direct control over farmers, via the direct global sourcing of produce and the use of contracts. The competition for supermarket shelf-space from food manufacturers has enabled supermarkets to charge substantial rent for this shelf-space and to drive down or to set wholesale prices.³² Supermarkets are also intent on taking a greater share of the food processing dollar by expanding their range of own-brand products, particularly at the premium-quality or gourmet end of the market, and to directly compete with brand-name products.³³

Supermarkets are now actively introducing and incorporating a range of otherwise 'alternative' food products, such as organic and fair-trade produce. The growing consumer demand for these products has made their inclusion viable, and the significantly higher prices of many of these alternative products translates into higher profit margins for retailers. Supermarkets are able to incorporate and subsume these alternatives as just another product line and as a means of providing an ever-wider array of choices for consumers. The inclusion of these now highly sought-after products enable supermarkets to diversify into up-market niches, as well as portray an image of corporate responsibility for supporting green or social justice issues. Supermarkets also have a range of strategies for capturing and benefiting from diet-related health concerns. This includes the stocking of a range of nutritionally engineered processed foods; the home-branding of premium-priced, quality products such as organic foods; the direct global sourcing of year-round supplies of fresh fruit and vegetables; and the creation of their own health and safety standards, systems of identity-preservation and supply-chain tracking, which are intended to assure customers of the quality and safety of their products.³⁴

One of the consequences of the centralization of food retailing in supermarkets and large shopping centres, and the associated decline of smaller and local neighbourhood food outlets, is the creation of so-called 'food deserts' in many neighbourhoods, whereby those with limited transport and mobility or on low incomes do not have ready access to fresh and healthy foods.³⁵

Food Consumption: Forms of Disconnection from Food and the Reintegration of Health Concerns

The practices and cultures of food consumption in the global North – and increasingly in the global South – have been characterized by a number of long-term trends, such as a decline in home-based food production; the shift from plant-based to animal-based diets; the shift from unprocessed wholefoods and home-prepared meals to increasingly processed, prepared and convenience foods; the shift from shopping locally at smaller retail outlets to centralized supermarket shopping; and an overall decline in the percentage of gross income spent on food.

Some of the changes in the cultures of food preparation that have been a focus of concern and debate include the standardization and loss of taste and texture of food products; the loss of traditional and locally-distinct foods, cuisines and farming practices, in the face of the global homogenization (or so-called McDonaldization) of food production and consumption; and a decline of cooking and food preparation skills.³⁶ A way of characterizing some of these issues surrounding the practices and cultures of food consumption is in terms of a profound sense of *disconnection* from food that citizens or end-consumers now typically experience. This disconnection from food may take a number of forms, including a physical disconnection from – and lack of knowledge of – where, how and by whom foods are produced.

French farmer-activist Jose Bove has referred to highly-uniform, anonymous and globally-disseminated produce and fast-foods as ‘food from nowhere’.³⁷ The increasing distances across which food is transported and the length of the supply chain makes it difficult to know much about the location and conditions of production. The availability of out-of-season imported fresh foods creates a disconnection from local seasons and climatic conditions. The decomposition and recomposition of foods and ingredients by the food processing industry makes it increasingly difficult to understand – or make any sense of connection with – these processed-reconstituted foods. This material decomposition of food into its component parts is paralleled by the way we now also commonly understand and speak of food in terms of its nutrient components, as in the nutritionism paradigm referred to earlier.

The dominant forms of agri-food production and consumption have been associated with a range of health problems and concerns. These include food scares such as BSE (mad cow disease), bird flu and periodic food-contamination episodes; diet-related health problems associated with processed-industrial diets; widespread malnutrition and hunger-related diseases; the exposure of farmers and farm workers to chemical pesticides; the chemical residues and additives in fresh and processed foods; and the decline in the nutritional quality of wholefoods. These diet and production-related health problems have opened up an important line of critique of the dominant food system and a space for alternative agri-food initiatives to flourish.³⁸ This includes growing demand for organic foods; a recognition of the importance of fresh and wholefoods; a shift to vegetarian diets; and changes in the menus of school canteens and lunches.

In responding to these contemporary trends, the dominant players in the food industry have approached these health concerns as an opportunity rather than a threat to their markets and power structures, and they have actively used health and nutrition issues to capture new markets, consolidate their market power and further integrate their production and supply chains. The strategies being used (some of which have already been mentioned above) include the global distribution of fresh and organic

foods; the development of processed foods and GM crops with modified nutrient profiles; the promotion of meat-centred fad diets;³⁹ and the ability of supermarkets to deliver a range of health-centred products and develop their own health and safety regulatory systems. These are examples of the dynamic nature of the dominant agri-food system and its ability to adapt and respond to new developments and challenges.

Alternative Agri-Food Movements

A number of alternative agri-food movements and initiatives have emerged over recent decades in an attempt to address various economic, environmental and health problems and the inequalities and crises associated with the dominant agri-food system. These alternative agri-food movements, initiatives and practices can broadly be divided into two forms of political activity: *oppositional* and *constructive*.⁴⁰

Oppositional forms of politics are primarily aimed at directly opposing or challenging existing institutions, structures and practices in an attempt to reform – or completely transform – aspects of the dominant agri-food system. Oppositional agri-food movements include the anti-corporate globalization and anti-WTO movements; trade reform movements; anti-GM food and anti-pesticides campaigns; animal liberationist campaigns against factory farming; farmers' unions and peasant movements; anti-McDonald's protests; and public health and consumer-based movements against the availability and advertising of junk foods for children. These civil society movements are largely aimed at opposing or reforming government policies, trade and safety regulations and corporate power and practices. They focus on such problems as environmentally harmful farming methods; food subsidies in the global North; the need for land reform and redistribution in the global South; the right to union membership and decent conditions for agricultural workers; gender-based inequalities and the role of women in food production; free-trade regulations designed to open Southern markets; and patenting and intellectual-property regulations that facilitate the theft of commonly-owned and traditional seeds and knowledge.

While these movements and campaigns are sometimes single-issue focused, they also tend to articulate a broader critique of the dominant agri-food system and put forward similarly broad alternative agendas, such as the demands for ecologically sustainable forms of agriculture, 'food justice', 'food democracy' or 'food sovereignty'. For example, the international peasant and small-scale farmers' movement Via Campesina has defined food sovereignty as

the right of each nation to maintain and develop its own capacity to produce its basic foods respecting cultural and productive diversity. We have the right to produce our own food in our own territory. Food sovereignty is a precondition to genuine food security.⁴¹

In contrast with oppositional politics, the more *constructive* forms of political activity are primarily concerned with directly creating and supporting alternative practices, structures and institutions. These alternatives may to an extent be developed outside of and in parallel with – but also as a direct challenge to – the dominant economic and political systems and power structures. Constructive or alternative agri-food initiatives may include the organic and sustainable farming movements, free-range animal practices, fair-trade schemes, farmers markets, box delivery schemes, Community Supported Agriculture schemes (CSAs), seed-saving networks, local and community food production movements, food retail co-operatives, the Slow Food Movement, and vegetarianism. Each of these alternative agri-food initiatives in some way addresses one or more dimensions of the problems identified with the dominant agri-food system.

There is often much overlap, close interconnection and common cause between oppositional and alternative agri-food initiatives. Some agri-food movements are actively involved in both oppositional and constructive initiatives. At the same time, oppositional movements often aim to open up spaces for alternative or subordinate practices and institutions to be established, maintained or to flourish. The anti-GM food campaign, for example, has promoted organic and sustainable forms of agricultural production as an alternative to genetic-corporate agriculture, and this campaign is likely to have fuelled the rapidly growing demand for organic food over the past decade.

Alternative Production, Exchange and Consumption Initiatives

Within the range of constructive/alternative agri-food movements and initiatives, three types of initiatives can be distinguished: alternative practices and relations of food production; alternative relationships and networks of distribution and exchange; and alternative food consumption practices.

Alternative practices and relations of food production may involve alternative ecological, animal welfare or economic values. These include organic forms of agricultural production; free-range and less-cruel forms of animal rearing; and fair-traded products that ensure a fairer price paid to farmers, and fairer pay and conditions for farm workers. These alternative practices and relations of production are typically manifested in the form of commodified alternative end-products which carry certifying labels that identify and guarantee these alternative values, such as their organic, fair-trade, free-range or local character, or that identify the specific location of production. These labelled products often carry a corresponding price premium that more accurately represents the costs of production. Alternative end-products may be distributed through alternative exchange and retail networks. However, the price premiums and growing demand for these alternative products has seen them increasingly distributed through conventional food networks, and stocked and promoted by large

supermarket chains, particularly in the case of organic and fair-trade products.

Alternative practices and networks of distribution and exchange include shorter and less exploitative supply chains (for example, fair-trade products); more localised food-distribution channels; alternative retailing that bypasses supermarket chains (for example, food retail co-operatives and small-scale retailers); and more direct exchanges and relationships between producers and consumers (for example, CSAs, box-schemes and farmers markets). These alternative exchange networks and practices may be used to distribute both alternative and conventional food end-products. They offer ways of reconnecting producers and consumers, of delivering more of the food retail dollar to producers and of undermining the power of large processing and retailing corporations.

Alternative agri-food *consumption* practices can involve a different aesthetic and appreciation of food, such as a revaluing of the taste, nutritional and health-giving qualities of food, and they can incorporate wider concerns about the environmental and economic conditions of production.⁴² These alternative consumption practices may entail purchasing alternative agri-food end-products (for example, organic, free-range, fair-trade, locally produced or seasonal foods) or the purchasing of food through alternative distribution and exchange networks. But they can also involve the *decommodification* of food consumption practices, such as by eating further down the industrial food chain (to reduce processing, transport, *et cetera*), and by assuming a greater level of direct involvement in the growing, preparation and sharing of food.⁴³

These decommodifying practices include growing one's own food locally (for example, home-based production, city farms, community gardens, school kitchen gardens, edible landscapes), removing some of the commercial processing and value-adding stages of food preparation (for example, eating less processed foods and preparing meals from wholefoods), and the refusal to eat certain foods for environmental, animal welfare, health or socio-economic reasons (for example, vegetarianism and veganism). Vegetarianism and veganism, for example, involve the refusal to eat meat on the basis of an opposition to the killing of animals, the cruel treatment of animals in industrial production systems, and/or due to the land, feed and water resources typically consumed by meat production systems. As the increase in consumption of processed foods has facilitated the concentration of power held by the intermediaries between producers and consumers (such as food processors and supermarkets), decommodifying practices may be an important strategy for undermining the power of these industries and corporations and may be a prerequisite for the success of other alternative agri-food initiatives.

While alternative production, exchange and consumption initiatives are growing in strength and popularity, they only constitute a fraction of global

production and exchange within particular sectors at present, and may to date have had only minimal impact in terms of challenging or reversing some of the dominant tendencies of the conventional food system in many sectors. Nevertheless, the very existence of these alternative initiatives, and the considerable time, money and passion that is put into establishing and maintaining them, is an indication of the crisis of legitimacy facing the dominant food system. As James Kirwin suggests, the true significance of some alternative agri-food initiatives may be 'in challenging the established relationships within the "conventional" agro-food system, and sending a signal to other actors within the food system that may in turn influence their actions.'⁴⁴

Mary Hendrickson and William Heffernan have argued that these alternative initiatives might best flourish in the spaces where the dominant food system is most vulnerable. The vulnerabilities they identify include the difficulties that corporatized, mass-production systems have in serving smaller, differentiated and ever-evolving markets; and the difficulty in responding to consumers' demands for trust, transparency, and social and environmental concerns. They suggest that these alternatives focus on developing more personalized relationships (based on more direct interactions between producers and consumers), be based on different time and space relations (such as emphasising seasonality and locality), and be based on more comprehensive understandings of sustainability which encompass both farm production and distribution practices.⁴⁵

The power of these alternative movements and initiatives in part lies in the way they are often bound up together, such that they form multi-dimensional – rather than isolated – challenges to the dominant food system and combine to create alternative food networks and food cultures. However, the dominant system always threatens to fragment these initiatives, to integrate them into the conventional system one at a time, and to thereby dilute and disperse the challenges they pose.

As noted earlier, alternative food products can also have an ambiguous identity, as they may readily fit into, and be associated with, more affluent and elite forms of consumption on the one hand, while representing a point of resistance to the dominant food system on the other.⁴⁶ At present, the retail price premiums for some alternative and quality food products makes them less affordable to lower-income groups, thereby threatening to accentuate income-related class differences. As David Goodman argues, 'in the absence of consumer price subsidies and related institutional changes, *alternative* quality food production seems destined to retain its status as a narrow "class diet" of privileged income groups.'⁴⁷ However, the adoption of decommodifying practices, and the establishment of shorter supply chains (such as CSAs and organic food-buying co-operatives) that reduce the number of intermediaries between producers and consumers, may be other

pathways for ensuring that alternative and quality food products become accessible to lower income groups.

Organic Farming

Organic farming is an important and increasingly successful part of the alternative agri-food and sustainable agriculture movements. There are a wide range of organic farming styles and philosophies, and various ways in which organic farming can be seen as either working outside or being incorporated back into the dominant agri-food system. Organic farming can be understood as responding and offering alternatives to the health and environmental problems associated with conventional technologies and practices of production, including concerns with chemical and genetic technologies of breeding and farming. Organic certification systems worldwide have explicitly prohibited the use of genetically modified organisms, and for this reason the strong public backlash against GM foods may have contributed to the growing demand for organic foods.

The early organic farming movement tended to embrace a range of alternative ideals, and was associated not only with chemical-free, smaller-scale, diverse and sustainable farming and humane animal rearing practices but also with alternative distribution and retailing networks and the counter-cultural wholefoods movement. In other words, organics was – and still is for many people – bound up with a broader alternative vision of the agri-food system. However, the growing demand for organic produce, as well as the price premiums it commands, has seen organics increasingly incorporated into – and reproducing some of the structures and characteristics of – the dominant agri-food system.⁴⁸

Organic farming methods can vary greatly and represent divergent ecological and socio-economic paradigms. On the one hand, there are the agro-ecological, biodynamic and permaculture farming styles which emphasize diversity, the health of soils, the humane treatment of animals, farm-level and local integration of the various parts of the farming system and greater self-reliance in terms of farming inputs. Such practices potentially enable farmers to reduce their dependence upon and subordination to corporate agri-input suppliers of seeds, pesticides, fertilisers and other techno-scientific products. But organic farming is also increasingly characterized by large-scale, specialized, monocultural farms that rely on minimalist organic certification standards, the replacement of conventional inputs with organic external inputs⁴⁹ and the continuation of intensive animal rearing practices.⁵⁰ As large-scale farmers and corporations attempt to shift into and capture the price premium of organics, they may also exert pressure for the watering down of organic certification standards.⁵¹

Organic end-products have until recently been distributed primarily through local channels and small-scale organic retail outlets. But as a certified end-product with a price premium, these organic products have readily and

increasingly been incorporated into global distribution channels, such that organic produce is now being exported to affluent consumers all over the world.⁵² Organic food is also increasingly being corporatized beyond the farm gate, as large manufacturers produce a growing range of organic processed foods⁵³ and supermarkets not only stock a range of fresh and processed organic foods but now also home-brand organic products in order to capture a larger slice of the organic price premium.⁵⁴ The transportation, processing, packaging and retailing of organic foods – and the associated energy consumed and waste produced – has in many ways come to resemble the life-cycle of conventionally-grown foods and tends to erode some of the environmental benefits of organic-farming practices.

This incorporation of organics into the dominant agri-food system has enabled a rapid expansion in the availability of and demand for organic products. But it may also subject organic farmers to the same market pressures, contractual arrangements and monopolized distribution channels currently faced by conventional producers. One of the dangers of the growing interest from food manufacturers and supermarkets for organic produce is that they will begin to use their market power and contracting strategies to drive down the prices paid to farmers. Unlike fair-trade products, organic-certification schemes tend to primarily certify the production methods used, and there is no guarantee of a fair price paid to the producers of organic produce.⁵⁵ Nor is there sufficient transparency for consumers, with respect to the premium retail prices they pay and the percentage of the organic premium price that is earned by primary producers. Large manufacturers and retailers may also prefer to deal with a small number of larger-scale growers, thereby shutting out small-scale producers. As Bill Vorley notes with respect to the UK organics industry:

The dominance of organics by the big producers is positive for the environment and market development, but it underlines the growing realisation that organic and high-welfare production is not a refuge for smaller scale producers in modern agri-food systems.⁵⁶

Fair Trade

Fair-trade labelling schemes are a certification system for subverting some of the inequalities and injustices in the food system, particularly the low, fluctuating and downward spiral of commodity prices and the poor treatment of agricultural workers. The fair-trade system enables producers to be paid a guaranteed price for their produce, which is typically higher than global commodity prices, and that may enable a reasonable livelihood for producers. Fair trade schemes also typically offer producers longer-term contracts, partial payment in advance, a social premium to the producer cooperatives that is often invested in local community projects, and minimum working conditions for farm workers. At present, fair-trade foods mainly consist of a select number of cash-crops, such as coffee, tea, cocoa and bananas, and these crops are produced by growers in the global

South, largely for consumers in the global North. Consumers indicate their willingness to pay more for such foods where they perceive that farmers and farm workers receive a fairer return for their produce and their labour. In this sense, it represents an alternative relationship between producers and consumers, based upon greater transparency and responsibility.⁵⁷ Fair-trade products may travel through different and typically shorter distribution channels in an attempt to cut out some of the intermediaries in the food system and to thereby capture a greater share of the retail price. Supermarkets are also increasingly stocking fair-trade products, a reflection not only of the growing consumer demand for these products but also the higher profits to be gleaned from their premium retail prices.⁵⁸

While fair-trade products guarantee a higher or fairer (if not necessarily 'fair') price to farmers at the farmgate, these products may accumulate a similar rate of price mark-ups, as they travel along the supply chain, as conventionally traded products, such that producers may still receive only a fraction of the final retail price. This, perhaps, brings into question whether the spirit of the fair-trade system is being carried along the full length of the supply chain and whether there is sufficient transparency for the consumer regarding the portion of the retail price that is retained by intermediaries. Further, while fair-trade producers are required to adhere to certain conditions in order to gain certification, there are no corresponding criteria for the importers, exporters or retailers.⁵⁹ For example, fair-trade products may only form a small portion of the products handled by supermarkets and coffee outlets, revealing a lack of commitment to fair trade principles by these companies.⁶⁰ Supermarkets may at the same time use their stocking of a small number of fair-trade products to present an image of themselves as fair-trade retailers or as evidence of their corporate social responsibility.⁶¹

While fair-trade schemes purport to challenge conventional trade relations between the global North and global South, in practice it is only the farmgate price and other on-farm practices that are regulated, while 'market forces' are essentially left to determine the rest of the supply chain.⁶² Ultimately, fair-trade labelling schemes cannot in themselves replace the need for fairer trading regulations and terms of trade between the global North and global South and, therefore, the need for far-reaching policy reforms. Aimee Shreck argues that

without working towards achieving more transformative changes, it seems plausible that the Fair Trade movement will reproduce and perpetuate some of the inequities and hierarchical relationships that currently characterise international trade. That is, even though Fair Trade initiatives seem successful in tilting the balance of power, perhaps making trade less unfair for producers, the movement appears to lack any vision of liberation from the so-called free market, capitalist system.⁶³

Despite these limitations in the existing models and practices, fair-trade schemes are an important development, with the potential for directly

creating alternative trading relations and fairer working conditions for many farmers and workers. These schemes could be expanded not only within exchanges of produce between the global South and the global North but even to locally traded products within the North.⁶⁴ The increasing availability of fair-trade products also serves to bring the unfairness of trade to public attention and may, thereby, strengthen support for the reform of trading regulations.

Food Localization Movements

What could simply be described as *food localization movements* is a way of grouping together a broad range of alternative agri-food initiatives that generally attempt, at least in part, to reorient towards or to strengthen local forms of production, exchange and consumption. This includes local production initiatives such as home-based production; city farms and community gardens; more direct exchange relationships between farmers and consumers, such as CSAs, box delivery schemes and farmers markets; local and alternative retail outlets, such as small local businesses and consumer food cooperatives; and food consumption practices which favour locally produced and less-processed foods.⁶⁵

There are a number of perceived benefits that are common to localized forms of food production and exchange. Firstly, shorter supply chains and more direct exchanges between producers and consumers make it possible for a greater share of the retail price to be captured by producers rather than being appropriated by intermediaries, as well as, potentially, lower retail prices for consumers. Secondly, localized and more direct exchanges enable a greater degree of transparency and awareness regarding where, how and by whom food is produced, as well as more direct and personalised interactions between producers and consumers, which, in turn, may encourage citizens to take greater responsibility for their food consumption practices. Thirdly, local and shorter supply chains reduce the food miles travelled and the energy consumed transporting both fresh and processed foods and give consumers access to freshly harvested produce. The prospect of diminishing reserves and spiralling prices of oil in coming years – the so-called ‘Peak Oil’ scenario and the end of the ‘cheap oil’ era – have been taken up more recently by local food activists as an opportunity to promote the benefits of locally produced and distributed foods.⁶⁶ Fourthly, it is at the local level that many alternative agri-food initiatives and principles may more readily intersect with and reinforce each other.

Different kinds of alternative food localization initiatives and priorities may be emphasized, depending on whether they are situated in an urban or rural context. In an urban setting, food localization is often associated with the need to grow more food in the cities or for forming more direct links with rural producers through farmers’ markets and CSAs. In rural food-growing regions, food localization may simply mean finding ways of accessing locally produced foods that might otherwise be transported to more distant

markets, such as through farmers markets and retailers committed to supporting local growers.

In the context of an increasingly regionalized and globalized food system, the 'local' has become an important focal point and framework around which to conceptualize and build an alternative agri-food system. Food localization movements can be understood not only as an attempt to address specific problems or concerns associated with the dominant agri-food system but, more generally, as a way of taking back a degree of control over the production and distribution of food, of reconnecting with food, and as an important part of movements for food sovereignty and food democracy.⁶⁷ This isn't to suggest that all local forms of production and exchange constitute a substantial alternative to the conventional agri-food system or that they necessarily avoid some of the problems and inequalities that characterize the broader food system.⁶⁸ Nor can a simple 'local' versus 'global' distinction be used to map the 'good' and the 'bad' characteristics of food systems. As Clare Hinrichs argues, 'Making "local" a proxy for the "good" and "global" a proxy for the "bad" may overstate the value in proximity, which remains unspecified, and obscure more equivocal social and environmental outcomes.'⁶⁹

The global agri-food system has been in a period of rapid and turbulent transformation over the past couple of decades, including technological revolutions, ecological crises, corporate mergers and take-overs, and food and health scares. The shift from chemical-industrial to techno-corporate forms of food production have also been accompanied by the globalization of markets and distribution channels and the closer integration of the various sectors of the food system. But the conventional agri-food system has also faced a number of challenges to its legitimacy from alternative agri-food initiatives, institutions and practices, and has responded by attempting to reincorporate these initiatives or to shift into the ground occupied by these alternative forms of production, distribution and exchange.

Moving forward, the agri-food system faces a range of new or mounting challenges. Firstly, there are the ecological problems associated with climate change, water availability, soil degradation and the dwindling of oil reserves. These challenges may facilitate a far-reaching shift to low-input and more environmentally and geographically appropriate forms of production, more localized distribution of food, a reduction in energy-intensive food processing, and associated changes in the cultures and practices of consumption. However, such a shift is far from inevitable, for there are other possible responses and future trajectories, such as a more radical shift to a biotechnologically and nanotechnologically engineered food supply geared towards the efficient production of cheap processed-reconstituted foods with tailored taste and nutrient profiles, particularly for those unable to afford what may be increasingly expensive (and even locally produced) fresh wholefoods.

Secondly, there are the problems of growing inequalities and power imbalances in the food system. The expanding power of transnational agri-food corporations and large-scale producers are placing greater pressures on and further undermining the livelihoods of small-scale and subsistence farmers and landless agricultural workers. With a large percentage of people in the global South directly dependent on food production for their livelihoods and with hundreds of millions of people suffering from malnutrition and vulnerable to hunger related diseases, the questions of who has access to the land and resources to produce food may continue to largely determine who consumes it.

Thirdly, there are changing forms of governance which tend to undermine direct democratic involvement or control, including the shift from national to global regulatory regimes (for example, the WTO and Codex) and the market-based management of resources (for example, carbon trading and water trading). At the same time, a range of farmer and civil-society movements have emerged within and across nations to challenge some of these structures and paradigms of development, and demanded more direct involvement in decision making. The possible futures of food are now wide open, and they very much hinge on the outcome of these contrary forces and dynamics.

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STATE FOOD COMMISSIONS - THE MASSACHUSETTS EXPERIENCE

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The Commission and Its Organization

In October of 1973, the Governor of Massachusetts appointed a Commission on Food that included citizens representing agriculture, labor, the food industry, education, government and consumers. The Commission was charged with the task of recommending programs and policies that would assure Massachusetts residents an adequate supply of food both now and in the future.

The appointment of the Commission was a response on the part of the governor to rapidly escalating food prices and growing alarm about the declining agricultural land base in the Commonwealth. One must also recognize the political implications of the food price issue for a governor about to run for re-election.

Professor Ray A. Goldberg, Moffett Professor of Agriculture and Business in the Graduate School of Business Administration at Harvard University was appointed by the governor to chair the Commission. I was asked by Ray Goldberg to serve as Executive Director of the Commission, a task that I accepted without considering the consequences, especially in view of the fact that no budget was appropriated to support the work of the Commission.

The Commission approached the task by organizing into task forces to deal with six functional areas;

- (1) food production and supply,
- (2) labor and economic incentives,
- (3) transportation, distribution, storage and logistics,
- (4) marketing,
- (5) government institutions and structures, and
- (6) food prices and consumer policies.

Each task force was headed by a chairman who was a member of the Commission, and a professional resource leader was appointed to each task force to provide technical assistance and assume responsibility for completing the task force report.

The Food Situation in 1973

We are all familiar with the scenario in 1973 - the United States had moved from a problem of chronic surpluses of agricultural commodities to temporary shortages and rapidly escalating food prices. Poor weather and harvests in parts of the world, general inflation, the increased purchasing power of other nations and the policy decision of our government to export large quantities of grain all contributed to the world and U.S. food problem.

The net effect of the world and domestic supply and demand conditions was an increase of 14.5 percent in retail food prices from 1972 to 1973, the largest annual increase in a quarter of a century.

The Approach

The Commission through its six task forces approached the assigned task by addressing several central questions:

1. Do Massachusetts consumers pay more for food?
2. If so, why does food costs more in Massachusetts?
3. In what other ways does our dependency upon outside sources for food affect Massachusetts consumers?
4. How can we ease the burden of higher food prices for disadvantaged consumers?
5. What are our food production resources in Massachusetts and how can we utilize them more effectively?
6. What is the role of state government in the food system and how can it be made more effective?

The Conclusions

I will attempt to summarize the conclusions and recommendations of the Commission relative to the six central questions.

First of all, based upon budget data furnished by the Bureau of Labor Statistics it appeared that food costs were from seven to ten percent higher in Boston than in the average U.S. metropolitan area. Since Boston is the market center for Massachusetts and includes the distribution headquarters for several firms operating statewide, it was concluded that Massachusetts consumers probably do pay more for food than most other consumers in the U.S.

In order to determine why consumers in Massachusetts pay more for food an analysis was made of the cost of marketing services which represents about 60 percent of the retail price of food. With the exception of transportation costs, marketing services did not appear to cost more in Massachusetts than elsewhere in the U.S. Transportation costs were found to be higher in Massachusetts for several reasons including the high degree of dependence upon other areas for our food supply, (the production of food in Massachusetts is equivalent to only about 16 percent of the total consumption) the distance from many major sources of supply, the continuing shift from rail to truck and the insufficient availability and use of special volume rail rates for feed and food shipped into the state. The bleak outlook for energy costs made it likely that transportation costs would place Massachusetts consumers at an increasing disadvantage in the future.

In addition to relatively higher transportation costs, the high degree of dependency on outside sources for food makes Massachusetts consumers highly vulnerable to disruptions in the transportation system as demonstrated by the independent truckers' strike in 1973.

It was concluded that the burden of rapidly increasing food prices in Massachusetts was especially serious among the young (under 25), the elderly (over 65), the Black and Spanish speaking residents. It was also concluded that the Food Stamp Program was the best means available for helping alleviate the effects of high food prices on the disadvantaged.

An analysis of food production resources in the state indicated that the number of farms and acreage in farms had declined rapidly since 1945. The analysis

also indicated that there are only about one million acres of land in the state that is well suited for food production and, of that, only 29 percent of it was in cropland.

Seafood is one of the most important food resources in Massachusetts. Due to overfishing the annual catch of Atlantic ground fish has been declining. The landings of fresh fish at the three major Massachusetts ports in 1972 was only about half of the 1961 landings.

Finally, the role of state government in the food system was reviewed. It was found that most of the 10 executive departments in Massachusetts had programs or responsibilities that were related in some way to food production, marketing or consumption. However, there appeared to be a lack of coordination among the state agencies and no well-defined food policy. In addition, there appeared to be a need for additional regulations or legislation in some instances as well as deregulation in others when existing regulations were no longer useful in maintaining a competitive food system.

The Recommendations

Based upon the findings of the Commission a series of recommendations was made to the Governor. These recommendations included programs and policies that could reduce the disadvantage of Massachusetts consumers with respect to the supply and price of food. The major recommendations dealt with transportation, food processing facilities, the Food Stamp and other food assistance programs, new food sources, consumer information and education, the protection of Atlantic fishing resources, incentives for expanding agricultural production and the role of state government in the food system.

The recommendations were mostly actionable at the state level but included some that involved national legislative or policy changes.

The Commission recognized that the food system in Massachusetts is part of an interrelated national and international system and that a single state has no direct control over what happens in the entire system. However, it was also apparent that the New England region shared some common problems and that a concerted and unified effort on the part of New England congressmen could influence national policies and programs vital to maintaining a sound food system in the region. The Commission report identified some of the issues that had important implications for the New England food system.

The Commission report was responsible, at least in part, for bringing about some tangible results, particularly with respect to food assistance programs, consumer education and food production policies. The report also led to feasibility studies for food processing the state and the development of a state food policy endorsed by the governor.

I believe that the most important results of the Governor's Commission on Food were to bring about improved communication and understanding among the various interest groups and a greater public awareness of the issues and their importance to the food system in Massachusetts. Meaningful and effective public and private action to improve the production and delivery of food will depend to an increasing extent upon a well informed population.

Back to the Land

Food, Climate Change and the Coming Energy Crises.
by Graham Stouts

Some years ago a friend in Mayo told me she had been visited by a neighbour of hers, a farmer, who was curious to see what she was doing planting potatoes in her garden. Apparently the neighbour farmer could not understand why on earth she was going to the trouble and hard manual labour of digging beds and setting seed potatoes when they were so cheap to buy.

In recent years farming has become defined more and more by the availability of grants and subsidies, and by the dictates of international trading agreements. One of the consequences of this is that individual farms are producing an ever diminishing range of products for an increasingly global market.

Simultaneous to this, the home garden has become a fashion extension of manicured lawns and clipped shrubs. Growing food has become a special-interest hobby or is viewed as some kind of regressive primitivism which swims against the tide of lawnmower culture now becoming prevalent in the suburbs. Across the water, the easy complacency which surrounds the supply of food was severely tested in September of 2000 when after just a few days of a nation-wide truckers' strike, many parts of the UK found themselves

facing what has become unthinkable in modern times: a shortage of food. Once the deliveries stopped arriving, it was only a matter of days before the shelves were emptied. Since little food was produced locally, it quickly became apparent that there really was no other source of food available.

Modern farming and globalised systems of trade have created a situation in which we are perilously vulnerable to political and environmental factors quite beyond our control. Unless we start taking this issue seriously and make dramatic changes to the way we think about and produce food, we are facing the increasing likelihood of food shortages and yes, famines, even in the most developed and 'modern' parts of the world.

Food and Fossil Fuels

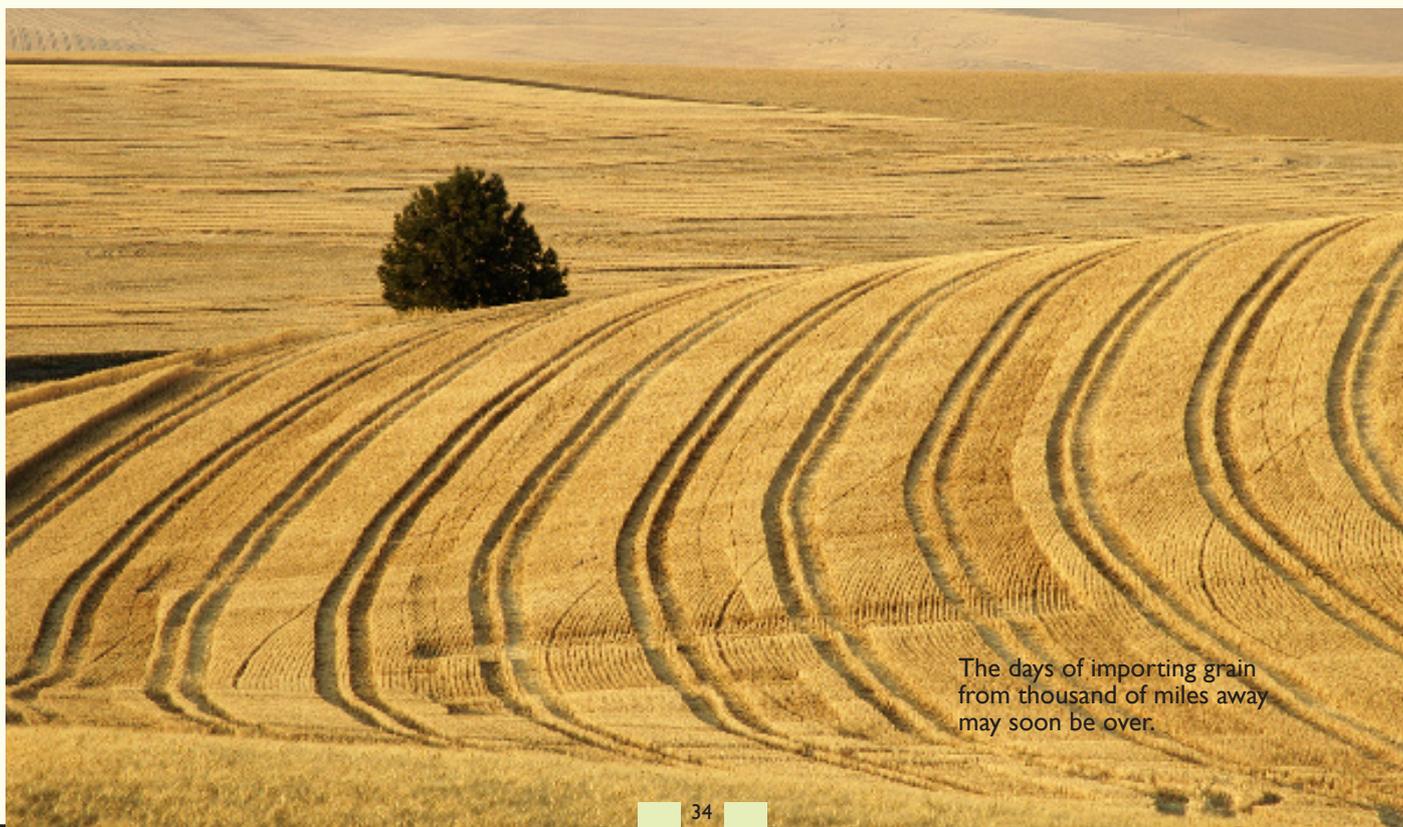
When people think of energy shortages and the effects of rising energy costs, they tend to think of possible blackouts, or rising prices at the petrol pumps. Much more fundamental than these consequences, however, will be the effect on our food supply, not simply because of possible interruptions in transport, but because, since the 1950s, food is fossil energy:

"The Green Revolution increased the energy flow to agriculture by an average of 50 times its traditional energy input. In the most extreme cases,

energy consumption by agriculture has increased a hundredfold or more. In a very real sense, we are eating fossil fuels". (1)

One of the most significant developments in agriculture in the past 150 years was the Haber-Bosch method of manufacturing ammonia fertiliser from atmospheric nitrogen and natural gas. Nowadays the production of artificial fertilizer represents around one third of all the energy used in modern agriculture. Another 8 percent is used in the manufacture of pesticides from oil. Finally there are the liquid fuels used in farm machinery, transport, packaging and food processing. Today, an average of ten calories of fossil-energy are used to produce just one calorie of food. (2)

This transformation of agriculture is believed to be one of the main factors behind the exponential increase in the world's population. There has been a doubling in the last thirty years and a six fold increase since the beginning of the Industrial Revolution. The use of fossil-based fertiliser and pesticides has permitted the feeding of at least four times the number of people from the same amount of land than 'traditional' methods of agriculture (3) When people talk about 'Climate Change' the concerns expressed are often to do with the economic impact of changing climate or of extreme weather events like hurricane Katrina or the January storms in Europe this



The days of importing grain from thousand of miles away may soon be over.

year. The gravest effects of a more unstable climate on the developed nations, however, will be in relation to food production.

Much of Europe's food is imported from distant countries already under increasing environmental stress for other reasons, including topsoil loss and water shortages. Farming depends on a stable climate, and as weather patterns across the world become less predictable, we will find we can no longer rely on the rest of the world being able to produce our food for us. The urgency of this situation has recently been highlighted in a report by Caroline Lucas MEP of the *European Green Party*, who writes:

"The Common Agricultural Policy must be replaced by a policy framework that minimises fossil-fuel use through a prioritisation of self-reliance so that Europe can meet this new challenge head-on, delivering food security into the future". (2)

The task is enormous, because what is required is a complete reversal of the policies which have defined agriculture during the last 50 years. These policies lead to a massive movement away from the land and to an increased dependency on imports. In response to this, there needs to be a massive cultural shift towards local food production. The impending peak in global oil and gas supplies means this transformation needs to begin now: an energy crisis will mean a food crisis.

Moving Forward

There are a number of steps which can be taken at an individual, community and national level in Ireland. Key areas include the following:

Education

Sustainable agriculture requires far more skills and human labour than industrial systems, and a much greater number of farmers and gardeners to participate in it. Educating for this new enlarged workforce should begin as early as possible. Gardening and horticultural activities should become an integral part of every school and educational establishment. The large

areas of green space around schools and universities should become places for food production and crop research.

Tree Crops

Perhaps one of the most exciting areas for developing new forms of food production is nut trees. Cob nuts and filberts (larger relations of the native hazel) do very well in most lowland areas of Ireland and recent research suggests that viable crops of walnuts and sweet chestnuts may be achieved in the drier and warmer parts of the country. Yields of around 3-4 tonnes per hectare are achieved in other countries where walnuts and chestnuts are planted on a large scale. Given the high protein value of nuts and the possible integration of nut production with low density grazing of livestock, the potential benefits of indigenous nut production are too great to ignore. State funding should be provided for further research in this area, to determine which cultivars are most suitable for the Irish climate. (visit www.woodkerne.net for details of Irish research into nut production. Cob nut trees are available mail order from the Sustainability Institute)

Heritage Seed Varieties

One of the effects of globalised, industrial, agriculture has been the tragic loss of the great diversity of seed varieties once common in traditional systems (3). An essential part of local food production and food security is the ability of farmers and gardeners to save their own seeds, and develop the skills to breed new varieties. The principle organisation devoted to the preservation of seeds in Ireland is the *Irish Seed Savers Association*. This important non governmental organisation deserves far better support and funding. See: www.irishseedsavers.ie.

Productive Urban Landscapes

In response to the greater urbanisation of our society, we need to develop strategies for producing more food in our towns and cities. There are many opportunities for this: community gardens, allotments, city farms and back yards. Andre Viljoen (4) has written

of the "continuous productive urban landscape" which he believes will be an integral part of urban design in the future.

The Intensive Home Garden

During a visit to Slovenia in 2005, I was struck by the prevalence of the home food garden. It appeared more common than not to find food gardens outside the front and back doors of apartment buildings and private houses, even in the city. A stroll around the area in the evening would find people gently hoeing their plots while chatting with the neighbours. Interestingly, none of this seemed to be at odds with the accoutrements of modern life such as TVs and mobile phones! There is no expectation that we will all be growing all our own food, but in the future far more people will need to be involved in local food production than is presently the case. Many people could become involved in home food production, even if this is only growing tasty salad crops in a window-box.



Local Food Plans

Permaculture students in *Kinsale Further Education Centre* are working on producing a Local Food Plan. This will look at various different aspects of food production in and around Kinsale. The proposals include community and school allotments, orchards, composting banks, and the development of a long term food production and security strategy for the area.

Ireland would be well served by having its own local food-production culture. Probably the most useful life skill we can teach our children is how to grow food.



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