

FOOD SECTOR DEVELOPMENT: MULTIFUNCTIONALITY AND ETHICS

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ABSTRACT

The food sector can be defined as the whole range of activities that determine the relationship between agricultural production and the consumer. The food sector includes all sorts of technical, trading and service activities related to the storage and processing, packaging, transport, distribution of food, and catering. The first section of this paper analyzes the challenges facing the future of the food sector, in a context of demographic growth, urbanization, increasing poverty and disparities, environmental degradation and increasing remoteness in Man's relationship to his food. The main function of the food sector is to provide healthy, nutritious food to satisfy consumer requirements. However it also has other functions, which are social, economic and environmental and which can together be termed the "multi-functionality" of the food sector. This concept, first developed for the agricultural sector, is used in the second section to describe the various direct or indirect, positive or negative, short- or long-term effects of food sector development. Food has a cultural function and makes a key contribution to the sense of individual and collective identity; the food sector offers opportunities for economic activity, employment and income in both rural and urban environments; as far as environmental issues are concerned, food sector activities may have both detrimental (pollution) and positive (depollution, regional development) effects. Assessment of the main functions of the food sector and the trends in its evolution raises ethical questions, mainly related to sustainability and equity, and these are discussed in the third section. The debate can be formulated in the following terms: can the model of food sector development initiated by the industrialized countries be applied to the entire world on a sustainable and equitable basis, given the effects of this development with regard to the energy consumed, the changes in dietary behaviour, the new demands in terms of food safety and the questions of biodiversity and disparities?

Key words: Food Sector, Multifunctionality, Sustainability, Equity, Ethics

INTRODUCTION

Although the food sector has significantly contributed to ensuring food security, questions are now being asked about its recent evolution and the disruptive effects of uncontrolled industrial and technological development on the environment and on society (Raoult-Wack and Bricas, 1998). The aim of this paper is to show that after a century of major technical advance, essentially achieved by and for the industrialized countries, the evolution of the food sector should no longer be thought of in terms of a "headlong pursuit". New priorities have emerged, which are not solely directed towards the production of healthy, nutritious food for all. The first section of the paper analyzes the challenges facing the future of the food sector in the present context of demographic growth, urbanization, increasing poverty and disparities, environmental degradation and increasing remoteness in Man's relationship to his food. Although the main function of the food sector is to provide healthy, nutritious food to satisfy consumer requirements, it also has other functions, which are social, economic or environmental. The "multi-functionality" of the food sector is analyzed in the second section, in terms of the various direct or indirect, positive or negative, short- or long-term effects of food sector development. Assessment of the main functions of the food sector and the trends in its evolution raises ethical questions, mainly related to sustainability and equity, and these are discussed in the third section.

EVOLUTION OF THE FOOD SECTOR: MAIN TRENDS AND CHALLENGES

The present challenges facing the future of the food supply stem from the need to satisfy food demand. In overall terms:

- food demand is increasing, with the world's population growing at an ever-increasing rate and an extra 1.7 million mouths to feed each week. Debates over the last few years concerning the future of the planet have seen the question of food sufficiency reappear. The Malthusian fears of a widening gap between people's needs and food production are once more coming to the fore (Brown, 1995; Azel and Agcaoili, 1995). The problem arises mainly in the developing countries;
- food demand is moving away from the areas of agricultural production, owing to the rate of urbanization. This is particularly rapid in the developing countries, where it exceeds the rate of demographic growth;
- food demand is changing rapidly in line with present-day socio-economic changes: changes in consumption trends related to changes in lifestyle (less time spent preparing and eating meals, women going out to work, eating out, infatuation with fast food, etc.), changes in the international context, with the new World Trade Organization rules and the Codex Alimentarius, and changes in consumer requirements in terms of food safety.

All this is taking place in a context characterized by:

- increasing environmental degradation;
- increasing poverty and widening disparities (Landes, 1998);
- an overall long-standing, long-term move towards greater remoteness in Man's relationship to his food (and to the world of nature in general). Although the development of farm produce, organically grown produce and home-grown garden produce reveals a move towards greater proximity, this is clearly not the predominant trend. Several factors contribute to greater remoteness. With the food sector becoming more industrialized and self-contained, with food supply chains growing longer and more complex and with food processing technologies and food itself becoming more sophisticated, consumers are moving away from their traditional proximity their food (Raoult-Wack and Bricas, 1998). As a corollary, they are becoming increasingly suspicious of the industrial food sector and its lack of openness. The crisis associated with Genetically Modified Organisms (GMOs) and bovine spongiform encephalopathy (or "mad cow disease") are but further episodes in a series of crises that include baby milk, hormones in veal, food colourings and ionized foodstuffs in Europe, mercury in fish in Asia, and food aid cereals, flavour cubes and mangoes treated with acetylene in Africa.

In such a context, the development and efficiency of the food sector are key issues in that the food sector is the privileged field of activities that determines the relationship between agricultural production and the consumer. Let us now examine the various functions of the food sector.

FOOD SECTOR MULTI-FUNCTIONALITY: A MEANINGFUL CONCEPT

The food sector includes all sorts of technical, trading and service activities related to the storage and processing, packaging, transport and distribution of food. It should be noted that only food for human consumption (and not for feeding to animals) is considered in this paper. The concept of multi-functionality makes it possible to assess the various social, economic and environmental effects, direct or indirect, positive or negative, short- or long-term. This concept, first developed for the agriculture sector (FAO, 1999), is useful for improving our understanding of the food sector, which can be assessed in terms of four different types of function.

➤ Primary function:

The primary function of the food sector is to provide food to satisfy consumer requirements in terms of quantity, quality (nutrition and safety) and cost. In these terms, processing activities are a key factor in the capacity of the food sector to determine the relationship between agricultural raw materials and the consumer. Agricultural raw materials are living, and therefore unstable, systems, usually with a high water content (between 70 and 90% of the weight of most roots and tubers, fruits and vegetables, fish and meat). Owing to the presence

of water, a multitude of reactions develop spontaneously after harvest (in the case of plant products) or slaughter (in the case of animal products): enzyme reactions (e.g. phenoloxydase activity in plants, protease and lipase activity in animal products), microbiological reactions (e.g. bacteria, yeasts and moulds) and biochemical reactions (e.g. oxidation). These reactions lead to rapid spoilage of the food system, and if nothing appropriate is done the food goes rotten and is no longer edible. Food processing techniques make it possible to prevent food decay, thus reducing post-harvest losses and increasing shelf life. This enables the transportation of food from the point of production to the point of consumption. There are various ways of preventing food decay: by removing water (drying, mechanical pressing, or filtering) or immobilizing it in the form of ice (freezing), by changing the temperature of the food (chilling, heating or cooking) to prevent reactions, by adding preservative molecules (salting, candying, pickling), and so on. Food processing techniques also make it possible to improve or exploit the properties of the food, for instance i) by removing inedible bulk (e.g. seed husks) or toxic parts (e.g. cyanogenetic compounds in cassava, antinutritional factors such as phytates in certain pulses, which reduce the absorption of iron and calcium; or antitryptics, which inhibit digestion); ii) by exploiting the useful parts of foodstuffs (e.g. extraction of oils, starch or flavourings), iii) by subjecting the food to various combinations of operations (e.g. converting milk into cheese or wheat into flour, semolina, bread, pasta, biscuits or couscous) or mixing several different products together (in culinary preparations).

➤ Cultural functions

Food should not be considered solely in terms of its primary function. By processing agricultural raw materials, it is possible to obtain foods with shapes, textures, flavours, colours, etc. that are specific to each culture. Consumption, in the sense of cooking, the organization of meals, ways of putting the food in one's mouth (with one's hand, or using knives and forks, chop-sticks, leaves, etc.) is a powerful medium for the construction of cultural identity. Moreover, food is different from other consumer products in that it passes through the body. Man is transformed by it to a greater extent than by any other product and it affects his well-being more directly. It contributes to growth and good health - but can also cause illness or even death. Overall, food contributes to both sensory and social pleasure and also has a considerable effect on Man's sense of individual and collective identity (Fischler, 1995).

➤ Social and economic functions

Food sector development offers opportunities for economic activity, employment and income in both rural and urban environments. However, the globalization of the food trade should not be allowed to mask the diversity of food sector development models and the very marked contrast between North and South. In the countries of the North, which are mostly industrialized, the food sector consists mainly of SMEs¹ (which contribute to over 80% of food sector turnover in regions such as Europe or North America), with a few large groups, some with international interests, and with mass distribution (hypermarket-type food outlets). These countries have a wealth of scientific and technical resources, and current R&D trends focus on the sophistication of food products (built-in service factor, packaging, composition) and processes (automation, computerization). In the developing countries of the South, the food sector is characterized by the prevalence of very small-scale food enterprises, either rural

¹ Small or Medium-sized Enterprises (in EU terminology, an SME has fewer than 250 employees).

or urban (e.g. so-called rural agro-industry in Latin America, street-food enterprises in Asia, small-scale urban food workshops in Africa) (Smit et al., 1993; Boucher and Muchnik, 1995; Winarno, 1996; Bricas and Bridier 1993), often with fewer than 10 employees and with a family-based organization. These small-scale food activities have often been termed "decentralized" or "unstructured". The public authorities were often not officially notified of the existence of such activities, so their key contribution to the supply of processed food products was usually not taken into account. These activities are mostly run by women, whose traditional role, from a social and cultural point of view, involves feeding and food-related activities and the transmission of the processing know-how that they use in economic activities.

➤ Environmental functions

The food sector has negative effects on the environment, in particular because of the pollution associated with its processing activities, which consume large amounts of energy and water and which generate pollutant effluents. These aspects are relatively well managed in industrialized countries, including the problem of effluents (unlike agricultural effluents, food industry effluents are relatively easy to treat). In the South, all the effects of food sector activities on the environment are very poorly controlled.

However the food sector can also have positive effects on the environment, thanks to its potential for i) depollution, downstream of the agricultural sector (e.g. utilization of agricultural by-products and co-products, processing of abattoir waste), and ii) regional development (e.g. forest preservation in Amazonian regions through the exploitation of fruit and plants gathered in the wild, and the fight against rural depopulation through the establishment of income-producing activities in rural areas).

ETHICAL ISSUES RELATED TO THE EVOLUTION OF THE FOOD SECTOR: SUSTAINABILITY AND EQUITY

Assessment of the main functions of the food sector and the trends in its evolution raises ethical questions, mainly related to sustainability and equity. The debate can be formulated in the following terms: can the model of food sector development initiated by the countries of the North be applied to the entire world on a sustainable and equitable basis, given the effects of this development with regard to the energy consumed, the changes in dietary behaviour, the new demands in terms of food safety and the questions of biodiversity and disparities?

Sustainability

➤ Overall energy efficiency of the food processing system.

The present trend in the growth of demand and the rate of urbanization reinforces fears of a widening gap between people's needs and long-term food production. Town-dwellers eat more meat and more processed products with a built-in service factor (convenience foods), in other words calories that cost more to obtain, and this is accentuated by their rising level of

income. North Americans thus consume the equivalent of 800 kg of grain per annum, Italians 400 kg and Indians 200 kg (Brown, 1995). To supply populations with enough food, more and more energy has to be injected into the processing system, given the increased sophistication of the technology it uses and the services involved (packaging, portioning, pre-cooking, etc.) The newly industrialized and urbanized countries are moving towards an agro-nutritional model the energy requirements of which appear impossible to cater for on a sustainable basis for the entire world (Malassis, 1995).

➤ Product supply and dietary behaviour.

In the countries of the North, which are in a situation of "food satiety", but also in the newly industrialized countries of the South, the overabundance of food products on the market, with an ever-higher fat and sugar content, combined with changes in lifestyle (less physical exercise) and the blurring of dietetic reference points, is reflected in an increase in illnesses caused by dietary excess: overweight, obesity, diseases of the cardiovascular system, acquired diabetes. All these phenomena suggest that a change in dietary behaviour is necessary.

➤ Undue focus on food hygiene: Too much hygiene is counterproductive.

In the industrialized countries, a number of recent crises (mad cow disease, listeria, preservatives) have exacerbated consumer concerns about food safety. The need to take this concern into account has become a watchword for politicians and business firms. However, there are major risks involved: i) the risk of reducing the population's immunity in the long term through the provision of increasingly aseptified food; ii) that of creating resistant pathogens, already responsible for a constant increase in levels of food sterilization; iii) that of preventing the natural protection of food by its natural competitive flora. Too much hygiene is thus totally counterproductive. Here too, a balance must be found.

➤ Biodiversity.

Industrialization of the operations used in the processing of agricultural raw materials results in raw materials being standardized in order to take account of technical constraints. The industrialization of the processing systems therefore leads to a reduction in varietal diversity, reinforcing the tendency already inherent in the industrialization of agricultural production systems.

➤ Respect for cultural specificity and identity

Food is a powerful medium for the construction of cultural and collective identities, in a context of major internationalization. The start of internationalization is far from recent, given that Europe has imported tropical goods like spices, sugar, coffee, cocoa and tea since the 12th century. Nowadays, not only are foodstuffs "blended" on an international scale but also an important role is played by well-known international food groups such as Danone, Unilever, Kraft Jacob and the like. The major presence of large companies in the media and the worldwide distribution of bread, rice, chicken, dry milk solids, beer, hamburgers and Coca-Cola may provoke fears that local produce will disappear and that food will become completely standardized. This risk must be taken into account, even though further analysis of

consumption practices reveals a considerable capacity for appropriating and reinterpreting external elements thanks to local styles of cookery and consumption.

Equity

➤ Equal access to healthy balanced food.

Most efforts in the food sector are concerned with the production of high value added food. The current trend towards increasingly sophisticated processes and products benefits the population of wealthy countries, where there is an overabundance of products on the market, or only the wealthy section of the population in poorer countries. With research and development carried out essentially by and for the industrialized countries of the North, it is patently obvious that the current major issues of food security are completely ignored (Raoult-Wack and Bricas, 1998).

➤ North-South imbalance

The inequality of access to food resources on an individual level is aggravated by a major imbalance between North and South in terms of their capacity to provide food sector support, and by a lack of recognition of the South's resources. The historical roots of this discrepancy can be found in the conception of the food problems of third-world countries that has prevailed since World War II (Raoult-Wack and Bricas, 1998). Food security was initially perceived as a quantitative question, in the face of fears of an increasing gap between demographic growth and agricultural production. Production had to be increased because it was difficult to slow down demographic growth or in addition to doing so. Efforts at the time mainly focussed on increasing yields with the "green revolutions", and agricultural research resources were primarily allocated to the agronomic sciences. It was only more recently that the need was felt to develop resources for research into the use and consumption of local produce. The practical feasibility of such a readjustment is open to question, however, given the current crisis in public research funding. Moreover, cooperation-oriented scientific exchange funding and practices are still largely dominated by the idea of the transfer of knowledge, methods and technologies from the North to the South, and they are at times solely concerned with exploiting local resources on the cheap.

➤ Ownership of knowledge

There is deeply felt anxiety on this subject, as evidenced by the exchanges recorded during the 1999 World Conference on Science in Budapest. It appears essentially to spring from scientific and technical "domination" by the countries of the North, the technological and economic dependence of the countries of the South, a lack of respect by the North for the South's technical resources (or an ignorance of them), "pillaging" of the South's resources by the countries of the North (genetic material, know-how, raw materials, scientific skills, etc.) (Raoult-Wack et al., 1999). By identifying and characterizing the traditional knowledge of a particular human community, a research team potentially disseminates it on a worldwide basis, through its publications. Nothing then prevents other communities or business firms from appropriating and using such knowledge. The community that had time-honoured ancestral control of this knowledge can find itself dispossessed of the possibility of putting it

to economic use. It is still legally very difficult to protect traditional knowledge, in particular for poor countries that do not have access to the costly tools of international legal protection.

➤ Problem of equity between men and women.

Whether on a world scale and over a long period of time or on a more local level, it is noticeable that the development of the food sector often results in the appropriation by men of activities that were usually the domain of women. Even projects for the mechanization of small-scale processing operations in tropical countries cannot escape this problem. The introduction of motorized mills for cereals or roots and tubers, of oil presses or of dryers very often results in the seizure by men of know-how previously put to economic use by women. The consequences of this phenomenon are not yet known, but this should still not stop us from wondering about the risks involved.

CONCLUSION

In this paper we have taken the view that the food sector should not only meet a rapidly increasing food demand (overall growth, higher required quality criteria, new food safety requirements) but also create jobs and encourage dietary behaviour that is "defensible" in terms of energy and of dietetic requirements, respecting the environment, biological and cultural diversity and equity (access to healthy balanced food for all, ownership of knowledge and resources).

We have shown that, in terms of multi-functionality, current trends in the evolution of the food sector are giving rise to questions and debates of an ethical nature. If such ethical considerations are taken into account, it should logically become necessary to revise and modify the priorities, models and methods of intervention in national and international public policies, in particular i) research priorities (at present too much determined by and for the North and not taking the long term sufficiently into account); ii) modes of scientific cooperation, in a context of a major imbalance of power; iii) food sector models (structuring and industrialization), iv) nutritional education and dietary behaviour.

On the other hand, if the food sector is considered solely in terms of its primary function of providing healthy, nutritious food, such debates are groundless. This more restrictive point of view should logically lead to a move towards the disengagement of public policies from the food sector, which would then be under private sector control. The question would then be to know how to manage the long-term risks analyzed in this paper, in a context of pure market logic.

Some of the ethical questions presented above have already become consumer concerns: the search for less polluting packaging, for more natural, more authentic products that enable consumers to rediscover their roots. Wider ethical concerns like equity in the balance of power in the different industries, protection of the environment, the interest of future generations, animal welfare and children's rights are also increasingly reflected in dietary behaviour, as they are in other areas of consumption (Pouteau and Raoult-Wack, 2000). It is important, however, to emphasize the very specific nature of food, which has a special place among consumer goods in that it passes through the body and has a direct effect on the well-

being and health of the individual. This specific nature of food has a direct influence on innovation management in the food sector, with some innovations being rejected by consumers. One can mention in particular the rejection of scientific innovations linked in part to uncertainty about the long-term environmental effects of the technologies used (e.g. transgenic or irradiated foodstuffs).

This type of social concern should induce politicians and business firms to pay greater attention to such questions. There is a danger, however, that ethical concerns will simply become commercial attributes of products. There is already a tendency to try to assess the commercial value of ethical considerations. What price will the consumer be prepared to pay for products that derive from an equitable trading relationship or that remunerate the ancestral know-how of the community from which they originate? If ethics is profitable, if it can represent value added for products, it is safe to bet that it will become a genuinely shared concern. But what if this is not the case? Does it mean that the collective values reflected in the marketplace are effectively the values and concerns of business corporations? Nothing is less certain when one knows that no two individuals or cultures have the same weight in the marketplace.

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