

Buying locally: the benefits are not always the ones we expect

The craze for local agri-food products is in part linked to the expectation of lesser environmental impacts from these forms of marketing, and in particular from a more favourable carbon footprint on account of a shorter distance travelled by the products. However, it is the production phase which weighs most on the environmental impacts of agri-food products and in particular on their carbon footprint. As a result, the shorter distances usually travelled by local products are not enough to ensure their environmental quality.

The benefits of local food distribution channels consist more of socio-economic benefits: return of local food production, greater added value of the products for the producer, closer relationship between farmers and consumers, greater involvement of public stakeholders and inhabitants in agriculture, and greater involvement of consumers in their food choices.

Local marketing of agri-food products is generally characterised by two types of distribution channels: local and short.

Local distribution channels are defined by a reduced distance between the producer and the consumer.

Short distribution channels consist of one sales intermediary at the most (as defined in the "Plan of action to develop short distribution channels" launched by the Ministry of Agriculture in 2009). These distribution channels can cover extremely varied forms of marketing:

- for direct sales. For example: direct farm sales, farmers' markets, CSA (Community Supported Agriculture scheme);
- for sales via one intermediary maximum. For example: sales through a supermarket or a cooperative.

These distribution channels generally involve short distances. They can correspond to various farming systems, i.e. organic or conventional.

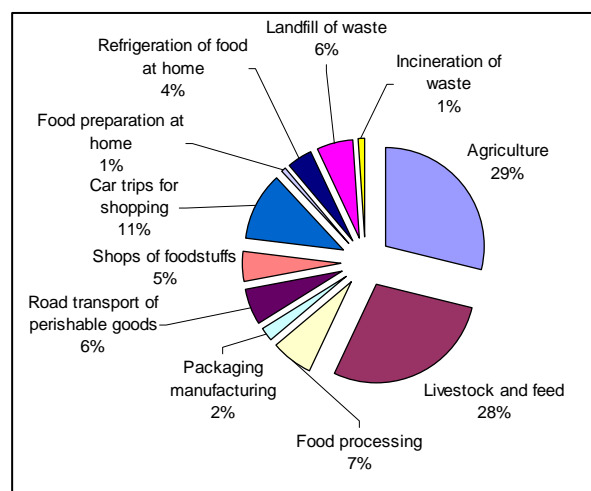
According to the 2010 agricultural census, in 2010, 21% of farms (producing honey, fruit, vegetables, wine and animal products) sold their products through short distribution channels and in particular through direct sales. Involvement in these local food systems depends on several factors. It is particularly more common among small farms (excluding the wine sector) and in the honey and vegetable sectors.

Environmental impacts depend more on farming practices than on transportation

Most of the environmental impacts, greenhouse gas emissions included, result more from the agricultural production phase than from transportation.

57% of greenhouse gas emissions from the food supply chain are linked to the production phase and only 17% to transportation phases (see Figure 1).

Figure 1: Sources of impact of greenhouse gas emissions in the food supply chain



Sources: Ifen (2006); according to Citepa (Setcen format), Ademe, Ministry of Industry (DGEMP), Ministry of Transport (DAEI), Ministry of Agriculture (Scees), Insee.

That order of magnitude is close to the one observed in Germany, according to a rather old study: 52% of GHG emissions came from agricultural production and only 13% from distribution (study discussed in Redlingshöfer, 2006 [1]).

This predominance of the production phase concerns all environmental aspects - greenhouse gas emissions as well as water quality and consumption, biodiversity, etc. - and it is confirmed by several studies carried out on specific products, which take into account the entire life cycle.

The ongoing developments in life cycle analysis research will provide more precise and updated elements on these aspects.

Environmental benefits that depend on farming practices

Agri-food products have environmental impacts throughout their entire life cycle. These impacts are generally classified into 4 major categories: resources (water, etc.), health (human toxicity, ecotoxicity, etc.), biodiversity and climate change. They depend on the way we produce, manufacture, transport and use the product, as well as how we manage its end-of-life. These phases of the product's life can differ according to the types of short and local distribution channels. Consequently, local products do not have any specific environmental advantages.

Environmental impacts of the agricultural production phase are more often than not predominant in the lifecycle of food products and depend on the farming practices used. Consider these two examples:

- 1) A tomato grown in a greenhouse in winter has a higher impact in terms of greenhouse gas emissions than a field-grown tomato which does not require energy to heat the greenhouse;
- 2) An organically grown tomato does not have the same environmental impacts as a tomato grown through conventional farming practices. For example, it does not require synthetic fertilizer or plant protection products, which is a positive factor in its environmental footprint (there are fewer greenhouse gas emissions linked to the manufacturing of fertilizers, fewer effects on water quality, better preservation of biodiversity, etc.). On the other hand, yield per hectare is usually lower in organic farming. Thus, even if the environmental impacts per hectare are lower for the organic tomato, they may remain at such a level that the "impacts/product quantity" ratio may be higher than that of conventional farming.

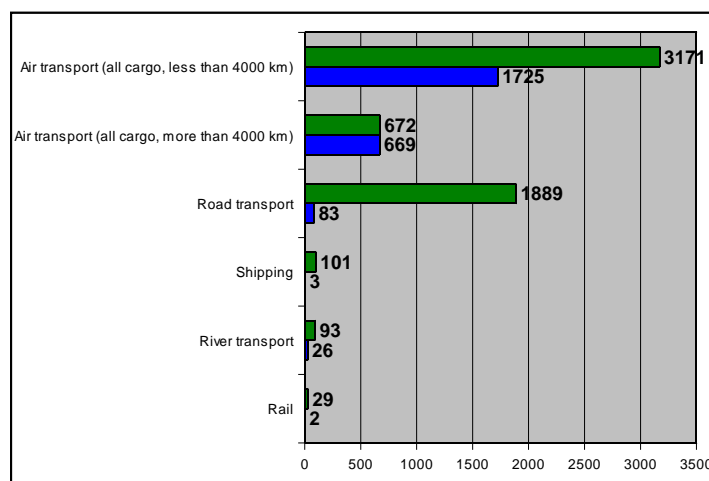
Variable efficiency of the transportation phase depending on the logistics system

The distances travelled by locally marketed products are usually lower than those for long distribution channels, which is a factor in reducing greenhouse gas emissions.

However, that is not necessarily enough to reduce the greenhouse gas emissions linked to the transportation phase, as these emissions depend mainly on the mode of transport and optimisation of logistics.

The most common mode of transport in short and local distribution channels is road transport. The range of CO₂ emissions per tonne-kilometre is particularly wide for this mode of transport which includes very different vehicles: lorries, vans, and cars. For example, a light utility vehicle weighing 3.5 tonnes that transports parcels (this type of vehicle can for example be used by a producer to sell their products at the market) will emit on average 1,068 g CO₂/tkm, while a 40-tonne articulated lorry transporting various goods over a long distance (this type of transport can be used to transport imported products from the unloading port to a supermarket logistics site for example) will emit 84 g CO₂/tkm. Thus, since emissions from railway transport and especially maritime transport are generally much lower, and also less variable (figure 2), a shorter distance does not always mean fewer CO₂ emissions per tonne-kilometre.

Figure 2: CO₂ emissions according to mode of transport (in g per tonne - km)



(In blue, low estimate; in green, high estimate)

Sources: for air transport, the DGAC's TARMAAC calculator; for the other modes of transport, decree of 10 April 2012 on the application of decree 2011, regarding information on the quantity of carbon dioxide emitted during transport

In addition, for a given mode of transport greenhouse gas emissions depend on optimisation of logistics. Such optimisation is related to the quantity transported and the loading rate of the mode of transport. Both these aspects could be improved in the future for most short and local distribution channels. Indeed, the volumes to be transported do not always permit a high loading rate. Traditionally, in several forms of local marketing (markets, baskets delivered to a specific location, etc.), empty return journeys from the point of sale are still common practice. Moreover, variability of the loading rate is higher for road

transport than for other modes of transport; this is particularly the case at the beginning and/or end of the journey - transportation phases where optimisation is minimal. Furthermore, the degree of optimisation of the transportation phase can also be very diverse depending on the type of distribution channel. For example, it will be more difficult for producers to optimise transport if selling at the market individually than if selling at a cooperative store.

To give an example, the amount of energy consumed in the transportation and distribution phases for a lamb raised in New Zealand and marketed in Germany, and for a lamb raised in Germany and marketed locally through direct sales is rather comparable despite major differences in transportation distances (Schlich *et al.* (2006) [2]), because using bulk transport methods, i.e. heavy goods vehicles and cargo vessels, considerably reduces the emissions per kilo transported. In this study, the lamb from New Zealand is transported by refrigerated ship over 20,000 km (the boat returns full to New Zealand), then by heavy goods vehicles with refrigerated containers over 400 km (empty return journey). The German lamb is transported in a van by the producer over 100 km (empty return journey).

Considering all these elements, despite the shorter distances travelled, it is difficult to draw conclusions on greenhouse gas emissions involved in the transportation phase of these distribution channels.

The consumer's means of transport also plays a role

For example, with regard to energy, a study carried out on bread shows that the advantages of consuming bread produced locally (at home or by a traditional bakery, as opposed to bread made by an industrial bakery) depend on the means of transport used by the consumer and the distance between their home and the supermarket. In fact the energy footprint of locally produced bread is actually higher during the production phase, than that of industrial bread: producing 1 kg of bread, at home or in a traditional bakery, requires twice and one and a half times more energy respectively than producing the same amount in an industrial bakery. However, making bread at home or buying bread from a traditional bakery can become more energy efficient for 1 kg of bread if the consumer uses their own car, as soon as the distance between the home and the supermarket exceeds 1 km for bread produced at home, and exceeds 500 m for bread produced by a traditional bakery (study carried out by Reinhardt, 2005 [3]).

A potential source of environmental amenities

Producers committed to local food systems may also be committed to using alternative farming practices, especially **low-input farming** or organic farming (chemical inputs are not used in organic farming and use of approved inputs is limited), see Maréchal and Spanu (2010) [4].

One of the strengths of local food systems is **keeping environmental impacts local**, according to

ADEME: local production is subject to **local regulatory requirements**, which are often more strict in France and in Europe on environmental issues; it also avoids transferring the impacts to other regions (ADEME notice entitled "Les circuits courts alimentaires de proximité" (2012) [5] on local short food distribution channels).

The presence of a green belt in a peri-urban area can also be a factor in preserving the living environment and biodiversity. It can also play a role in both the mitigation of climate change (biodiversity helps to regulate the climate), and adaptation to climate change (evapotranspiration contributes to reducing air temperature by sourcing energy from the ground and plants). It can also encourage the preservation of local varieties which are not suited to standard distribution channels.

Potential improvement in profitability

This was the case, for example during the last crisis in the pig industry for pig farmers in Pays Cathares: they were able to increase the value of their pork to €1.90/kg compared to €1.11/kg at auction sales, thanks to a joint decision between producers and butchers (*Campagnes et environnement* No.14, February 2011).

A social cohesion factor

An analysis of about ten experiments carried out in rural and peri-urban areas in 2009-2010 shows that local food consumption is a factor in social cohesion [6]. This analysis revealed in particular that short distribution channels contribute to strengthening social bonds. With short distribution channels, producers and consumers also better understand their respective worlds. Consumers are reassured by knowing about production conditions, and come to understand the constraints faced by farmers. These channels can also provide producers with additional motivation to do their job.

A trend towards more responsible citizenship among consumers

The adoption of civic choices by consumers of local products is highlighted in "the analysis of a corpus of approximately 110 articles taken for the most part from English sociological literature so as to give an account of the main debates regarding alternative food systems" (C. Deverre, C. Lamine, *Economie rurale* No. 317, 2010).

In several of the works analysed, alternative food systems, including short distribution chains, appear to weigh significantly in the balance of power within food systems: the role of the consumer becomes more important. These systems facilitate learning, not only for consumers, but also regarding agricultural practices and their impacts, culinary practices, and even democratic practices themselves. The consumer becomes a "food citizen" and reduces the passivity of their food choices.

A tool for more sustainable food consumption

The solution of short and local distribution channels could be part of a response to the challenge of sustainable food. As such, they are encouraged by public policies (see text box below).

These marketing channels cannot however meet all the challenges of sustainable food.

For example, it is in the interest of cities to ensure diversity in their food supply sources for at least three reasons (see duALine foresight study by INRA and CIRAD on sustainable food [7]):

- 1) Strategic and food security aspects: for example, Ile-de-France would need 6 times more farmland than the area currently used to feed its 11 million inhabitants; diversity in supply regions can help limit shortage risks;
- 2) Environmental aspect: local products do not necessarily have fewer impacts on the environment as previously stated;
- 3) Ethical aspect, which can be illustrated by the acquisition of products within the context of fair trade.

Public action and the viewpoint of public stakeholders

The Ministry of Agriculture and Food launched a plan of action to develop short distribution channels in 2009 and the implementation of that plan is one of the key actions of the National Programme for Food (PNA).

At the European scale, the Committee of the Regions published an outlook opinion on "local agri-food systems" in 2011. The document acknowledges that local agri-food systems help support the local and regional economy and considers that these systems "are of the utmost importance in less-favoured regions". It underlines that short distribution channels "lead to greater interaction between consumers and producers" and "also provide a basic level of food sovereignty". It also considers that short distribution channels "bring environmental benefits through more sustainable production systems". The regulation on quality schemes for agricultural products and foodstuffs, recently adopted by the Parliament and the Council, provides for a Commission report on the case for a new local farming and direct sales labelling scheme to assist producers in marketing their produce locally.

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[4] Maréchal and Spanu (2010). *Les circuits courts favorisent-ils l'adoption de pratiques agricoles plus respectueuses de l'environnement?* (Do short distribution channels encourage the use of more environmentally-friendly agricultural practices?) INRA *Courrier de l'environnement* No. 59, October 2010.

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[6] Short distribution channels & Social cohesion – *Capitalisation et analyse d'expériences conduites sur les territoires ruraux et périurbains en 2009-2010* (Capitalisation and analysis of experiments carried out in rural and peri-urban areas in 2009-2010.) Inra, Réseau Rural Français, Datar, Ministry of Agriculture and commitment from Europe, Cevalar (Cevalar, Study and Liaison Committee for Agricultural and Rural Associations, coordinates rural players in sustainable development).

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le point sur

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