

## **Forgotten edibles as a guarantee of future food security.**

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Sustainability and food security have been troubling scientists for many years with more recent publications addressing “wild edibles” as the future of food during hunger and pandemics. From an ethnobotanical perspective, a wild edible is a source of food that grows locally and can only be obtained by the act of foraging. During the second World War they made up a large part of the diet due to the destruction of commercial food supply chains. Nowadays, with the establishment of global supply chains, the abundance of food from all over the planet has become a reality. Although the level of food security has improved, the agricultural sectors of most European countries have shrunk. The Diversification of food sources has the potential to elevate food security and improve sustainability by introducing locally obtained wild edibles.

### **The current state of European food supply chains**

Despite the heterogeneousness of European food supply chains and the abundance of sophisticated modern agricultural practices (monoculture farming), supply chains are constantly endangered. Agricultural risk management in the European Union or European Food Safety Authority (EFSA), with which the UK may still interact to some extent at member level, state that the weather including natural disasters and price volatility is considered by far to be the largest hazard along the supply chain. Other such threats of a slightly less significant level but still considered probable, include those of marketing difficulties, political measures, technological processes, input market and national debt. The ratio of distribution of risk factors associated with weather and natural disasters with compelling effects on farming, ranges between 86.4% in Poland and 52.3% in Germany. Where there is a significant disruption to the agricultural sector by any of the above risks, shortages of certain produce would be likely to occur, especially when considering the limitations of outbound producers.



Photo 1 Example of monoculture farming field

Reports on the state of the European Union’s agricultural sector indicate that the most used risk management tools on average, are those designed for crop and property insurance at 38.8% and 56.1% respectively. Conversely, crop diversification (see photo 2) is only practised by around 23% of

companies, however companies in some countries apply diversification at a much lower level. Most of the remaining risk management tools are derived from either private insurance policies or as financial support from governmental bodies. The aspects of actual crop losses due to the above risks seem to be forgotten despite being the most tangible.



Photo 2. Example of diversified crop field

### Food Market Saturation

In most European countries such as Germany, Italy and France, 80% of the grocery markets are controlled by large retailers, including discount stores, supermarkets and hypermarkets. In the UK, the figure has been quoted by some sources as being even greater at 96% (see photo 3). With these figures in mind, it is crucial, therefore, to understand how the sales and therefore, the procurement processes take place across the agricultural sector. A tendency towards co-operative sales for consumers is common amongst central and eastern European countries where the number may reach 80%. On the other hand, western European countries have a much lower individual-sale tendency, around 40% to 60% of distribution achieved through cooperative-sales, mainly through large grocery stores. These figures clearly explain the level of dependency on certain segments of the agricultural sector compared to that of the retail sector. From the consumer's point of view, the availability of food in such grocery stores is limited by both the farming sector's efficiency/production as well as the retailer's demand for those goods.

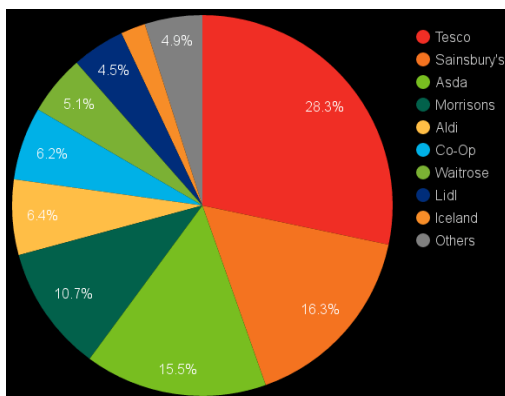


Photo 3 Dominance of supermarkets in UK.

After the exclusion of processed foods, the spectrum of fresh and unprocessed products generally found across these stores is rather narrow. In the UK, the top five most popular fresh edibles sold across these retailers are potatoes, strawberries, peas, onions and bananas, all of which make up over 64% of all unprocessed edible sales. These figures are similar in most European countries however, certain anomalies exist, for example the vast numbers of disparate tomato sub-species available in

retail outlets in Spain and Italy as well as those of potatoes and apples in eastern European countries. This is minimal, however, when compared to the wide variety of fruits and vegetables grown only within the boundaries of continental Europe, not to mention the endless varieties of the above edibles. Whilst diversification across the farming sector, in terms of increasing the number of crop species grown has the potential to strengthen the supply chain's in-built resistance to change, despite the implementation of predicaments (compromising in lower yields and positive impact on sensory characteristics), and the necessity to create appropriate customer awareness.

### **Forgotten edibles as assets**

It is crucial to understand that increasing the size of the pool of available fresh edibles, creates many advantages including an overall increase in food security as well as beneficial nutritional implications. The seemingly inexorable increase of obesity amongst western Europeans, signifies that a diet change for this group of the population is now not only necessary but urgent. Considering that health-related problems are often connected to micronutrient deficiency, the introduction of new edibles which have a tendency to possess higher absorption rates of these micronutrients, will inevitably serve to boost the nutrition values, particularly amongst those consumers who were not previously exposed. Routine consumption of the same edibles tends to have declining absorption ratios of these nutrients.

A further benefit of some species of forgotten edibles is that of comparatively high flavour profiles. By way of example, numerous wild edibles from the family of onions, cabbages, fennels and sorrels are abundant across Europe and can be used instead of common salad leaves normally available in grocery stores, the flavours often shown to be preferred over the established species. Collecting such edibles by individuals is colloquially known as foraging and it is becoming ever more popular.

### **Innovation from Nature**

The concept of diversification of the food supply chain does not only improve food security but is also economically justifiable. Despite an individual's limited impact onto the food grocery sector, trends amongst consumers are considered as important as in other industries. Food choices are fashionable, with new trends continually emerging. In today's World, sustainability is increasingly important to consumers who are becoming far more critical of their food choices and the impact those choices have on their diets and the environment. Hence the emergence of the many sustainable food options in which environmental impact, nutrition and health are equally important. Such changes may be observed across the grain sector where new species emerge annually where, for example, quinoa is now being rejected in favour of millet and teff grains. This is, of course, typical of the ever-changing trends and most likely to change at short notice. However, the modern-day constant in such fickle markets, whilst often driven by novelty, is that of a preference for choosing a product that is produced in sustainable manner.

The introduction of wild edibles into the supply chain does not only have to happen as raw ingredient but may also include processed products. For example, a shift towards baked goods with lower glycaemic index has the potential to become a large market over the next few years. Once a very popular grain, spelt is reappearing across the supply chain as a substitute for standard flours. Although substituting traditional ingredients with wild edibles might decrease consistency, reformulation practices can introduce such change at a practical and feasible level, with minimal impact on their sensory characteristics.

### **Limitations of Diversification**

The limitations and challenges associated with the idea of food supply chain diversification are mainly related to challenges in implementation. This is due to farming practices which generally involve monocropping resulting in lower farming costs and higher yields. Additionally, increased resistance to diseases can be enjoyed through the application of fungicides, bactericides and nematicides, but with higher precision and consistency. Development of effective cultivation practices for entirely new edible species would generate challenges and therefore costs. The research and identification process of the right group of edibles would also require higher market integrity and resources which would have to be translated into feasible farming, harvest, and storage practices. Lastly, market demand is probably the most important factor here, as with no demand there will be no justification for the previous steps.

## Conclusion

Current supply chains of fresh edibles are constantly exposed to uncertainty. As a result of standardisation of available edibles, the agricultural sector is more liable to crop diseases and risks associated with unfavourable weather, disease, and politics. Monocropping is yet another example of a path that might lead to future issues in food security, principally in the form of soil depletion. Diversification of the supply chain by introducing wild and forgotten edibles might be the answer to the above controversies. Although not an easy task, such shift would enable the countries and people within to become more self-sufficient, increase biodiversity across the agricultural sector and improve the level of overall food security.

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