



Issue 16: March, 2023: This e-bulletin is aimed at health professionals, consumers, growers, farmers, packers, processors, distributors, retailers, and others in the plant foods area.

Plant-based food products: - are they sustainable & healthy?

Developments in plant-based meat alternatives ('meatless meats') were outlined in PlantFoods-ucd Issue 11 (2021). However, there are many other plant-based food products on the market such as plant-based fish and a wide range of plant-based milks. Currently the popularity of milks is increasing rapidly as evidenced by spot checks in Dublin coffee shops with oat milk the most popular followed by soya, coconut and almond-based milks. Much of the development in the plant-based food products market is fuelled by younger consumers who are increasingly flexitarian, and are concerned about the high carbon footprint of conventional meat and dairy production systems. Arising from this the European plant-based market is expected to grow to €18.3bn by the end 2023 (Kerry 2020). However, some recent USA data suggest a flattening of the plant-based meats sales curve.

Plant-based food products vs sustainability

Ireland's meat/dairy sectors will not meet their greenhouse gas emissions (GHG) target despite being highly efficient in having one of the lowest carbon footprints, internationally, per kg of dairy products/meat produced. This excellent level of efficiency is offset by the number of units i.e. cattle numbers, and animal production is not sustainable in terms of carbon footprint unless cattle numbers are drastically reduced. This aspect has also been highlighted by Macdiarmid (2023) and many other authors. Soya protein is one of the cornerstones of plant-based foods but proteins from wheat, potatoes, legumes (especially peas) and other crops are playing an increasing part. The very much lower carbon footprint of isolated soy protein compared with beef has been highlighted by DuPont (2017). Soy production often receives a bad press concerning water and land use, and also deforestation. However, this is refuted by DuPont who stress that soy is a high yielding crop that uses limited amounts of fertilizer or irrigation water i.e. it has a low land-use footprint. Marshall (2023) also refutes the bad press and shows soy at the centre of a more circular economy. Despite this it is difficult to assess the true sustainability of plant-based proteins as many are produced globally and local conditions, e.g. deforestation, air/truck miles, and other factors may come into play. However, a recent *Future Proteins* conference in Germany discussed the issues and challenges of producing sustainable alternative proteins and their resulting plant-based food products (Multivac & Handtmann, 2023); consensus outcomes were highly positive in favour of the sustainability of alternative proteins. Current literature from many sources would also concur with this. Plant-based milks are likely to be sustainable as they are 'simple' products with a minimal ingredient list (mostly water). They require a heat process and packaging (a carton) but most can be stored at ambient temperature meaning no further energy requirements. However, the sustainability of more complex products such as meatless burgers, ready-meals and

convenience savoury products made from plant proteins is more difficult to quantify as other factors come into play. These products require ingredients for texture, flavour and colour development and these ingredients come with their own carbon footprint. Most plant-based food products need processing, packaging and chilled/frozen storage all of which require an energy/materials input. Some of the above issues have been addressed by Crawford (2023) while FoodDrinkEurope (2022) highlighted the importance of circular packaging for food and drink products in a recent position paper.

Plant-based food products vs health

Red meat is a good food containing many important nutrients and is an important component of a good diet provided portion sizes and frequency of consumption are modest. Reducing red meat consumption may have benefits for human health in lessening risk of so-called modern diseases (McAfee *et al.*, 2010). The alternative to red and other meats is plant-based consumer food products which are likely to be classified as ultra-processed foods (UPFs), e.g. a pizza. These contain a range of ingredients which may be sourced from many parts of the globe and some may have health risks, e.g. high levels of salt and vegetable oils. Some companies are now producing 'smarter' fats to perk up plant-based options in Europe (Morrison, 2023). Under the NOVA classification system (Petruș *et al.*, 2021) virtually all processed foods, even minimally processed, are UPFs and should be avoided. However, Gibney (2021) addressed the NOVA classification system of foods with emphasis on category 4 UPFs and concluded that there is currently no good reason to exclude UPFs from the diet but that the European Federation of Food Science and Technology (EFFoST) should draft new guidelines on the reformulation of processed foods. An opposing presentation (Christodoulou, 2021) focused on the SIGA concept of working together for more natural and healthier foods. UPFs are characterized, according to SIGA, by the presence of at least one deliberately added substance obtained by synthesis or by a succession of physical, chemical and/or biological processes leading to its purification and/or substantial deterioration compared to the original material in the list of ingredients.. However, EU food law is probably the strictest in the World and consumers can feel assured that they are well protected re the safety of additives and ingredients in UPFs.

Consumer dimension

Recent food guidelines from Brazil, Canada, Uruguay, France, Belgium and also the WHO invite consumers to drastically reduce consumption of UPFs. Increased home cooking of farm- and sea-fresh foods is a good idea, however, it may be difficult to source such foods and even the most nutritionally aware time-poor consumers eat significant amounts of UPFs i.e. convenience and fast foods as a matter of necessity. It is unlikely, therefore, that there will be a significant decrease in UPF consumption in the medium term. This was discussed at an EFFoST conference round table session by Ahrné (2023) who stressed the need to highlight processing as a key enabler for securing the food system from farm to fork for today and tomorrow i.e. processed foods are here to stay. This view was supported in a recent review entitled 'it is time to appreciate the value of processed foods' by Fitzgerald, 2023. Other points highlighted at the EFFoST session were: (i) how sensory cues and eating behaviours moderate energy intake from UPFs (ii) communicating to consumers the importance of food processing for reformulation, fortification, food security and in achieving healthy and sustainable diets. Key points from another consumer survey (n=1000) (Anon, 2020) on plant alternatives to meat were: (i) most consumers in the survey identified as omnivores (ii) almost 50% had eaten a plant alternative to animal meat; (iii) new food curiosity drives plant-based food consumption; (iv) plant alternatives are perceived to

be more environmentally friendly than animal meat; (v) plant alternatives are viewed as healthier based on nutrition facts. A recent consumer survey by **ofi** indicated that 67% of consumers see plant-based dairy as complementary to dairy products, and 'an opportunity to try something new' (65%).

Conclusions

The debate on plant-based food products in terms of sustainability and healthiness is only in its infancy and will continue to escalate at industrial and consumer levels i.e. the jury is still very much out. The best current conclusion is to follow a good diet i.e. (i) eat at least 5-portions of fruit/vegetables daily; (ii) eat fish and especially oily fish 2-3 times weekly; (iii) ensure a daily dietary fibre intake >25g; (iv) consume porridge daily; (v) eat modest portions of dairy products, red/white meats, potatoes/rice/pasta, bread/bakery products, assorted grains, red wine and UPFs; (vi) eat fresh (not processed) and whole (not refined) foods where possible; (vii) minimise salt intake. *Last but not least amidst all the hype - - let's continue to enjoy our food!*

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