Food quality and its relevance to optimum health

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It seems I've been banging on about the dangers to general health of mineral deficiencies in foods for over 25 years and at long last the significance of the micronutrient content of foods has begun to find traction. Now, in addition to the physical composition of foods, I have become more aware of less quantitative, more qualitative aspects of foods. I feel there's need to conduct future research work into their significance – and maybe this can ultimately lead to a more inclusive less reductionist scientific paradigm than is currently in vogue.

Most food science focuses on the chemical content of what we eat. Only a few decades ago, little was known about the presence and importance of trace elements. The author presents evidence that these minerals though present in tiny amounts are less available in our foods than they were 50 years ago. If, as some suspect 'food vitality' is also declining, do we need to revisit the notion of 'vital force', now viewed as an emergent bio-physical informational 'quality'. The article touches on ways of visualising food-vitality.

In the mid 1990s I wrote a report that reflected a mantra evident at that time within the naturopathic fraternity – that the foods we eat today are not as nutritious as they once were. Its implications for the general health of the UK population were of course negative. The report was eventually picked up by a wider audience and this resulted in its being expanded and published in 2002 in the journal, *Nutrition and Health* (Thomas, 2003) The report used as a historical comparison food analysis data first published by the Medical Control Agency in 1940 (McCance and Widdowson, 1940) with subsequent publications under similar reputable government agencies through to 1991 (McCance & Widdowson, 1991). The first publication was initiated because, in the 1930s, it was hypothesised that the rising incidence of diabetes was in some way connected to diet. At that time there was no quantitative data relating to the chemical composition of foods.

The current awareness of micro-nutrient content of foods is of course far more substantial. We are now aware that foods contain carbo-hydrates, minerals, trace elements, essential fatty acids, vitamins, amino acids, phytonutrients, probiotic material, and the list constantly being added to as we find out more about the essential roles of certain food components to health and wellbeing: the microbiome being the latest to come into the spotlight

Historically, food compositions were categorised into far fewer subdivisions. *The Chemical Composition of Foods*, published in 1940, identified fats, proteins, available carbohydrate (as glucose) and minerals as the main subdivisions. Of those minerals, the only trace mineral (other than Iron) was copper – which was found to be essential in 1928. Consequently, my report could only record the mineral content of those foods analysed – sodium, potassium, phosphorous, calcium, magnesium, iron, copper and sulphur. Since that time many other trace minerals have been named as essential – these include zinc, cobalt, manganese, molybdenum, boron, iodine, selenium and chromium.

Table 1 summarises the results of my subsequent study (Thomas, 2007) which demonstrated that over a 62-year period across 72 different foods the mean average copper content in those foods was reduced by 62%.

Table 1: Historical essential mineral depletion changes in five categories of food products

	1940 to 1991 Vegetables (n = 28)	1940 to 1991 Fruit (n = 17)	1940 to 2002 Meat (n = 14)	1940 to 2002 Cheeses (n = 9)	1940 to 2002 Dairy (n = 4)	Weighted Average (n = 72
Sodium	-49%	-29%	-24%	-9%	-47%	-34%
Potassium	-16%	-19%	-9%	-19%	-7%	-15%
Phosphorous	9%	2%	-21%	-8%	34%	1%
Magnesium	-24%	-16%	-15%	-26%	-1%	-19%
Calcium	-46%	-16%	-29%	-15%	4%	-29%
Iron	-27%	-24%	-50%	-53%	-83%	-37%
Copper	-76%	-20%	-55%	-91%	-97%	-62%

To put the significance of these findings into perspective, let's consider the european nutrient reference values (NRV) for magnesium (375mg), zinc (10mg) and chromium (40μg), which many nutritionists consider to be the minimums below which deficiency diseases begin to manifest. How much is this actually per day? Given that a level teaspoon represents 5mg, 1/13th of a level teaspoon would represent the magnesium quota; 1/500th is the requirement for zinc; while approximately a 1/125,000th of a teaspoon is all that is required for chromium. In relationship to the amount of food we eat each day, these are minuscule amounts: yet deficiencies do indeed occur. Consequently, micronutrient content can be considered one fundamental signifier of a food's nutritional quality.

Deficiencies of micronutrient content in food has been linked in part to declining soil quality. The UK Environment Agency recently published a report (Environment Agency, 2019) on poor soil quality in the UK, which although it doesn't directly link to reduction in nutrients within our food, can be used to draw conclusions between the two. There is a growing awareness of the significance of soil health to the health and welfare of not just commercial crops but of the neighbouring ecosystem. Jim Porterfield, an independent researcher in the US, has alerted me to how the low mineral content of vegetables and grains can be positively improved by following guidelines given in the publication *Ideal Soil* (Astera, 2014).

With these facts in mind the reader can make their own judgement as to the relevance of my findings – but I contend that the loss of minerals in our food – directly or in association with other factors for which these levels are a surrogate marker – will have a fundamental bearing on the prevalence of chronic disease. Similar studies have also been published (Davis, 2004; Davis, 2009; Bergner, 1997). Since 2000, as the incidence worldwide of chronic non-communicable disease conditions has increased, the evidence supporting the importance of micronutrient content of foods in relationship to health and wellbeing has grown.

Is there more to the quality of foods than their micronutrient content?

This thought was inspired by the 1940 publication *The Chemical Composition of Foods* (McCance and Widdowson, 1940), which implied that there is more to foods than their chemistry. This is in contrast to a subsequent edition (McCance and Widdowson, 1991) which implied that chemistry is all we need consider when assessing food quality. However, the current debates about food quality must include the food production methods of organic and bio-dynamic farming, methods that certainly guarantee that no toxic chemical residues of pesticides, insecticides, fungicides, etc so often used in conventional farming practices. will be present. This emphasis on 'absence of' detracts from the positive qualities that result from excellent husbandry and stewardship of the land by farmers committed to these methods. These aspects, humanly and humanely important though they are, do not according to accepted ways of measuring nutritional quality add any value. Were this 'vitality' or 'vibrancy' quality to be scientifically demonstrable, organic and bio-dynamic practices would gain a very valuable unique selling point, but more than this, the awareness of 'vitality' and food quality would have important consequences for individual, communal and planetary health.

The scientific model bequeathed to us in the 1600s has at its centre a dualism that separates qualities from quantities, and a reductionism that assumes we can understand the whole by measuring the parts. However, in striving to grasp at ever smaller components, have we as a society lost sight of the whole? I was reminded of the fable of Sir Isaac Newton who, sitting under a tree, when the apple fell on his head suddenly understood the law of gravity. Has science, in its endeavours to discover ever more about the material world (and despites the many 'gifts' that research has provided) been less curious than it ought to have been about how the apple got up there?

Consequently, suspecting this worldview was incomplete, I started to look at what else could give some indications of food quality. And indeed I found plenty of indicative research which, although currently considered too subjective and qualitative, nevertheless could suggest methods for researchers interested in 'measuring' the 'vitality' of foods; and not only through subjective attributes of sight, taste, aroma, touch – the senses we instinctively use to judge what to eat and what to avoid. The true scope of food quality suddenly weaves an intricate web of components, some physical (its farming, storing, shipping, processing and manufacturing practices), some mental and emotional (that shape individual choice), some cultural (that influence preparation, and whom we can and cannot eat with) and possibly even the spiritual (expressing appreciation and gratitude through the saying of Grace and giving thanks for the food that nourishes us and the web of life). All these dimensions have their own validity, but within today's scientific paradigm only one, its chemical composition, is readily accepted as credible. Though we all recognise the quality of aliveness (after all, a person who has just died physically has all we have, except 'life') this isn't something to be quantified, ie weighed and measured. And that's the difficulty. Yet maybe this paradox could be the motivation for establishing some scientifically viable parameters that represent food's living qualities.

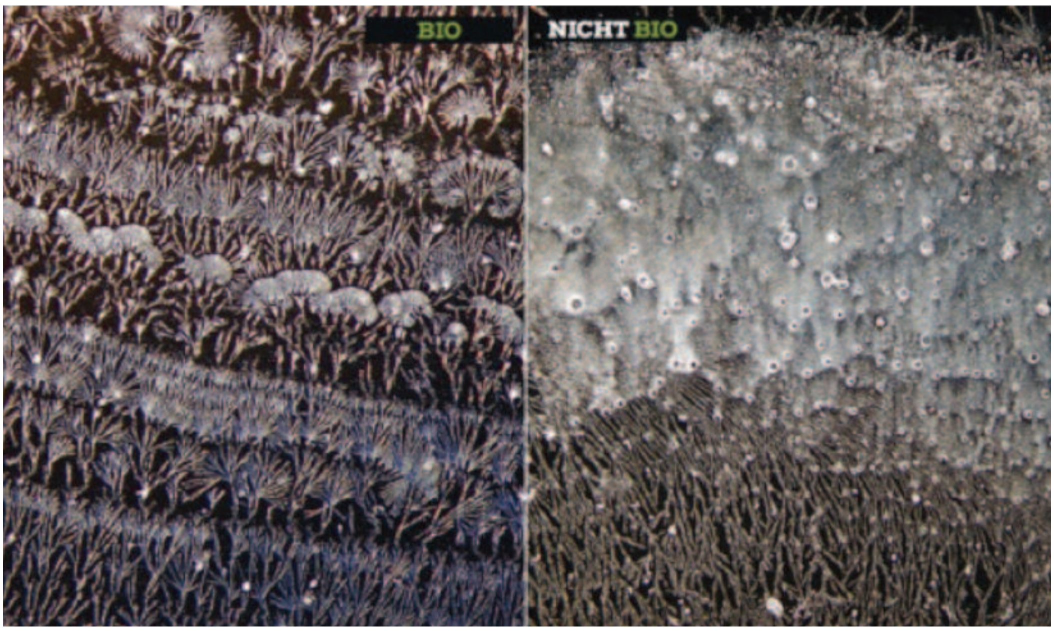
Picturing nutritional forces within foods

Biophotonics is a branch of quantum biology dealing with interactions between photons and living tissues, from which very low levels of biophoton emission have been widely reported. Extensive research by Dr Fritz-Albert Popp has explored the function of biophotons as taking part in an information system signalling within and between cells. Some who have speculated that this system facilitates physical healing hypothesise that levels of biophoton emission may correlate with the vitality of biological tissues. If this were shown to be the case it would provide us with a much needed quantitive measure of food quality (www.biontologyarizona.com/dr-fritz-albert-popp).

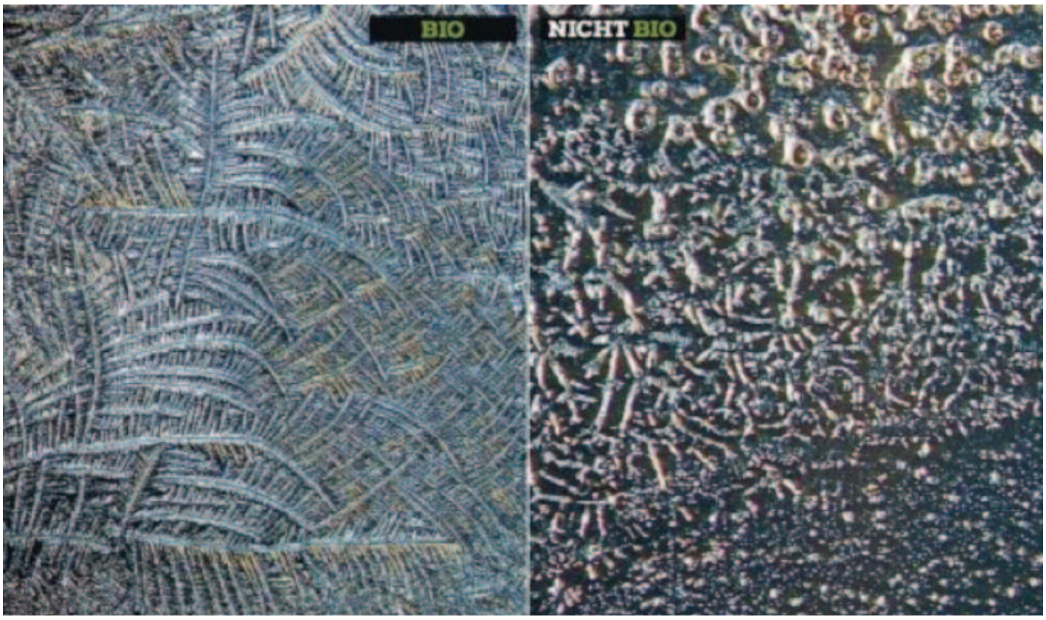
An earlier attempt to reveal the nutritional forces present within foods was Ehrenfried Pfeiffer's sensitive crystallisation method, which was developed on the basis of indications by Rudolf Steiner, who was concerned about a decline in food's nutritional properties. Steiner believed a loss of vitality was a direct consequence of introducing mineral fertilisers into agricultural practice. Pfeiffer – who developed the bio-dynamic farming method – found a 10% solution of copper chloride when it crystalised showed patterns that correlated with the 'quality of the food substance used'. The problem associated with this method though, is the amount of training required to interpret the complex crystalisation patterns and form a judgement on the quality of the product.

The beautiful crystallisation image above (of biodynamic wine) has been created using the sensitive crystallisation method developed by Pfeiffer

Sensitive crystalisation has been further developed by the Bio-Dynamic Association, which in 2016 held a conference on the theme *Vitality and Quality as Seen Through Picture Forming Methods* (Lia, 2016). A more



Walter Danzer's photos: left: extract from an organic apple; right: non-organic extract recent pictorial development has been achieved by Walter Danzer. He has investigated more than 50 foods, both organic and non-organic, in his own specially designed laboratory and published a book of his results (Danzer, 2016). In it, the author says: 'I have discovered that organic foods possess an amazingly beautiful life-energy or *order force (life design principle)*, whereas the life-energy of non-organic foods is generally weakened, disrupted or destroyed. Since I find this important I wanted to share it with you, so that you can make informed decisions'.



Extract from a grain of rice, magnified x 400; left: organic; right: non-organic.

These investigations point to the possibility of an emergent informational quality in living tissues, and therefore that the food we eat is more than just its material molecules. The hypothesis is that in the process of organising itself into *life* a new property emerges, of a subtle but literally vital and necessary informational content which contributes to the physical material chemical body's ability to self-organise. Danzer's work implies that we need food that can nourish this vital information body through its abundance of *order force (life design principle)*, which represent in a sense the informational memories and experiences of the food's growth. If this is so then there is a significant value to the way our food is grown and prepared. A parallel research area, which seems to support Danzer's hypothesis involves *empathic food testing* whose aim is to evaluate scientifically the emotional and physical impacts of food, and how the 'emotional properties' of food products influence our well-being and performance (www.wirksensorik.de/en).

Conclusion

The gut prevents products of digestion and other 'foreign' substances from leaking into the circulation. When the system fails to do so and foreign proteins get into the body fluids undigested they can have toxic effects in the short and longer term. Ought medicine therefore be more curious about how the more subtle food qualities previously alluded to are absorbed and assimilated, and how they affect health and wellbeing? I'm reminded of the scenario where a group of blind people attempt to describe an elephant. With each holding and describing a part, all are correct in their own way, but none 'see' the whole elephant. In terms of food quality the big picture is huge and its study, even leaving aside biological and chemical content, would entail a nested hierarchy of disciplines that include geology, climate science, soil studies, agricultural history and anthropology, the logistics and economics of storage, transport, processing and manufacturing. Each layer will have had an effect on the chemical composition and the informational 'life' force qualities of the emerging food product, and the cultural background and individual circumstances in which these foods are prepared and ultimately eaten.

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