Nutrition, Food Health and Bumper Harvest

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The fundamental attention of nutritionist is humans living a healthy life which they believe begin with healthy eating. Having the correct proportions of essential nutrients in the diet is the key parameter of their assessment. They often make recommendations on the basis of food crops. Fruits and vegetables are good and if a recommendation is to be made for a person with diabetes, they advise on consumption of fibre foods. All these are good but the health and vitality of food crops depend generally on the health of the cultivated land and the associated soils. Over cultivation of same land for same crops over long periods has resulted in the depletion of some essential trace elements or essential nutrients in the cultivated lands. This farming method and additional geological processes acting on the cultivated lands introduce some essential trace elements and potentially harmful elements. As indicated by Arhin., et al. [1], the sources of many of the essential elements for human developments obtained through healthy eating originate from soils that are formed from the underlying rocks. Plants cultivated on any land bear fruits and crops containing fractions of contained minerals and trace elements in the soils and the underlying rocks. Changes in the minerals and elements compositions occur only when the landscape have undergone some modifications. The modifications can be natural or anthropogenic. Arhin., et al. [2] work on Selenium in Talensi district revealed different concentration levels in maize and millets grown and eating by the inhabitants. Contribution of Se in relationship to human immune development is long known and their dietary sources are via cereals e.g. maize and millet in the Developing Countries. Similarly the miracle mineral magnesium is predominant in cereals, vegetables and fruits. The food health of these food crops can be assessed on vitality and health if the soil health is known. Errors on advice by nutritionist are possible if the cultivated lands are depleted in some of the essential nutrients due to their depletions in the soils. This renders blanket advice by nutritionist on the basis of food crop-types consumption in line with improving healthy eaten in Developing Countries extremely challenging and as such is requested to be done sparingly. The risk of the cultivated lands being enriched and/or depleted of the requisite essential elements may exist because farmers’ wishes are to get bumper harvest at the end of the cropping season and that their least concerns are health and vitality of the crops. Conversely the nutritionist interest is in the quality of the crop but that also is the specialty of a geoscientist. These three groups seem not to work together but interdisciplinary corporation and collaborations from them will make the Earth a safe haven.

Taking tomato as an example; why should the same species provide different taste and in terms of ripening different colours ranging from bright red, red yellow and greenish red be available in the same geographic area? These are testimonies of differences in the minerals and elements in the soil. It might therefore not be correct if nutritionist only advice the consumption of tomatoes disregarding the important contributions of the contained elements in the environmental soils. Another question is why is it that organic tomatoes sells higher than its inorganic counterpart even though the inorganic types often appear bigger and attractive (Figure 1)?

I am sure your guess will be as good as mine- ‘lack of the prerequisite minerals and essential elements in the inorganic tomato’. Another revelation which bothers the minds of many people and is yet to be communicated openly is; the delicious tomatoes from our childhood today are tasteless. This is not just childhood nostalgia but this probably has to do with minerals and trace elements in the soil that has undergone some modifications as a result of continuous and constant agricultural practices. We will get the food crops as usual but with decline in quality from the farming method of continuously cultivating the same land. The growth, the health, the vitality and the quality of food produced depends on the right amounts of essential nutrients and trace elements. For example tomato plants require a multitude of nutrients to produce bright-red, rich-tasting juicy fruit. This thus makes them excellent benchmarks for determining the health and vitality of the soil that they grow in. The caveat is if there are not enough minerals or essential trace elements in the soils, there are not enough minerals in the tomatoes. Occasions where this is the situation, the tomato plant will yield dull and tasteless fruit dependant on the depleted mineral or essential trace elements. The significance of interdisciplinary collaboration among the nutritionists, geoscientists and agriculturalists are so important now.

Notably from geoscience perspective the minerals and essential trace elements that the tomato need vary across the landscape because of the variability of the underlying rocks [3]. This is something that needs to be evaluated at the beginning of the farming season to the maturation period of the crops to guide in producing healthy tomatoes for human consumption. The geological and geographical influence of the underlying rocks on trace elements uptake by plants is explained by Arhin and Kazapoe [2] and also in the editorial [4] in EC Nutrition Journal. There is still an unanswered question why Ghanaian tomato sellers preferred tomatoes from Burkina Faso over tomatoes from Navrongo in Ghana even it is known currently that same seed species are grown in the two West African States. This is an indication that not all food crops have same qualities. Therefore for nutritionist to prescribe food crops for healthy living there should be some standardisation which I think may not be easy particularly in the Developing Nations [5] report the environmental effects of conventional and organic farming systems. The elements concentrations and distributions in the environment is known to be variable and their variability in parts are as the result of different underlying lithological settings and differences in the landscape modifying processes [3].

For instance, vegetarians hope to supplement the mineral and essential trace elements from diet. The doubt is how to ascertain that the dietary product contains the elements of interest and that the concentrations are good for that purpose. In Developed World this problem may not be in existence because they do not eat what they cultivate. On the contrary we eat what we grow and as such the understanding of the underlying geology needs to be clear. In addition to knowing the geology from which the soils are developed from, there is also the need to appreciate contributions from the climate. Example rocks formed from same molten magma or melt can weather to different soil types depending on the climatic conditions. This can lead to differences in elements concentrations and distributions. These concentrations and redistributions of elements in soils, ultimately ends up in the food crops. The consequences are so many unexplained deaths particularly in the Developing Countries. It is long known by nutritionist, the geoscientist, the agriculturalist and the medical workers that ‘we are what we eat’ and since people in the Developing World generally consume what they grow; then the propositions by ‘The Gardeners Clinic’ will be useful in addressing the deficiencies of essential elements in the populations in the Developing World from their local diets. The propositions are:

1. The earth hosts virtually everything that we want and cherish.
2. Scientist only adds value to them to get attraction and there is nothing so valuable if the source is natural or near natural.
3. Gardeners are advised to add nutrients and trace elements to soils before planting, especially before planting edible plants in order to produce healthy and quality crops.

In summary it is the recommendation of the author that the ‘Gardeners Clinic’ proposals be adopted as they will help in ascertaining the food health which to the nutritionist is mandatory. The application of the right fertilizer can be selected by the agriculturist to boost the harvest. The geoscientist satisfaction will be realized by providing the information on soil health which will highlight the enrichment and depletion of main nutrients (Nitrogen Potassium, Phosphorus and medium nutrients (Calcium, Sulphur) and trace elements such as Iron, Magnesium and Boron to the nutritionist and the agriculturalist. Finally the knowledge on essential and potentially harmful elements concentrations and distributions in the cultivated soils will guide the farm managers to adopt a right decision as to what and where to add nutrients and trace elements to the soil and that the nutritionist and the medical geologist can prevent many emerging diseases from spreading through diets.

Bibliography


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