

Food for All through Better Food Pathways

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Abstract

The well-being of a person is dependent on food consumption to a great extent. However, unavailability of food or bad choices in eating lead to deterioration in health. Factors like lack of local foods, poor storage and distribution infrastructures, over consumption, etc. contribute to this problem of hunger and obesity. These seemingly opposite end of spectrum problems can also manifest simultaneously in a person and can be an indicator of prevailing pernicious disparities in access to nutritious food and healthcare. Therefore, it is important to understand and act to alleviate this issue at the highest priority. The role of food science in educating the consumers, providing evidence to the governments for policy making decisions, and investing in right infrastructure should be a part of the overall solution.

Keywords: Food; Hunger; Obesity; Health; Solutions

Food is central to human health, both from quantity and quality perspective. The importance of food can be gauged from what George Bernard Shaw said - "There is no sincerer love than the love of food". Globally, people celebrate harvest festivals when farmers reap their crops and consider it a thanksgiving opportunity. Festivals like Rice Harvest Festival in Indonesia, Baisakhi and Pongal amongst others in India, Sukkot in Israel, Martinmas in Europe, are a few examples. In addition to such festivals, there are food related events celebrated every year, World Hunger day on 28th May followed by World Obesity day on 11th October and finally World Food Day on 16th October to promote international awareness and actions on respective issues. Ideally, we all like food because it sustains us, pleases us, creates bonding between us, and helps in sharing our love. However, an unhappy aspect related to food is hunger and obesity. There are other contributing factors as well, but food remains an important component in both cases. Looking at these problems from the context of food supply and availability shows a skewed distribution and consumption pattern. Food and Agriculture Organization (FAO) has put forth some interesting data, which I think is important to mention here. FAO [1] states that we have higher number of people suffering from obesity (670 million adults and 120 million boys and girls aged between 5-19, and over 40 million children) than from hunger (820 million). From a food point of view, this dichotomy indicates, in many ways the skewed availability and use of food.

The severity of hunger and the hungry is summed up in Mahatma Gandhi's saying, "There are people in the world so hungry, that God cannot appear to them except in the form of bread". Hunger is not due to not having enough food available for all but is due to the inequity in access to it. This brings us to the question of why is there inequity in access to food - doesn't enough food grow in the affected regions to make everyone food secure? It is known that agriculture is a big driver of the economy in developing countries, but lack of required attention and investment seems prevalent. On the contrary, obesity has been a public health concern arising due to change in dietary habits from a long time, mainly in developed countries. Diets rich in fat, meat, added sugars, and bigger portion sizes have all played a

role in furthering obesity. The so-called 'disease of affluence' has started showing up rapidly in developing countries. The rise of incomes have led to 'nutrition transition' (improved access to food coupled with decreased physical activity level) which is considered as a prime reason for increase in overweight populations. The lower socio-economic strata are more affected because of lower fruit and vegetable intake. These sections are laden with the double burden of higher obesity and under nutrition prevalence (due to excessive consumption of energy dense and nutrient poor foods). In other words, these physical conditions are often the manifestations of societal and environmental changes.

Agriculture practices today are generally aimed at producing sizeable quantities of food in the quickest time and at least cost [2]. This approach has led to lack of biodiversity in our food systems, which has stifled the availability and consumption of locally produced foods. Biodiversity loss occurs due to agricultural practices like tillage and intensive use of insecticides. FAO [1] states that presently only nine plant species accounted for 66% of the total crop production from more 6,000 species that have been cultivated for food throughout history. Agriculture in developing countries has low productivity due to abiotic (nutrient deficient, degraded, and often acidic soils) and biotic (fungal and viral diseases) stresses [3]. The lack of requisite technology and infrastructure are some of the causes for such a scenario.

Food science and technology (FST) has a critical role in providing safe, tasty, diverse, abundant, nutritious, convenient, and less costly food (Floros., *et al.* 2010). It is amply clear that more foods will be available for longer periods in regions where FST is seamlessly integrated with agriculture. The present day FST has been successful in blending various aspects of different science streams like chemistry, biology, physics, microbiology, nutrition etc. to find solutions that has enhanced affordability, food safety and nutrition. Again, developed countries are much ahead in the use of FST to secure and sustain their food production. An array of technologies and processes are available today to make processed foods to meet different consumer needs. Food processing is quickly gaining foothold in developing countries but poor handling and storage account for significant losses. Additionally, controversies associated with processed foods like cause for increased prevalence of obesity, use of chemicals/additives, labelling concerns etc. also contribute in some ways to the perception of FST's cost to the society.

Another dimension of food is the wastage of food. FAO states that 1.3 billion tonnes of food waste occurs annually which is one-third of the world food production. The maximum loss of 45% each occurs in fruits and vegetables as well as roots and tubers. This waste accounts for all stages of food supply chain starting from production to consumption at home. Again, the pattern of losses is different in developing and developed countries. 40% losses occur at post-harvest and processing stages in developing countries and 40% losses have been reported at retail and consumer levels in developed countries. Not enough investment in the infrastructure and workforce lead to losses at the early stages of food value chain in developing countries. However, over-emphasis on appearance of the product drives losses in developed countries. Whichever way the food loss happens, it has detrimental effect on humanity and climate. Currently, 8% of the greenhouse gas emissions are attributed to food loss [4].

So, I feel that there needs to be an urgent recognition of the breadth of the problem and the exigency to do more on how we handle food - from farm to fork, a common but often not very well understood term. Even though the goal is same for every region, better utilization and distribution of food, the strategy may differ based on regional needs and opportunities. Providing adequate nutrition to the people affected by chronic hunger is a crucial part of the solution in many low-and middle-income countries. While working with an international non-profit on food fortification, I have experienced first-hand, the positive effects of such interventions. That does not reduce the multitude of challenges in implementing these interventions. A positive pathway would be the active involvement of respective governments so that unnecessary impediments in programming these schemes are reduced. Active government support would also pave the way for local and regional participation in the campaign. This participation would include infrastructure development, technology to manufacture nutritious foods locally, developing skills of workforce to adopt new technologies and/or promoting investment for developing such an expertise/industry. I can observe that an immediate effect of government support would be encouraging farming of locally grown crops

and produce as a means to ensure easy, affordable and equitable distribution of fresh food. It would also cater to providing local raw materials for the food processing industry, which would be a step towards being self-reliant in reducing food losses. The intervention of technologies would enable integration of the farm produce with proper post-harvest and storage technologies to reduce the losses of agricultural produce and add it back to the food supply. For example, setting-up of cold chain units (solar powered in case of erratic power supply), introducing simple and effective drying technologies, investing in good storage houses as a part of post-harvest step, promoting 'lab-on-chip' may be useful for real-time detection of mycotoxins and pathogens for food safety, and producing products with local grown crops to enhance their acceptability.

The high-income or developed countries have well developed post-harvest processes along with advanced technologies for food processing. Solutions here would be different as food related problems are different. The diet in these regions are meat heavy with little contribution from the greens. Primarily, the attitude towards the type of food consumed has to be changed, which in many ways is a behavioral change. The over calorie consumption is driven by factors including such as income, urbanization, better retail networks etc. Consumer awareness would play a big role in creating pathways for making healthier choices like the ones with reduced sodium, low fat, high fiber etc. Reuse of remainder unused foods, reducing food waste, smart shopping (purchasing that what is only needed), and improving the bioavailability of nutrients are some ways to tackle this issue of poor food consumption choices. Promoting alternatives to converge with plant-based solutions or insects would help in reducing the environmental footprint of growing meat and help environment. Boosting of 3D foods would allow wider use of alternate ingredients into tasty products, help control over food portion sizes, and reduce wastage. So, a plethora of options and ideas can be used and implemented as per need.

This problem has to be tackled relentlessly till we find workable solutions for everyone. In that regard, World Food Day provides us with a chance to reiterate our commitment towards food for everyone through sustainable ways. My observation of World Food Day is therefore, an occasion to not only be aware of the nutritional needs of the population but also encourage greater participation of all stakeholders towards making better food choices. We need to realize that this commitment cannot be achieved through FST alone but would be an important tool in the overall scheme of things. This would involve participation from all quarters from agronomy to food distribution and all that is in between. Incorporation of information technology and entrepreneurship into the study curricula would further the cause of better control of food chain and income growth opportunities. A holistic approach towards adopting sustainable and efficient agriculture that promotes biodiversity, proper post-harvest handling, and appropriate FST methods would definitely help us inch towards the goal. We should continue with research on various aspects of this issue, which would help policymakers with credible information while planning sustainable solutions. A lot of progress has been done, but there is still a lot of ground to cover to solve this acute problem facing humankind.

Conclusion

Hunger and obesity are two problems with food as a major contributing factor. With the effects of climate change becoming more evident, this problem needs to be tackled with a greater sense of emergency. Region specific solutions should be incorporated instead of blanketing with a one solution fits all theme. Governments, scientists, and society all have to contribute and participate in finding workable solutions. The magic bullet is not in food per se but through the pathways of processing, distributing and consuming it in the right and equitable way.

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