

Developing weight management food products for the Indian population

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India is amidst a 'nutritional transition phase' with undernutrition and overnutrition coexisting in the population. There is accumulating evidence that when economic conditions improve, obesity and diet-related non-communicable diseases may escalate with higher levels of undernutrition. In fact, we are already seeing evidence of that; doubling of obese population from 1% to 2% and overweight population from 6.5% to 8% from 2005 to 2010. The link between obesity and cardiovascular disease and Type-2 diabetes is infallible and headlines like 'Diabetic Capital of World' and 'India with largest CVD burden in the world by 2020' rapidly being a reality. Rapid urbanization, coupled with high calorific content foods and sedentary lifestyle is compounding the problems. The population of India and other countries of south Asia are more susceptible to these metabolic disorders compared to their Caucasian counterpart. Recently, a WHO report suggested that the proportion of Asian people with a high risk of type-2 diabetes and cardiovascular disease is substantial at BMIs lower ($>23 \text{ kg/m}^2$) in comparison to the existing WHO cut-off point for overweight ($>25 \text{ kg/m}^2$). Diet has been known for many years to play a key role as a risk factor for such chronic disorders. In recent times, traditionally consumed diets have been swiftly replaced by high-fat, energy-dense diets. Euromonitor International (Consumer Lifestyle Report 2011) reports that consumer expenditure on food, alcoholic and non-alcoholic beverages will grow by 123% (absolute) between 2010 to 2020 (constant value terms). The health and wellness food and beverages market is expected to grow at a CAGR of 10% over the next ten years. On the technology front, two primary approaches that food companies are taking are the 'Lite or low energy versions' and the 'active weight control product'. The former requires a lot of understanding of food structuring so that saturated fat is replaced with natural ingredients and designed structures. Designed structures have also been used in such foods which fill the human gut and give a feeling of fullness resulting in hunger control. Active weight management involves physiological/biological targeting of gut hormones and digestive enzymes for satiety control and fat uptake.

Keywords

population impact of obesity on chronic disease; consumer food habits; technology options for weight management.

Enhancing food and income security of rural families through production, processing and value addition of regional staple food grains

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This paper is based on a research project on local crops being currently implemented by the M.S. Swaminathan Research Foundation with the support of the Canadian International Food Security Research Fund (CIFSRF). The primary research problem is how far the local crops could be leveraged to enhance food security through participatory research interventions aimed at increased productivity and profitability and how far value chain built on these

crops could enhance the income to poor farm families. Examining the extent of re-tooling of the interventions to make them women-centric for reducing their drudgery in cultivation and post-harvest processing and how enhanced consumption of these crops would improve the nutritional status are other aspects of the research problem. The important group of local crops being studied are three of the six small millets or the 'nutri-cereals', namely, finger millet (*Eleusine coracana*), little millet (*Panicum sumatrense*) and foxtail millet (*Setaria italica*). These grains are nutritionally superior to other grains for their higher levels of calcium, iron, fibre, certain limiting essential amino acids and vitamins and also nutraceutically in view of their low glycaemic index and higher anti-oxidant activity. The research examines how participatory seed selection could be used to increase productivity and how integrated method from use of quality seed to better crop management and introduction of a value chain approach could contribute to improved availability of nutritionally superior food and increased income. The study could successfully induct locally suited simple machineries to eliminate the drudgery of women in post-harvest processing of these grains, how drudgery reduction promotes consumption of these grains and how it promotes village level value addition of grain. These interventions could establish tangible benefit to the communities in terms of food availability, improved nutrition and income and better conservation of local genetic diversity of these crops.

Enhancing bioavailability of nutrients in whole grain products

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There is little doubt that consumption of whole cereals and other grains confers benefits to consumers, and a number of studies support the notion that health and wellness outcomes correlate positively with levels of whole grains in the diet. Although there are a number of strong assessments of the effects of whole grains on health, the biochemical evidence supporting many whole grain "benefits" is often indirect, circumstantial, or poorly defined, at best, although an enormous number of studies have added greatly to our understanding of grain composition and structure. It is obvious from these analyses that we are now much better equipped to define the physiological effects (and benefits) of whole grains, providing that we attempt to integrate appropriate epidemiological, genetic, and biochemical assessments. The soluble fibre components of cereals have received considerable attention over the past 20 years, in part due to their impact on serum cholesterol in human subjects, and in part because of their potential impact on mammalian immune systems. In addition to extensively documented results relating to beneficial effects of cereal fibre-enriched products, there remains a substantial array of additional grain components that are poorly characterized. Many of these are attracting increased attention, including many different antioxidants and immune stimulators, but it is becoming obvious that we have only superficial information regarding their availability as nutrients, their fate during processing, and their physiological impact(s) in common processed whole grain foods. Some of these grain components, including vitamins, minerals, and several low molecular weight phenolic compounds are particular emphasised with regard their nutritional availability when included in whole grain manufactured products.