

Dairy Industry: Processing and preserving strategies on antioxidant food tablets and supplements

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Abstract

Recently, the potential efficacy of the bioactive phenolics from natural sources has been the focus of great attention owing to their health benefits to human health for reduced risk of coronary heart problems and selected cancers. Food tablets as dietary supplements and/or fortified foods, food byproduct based food powders may be great value-added products for getting healthy bioactive components. Nutraceutical food tablets have been prepared by direct compression method through selected tablet machines and have been manufactured according to established prescription methods. The functional constituents of the foods or some preferable functional foods must be standardized as the nutraceutical product and generate under Good Manufacturing Practices (GMPs). Primarily, a nutraceutical or selected food must be detected for non-toxic food constituent strategy by advanced toxicity analyses, and then it must be detected and analyzed in terms of health benefits including disease treatment and/or prevention. Food tablet is described as unit dose, temper evident, solid preparations including one or more active ingredients or whole food powder.

Patient and/or consumer demand, routes of drug delivery, oral utilization capacity, the flexible design of dosage forms as technical manufacturing parameters has been considered; also the bulk density (g/ml), the tapped density (g/ml) as pre-compression parameters have been confirmed while thickness (mm), hardness (kg/cm²), % weight variation, % friability, % in vitro drug release as post-compression parameters have been carried out as physiochemical properties. The powder blend has been thoroughly mixed with talc and magnesium stearate and compressed into a 300-400 mg tablet using single rotatory punching machine based on tablet processing strategy. Among the trial/serial tablet formulations; mesir effervescent tablet could be more efficacious owing to majorly cinnamaldehyde (as v/v) whereas black mulberry effervescent tablet could be more beneficial due to the presence of morusin and apigenin phenolic anticarcinogenics and also mandarin peel effervescent tablet could be salutary because of its naringenin and hesperidin flavonone phenolic bioactives.

However, the initial proposal by Denham Harman that free radicals are causally related to the basic aging process is receiving growing acceptance as a possible explanation of the chemical reactions at the basis of ageing The free radical \

theory of aging hypothesizes a single common process, modifiable by genetic and environmental factors, in which oxygen-derived free radicals are responsible (due to their high reactivity) for the age-associated damage at the cellular and tissue levels. In fact, the accumulation of endogenous oxygen radicals generated in cells and the consequent oxidative modification of biological molecules (lipids, proteins and nucleic acid) have been indicated as responsible for the aging and death of all living beings

The free radical theory was revised in 1972 when mitochondria were identified as responsible for the initiation of most of the free radical reactions occurring in the cells. It was also postulated that the life span is determined by the rate of free radical damage to the mitochondria. In fact, mitochondria, in which there is a continuous generation of free radicals throughout cell life, and especially mitochondrial DNA, are key targets of the free radical attack. Cells which use oxygen, and consequently produce reactive oxygen species, had to evolve complex anti-oxidant defence systems to neutralize reactive oxygen species and protect themselves against free radical damage. Thus, the increasing oxidative stress in ageing seems to be a consequence of the imbalance between free radical production and antioxidant defences with a higher production of the former An ideal "golden triangle" of oxidative balance, in which oxidants, antioxidants and biomolecules are placed at each apex, has been described (In a normal situation, a balanced-equilibrium exists among these three elements. Excess generation of free radicals may overwhelm natural cellular antioxidant defences leading to oxidation and further contributing to cellular functional impairment

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