



CALCIUM SUPPLEMENTATION IN FRUIT FLAVOURED DRINK BASE

During the period of late teenage to young adulthood a significant reduction in dietary calcium typically occurs. This is especially true of the female population where reduced dietary calcium intake usually happens much earlier in life compared to their male counterparts. Accordingly, young women are especially susceptible to a prolonged calcium deficit over their lifespan and this may account for the greater incidence of osteoporosis in post menopausal women. The level of calcium intake early in life directly influences the peak bone mass achieved at skeletal maturity.

Calcium can be obtained from a variety of dietary sources and the primary source is dairy products, particularly milk. However, beginning in young adulthood and continuing through later life, milk is typically not consumed in sufficient quantities by the general population to obtain required levels of calcium. This may be caused by the unattractiveness of milk because of its high energy levels, unappealing taste, and allergic properties and lactose levels.

More appealing alternatives to milk are citrus based beverages such as soft drinks, cordials and drink base premixes. Nutritional supplementation of soft drinks with significant levels of calcium is technically challenging and a marketing dilemma. High levels of calcium can impart a “chalky” mouthfeel to soft drinks, especially if citric acid is used as the acidulant. This is partially alleviated by using phosphoric acid, but introduces problems of after taste. Another potential issue is precipitation of insoluble calcium salts which form over the shelf life period of soft drinks.

To address the problem of inadequate calcium intake a number of supplements have been introduced over the years but these also have inherent drawbacks. Calcium carbonate is popular because it has a high level of calcium (40%). Unfortunately absorption is low at about 22 - 24%, resulting in elevated urinary calcium levels, leading to the formation of calcium-containing kidney stones (nephrolithiasis) if consumed over a prolonged period. Organic supplements include calcium gluconate, calcium lactate, calcium citrate, calcium ascorbate and others. Although these have a higher level of bioavailability (30-35%), their activity is much lower and calcium gluconate, for example, is only 9%. A 2.22gm tablet would be required to produce an active calcium level of 200mgs.

A practical and effective alternative to milk, calcium fortified soft drinks, and calcium supplements is a calcium fortified acidic drink base. The product is based on the principal that inorganic calcium phosphate is converted to an organic calcium salt (calcium citrate) which is present in the ionic form to yield approximately 35% absorption. It has a number of benefits and these are as follows:

- * None of the disadvantages associated with milk.
- * Can be formulated to a pleasant sweetness/acid ratio as opposed to soft drinks which require high acid levels to prevent the “chalkiness” associated with calcium sedimentation.
- * A high level of elemental calcium (400mgs) is achieved in a serving size of 150mls (equivalent to 300mls milk).
- * Unlikely to produce kidney stone problems because of the high level of absorption.
- * Competitively priced in terms of absorbed calcium.