Over50MV - Multivitamin & Mineral Formula

Introduction

Vitamins and Minerals in Aging

All humans require the same vitamins and essential minerals (VM) to create, develop and maintain life.[1]
The Recommended Dietary Allowances (RDAs) for vitamins D, B6 and the mineral calcium* are slightly higher after age 50 or 70 yrs[2] (the B12 RDA is not higher but generally recognized that higher amounts are necessary in aging[3,4]). Chromium, chloride and iron requirements are set at slightly lower levels after age 50 yrs.[2] These differences are so minute in relation to acceptable nutrient ranges, that a properly formulated complete vitamin and mineral supplement (CVMS) can cover the corrective vitamin and mineral needs of almost all adults including an amount to offset semi-altered nutrient metabolism (e. g. aging, digestion, absorption, gender, etc.[1,2,5]) while remaining significantly under the tolerable upper limit (UL) when combined with diets in western nations (including fortification),[6] with the exception of very active and/or large humans as noted and referenced in a separate document titled "dotFIT Multivitamin & Mineral Formulas Specialty Design Criteria."
In summary, potentially except for persons with lifestyles that includes regular vigorous activity, according to our established guidelines, aging itself requires little to nothing special that cannot be contained in the same formula of younger adult counterparts.* See Table 6 in the article "Vitamin and Mineral Supplementation in Human Health – A Case for Public Policy[7]" showing: 1) recommended total vitamin and intake (RDA/Adequate Intake[AI]) for the designated life stage established by the Dietary Reference Intakes; 2) RDA/AI vitamin and mineral gaps when intake is from food alone (including fortification); 3) vitamin and essential mineral supplement safety range (mean food intake to UL) considering food intake; 4) proposed vitamin and mineral safe and effective supplement range to close the micronutrient gaps between the RDA/AI and food to achieve the scientific consensus of recommended vitamin and mineral intakes to complement the western food diet of typical adults regardless of gender or age.

Goal

To supply VM in amounts necessary to complement typical food intake to reach the established RDAs that promote health in all persons over 50 years of age. This formula considers food intake compared to the RDA and AI levels for health and supplies corrective amounts so that combined with diet, and other supplement intake if necessary, keeps the user within the safe and recommended vitamin and mineral range. The range is defined as starting close or equal to the vitamin and mineral RDA/AI and ending below the UL or No Observed Adverse Effect Level (NOAEL). Most importantly this formula contains 19 VM that are known to be potentially shorted when food alone is the delivery, so that the human vitamin and mineral needs are shored up within any typical American diet, other than those minerals that cannot fit in an acceptable pill size* such as calcium and potassium. Along with other often shorted VM, other than calcium and fiber due to pill size, the seven nutrients of concern (dietary fiber, choline, magnesium, calcium, and vitamins A, E, and C), identified by the Dietary Guidelines for Americans (DGA), are contained in the Over50MV in corrective amounts when added to known U.S. and other western nations' food intake vitamin and mineral content.

Rationale

The rationale for lifelong vitamin and mineral supplementation for all humans including athletes is detailed in the article titled: "Vitamin and Mineral Supplementation in Human Health – A Case for Public Policy,[7]" which is solely an educational publication but serves as a basis for proper vitamin and mineral usage (and will be noted) throughout the entire PDSRG Health Section.

Over50 Formula

To error on the side of caution due to iron's function including oxidation in vascular health, iron removal from this Over50 formula is the primary reason for making this product separately.[8,9] Although iron is an under-consumed nutrient of concern for much of the population without supplementation,[2] there is a tight window of safety and efficacy that may be tighter for older adults as excess iron has been proposed as a potential problem in the aging population since many may have unknown compromised cardiovascular systems.[8,10,11,12,13,14,] However, this does not mean older adults do not need to achieve iron's RDA,[2,12,15] they do, but they should accomplish it with food or get a blood test to identify an insufficiency and then supplement accordingly.[12,16] The most efficient test for the diagnosis of iron deficiency/insufficiency is the serum ferritin test.[17]

All ingredients contained in this formula follow the basic rules of filling gaps no matter the general western diet or adult age.[2,5,18] Additionally, this formula follows the same vitamin and mineral structural guidelines of all dotFIT MVM formulas (Vegan, Women's, Kid's and Active), in that the forms and dosage of ingredients are consistent in what has been shown to be potentially more beneficial than what is contained in multivitamin products commonly found in consumer channels (see previous section "dotFIT Multivitamin & Mineral Formulas Specialty Design Criteria" for more). These improvements over mass produced multivitamin products include the following:

- Maintaining a synergistic relationship with all dotFIT health products. Therefore, during multiple product use in any combination, users remain in the known safe and recommended vitamin and mineral range, which is from the ~RDA/AI to below the UL or NOAEL as previously noted.
- Both important forms of vitamin K, K1 and K2.[19,20,21] K1 and K2 have similar and unique properties. K2 (menaquinone) has recently emerged as serving an important role in vascular and bone health.[22,23,24] Calcium and vitamin D from food and supplements are complemented with vitamin K2 supplementation due to its increasingly recognized role as a "calcium chaperone and the facilitator of vitamin K's cardiovascular system protective role in the body."[21,23,24,25,26,27,28,29]
- Vitamin B12 is in two forms: methylcobalamin and cyanocobalamin. Both forms are important but methylcobalamin compared with other forms is the most effective at being delivered to neurons to support brain health.[30,31]
- Magnesium as Mg citrate: involved in more than 300 biochemical reactions of the body,[32,33] especially those that are involved in energy metabolism and neurotransmitter synthesis.[34] Aging is a major risk factor for magnesium deficiency.[35] Its total level reduces due to a decrease in bone mass which is the most important magnesium source in the body.[36] Additionally, studies show magnesium dietary intake is inadequate in most population groups, especially elderly people.[37,38,39,40,41] Low magnesium levels have been associated with weakness and sleep problems. In fact, magnesium supplementation in the elderly has been shown to improve both performance and sleep.[36,42,43,44,45] Magnesium in this formula complements the typical American diet to help achieve desired magnesium levels and when needed, work synergistically with the dotFIT SuperCalcium, which also contains magnesium, thus keeping total intake in the safe recommended nutrient range.[46] The magnesium in this formula is in the citrate form for greater bioavailability compared to other forms.[47,48]
- Vitamin A is in both 500µg of preformed Vitamin A (retinol and its esterified form, retinyl ester) and 2500IU of provitamin A (beta-carotene) since they both metabolize differently with unique and mutual actions.[49] However, partially attributed to genetics and other uptake factors,[50,51] there can be large interindividual differences in the ability to convert pro-vitamin A sources (e.g. alpha-carotene, beta-carotene, etc.) to the needed amount of vitamin A activity, known as retinol activity equivalents (RAE), therefore both forms can offset the possibility of too much or too little vitamin A activity and achieve the desired levels.[52,53,54]
- Choline bitartrate: rarely found in multivitamin products, choline is now considered and essential nutrient for proper muscle, liver and brain functions, lipid metabolism and cellular membrane composition and repair.[2,5,55] Depending on the age group, over 90% of Americans and populations of other modern western nations, have been

found to be dangerously below the establish Adequate Intake (AI)[56,57,58] and therefore choline is now listed as a nutrient of concern by the DGA,[2] meaning without correction, potential related health problems loom (e.g. shortages negatively impact cell structure, neurotransmitter synthesis/neurological disorders, liver health, atherosclerosis, etc.).[55,59,60,61]Choline is especially important during pregnancy, lactation, and early child development.[59,62]

In summary, since similar vitamin and mineral needs are well established between adults of all ages, iron removal, less of both forms of vitamin A, and an increase in both forms of B12 and choline are the primary significant age related changes from the other dotFIT adult formulas (Women's, Vegan and Active).

Over50MV Proper Integration with Age

The Over50MV would carry on from the ActiveMV for most humans over 50 years, because in general at this age, physical activity and lean body mass are being altered through age-related downregulation of overall metabolism (e.g. hormones, lean body mass, etc.) Although it may not appear or feel that is the case, you are doing less work (in fact you may feel like you are doing more to stay young), the inevitable (downregulation) is setting in as aging naturally changes the body's ability to perform at its younger levels.

The one-ActiveMV dose is for all children 11-17 years of age and all small adults (under 105 lbs). The two ActiveMV dose was designed to allow more antioxidant protection along with other vitamin and mineral actions to support all exercising/active males and highly competitive female athletes. For all females and males who do not perform rigorous prolonged regular training sessions, starting at age 50 they would use the Over50MV for the remainder of their lifespan. For those males and females continuing regular high volume and intense training, they would remain on the ActiveMV through age 65 at which time they would switch to the Over50MV.

*For all persons of all ages: calcium and potassium needs are based on diet and the amounts to correct food intake to meet the RDAs generally would not fit in an acceptable pill size along with the other VM. While impossible to quantify/validate all the individual vitamin and mineral content of your foods (unless testing each food immediately before consumption), calcium and potassium food content are relatively easy to discover, especially since the inception of new labeling laws. Therefore, the standard adult formula would leave these two minerals out allowing individuals to add separately only if needed, which a quick glance at one's diet can determine.

Typical Use

- For the general population over 50 years of age except as noted above
- Take two tablets daily with favorite beverage after consuming first meal of the day
- For CVMS contraindications, precautions, etc., see previous section "dotFIT Multivitamin & Mineral Formulas Specialty Design Criteria."
- There are no ingredients in the Over50MV that reach the UL or NOAEL including when added to typical food intake.

Supplement Facts Label

Supplement Facts

Serving Size: 2 Tablets Servings Per Container: 60	Amount Per Serving	% DV
Vitamin A (765 mcg as beta carotene and 500 mcg as acetate)	1265 mcg (4000 IU)	141%
Vitamin C (as calcium ascorbate)	250 mg	278%
Vitamin D3 (as cholecalciferol)	25 mcg (1000 IU)	125%
Vitamin E (as d-alpha tocopheryl succinate)	33.5 mg (50 IU)	223%
Vitamin K (as Vitamin K1 [phytonadione] and Vitamin K2 [menaquinone-7])	50 mcg	42%
Vitamin B1 Thiamin (as thiamine mononitrate)	6 mg	500%
Vitamin B2 Riboflavin	6 mg	462%
Vitamin B3 Niacin (as niacinamide)	20 mg	125%
Vitamin B6 (as pyridoxine hydrochloride)	10 mg	588%
Folate	400 mcg DFE (235 mcg folic acid)	100%
Vitamin B12 (as cyanocobalamin and methylcobalamin)	50 mcg	2083%
Biotin	100 mcg	333%
Vitamin B5 Pantothenic Acid (as d-calcium pantothenate)	10 mg	200%
Choline (from choline bitartrate)	150 mg	27%
Iodine (from kelp powder)	75 mcg	50%
Magnesium (from magnesium citrate)	150 mg	36%
Zinc (from zinc citrate)	15 mg	136%
Selenium (from L-selenomethionine)	70 mcg	127%
Copper (from copper gluconate)	1 mg	111%
Chromium (from chromium polynicotinate)	100 mcg	286%

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