

Choosing a Multivitamin: The Considerations

March 2010.

Article by Marek Doyle, www.blueprintfitness.co.uk

Whilst the benefits of a multivitamin have been known for some time, there is a wide array of options when it comes to the item itself. So much so, that many consumers and personal trainers are left unsure as to what differentiates a good multi from a glorified smartie. And, as a multivitamin is always (or at least should be) the cornerstone of any supplement program, it is crucial that this first step provide the nutritional support intended. So how can you ensure you are making the right choice?

The ingredients

Naturally, this is perhaps the most important factor in deciding whether a multinutrient formula is right for you. Whilst there are some similarities between some supplements, no two products are alike. In this regard, you can separate the full-spectrum products from their '100% RDI' equivalent. Although this 100% tag against a list of 17 nutrients may appear impressive at first glance, it is not; these RDI figures relate to the Recommended Daily Intake, Government-backed figures that were introduced in 1941.

The only problem is that these figures related more to the avoidance of scurvy and rickets than they did to optimum health. We are now 78 years on and widespread use of pesticides, picking of fruits whilst they are under-ripe, long-haul shipping and mineral depletion of the soil have all made a mockery of these RDIs (Oakley, 1998). If this is all your supplement contains, then the manufacturer knows nothing about your nutritional requirements and you should ensure their product remains firmly on the shelf, where it belongs.

Although more does not necessarily mean better, the idea that of consuming vitamins above RDA levels is necessary for optimal health is not new (Colgan, 1984). Many of the top brands that I recommend on a regular basis will contain a range of B vitamins between 25-50mg, and this would be a good starting point for comparison. Be aware that no multivitamin formulas tend to contain suitable amounts of calcium, potassium and magnesium – these macrominerals are required in much higher quantities than a supplement can provide so must be considered separately.

On top of simply dosage, the source of your vitamins should be given due thought. By this, I refer to whether they are natural-form vitamins or synthetic. Synthetic vitamins have a similar molecular structure to naturally-sourced equivalents and can reasonably be expected to confer the same benefit. Except they don't! To take vitamin E as an example, the d- form of vitamin E that is extracted from seed oils etc is different from the dl- form (the synthetic form). The dl- tocopherols are actually a mixture: the d-form and the l-form (usually a 1:1 mixture). The d- form is the type used by the body and is the type that is important for human health; the l- form appears not to have any effects in the body and is simply excreted. In any case, natural vitamin E has twice the potency of that created in laboratories (Harris and Ludwig, 1948). This is just one of several examples that demonstrates that natural vitamins are clearly a better choice. Another example involves that of vitamin C; as much as some manufacturers may tell you so, synthesized ascorbic acid is not vitamin C, it is simply the active factor within the natural vitamin C complex. For

full vitamin C activity, you need the whole complex. The ideal choice here would be to find a supplement that uses an extract of amla berries or rose hips, in which the vitamin C complex is pre-formed. However, potency issues dictate that ascorbic acid alongside a mix of bioflavonoids, rose hips or hesperidin/rutin is often the best solution available to the consumer.

Co-factors and co-enzymes

Another sure sign that your supplement manufacturer understands a little about the human body is whether they include anything alongside the basic 17 nutrients that are deemed essential. To use the B-complex vitamins again as an example, a cheap supermarket offering will likely contain just B1, B2, B3, B5, B6, B12. However, a more expansive equivalent is likely to provide choline, biotin, inositol, PABA and folic acid, all of which work in synergy with the whole complex so that the biological processes that involve this key group can now take place at a sufficient rate.

Mineral bonds

'The presence of Magnesium Oxide' or 'Zinc Oxide' is a sure sign that your intended multivitamin is not fit for purpose. Whilst these compounds are cheap as chips to produce, they yield minimal absorption in the intestines. Research from decades ago showed that, when magnesium was consumed in citrate form, 65% formed a soluble complex; in other words, 65% of it was absorbable (Lingberg et al, 1990). However, when the same ion was bound with oxide, the soluble complex was barely measurable. Citrates, taurates, ascorbates, and especially picolines are amongst the better chelations, and should be present in every good multivitamin.

Phytonutrient compounds

It has long been known that plant compounds can help the absorption, assimilation and utilisation of vitamins and minerals (eg vitamin and quercetin, for example). However, the extent that phytonutrient compounds play in the finely-tuned biochemical mixture that is our bodies appear to have gone under-rated for many years. This may be down the relatively unimpressive results yielded in short-term trials that have attempted to evaluate the effects of individual phytochemicals. However, more recent research (de Kok et al, 2008) suggests that modern science has again been outsmarted by nature and that these compounds have a powerful effect in the body when consumed together.

This synergistic effect, where the anti-oxidant capacity can be multiplied many times over, shows the added value of a phytonutrient base in a multivitamin supplement. Moreover, with over 10,000 phytonutrients now discovered, it also shows that a good multivitamin is only part of the story and that a varied diet based on plenty of real foods should never be overlooked. However, simply in regards to supplement choice, a product that contains carotenoid and proanthocyanin complexes or a herbal base of alfalfa, wheatgrass, barleygrass, etc will enhance the effectiveness of the other ingredients within your multi.

Fillers

Some companies use the left-over space to add a herbal blend that I discussed above. Others just use fillers like titanium dioxide, silica. Concern has been voiced against the use of magnesium stearate in supplements. Opponents to this compound – which is essentially blackboard chalk – say that this reduces mineral absorption in the intestines and can reduce the function of white blood cells once absorbed (Tebbey and Buttke, 1990). Magnesium stearate is a combination of magnesium and stearic acid and is regularly used as a lubricant to allow supplements to flow more smoothly into tablet presses or empty capsules. The effects of this compound clearly merit further research, but it should be

pointed out that stearic acid is a fatty acid present in many foods and that the small amounts contained within these supplements is unlikely to radically change your body's overall load of stearic acid. My thoughts are that, whilst the level of concern over this ingredient may be overstated, it is (at best) of no benefit and that this should be kept in mind when choosing a supplement, even if it is not the deciding factor.

Tablets vs Capsules

Formulas generally come in tablet form or capsule form. Neither format suggest higher levels of purity or better quality ingredients, although there is discussion as to the bioavailability of compounds contained within solid tablets in comparison with powder-containing capsules. Some experiments have concluded that, whilst absorption was much quicker with a capsule, total bioavailability was not significantly different between the two delivery methods (Rasetti-Escarguel and Grange, 2005). However, there is a bigger body of evidence that does show a measurable increase in bioavailability from capsules (Reid et al, 2008) in normal health subjects and this difference is likely to be increased should the consumer suffer from poor digestive function. Although it is not the biggest factor, a capsule appears to provide a more reliable delivery of your valuable nutrients and represents the preferred choice.

One-a-day vs Multiple Dose

Almost all the absorption of your nutrients occurs in the intestines, where compounds must diffuse through epithelial cell membranes. Thus, the rate of absorption is determined by the surface area available and the concentration gradient across the cell membrane. The intestines are very well adapted to these limitations, but limitations still exist; attempting to consume and absorb all of your required nutrients in just one go is always going to be a challenge and, whilst it is 100% nutrient absorption is an impossible dream, the rate of mineral absorption is markedly increased when split doses are administered (Heaney et al, 1990).

The absorption of water-soluble vitamins is also a key consideration in this choice. Vitamin B complex and vitamin C, the water-soluble vitamins, are not stored in the body like fat-soluble vitamins. When consumed from food sources, they maintain a concentration in the bloodstream for a number of hours but this leaves the body requiring regular intake of these important nutrients. The outcome is that split dose multis (two or even three doses per day) will always beat their one-a-day competitors.

In summary

The factors discussed above are not the final chapter in multivitamin supplements, by any counts, and do not discuss issues common to all multivitamins such as mineral competition/antagonism in the intestines. However, the article covers many important factors in making an informed choice and, in doing so, illustrates how many different factors can influence the value of a specific formula and how difficult a task it is to create a truly good multivitamin product. Naturally, a search for the 'perfect' multivitamin is destined to remain a fruitless task; by definition, this would have to consist of a complicated and specifically-timed regime of split dose capsules.

However, a good multivitamin confers a very useful tool which, combined with an appropriate diet that delivers a plentiful array of different phytonutrients, allows us as individuals to overcome many of the insults given to our food chain and nourish our cells with the more generous levels of nutrients upon which they have evolved.

References:

Colgan, M (1984). *Your Personal Vitamin Profile*. Frederick Muller Ltd.

Harris PL and Ludwig MI (1948). Relative Vitamin E potency of natural vitamin e and of synthetic a-tocopherol. *Journal of Biological Chemistry*, October 1948.

Heaney et al (1990). Absorbability of Calcium Sources. The Limited Role of Solubility. *Journal of Bone and Mineral Research*, 5(11): 1135-37.

de Kok TM, van Breda SG, Manson MM (2008). Mechanisms of combined action of different chemoprotective dietary compounds. *European Journal of Nutrition*, 47(2): 51-59.

Lingberg LS, Zobitz MM, Poindexter JR, Pak CY (1990). Magnesium bioavailability from magnesium citrate and magnesium oxide. *Journal of the American College of Nutrition*, 9(1): 48-55.

Oakley GP (1998). Eat Right and take a Multivitamin. *New England Journal of Medicine* 1998, 338:1060-61.

Rasetti-Escarguel C and Grange V (2005). Pharmacokinetic profiles of two tablet formulations of piroxicam. *International Journal of Pharmaceutics*. 295(1-2): 129-134.

Reid JM, Mandrekar SJ, Carlson EC, Harmsen WS, Green EM, McGovern RM, Szabo E, Ames MM, Boring D, Limburg PJ (2008). Comparative Bioavailability of Sunlindac in Capsule and Tablet Formulations. *Cancer Epidemiology, Biomarkers and Prevention*. 17(3): 674-79.

Tebbey PW, Buttke TM (1990). Molecular basis for the immunosuppressive action of stearic acid on T cells. *Immunology*, (70)3: 379-386.

Marek is a personal trainer, nutritional therapist, allergist and health writer operating in Kensington, Chelsea, West London and Basingstoke. He is the director of www.blueprintfitness.co.uk and www.blueprinthealth.co.uk.