ConsumerLab.com

www.consumerlab.com/reviews/multivitamin-review-comparisons/multivitamins/

Multivitamin and Multimineral Supplements Review

Best Multivitamins -- Caution with Gummies

Medically reviewed and edited by Tod Cooperman, M.D.

Updated August 14, 2025 ⓘ

Watch the video

Summary

What did ConsumerLab find testing multivitamins? Eight out of 29 (27.6%) of the multivitamin/multimineral supplements selected by ConsumerLab.com for testing *failed* to get our approval. These are marked as "Not Approved" in the **results table**.

What problems were found with multivitamins? Some had *lower* levels of nutrients than the label claimed (only 14% of the expected vitamin D in one case), some had *higher* amounts (particularly gummies, three of which had nearly double the expected folic acid, and a prenatal with 88% more iodine than listed), and one took *longer than permitted* to disintegrate ("break apart") in solution. All product deficiencies were confirmed in tests in a second independent laboratory (see **What CL Found** and How Products Were Evaluated).

Avoid toxicity: Of particular concern is that several products provided more than or close to the Tolerable Upper Intake Levels (ULs) of some vitamins and minerals, above which there is increasing risk of toxicity with regular use: A prenatal exceeded the UL for magnesium; nine multis exceeded the UL for niacin; and a men's multi was right at the UL for vitamin B-6.

ConsumerLab's *Top Picks among multivitamins*: Among products that were "Approved" in testing, including nine products tested through CL's voluntary Quality Certification Program, *Top Picks* were selected as being best for the following categories based on product quality, appropriateness of dosage, formulation, and value:

- **General Adult**
- **50+ General**
- **Women**
- **Women 50+**
- **Prenatal**
- **Men**
- **Men 50+**

- **Children**
- **Pet**

What to look for in a multivitamin? When selecting any multi, as a start, be sure it lists the right amount of each essential vitamin and mineral for you. You can check your own requirements using our **RDA table** as well as the detailed information for **each nutrient** in this Review.

Is it worth taking a multivitamin? There is some evidence that taking a multivitamin can slightly decrease the risk of cataracts, modestly slow cognitive decline in adults with cardiovascular disease, and reduce symptoms of respiratory illness in older people. Prenatal multivitamins may **reduce the risk of birth defects**. However, there is no clear evidence that multivitamins can reduce the risk of dying from cardiovascular disease, cancer, or any other causes (see **What They Do**). Multivitamins may help treat or prevent nutrient deficiencies in people at risk for such deficiencies — although more targeted nutritional approaches may be preferable, such as for deficiencies in iron, B-12, and magnesium.

Products tested in 2023, 2024 and 2025

What They Are:

Multivitamins/multiminerals (or "multis") are the most popular supplements among the general population in America. There's no standard formula for multis, so ingredients will vary dramatically from one brand to another. It would be impossible to make a one-size-fits-all multi anyway because nutritional needs depend on age, gender, health status, and several other factors.

What They Do:

In 2022, the U.S. Preventive Services Task Force reported that *inadequate* evidence exists to assess the balance of benefits and risks of multivitamin supplementation for preventing **cancer** or **cardiovascular disease** in healthy adults without nutritional deficiencies (USPSTF, JAMA 2022).

However, as discussed below, there is some evidence that a multivitamin can modestly slow cognitive decline in older adults with cardiovascular disease, slightly decrease the risk of cataracts, and reduce symptoms of respiratory illness in older people. Prenatal multivitamins may reduce the risk of **birth defects**. Multivitamins may also help treat or prevent nutrient deficiencies in people at-risk for such deficiencies — although more targeted nutritional approaches may be preferable, such as for deficiencies in **iron**, **magnesium**, and **vitamin B-12**.

There is no clear evidence from clinical trials showing that any specific multivitamin can reduce the **risk of dying** from cardiovascular disease, cancer, or any other cause (Park, Am J Epidem 2011). Similarly, an analysis of health records of 390,000 healthy adults in the U.S. found that those who reported taking a daily multivitamin had no lower risk of dying from heart disease, cancer or cerebrovascular diseases (e.g., stroke, aneurysms, etc.) over the next 24 to 27 years than those who reported not using a daily multivitamin, after adjusting for other differences between the populations. The study did not, however, determine if people had continued to use (or not use) multivitamins throughout the entire period and did not explore benefits other than mortality (Loftfield, JAMA Netw Open 2024).

Cancer risk

There is mixed evidence as to whether multivitamin use decreases the incidence of certain cancers. Multivitamin use may reduce the risk of death in women being treated for breast cancer, according to one observational study, but more research is needed to confirm this benefit.

A major study of male physicians 50 years of age or older found an 8% lower incidence of cancers among those taking a relatively modest-dose daily multivitamin compared to men taking placebo -- although there was no reduction in the mortality rate during the study period of approximately 11 years (Gaziano, JAMA 2012). The greatest reductions in cancer were among men with a prior diagnosis of cancer (27% fewer new cancers) and men with no family history of cancer (14% fewer cancers). There was no significant reduction in prostate cancer -- the most common type of cancer in the study; however, there was a 12% reduction in all other cancers combined. The supplement used in the study was *Centrum Silver*, although the formula in the study dated from 1997 and contained 400 IU of vitamin D3 and 5,000 IU of vitamin A with 50% beta-carotene.

A more recent and shorter (about 3.6 years) study (the Cocoa Supplement and Multivitamin Outcomes Study (COSMOS) among 21,442 men and women (average age 72) without a history of cancer within two years of the start of the study focused on the prevention of invasive cancers and used a more recent formulation of *Centrum Silver*. It found that a daily tablet reduced the incidence of lung cancer (by 38%) but did not significantly affect the occurrence of other invasive cancers (including melanoma or breast, colon, and prostate cancer), invasive cancers overall, or overall mortality, compared

to placebo. The formula used was *Centrum Silver 50+*, which included more vitamin D (1,000 IU) and less vitamin A (2,500 mg as 40% beta-carotene) than in the earlier study. It also included small amounts of lutein (200 mcg) and lycopene (300 mcg) and had more vitamin K (30 mcg vs 10 mcg) but less magnesium (50 mg vs 100 mg), iron (none vs 4 mg), and molybdenum (45 mcg vs 160 mcg) (Sesso, Am J Clin Nutr 2022).

A study of women aged 50 to 79 years with invasive **breast cancer** found that those who used multivitamins were 30% less likely to have died from the disease, compared to non-users, over an average period of 7 years (Wassertheil-Smoller, Breast Canc Res Treat 2013). Adjusting for factors such as age, race, and the use of other supplements did not substantially change this estimate. Unfortunately, the study did not evaluate the specific multivitamin formulas used, so it is impossible to say which formula, if any, was associated with the lowest mortality.

Cardiovascular disease

Although one observational study found that supplementing with a multivitamin containing minerals reduced the risk of cardiovascular death among people without a history of heart disease, placebo-controlled trials, which are needed to prove a benefit, have generally not found multivitamin use to reduce the risk of heart attack, stroke or cardiovascular death.

A U.S. study found that people who had used multivitamin/multimineral supplements for at least 3 years were 35% less likely to have died of cardiovascular disease over the following 20 or so years, compared to those who had not taken a multi. This positive finding was largely driven by results for women in the study, who were 44% less likely to have had a cardiovascular-related death. None of the subjects had cardiovascular disease at the start of the study, and the results were adjusted to avoid potentially confounding variables including race, education, aspirin use and blood pressure. Interestingly, the apparent benefit did *not* occur for people who had used multivitamins that lacked minerals, nor among people who had taken multis for less than 3 years at the beginning of the study (Bailey, J Nutr 2015).

However, in two clinical trials discussed earlier involving formulations of *Centrum Silver*, multivitamin use did *not* decrease the risk of heart attack, stroke, or death from cardiovascular disease compared to placebo (Gaziano, JAMA 2012; Sesso, Am J Clin Nutr 2022). [Note: In the 2022 study, a reduced risk of cardiovascular death was reported, but only among participants who also took a cocoa extract supplement.]

In addition, an analysis of 18 multivitamin studies, including the *Centrum Silver* study among male physicians discussed above, concluded that multivitamin/multimineral supplementation "... does not improve cardiovascular outcomes in the general population." However, most of the studies included in the analysis did not characterize the multivitamins used, making it impossible to generalize this conclusion to all formulas nor to populations with specific conditions or deficiencies (Kim, Circulation 2018).

A study among adults who **previously suffered heart attacks** found that giving them high-dose vitamins and minerals did not result in a statistically significant reduction in further cardiovascular events compared to those receiving placebo (Lamas, Ann Int Med 2013). The supplement consisted of 28 vitamins and minerals given as 6 large caplets daily and was designed by complementary and alternative medicine practitioners. It included amounts of vitamins A, C, and E and most B vitamins at several times the Daily Value, and up to three times the Daily Value for folate, selenium, chromium, and molybdenum. Patients took the supplement regimen for one to five years (median was 31 months) and were followed for two to five years (median was 55 months). Many people dropped out of the study due to the complexity of the regimen, although there was no evidence of harm. Another study using the same daily high-dose multi, but given to older adults (average age 67) with **type 1 or type 2 diabetes and history of heart attack**, found that over one to five years (median 48 months), it did *not* reduce the risk of a second heart attack, stroke, cardiovascular death, or death from any cause, compared to placebo (Ujueta, JAMA Intern Med 2025).

Memory and cognition

While there does not appear to be a benefit on memory and cognition in well-nourished seniors, a version of Centrum Silver (50+) modestly slowed cognitive decline and improved immediate recall in older adults with cardiovascular disease, possibly because they were more likely to have lower levels of certain nutrients than healthy adults.

Analyses of a long-term study using *Centrum Silver* among male physicians found no benefits on **cognition or verbal memory**, although the researchers noted that the participants may have been too well-nourished to benefit from a multivitamin (Grodstein, Ann Int Med 2013).

In contrast, a placebo-controlled study among 1,732 women and men (average age 73) who took a somewhat different formulation of *Centrum Silver* (*Centrum Silver 50+*, as described above and similar to Adults 50+ products in this Review) once daily for three years showed that it *modestly* slowed declines in episodic memory (i.e., recall immediately after or within 2 to 10 minutes of an event). The *overall* effect on memory and cognition after two years was considered equivalent to reducing aging by 2 years (Vyas, Am J Clin Nutr 2024). The effect was *strongest among participants with pre-existing cardiovascular disease,* whom the researchers noted, may be more likely to have lower levels of certain nutrients, such as vitamin B-12 (due to use of certain medications that may inhibit absorption), selenium, and vitamin C than people without cardiovascular disease, although blood levels of these nutrients were not measured (Baker, Alzheimers Dement 2022). (*Centrum Silver 50+* includes 25 mcg of B-12, 19 mcg of selenium, and 60 mg of vitamin

C.) Further analysis of the data also showed *slight* improvement in short-term memory (i.e., *immediate* recall of just one additional word out of 20) and, again, the effect was strongest among those with pre-existing cardiovascular disease. However, supplementation did *not* slow declines in executive function or short-term *retention* (recalling the same list of words after a 15-minute delay) (Yeung, Am J Clin Nutr 2023). The study did not find the vitamin to reduce the rates of **mild cognitive impairment (MCI)** or **dementia**. However, among those who developed mild cognitive impairment, there was slightly less decline in global cognition and executive function over the following year compared to those in the placebo group, and these differences were statistically significant, suggesting that *Centrum Silver 50+ may slow cognitive decline* among people with MCI. Unfortunately, this limited benefit was not found among people who developed Alzheimer's disease or other forms of dementia (Sachs, Alzheimers Dement 2023). In this study, taking a cocoa extract supplement in addition to multivitamin or placebo did *not* have any significant effect on cognition, or reduce rates of MCI or dementia compared to placebo (Baker, Alzheimers Dement 2022; Sachs, Alzheimers Dement 2023).

Eye health

In an analysis of the long-term study using *Centrum Silver* among male physicians, a 9% decrease in the risk of **cataract** was found among those taking *Centrum Silver* compared to those taking placebo, although there was no decrease in the risk of developing visually significant **age-related macular degeneration (AMD)** (Christen, Am Acad Opthal 2013). However, among participants who were randomized to also take a separate, daily, high-dose vitamin C supplement (500 mg synthetic ascorbic acid -- about 6 times the RDA), there was *no reduction* in cataract risk, while the risk of cataract decreased by 18% among those taking *Centrum Silver* (which contains 60 mg of vitamin C) without the additional vitamin C supplement.

Fracture risk

Centrum Silver 50+ daily for approximately three years did *not* decrease the risk of fracture (hip, spine, pelvis, forearm, or wrist) compared to placebo in a study among 21,442 men and women (age 65 or older). The supplement provided 25 mcg (1,000 IU) of vitamin D and 220 mg of calcium. Unfortunately, the study did not report blood levels or dietary intakes of calcium and vitamin D, but participants were told to limit total calcium from supplements to 1,200 mg per day, and 1,000 IU of vitamin D per day (Crandall, J Bone Miner Res 2025). However, this study does not prove that supplementing with calcium is not beneficial, as other studies have suggested a benefit to postmenopausal women taking somewhat higher amounts of calcium daily (300 to 500 mg), as discussed in our Calcium Review. The benefit of vitamin D supplementation on fractures appears to be limited to people deficient in vitamin D.

Respiratory illness

Taking a multivitamin does not seem to prevent respiratory illnesses in older people, but it may shorten the duration and severity of sick days that occur.

A study in 42 people 55-75 years old found that taking two tablets of the multivitamin *Redoxon Vita Immune* (Bayer AG) once daily for 12 weeks did not reduce the percentage of people who reported respiratory illnesses, but those given the multivitamin reported fewer sick days compared to those given placebo (2.29 days vs 6.43 days), and symptoms tended to be more mild. A daily dose of two tablets provided a large amount of vitamin C (1,000 mg — about 10 times the daily requirement) but more moderate amounts of vitamin A (700 mcg), vitamin D (400 IU), vitamin E (45 mg), vitamin B6 (6.6 mg), folic acid (400 mcg), vitamin B-12 (9.6 mcg), iron (5 mg), copper (0.9 mg), zinc (10 mg), and selenium (110 mcg). Supplementation did not significantly affect measures of immune function such as white blood cell (neutrophil) activity or cytokine levels, although, interestingly, patient blood samples with higher levels of vitamin C showed *reduced* ability to kill bacteria than those with lower levels. On the other hand, increased zinc levels were modestly associated with a decrease in days ill and severity — suggesting that zinc may have been responsible for some of the benefits (Fantacone, Nutrients 2020).

What CL Found:

Multivitamins can differ greatly in terms of quality. The large number of ingredients in these products opens the possibility for more things to go wrong than with single-ingredient supplements. One potential problem is that the ingredients and/or amounts of ingredients in the bottle may not match those listed on the label. As with many mineral and herbal products, there's also a risk that a multi could be contaminated with lead or other toxins. In addition, if tablets are too dense or improperly coated, they may not properly disintegrate ("break apart") in the body.

In our tests of multivitamins in 2020, 44% of the multivitamins selected for testing failed to meet quality specifications. Similarly, 46% failed in 2017.

It was reported in 2025 (after publication of this Review) that tests of 156 prenatal supplements purchased in the U.S. found that 15% exceeded 0.5 mcg of **lead** per serving (above which a "reproductive harm" warning is required in California) with the highest amount being 2.62 mcg. Similarly, 33% of nine *prescription* prenatal vitamins exceeded this limit, with the highest amount being 1.12 mcg. Names of products were not published (we have requested this information and will publish it here if received) (Gardener, Environmental Research, 2025).

In 2025, **phthalates** (plasticizer chemicals that can cause hormone disruption) were detected in four out of nine popular children's multivitamins purchased and tested by a separate testing group, Mamavation. However, total phthalate levels were generally low, ranging from 39 ppb (or mcg/kg) to 222 ppb for three of the products. The highest concentration, 1,264 ppb, was found in *Life Extension Mix - Children's Formula, Natural Berry Flavor* chewable tablets. That's about 3.78 mcg per daily 2-tablet serving (assuming the tablets have a total weight of 3 grams), which is well below the European tolerable daily intake of 1,120 mcg for a child weighing 50 pounds (based on four phthalates with established limits — all of which were included in Mamavation's total 14 phthalates measured). Similarly, in 2024, a specific phthalate, DEHP, was reported in *One-A-Day-Prenatal-1* by the website PlasticList, but the amount found per serving (10.8 mcg), was far below the daily limit for DEHP established by the US EPA (1,400 mcg) and in Europe (3,500 mcg) based on a lifetime of daily exposure for a typical adult (154 lbs) to avoid appreciable risk (see our Update about this in our Fruits, Veggies, & Other Greens Review).

No U.S. agency routinely tests multis or other dietary supplements for their contents or quality. That's where ConsumerLab.com comes in. As part of our mission to independently evaluate products that affect health and nutrition, ConsumerLab.com purchased leading multivitamin/multimineral products sold in the U.S. and Canada, including multis for pets, and put them to the test in the laboratory.

We couldn't test every ingredient in every product, so we chose to focus on several standard nutrients including folate (such as folic acid), iron, and vitamin D. We made some substitutions as needed. If a product didn't contain folate, for example, we tested for vitamin C instead. If it didn't contain significant iron, we checked the levels of zinc or calcium. The amount of iodine was also checked in every prenatal vitamin claiming to contain it. We also tested tablets for disintegration (how long it takes to break apart in liquid); if tablets can't break apart fast enough, less ingredient may be available for absorption by the body. In any product claiming to contain whole herbs or more than 130 mg of minerals per daily serving, or those declaring any amount of dicalcium phosphate, we also tested for potential contamination with arsenic, cadmium, and lead.

Products had to pass testing for all of these criteria, as well as meet FDA labeling requirements, to earn our "Approved" rating in the table below (see Testing Methods and Passing Score).

What CL Found:

Update (3/20/24): Two additional prenatal multivitamins were chosen by ConsumerLab.com to be added to this Review, as discussed in the ***Top Picks*** section.

Among the 29 multivitamins selected by ConsumerLab.com for testing, *eight failed to get our approval*. These are marked as "Not Approved" in the **results table** below. Some had lower levels of nutrients than the label claimed, some had higher amounts (particularly gummies), and one took longer than permitted to disintegrate ("break apart") in solution. All product deficiencies were confirmed in tests in a second independent laboratory. Nineteen products selected for testing were Approved, as were an additional 11 products tested through our voluntary Quality Certification Program.

Problems Found — Particularly with Gummies
Gummy vitamins were the most likely form to contain *much more* of an ingredient than listed. In fact, all four of the gummies we selected for review failed testing. The only gummy to pass testing was *Nature's Way Alive Women's Gummy*, which was tested through our voluntary Quality Certification Program.

- *VitaFusion Men's Multi* — Found **197.2% of its claimed folate** (788.8 mcg DFE instead of 400 mcg DFE per 2 gummies)
- *Olly Kids Multi-Gummy Worms* — Found **190.4% of its claimed folate** (190.4 mcg DFE instead of 100 mcg DFE per gummy)
- *New Chapter Women's Multivitamin Gummy* — Found **182.3% of its claimed folate** (729 mcg DFE instead of 400 mcg DFE per 3 gummies)
- *Smarty Pants Prenatal Formula* — Found **only 78.3% of its claimed vitamin D** (only 23.5 mcg instead of 30 mcg or 1,200 IU per 4 gummies) — although the amount found is still more than adequate.

Fortunately, none of the overages of folate that we found would put these multis over the daily Tolerable Upper Intake Level (UL) from synthetic folate (which, for adults, is 1,000 mcg, equal to about 1,700 mcg DFE), although consuming other supplements or foods with synthetic folate will add to one's daily exposure. Potential risks associated with getting high amounts of folate from a synthetic form (like folic acid or methylfolate) include masking signs of B-12 deficiency, kidney toxicity, peripheral neuropathy, promotion of cancer, and autism in offspring.

Gummies are notoriously difficult to manufacture because it is hard to measure in the correct amounts of vitamins and minerals (some are simply sprayed on a candy base) and the ingredients in a gummy are more likely to degrade, so manufacturers often intentionally put in more (an "overage") than the listed amount. In fact, in a nod to this difficulty and, particularly, the poor stability of folic acid in a chewable gel matrix, in mid-2022 the United

States Pharmacopeia (USP-NF/PF) allowed gummies to have up to *245% of their listed amount of folate* and still qualify as meeting USP standards as long as the actual amount does not exceed the Tolerable Upper Intake Level (UL). The limit for *vitamin C is even higher — 250%, with no restriction on the overage causing the amount to exceed the UL*. In contrast, the USP limit for these two nutrients in tablets and capsules is tighter — only 150%. The USP gives an extra 5 to 20 percentage points leeway on maximum amounts of other vitamins and minerals in gummies beyond what is allowed for tablets and capsules. However, some manufacturers seem to have figured out how to make gummies within the same limits applied to tablets and capsules and as the *tighter limits are safer for consumers, we apply the same tighter limits to gummies as we apply to tablets and capsules*.

If you are prone to iron deficiency, also be aware that gummy vitamins typically do not contain **iron**, likely due to iron's metallic taste.

Problems were also found with the following multis formulated as tablets or capsules:

- *Rainbow Light Prenatal One* — Found **188.4% of claimed iodine** (546.2 mcg instead of 290 mcg per tablet). This is twice the recommended 220 mcg iodine intake for pregnant women, but, fortunately, well below the upper limit of 1,100 mcg.
- *Swanson Real Food Multi - Men's Daily* — Found **171.9% of claimed folate** (343.7 mcg DFE instead of 200 mcg DFE per 3 veggie capsules)
- *Source Naturals Men's Life Force* — Required slightly **more time for tablets to disintegrate than allowed** (40 minutes instead of the 30-minute limit established in the USP). This test is conducted in an apparatus in which the tablets are continuously moved up and down in warm water (at body temperature). A concern with slower disintegration is that the ingredients may not be fully available for absorption in the gut.

One of three supplements for pets also failed testing:

- *Pet-Tabs - Dog* — Found **only 13.8% of claimed vitamin D** (1.7 mcg rather than 12.5 mcg per ½ tablet)

Caution: High Doses
Be aware that several products exceed Tolerable Upper Intake Levels (ULs) for certain nutrients based on their listed amounts of these nutrients in a daily suggested serving. It may be appropriate to exceed these levels to treat a known deficiency, particularly on a short-term basis, but exceeding the UL on a daily basis with supplements is associated with an increased risk of adverse effects:

Above UL for **magnesium** (which, for adults, is 350 mg from supplements):

- *Solgar Prenatal Nutrients* — Above the UL for magnesium at 450 mg from 4 tablets.

Above UL for **niacin** (which, for adults, is 35 mg). However, the UL is based on niacin causing skin flushing, which does not occur with niacinamide and is the only form in some of these, as noted:

- *Altipure Complete Multivitamin* — Above UL for niacin at 65 mg from 4 capsules, as niacinamide and niacin.
- *Thorne Basic Nutrients 2/Day* — Well above UL for niacin at 80 mg from 2 capsules, although as niacinamide.
- *Deva Vegan Multivitamin & Mineral Supplement* — Above UL for niacin at 50 mg from 1 tablet, although as niacinamide.
- *GNC Mega Men* — Above UL for niacin at 50 mg from 2 caplets, as niacin and niacinamide.
- *GNC Women's Multivitamin Ultra Mega* — Above UL for niacin at 50 mg from 2 caplets, as niacin and niacinamide.
- *Life Extension Two-Per-Day Multivitamin* — Above UL for niacin at 50 mg from 2 tablets, although as niacinamide.
- *Source Naturals Men's Life Force* — Above the UL for niacin at 50 mg from 3 tablets, as niacinamide and niacin.
- *Nature's Way Alive! Men's 50+ Ultra Potency* — At the UL for niacin of 40 mg from 1 tablet, although as niacinamide.
- *USANA Vita Antioxidant* — Above UL for niacin at 40 mg from 4 tablets, as niacin and niacinamide.

At the UL for **vitamin B-6** (which, for adults, is 100 mg in the U.S. but much lower in Europe — just 12 mg/day) nerve-related side effects have been reported, and there have even been reports of such side effects in older people at a daily dose of **only 6 mg**:

- *Source Naturals Men's Life Force* — At the UL for vitamin B-6 at 100 mg from the maximum daily dose of 6 tablets.

For a list of current ULs, as well as Recommended Daily Allowances, for vitamins and minerals, see our **RDAs table**.

Cost

As shown below, the daily cost for a multivitamin ranged from just 3 cents (*21st Century Sentry* and *Kirkland's Daily Multi* and *Mature Multi*) to $1.17 (*Altipure Complete Multivitamin*). As ConsumerLab has observed in other Reviews, lower cost does not mean lower quality, and many of the lowest-cost supplements were Approved in testing. Similarly, higher cost does not mean higher quality, as several of the products that were Not Approved were expensive, such as *New Chapter Women's Multivitamin Gummy* (80 cents), *Smarty Pants Prenatal Formula* (86 cents), and *Swanson Real Food Multi - Men's Daily* (67 cents).

More expensive products are often special formulations, like gummies, or provide proprietary blends or ingredients that you may not need and, in some cases, are just "window dressing" when provided at doses lower than shown to be effective.


Daily Cost of Multivitamin
General (Adult) Products
21st Century Sentry (1 tablet) $0.03
Kirkland Signature Daily Multi (1 tablet) $0.03
Puritan's Pride ABC Plus Multi (1 tablet) $0.07
DEVA Vegan Multivitan & Mineral Supplement (1 tablet) $0.23
Life Extension Two-Per-Day Multivitamin (2 tablets) $0.27
Pure Encapsulations O.N.E. Multivitamin (1 capsule) $0.65
Thorne Basic Nutrients 2/Day (2 capsules) $0.97
USANA Core Minerals (4 tablets) $1.00
USANA Vita Antioxidant (4 tablets) $1.00
Altipure Complete Multivitamin (4 capsules) $1.17
Adults 50+ Products
Kirkland Signature Mature Multi (1 tablet) $0.03
Equate Complete Multivitamin Adults 50+ (1 tablet) $0.04
Women's Products
Bayer One A Day Women's (1 tablet) $0.09
Rainbow Light Women's One (1 tablet) $0.27
Nature's Way Alive! Zero Sugar Women's (2 gummies) $0.50
GNC Women's Multivitamin Ultra Mega (2 caplets) $0.56
New Chapter Women's Multivitamin Gummy (3 gummies) $0.80
Women's 50+ Products
Nature Made Multi For Her 50+ (1 tablet) $0.10
Bayer One A Day Women 50+ (1 tablet) $0.12
Centrum Silver Women 50+ (1 tablet) $0.13
Naturelo One Daily Multivitamin For Women 50+ (1 capsule) $0.37
Prenatal Products
Rainbow Light Prenatal One (1 tablet) $0.27
Smarty Pants Prenatal Formula (4 gummies) $0.86
MegaFood Baby & Me 2 (2 tablets) $0.93
Solgar Prenatal Nutrients (4 tablets) $0.93
Men's Products
VitaFusion Men's Multi (2 gummies) $0.18
GNC Mega Men (2 caplets) $0.56
Swanson Real Food Multi (3 capsules) $0.67
Source Naturals Men's Life Force Multiple (3 tablets) $1.00
AlphaSperm® Men's Prenatal + (4 capsules) $3.33
Men's 50+ Products
CVS Health Spectravite Men 50+ (1 tablet) $0.09
Nature's Way Alive! Men's 50+ Ulta Potency (1 tablet) $0.24
Diabete Product
Nature's Way Alpha Betic (1 tablet) $0.40
Bayer Flinstones Complete $0.15

"Other Ingredients" — Titanium Dioxide, BHT

Multivitamins often include "Other Ingredients" (typically listed on labels at the bottom of the Supplement Facts panel) that are binders, flow and bulking agents, or colorants. These are known as excipients. As explained in our Inactive Ingredients Review Article, the FDA considers these ingredients to be safe when used in the small quantities typically found in supplements. However, some people may be sensitive to some of these ingredients. For example, although rare, some people have experienced allergic reactions to colorants (such as FD&C Yellow No. 5 or No. 6) or polyethylene glycol, a binder and flow agent. Some people may wish to avoid titanium dioxide (a naturally-occurring mineral used as a whitening agent), as animal studies have raised concerns that it is potentially carcinogenic, although research in people is lacking.

There is also concern about BHT, a preservative that is a synthetic antioxidant and caused liver cancer in rats fed very high amounts. Four products in this Review include BHT: *Centrum Silver — Women 50+*, *CVS Spectravite — Men 50+*, *Equate Complete Multivitamin — Adults 50+*, and *Healthy Promise™ Multi-Vitamin for cats*. Amounts of BHT in these products are not labeled, so it is hard to know the level of risk posed (we've requested details from the supplement companies and have either received no reply or been told that the amount is "proprietary"). Until more is known, you may want to opt for products without BHT.

If you are looking to avoid certain ingredients, you can check for them in any reviewed product by looking in the last column of the Results table. Also see the 3rd to last column of that table, where we indicate notable claims and features.

Top Picks:

Below is a summary of our findings for each type of multivitamin, with special focus on our *Top Picks* in each category, i.e., those that were Approved in testing, provide useful amounts of nutrients for their target populations without raising a risk of toxicity, and are favorably priced.

Note: If you have a known deficiency of a vitamin or mineral, it may be better to take a supplement with that single ingredient rather than getting it from a multi. This will allow you to: 1) take a form that may be better absorbed, such as taking magnesium bisglycinate (about 24% absorption) rather than magnesium oxide (about 4% absorption, but common in multis because it is less bulky and less expensive); 2) avoid potential competition for absorption that can occur between nutrients; and 3) take it under the best conditions for absorption for that particular ingredient, such as with or without food.

General Adult:

This category covers multivitamins for adults that are not specific to one gender or age range. Essentially, there are two types: general daily multis and high-potency multis (providing more than the daily requirements). Unless you are known to be deficient in a nutrient, a general daily is probably your best, and least expensive, option.

Our Top Pick: Kirkland Signature (Costco) Daily Multi is our *Top Pick* as a general daily multi, providing at least 100% of the recommended daily intake of most vitamins (such as vitamin B-12) and minerals (other than calcium, magnesium, and potassium, which are provided at lower percentages as these should mainly come from the diet) without exceeding any Tolerable Upper Intake Levels (ULs). It costs just 3 cents per day (1 tablet) -- far less than most other multivitamins.

Be aware that if you're a man over 50 or a postmenopausal woman, look, instead, for a multi designed for people over 50 because 1) you don't need the 18 mg of iron in *Kirkland Daily Multi* and 2) if you're over 70, you may want more vitamin D since your daily requirement of this vitamin is higher.

21st Century Sentry is very similar to *Kirkland* in cost and composition, with the most important differences being that *Kirkland* provides more magnesium (100 mg vs 50 mg) and vitamin C (90 mg vs. 60 mg) -- which may be beneficial for people who don't get enough of these nutrients. On the other hand, *Kirkland* provides only 400 IU (10 mcg) of vitamin D, a bit less than the daily requirement of 600 IU for adults up to age 70 or 800 IU for adults 71 and above. If you don't get much sun on your skin and don't get vitamin D from another supplement or fortified foods, consider *21st Century Sentry*, as it provides 1,000 IU of vitamin D which, although above the required level, is quite safe.

Kirkland includes very small amounts of **lutein** and **lycopene**, which are essentially "window dressing" since higher amounts are generally used.

Be aware that all multis, like *Kirkland*, that provide significant amounts of calcium and magnesium in a single tablet will be fairly large.

Some of the multis that we tested are two-per-day, such as those from *Life Extension* and *Thorne*. A slight advantage to taking a multi twice per day is that, if you are deficient in vitamin B-12, taking it twice per day is better than once per day, as you can only actively absorb a small amount of B-12 at a time. However, it would be less expensive to take a B-12-only supplement at a different time of day, as these can cost as little as 4 cents.

Our *Top Pick* general daily multi **for vegans** is *DEVA Vegan Multivitamin* because one daily tablet (23 cents) includes significant amounts of many of the **nutrients that vegetarians and vegans are most likely to fall short on**, namely, vitamin B-12 (100 mcg), vitamin D (800 mg, from D2, since D3 is often derived from lanolin from wool), iron (18 mg), zinc (14 mg), iodine (150 mcg), as well as some calcium (100 mg). The tablet is more slender than that of *Kirkland* because *Kirkland* provides more calcium and magnesium, both of which are bulky.

Although *DEVA* is more expensive than *Kirkland*, it is less expensive than some other vegan multivitamins, such as *Essential Vegan Multivitamin* by Future Kind, which costs $1 per 2-softgel daily serving and contains *just two essential nutrients* in amounts that may be unnecessarily high: vitamin D3 (50 mcg or 2,000 IU) and vitamin B-12 (400 mcg). Unlike *DEVA*, *Essential* includes a good daily dose of EPA (135 mg) and DHA (270 mg), both from algal oil, although our ***Top Pick* algal oil** (which also happens to be from *DEVA*) costs only 32 cents and provides similar amounts of EPA and DHA (123 mg EPA and 196 mg of DHA per softgel). You could buy *DEVA's* multi *and* its vegan algal oil supplement for nearly half the cost of *Essential* while getting additional essential nutrients, such as iron, zinc, iodine, and some calcium.

Adult 50+:

Our Top Pick: Kirkland Signature Mature Multi (3 cents per day). This is nearly identical in vitamin and mineral levels to *Equate [Walmart] Complete Multivitamin 50+* (4 cents per day), except that *Kirkland* provides the full RDA of vitamin C (90 mg) compared to 60 mg in *Equate*, and *Kirkland* does not include the preservative BHT, which is good. Both are very similar to *Up & Up [Target] Adults 50+ Multivitamin* (which is about the same price and was tested and Approved in 2020) as well as to *Centrum Silver Adult 50+*, which costs a few cents more per tablet but was shown to slow some aspects of cognitive decline.

These products provide the RDAs for most of the required nutrients, except they provide no iron (the requirement for people over 50 is only 8 mg per day) and just 30 mcg of vitamin K, which is about one-third of the Adequate Intake (AI). It should not be difficult, however, to get these from foods. They provide a significant amount of calcium (220 mg) but only a modest amount of magnesium (50 mg).

Since 2017, the amount of vitamin D in these products doubled from 500 IU to 1,000 IU, so they now provide more than the RDA for vitamin D (600 IU and, for those 71+, 800 IU). Like other multis, they do not provide large amounts of calcium, magnesium, or potassium, which you should get from foods. Each also includes very small amounts -- less than one milligram of lutein and lycopene.

Women's:

Our Top Pick: Bayer One A Day Women's Complete Multivitamin, which costs 9 cents per daily tablet. Each tablet provides 1,000 IU or 25 mcg of vitamin D -- a bit more than you may need, but still a safe level. It also provides the full 18 mg RDA of iron for non-pregnant women up to age 50, and more than adequate amounts of all B vitamins, including folate. Due to the importance of folate to developing fetuses during the *first few weeks after conception*, it is recommended that *all women capable of becoming pregnant consume 400 mcg of folic acid (or methylfolate)* from supplements or fortified foods in addition to folate naturally occurring in a varied diet.

[UDPATE (5/13/23): *The One A Day Women's* formula was recently updated. We have not tested the new formula, but we see the changes as generally positive. The major change is a reduced amount of calcium per tablet from 400 mg to 130 mg. We're not big fans of taking more than 300 mg of calcium at a time, so this is fine -- as long as you're getting a good amount of calcium from the rest of your diet. The new formula also provides a small amount of magnesium, which is good, while the earlier formula did not. Small amounts of vitamin K, manganese, and chromium that were in the formula have been removed, but this should be okay for most women, as it is rare to be deficient in these nutrients. Amounts of many B vitamins, other than folate, were increased, but are still well below upper limits.**]**

Three other Women's multis were Approved but were more expensive and not necessarily better: *Rainbow Light Women's One* (27 cents) includes 100 mg of magnesium, which is good, although more vitamin D than normally needed (2,000 IU or 50 mcg) unless you are deficient in it, and *GNC Women's Multivitamin* (56 cents for 2 caplets) has more niacin than needed (50 mg), which puts it over the Tolerable Upper Intake Level for niacin. *Nature's Way Alive Women's Gummy* provided adequate amounts of B-12, folate, and vitamin D, but provides no iron or magnesium, and just 26 mg of calcium per 2-gummy daily serving, which costs 50 cents. As noted earlier, *New Chapter Women's* (80 cents per day), which is also a gummy, was found to contain much more folate than listed, so it was *Not* Approved — it also provides no magnesium or calcium.

Women's 50+:

Our Top Pick: Nature Made Multi For Her 50+ is not only the lowest cost multi in this category (10 cents per daily tablet), but provides 1,000 IU of vitamin D, 25 mcg of vitamin B-12, 200 mg of calcium and 100 mg of magnesium, which are all substantial supplemental amounts. It also provides more vitamin K (80 mcg) than most of the others — although be aware that this can interact with the drug warfarin, a blood thinner.

If you are still menstruating, Centrum Silver Women 50+ (13 cents) may be a better choice, as it is the only multi in this category to provide some iron (8 mg) and checks all the other boxes as *Nature Made*. However, it contains BHT.

Naturelo One Daily Multivitamin for Women 50+ is our ***Top Pick in this category for vegans***, although it costs about three times as much as the other supplements and provides less calcium and magnesium than most others (only 60 mg of each). Its source of vitamin K is K2 as MK-7, which can increase vitamin K blood levels more than the K1 form in the other supplements, and it provides a large dose — 120 mcg — which could interfere with the blood-thinning drug warfarin. Its source of folate is methylfolate, which may be useful to people with MTHFR genetic mutation, although most people don't need this form. It provides 880 IU of vitamin D3 from lichen.

Prenatal:

Update (3/20/24): We changed our *Top Pick* prenatal multivitamin. It is now *One A Day Prenatal Advanced*.

In January 2024, several months after publication of this Review, the U.S. Government Accountability Office published results of tests of 12 prenatal supplements sold in the U.S., finding that 11 (including gummies, softgels, and tablets) had levels of at least one nutrient outside acceptable deviations from the label value. One product had an average amount of folic acid that may cause health concerns. Unfortunately, the names of products were not published. This prompted us to purchase and test the latest version of our *Top Pick* at the time, *MegaFood Baby & Me 2*, as well as test an additional, popular prenatal -- *One A Day Prenatal Advanced*. Both products passed our tests of quality, and both provide important nutrients for pregnancy. However, we found that *One A Day* offered some important advantages over *MegaFood*, and costs *half as much* (48 cents vs $1 per day) making ***One A Day Prenatal Advanced* our new *Top Pick* prenatal multivitamin**.

One advantage of *One A Day* is that it includes the omega-3 fatty acid DHA (200 mg) as well as some EPA (35 mg) from fish oil. *MegaFood* does not. There is no U.S. Dietary Recommended Intake (DRI) for DHA, but the FAO/WHO recommend a minimum intake from the diet of 200 to 300 mg of DHA per day and up to 1,000 mg during pregnancy and breastfeeding, as it plays a role in normal development and functioning of the brain and may reduce the risk of premature birth. Similarly, experts in Europe recommend that all women who are pregnant should obtain at least 250 mg/day of DHA plus EPA, plus an additional 100 to 200 mg/day of DHA from foods and/or supplements, and women at risk of preterm birth due to inadequate DHA intake should get up to 1,000 mg of DHA plus EPA, or DHA alone -- although be aware of some concern that getting omega-3s *from supplements* during late pregnancy may increase the risk of postpartum hemorrhage (see During Pregnancy in the Fish Oil Supplements Review).

One A Day also provides the full recommended daily intake of iron during pregnancy -- 27 mg -- while *MegaFood* provides 18 mg (the rest can easily be acquired from the diet). Both *One A Day* and *MegaFood* also provide 150 mcg of iodine (somewhat below the 220 mcg daily requirement during pregnancy and 290 mcg during lactation) and proper amounts for pregnancy of selenium and chromium, as well as vitamins A, C, D, E, and most B vitamins, including riboflavin, which is particularly important for women who consume a vegetarian or vegan diet during pregnancy, as they are at increased risk of riboflavin deficiency which can be harmful to infants. *One A Day* does not include vitamin K, while *MegaFood* does, although deficiency is rare.

Be aware that *MegaFood* does *not* include calcium, magnesium, or potassium, and *One A Day* provides no potassium and relatively small amounts of calcium (150 mg) and magnesium (40 mg), so *more of these must be obtained* from the diet or other supplements if one's diet does not provide enough. (If you need to supplement more than 200 mg of calcium, it's best to take it at least two hours before or after the prenatal as calcium can significantly interfere with iron absorption.

MegaFood has an unnecessarily high amount of biotin (300 mcg rather than the 30 mcg considered to be adequate and the 35 mcg in *One A Day*) but there is no known harm associated with this amount and no upper tolerable intake level has been established for biotin. However, there is a small chance that it could interfere with thyroid tests, so it would be best not to take it within a few hours prior to such a test.

Both supplements provide more than adequate amounts of folate without exceeding upper limits, with *One A Day* providing it as folic acid -- the form recommended by the CDC to help prevent neural tube (spinal cord) defects. *MegaFood* uses a different synthetic form, L-5-methyltetrahydrofolate (also called methylfolate), which is likely to be just as effective but has not been as extensively studied during pregnancy. Fortunately, neither product provides more than 800 mcg of these synthetic forms, which has been associated with an increased risk of high blood pressure during pregnancy, or is above the daily upper limit for synthetic folate of 1,000 mcg, which is associated with an increased risk of adverse effects in offspring.

One A Day provides choline (as a separate pill), although not as much as *MegaFood* (110 mg vs 300 mg). Other prenatals provide only 55 mg or less. Choline may reduce the risk of birth defects and is recommended in prenatal vitamins by the American Medical Association. But most women obtain too little choline from their diets. Getting about 200 to 400 mg of choline daily would fill the gap for most women, although even more (up to 600 mg) during the 3rd trimester may be beneficial, so one may want to consider getting more from the diet or an additional supplement (see **Choline Review**).

Note: Testing in 2024 by Lead Safe Mama — a business focused on childhood lead poisoning prevention and consumer goods safety — classified *MegaFood* as "unsafe for consumption by children" due to its levels of heavy metals, but these levels were very low: *MegaFood* contained 62 ppb (i.e., 0.062 mcg per gram) of lead, 67 ppb of cadmium, and 27 ppb of arsenic. These levels agree with our own test results for *MegaFood*, which, for a 2-capsule serving, amounted to 0.302 mcg of lead, 0.125 mcg of cadmium, and 0.156 mcg of arsenic — all of which are far below the strict State of California's Prop 65 limits of 0.5 mcg for lead, 4.1 mcg for cadmium, and 10 mcg for inorganic arsenic. Lead Safe Mama based its concerns on the fact that the levels exceeded concentration limits proposed in the Baby Food Safety Act of 2021, did *not* become law and focused on concentrations in infant and toddler *foods*, which are consumed in much large quantities than pills. In 2025, the same group reported that *One A Day Prenatal Advanced* contained 88.5 ppb of lead, 216.2 ppb of cadmium, and 33.1 ppb of arsenic. However, like our own findings for this supplement, these levels fall far below strict limits per daily serving.

Be aware that requirements are different during lactation than during pregnancy, with a significant increase in the required amounts of vitamin A and vitamin C, while the need for iron decreases.

Other prenatals:
Although *Solgar Prenatal Nutrients* passed testing, it would not be a *Top Pick*, as it provides too much magnesium -- 450 mg — and you should not get more than 350 mg from a supplement as it can cause nausea. As noted earlier, two prenatals failed our tests: *Rainbow Light* had 88% more iodine than listed (546.2 mcg instead of 290 mcg), and *Smarty Pants* had 22% less vitamin D than claimed. The actual amount of vitamin D found in *Smarty Pants* is still more than adequate (940 IU or 23.5 mcg), but it has *no iron* (like most gummies), so it would not have been a *Top Pick*.

Our previous *Top Pick* among prenatals, *Deva Prenatal One Daily*, was not selected for testing this year because its formula has changed. When we tested this product in 2020, it was the closest product on the market to the then-current recommendations. Other products have caught up and, in the meantime, *Deva* prenatal was reformulated and it contains amounts of B vitamins significantly above the daily requirements. This includes 45 mg of niacin, an amount that is slightly above the 40 mg level at which niacin may cause skin flushing -- although the form in *Deva* is niacinamide, which is less likely to cause flushing. *Deva* also provides about 9 times the daily requirement for riboflavin (vitamin B2), which can turn urine bright yellow, although this is not dangerous.

Are pregnant women getting the right amounts of nutrients?
Due to supplements, 33.4% of pregnant women in the U.S. were estimated to exceed the upper level for folic acid based on 2001-2014 reported intakes and 27.9% exceed the upper level for iron. However, the same study showed that, even with supplements, 36.2% of pregnant women still got too little iron, and even higher percentages of pregnant women got too little magnesium (47.5%), vitamin D (46.4%), and vitamin E (42.3%) (Bailey, JAMA Open 2019). Analysis by the same researchers of labels of over 400 prescription and non-prescription prenatal supplements sold in the U.S. as of May 2022 found that only about 10% of products contained an optimal dose (sufficient but not excessive based on recommended intakes) of folic acid or iron, while most products contained excessive doses (at or near ULs) of these nutrients. The analysis also showed that almost 90% of products contained only a low dose of calcium (less than 383 mg) or lacked calcium altogether; 30% of the products contained a low dose (280 IU or less) of vitamin D or lacked vitamin D altogether; 40% contained no vitamin A, and most did not provide DHA. Interestingly, researchers identified one supplement *not* marketed as a prenatal that provided all nutrients evaluated in the study (vitamins A and D, folate, calcium, iron and DHA/omega-3s), *Shaklee Life with Iron*, although this multivitamin requires taking seven pills daily and is very expensive ($6.87 per daily serving) (Sauder, Am J Clin Nutr 2023).

A similar review of several prenatal vitamins in the U.S. found that only *Nature Made Prenatal + DHA* and *TheraNatal Complete* came close to correcting actual dietary deficits based on the recorded nutrient intakes of 39 healthy pregnant women. Without a supplement, intakes of potassium, vitamin D, iron, and vitamin C were at least 30% lower than recommended during one or more trimesters. Other prenatals evaluated that did *not* correct for most nutrient deficits included *Ritual Essential Prenatal*, *Women's One a Day Prenatal*, *New Chapter Perfect Prenatal*, *Vitafusion Prenatal Gummies*, *Garden of Life Mykind Organic Prenatal*, and *RainbowLight Prenatal One + DHA* (Smith, RFCH 2024). (Note: None of these products were tested by ConsumerLab in 2023).

Be aware that some preliminary research suggests omega-3 supplementation during late pregnancy may increase the risk of postpartum hemorrhage — see the Concerns and Cautions section of our Fish Oil Review).

Men's:

Unfortunately and as noted earlier, 3 out of the 4 men's multis failed testing (*Swanson* and *VitaFusion* contained much more folate than listed, and *Source Naturals* tablets took too long to break apart). The fourth men's multi, *GNC Mega Men*, passed testing but has 50 mg of niacin, which is above the

Tolerable Upper Intake Level of 35 mg and could cause skin flushing. Consequently, we have no *Top Pick* in this category, but suggest our *Top Pick for Men 50+ (below)*, as the needs of men do not change significantly until age 70, when slightly more calcium (1,200 mg vs 1,000 mg) and vitamin D (800 IU vs 600 IU) is recommended.

Men's 50+:

Our Top Pick: CVS Health Spectravite Men 50+ Multivitamin (9 cents per daily tablet) also provides just about all the vitamins and minerals needed by older men and even more vitamin C (120 mg vs. RDA of 90 mg) and vitamin D (1,000 IU vs. RDA of 600-800 IU). It also has plenty of vitamin B12 (100 mcg vs. RDA of 2.4 mcg), which may help some older men since B12 can be harder to extract from food with age. It includes 210 mg of calcium and 75 mg of magnesium, which provide good starts toward reaching the RDA through the rest of one's diet.

One potential downside to *Spectravite* is that it contains the preservative **BHT** which, given in large amounts has been shown to cause liver cancer in lab animals. Although considered safe at amounts typically in supplements, it is best to limit total daily intake of BHT to under 17.5 mg and the FDA actually limits the amount in selected foods, like dry cereals, to about 2 mg per serving. *Spectravite* claims that 2% or less of its weight (about 1.6 gram per tablet) is BHT, which could potentially mean as much as 32 mg of BHT per tablet (we contacted CVS for the specific amount, but were told that it is "proprietary"). If you prefer to avoid the BHT in *Spectravite*, consider *Nature Made Multi For Her 50+* (our *Top Pick* for women 50+), as it is also suitable for men 50+ -- it is nearly identical to Nature Made's formula for men 50+, it just has a little more calcium (20 mg) and a little less selenium (35 mcg).

The other men's 50+ product tested, *Nature's Way Alive Men's 50+ Ultra Potency Complete Multivitamin*, costs almost three times as much (24 cents) as *Spectravite* and provides less calcium (130 mg) and magnesium (55 mg), more than the needed amounts of vitamin D (2,000 IU or 50 mcg) and niacin (40 mg), and tiny amounts of various fruit, herb, and greens blends, totaling less than 0.5 grams, that are likely to be inconsequential (see our Fruits, Veggies, and Greens Review).

Men's "Prenatal"?

Do *men* need special nutrients prior to conception?

In general, very few studies have evaluated nutritional requirements for preconception care of men (Cassinelli, BMC Public Health 2024). Limited evidence suggests that **L-carnitine, vitamin E, vitamin C, and/or CoQ10 *might* improve sperm quality and/or live birth rates** when taken by men, typically for 2 to 3 months prior to conception (Kuchakulla, Urology 2020; Majzoub, Arab J Urol 2018). However, doses that have shown benefit in clinical research are generally higher than normal requirements and might cause adverse effects. For example, male fertility benefits have been shown among men taking 2,000 mg of L-carnitine (Cavallini, J Androl 2004; Lenzi, Fertil Steril 2004) (which has been linked with adverse cardiovascular events in other research), 300 to 800 mg/day of vitamin E (Wang, Urol J 2022) (which approaches the Tolerable Upper Intake Level for vitamin E of 1,000 mg/day), 500 to 2,000 mg/day of vitamin C (Majzoub, Arab J Urol 2018; Akmal, J Med Food 2006) (which might increase the risk of kidney stones or kidney damage), and 200 to 300 mg/day of CoQ10 or 150 mg/day of ubiquinol (the active form of CoQ10) (Thakur, J Clin Diagn Res 2015; Nadjarzadeh, Andrologia 2014). A study published in 2020 that reviewed ingredients listed on the labels of 17 popular male fertility supplements sold online in the U.S. concluded that only 17% of included ingredients had any evidence of benefit for improving sperm parameters and/or birth rate (Kuchakulla, Urology 2020).

In January 2025, we Approved the quality of *AlphaSperm Men's Prenatal +*, which was tested through our voluntary Quality Certification Program. *AlphaSperm's* label suggests that it should ideally be started nine months prior to conception. However, we do not consider it or any other supplement a *Top Pick* as a men's preconception supplement, since there is very little clinical evidence showing that multivitamin supplementation for men attempting to plan a pregnancy is beneficial (Ligny, Cochrane Database Syst Rev 2022; Scovell, Reprod Syst Sex Discord 2014). *AlphaSperm* does contain all of the ingredients noted above as having possible benefits, although in amounts lower than what has been used in clinical studies. *AlphaSperm* contains 300 mg of vitamin C, 15 mg of vitamin E (as alpha-tocopherol), 60 mg of CoQ10, and about 210 mg of L-carnitine (as L-carnitine-L-tartrate 310 mg) per suggested serving size. *AlphaSperm* also contains folate (1,333 mcg DFE from methylfolate) and zinc (10 mg), which are sometimes promoted for improving fertility among men, however a large study conducted in the U.S. among 2,370 couples planning infertility treatment showed that giving the male partner a very large dose of folic acid (5,000 mcg) and 30 mg of elemental zinc daily for 6 months did not improve sperm quality or live birth rate by one year after supplement discontinuation compared to placebo (Schisterman, JAMA 2020). The vitamins and minerals listed in *AlphaSperm* (which include several others, noted in the Results table) safely meet or exceed daily requirements of men for these nutrients, but *AlphaSperm* is an expensive way to get these nutrients, costing $3.34 per daily serving of four capsules.

Diabetes (Adult):

Our Top Pick: None

We tested one multi marketed toward people with diabetes, *Nature's Way Alpha Betic*, but, for several reasons, it is not a *Top Pick*. First, despite being relatively expensive at 40 cents per daily tablet, it's not as well-rounded a multi as our other *Top Picks* in this review. Second, although it provides some alpha lipoic acid, which may help improve symptoms of peripheral neuropathy and improve insulin sensitivity and blood sugar control, the dose provided

is only 100 mg once daily -- much lower than the typical dose for these purposes: *200 mg or more 3 times a day*. Third, while it provides substantial amounts of B vitamins, it provides only 400 IU of vitamin D and no vitamin K. As for minerals, it includes 150 mg of magnesium, but no calcium and, most surprisingly, no **chromium**, which may be helpful in diabetes if one does not get enough chromium from their diet because chromium plays a role in glucose metabolism.

If you have diabetes and seek a multivitamin, you might consider one of the multivitamins Approved in this Review and, if you would like to use alpha lipoic acid, separately purchase an alpha lipoic acid supplement — we have tested several in our **Alpha Lipoic Acid Review**. This approach is also less expensive, since the cost of a good multi can be about 3 to 13 cents (most of which include chromium) and the cost of alpha lipoic acid is about 3 to 7 cents per 100 mg. Be aware of **potential side effects of alpha lipoic acid** and that alpha lipoic acid is sold in the R-form (the purely active form) or mixed form, only half of which is the R-form. When the form is not disclosed (as was the case with *Alpha Betic*), the mixed form is most likely being provided.

Bariatric Surgery:

Not tested this year. This category is for people who have had gastric bypass surgery or other stomach surgery to lose weight, which, depending on the portion of the stomach/intestine affected, can **reduce absorption of nutrients**, particularly iron, calcium, zinc, vitamin D, and B vitamins (thiamin (B-1), B-12, folic acid, and thiamin). We did not test any products in this category this year, but we did test one in 2017 that was Approved: *ProCare Health Bariatric Multivitamins* (52 cents per once daily capsule in 2023). It provided significant amounts of a broad range of vitamins and minerals, with particularly high amounts of B-12 (1,000 mcg), vitamin D (3,000 IU), niacin (40 mg), thiamine (20 mg), and folate (1,360 mcg DFE). If you have had bariatric surgery, check with your doctor regarding your particular nutritional needs.

Children's:

Our Top Pick: Flintstones Complete **(chewable tablets)** (15 cents per chewable tablet; ½ to 1 per day, based on age). *Flintstones* is, once again, our *Top Pick* for children, but be aware that its formula has changed over the past two years: It now provides more vitamin C and vitamin D, which is more consistent with the latest recommendations. Each tablet now provides 800 IU (previously 600 IU) of vitamin D, which is 200 IU more than kids over age 4 need, although still quite safe, but, at ½ tablet, is what younger children require. Vitamin C went from 60 mg to 90 mg per tablet, also consistent with the latest recommendations. However, iron was reduced from 18 mg to 10 mg of iron, which is fine for most children over age 4 except it is a little lower than the daily requirement of 15 mg for girls ages 14-18. *Flintstones* has 140 mg of calcium (up from 100 mg) and no magnesium, so it's important that those be obtained through the diet or, if necessary, as a separate supplement.

Chewable tablets like *Flintstones* are, in our opinion, the best multivitamin formulation for kids because they are tasty but, unlike gummies, can include iron and other minerals like zinc, and copper. You generally won't find these in significant amounts in gummies, which is a real drawback since kids need more iron than adults. This is the case with the other children's multi that we tested, *Olly Kids Multi Gummy Worms*, which contains no iron or copper, little zinc, and no calcium -- so should *not be relied on* for these minerals.

For sweetness, *Flintstones* includes small amounts of the sugar alcohols **sorbitol** and mannitol and an even smaller amount of fructose. A benefit of sugar alcohols over sugars is that they do not cause tooth decay. While moderate amounts of sugar alcohols (typically 5 grams or more) can cause gas, and higher amounts can cause diarrhea, which is of particular concern for small children (Payne, J Am Diet Assoc 1997), the amount of sorbitol in a *Flintstones* tablet is less than 0.3 grams (based on the fact that it is listed as an ingredient after calcium carbonate, of which there is 0.35 grams per tablet, providing 140 mg of calcium), which is a bit less sorbitol than normally found in an apple (Aprea, Sci Rep 2017).

Note: Testing in 2024 by Lead Safe Mama — a business focused on childhood lead poisoning prevention and consumer goods safety — classified *Flintstones Plus Extra Iron Chewable Multivitamin*, as "unsafe for consumption by children" due to its lead and arsenic content, but the levels were actually very low and, we believe, pose very little risk. *Flintstones Plus Extra Iron* contained 60 ppb of lead and 30 ppb of inorganic arsenic, which is somewhat similar the amounts we found in *Flintstones Complete*: 41 ppb of lead and <67 ppb of total arsenic, which is equivalent to 0.055 mcg of lead and <0.091 mcg of arsenic per tablet — levels that are way below the state of California's Prop 65 limits for lead (0.5 mcg) and inorganic arsenic (10 mcg). Based on Lead Safe Mama's findings, *Flintstones Plus Extra Iron* would also fall far below these limits. Lead Safe Mama based its concerns on the fact that the concentrations exceeded the limits of 5 ppb for lead and 10 ppb for arsenic proposed in the Baby Food Safety Act of 2021, which did not become law and focused on baby foods, which have much larger serving sizes (tens of grams) than supplements (typically 1 gram or less).

Be aware that **many children's multivitamins provide amounts of vitamins and minerals that are too high and/or too low**. A review of 288 multivitamin/multimineral supplements for children (ages 1 to <4 years) conducted by the U.S. government's Office of Dietary Supplements found that Tolerable Upper Intake Levels (ULs) for young children were exceeded for folic acid in 49%, for vitamin A in 17%, and for zinc in 14% of products reviewed. Forty-four percent provided just half or less of the Daily Value of vitamin D for children ages 1 to <4. Nearly all reviewed products that contained calcium and/or potassium provided 25% or less than the DV for these nutrients — although supplements should not be expected to provide

much more for these macronutrients, which should largely be obtained from the diet (Dwyer, J Acad Nutr Diet 2021). A review of 52 pediatric multivitamins purchased from popular U.S. pharmacy chains similarly concluded that many exceeded the UL for vitamin A, folic acid, and zinc, as well as niacin and copper (Samuel, Nutr Health 2022).

Keep in mind that **the needs of teens generally fall between those of adults and children**, although teenage girls need much more iron than younger girls, and teenage boys need a bit more iron than men and children. So, for teenage boys, an appropriate multi could be one of the Approved General (Adult) multis that are not high-dose but include iron, such as *Kirkland Signature (Costco) Daily Multi*. For teenage girls, one of the multis listed above under "Women's" would be fine, such as *Bayer One A Day Women's Formula* as these not only contain a significant amount of iron, but more calcium per day than you'll get from *Flintstones* — at a time when many young girls don't get enough calcium.

Pet:

Our Top Picks:

For Dogs: ***Pet Honesty 10-For-1 Multivitamin - Flavor: Chicken — Dog*** (30 cents per soft chew; 1 to 3 chews per day, based on weight) provides significant amounts of vitamins A, C, D, and E, as well as niacin and thiamin, although it does not provide minerals other than selenium. It also lists modest amounts of glucosamine and chondroitin (for joints) and probiotic organisms. Our previous *Top Pick* for dogs was *Pet-Tabs* but, in our recent tests, it contained much less vitamin D than listed (only 13.8%) and was, therefore, *Not* Approved, although the amount found is actually not much different from the amount provided by *Pet Honesty*.

For Cats: ***Healthy Promise™ Multi-Vitamin - Savory Chicken Flavor - Cat*** from Four Paws (15 cents per soft chew, 1 to 2 chews per day) provides significant amounts of vitamins A, B-6, B-12, D, E, folate, niacin, and thiamin, as well as iodine. A potential concern, however, is that it contains an undisclosed amount of BHT as a preservative (we contacted Four Paws for the specific amount, but were told that it is "proprietary"). High amounts of BHT were shown to cause liver cancer in rats.

Be aware that our tests in 2020 found that *Sparkle Dog Multivitamin Daily Soft Chew* fell way short on its claimed amounts of vitamin A and folate and contained much more zinc than listed, and neither of the multivitamins for cats passed testing: *ActiPet Feline Formula Multi-Vitamin* contained hardly any of its listed vitamin A (just 0.1%) and *VetriScience Nu Cat Multivitamin* contained nearly double the amount of iron that it listed.

Test Results by Product:

The table below provides information about 40 supplements that ConsumerLab.com tested for this report. Twenty-nine were selected by ConsumerLab and 11 are included for having passed testing through CL's **Quality Certification Program**. Products listed as Approved met all quality criteria (see **Tests Performed**). However, this does not necessarily mean that these products are right for you. You need to compare their ingredients to your particular needs. Use the extensive information in the **ConsumerTips™** section as a guide.

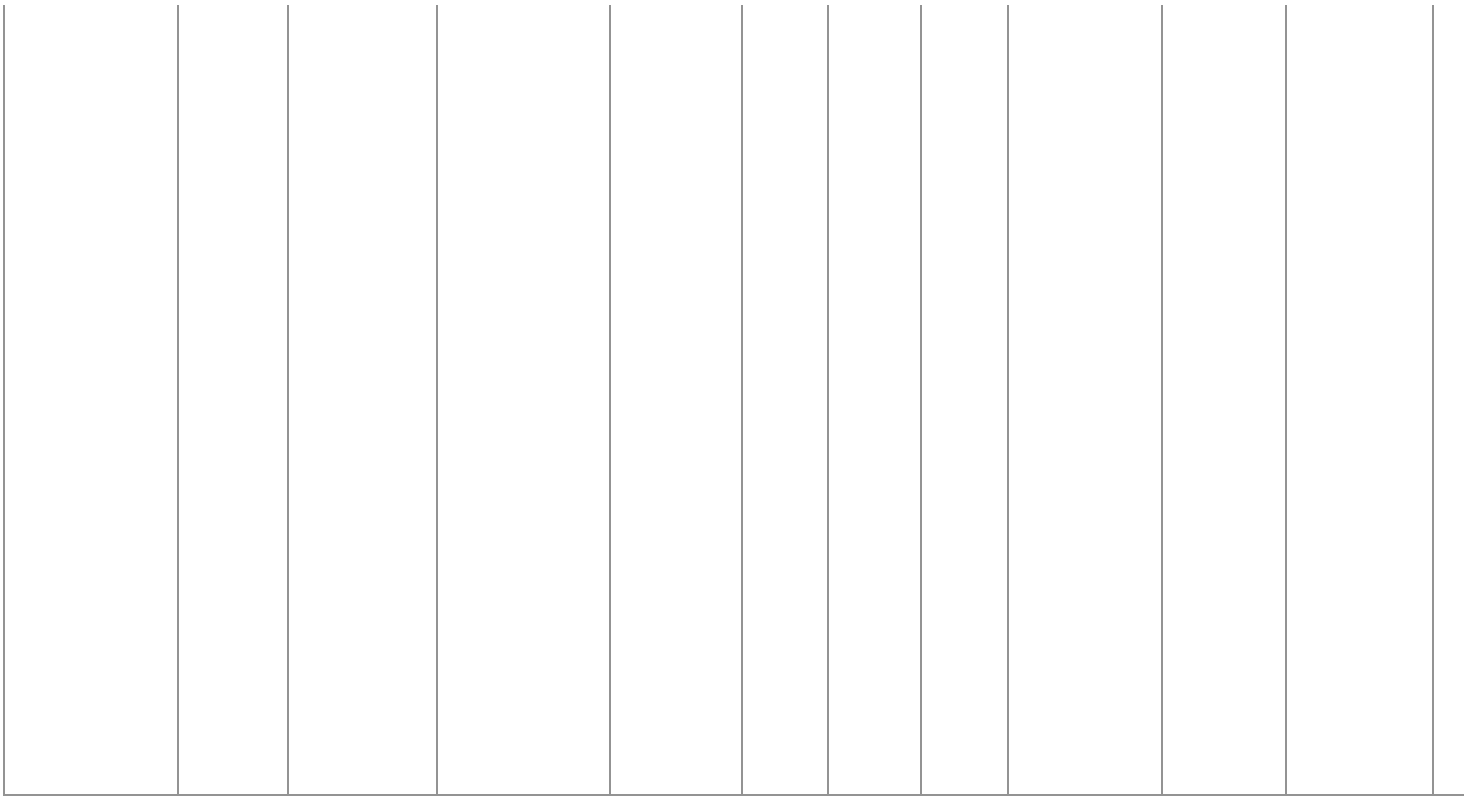
In the table you'll also see what problems ConsumerLab uncovered in its tests that caused a product to be "Not Approved." You can also easily compare the nutritional contents of products, scrolling to the right across the columns. Price comparisons are shown in the 4th column. Some of the notable features of each product and their complete lists of ingredients are found in the last three columns.

Results of ConsumerLab.com Testing of Multivitamin/Multimineral Supplements

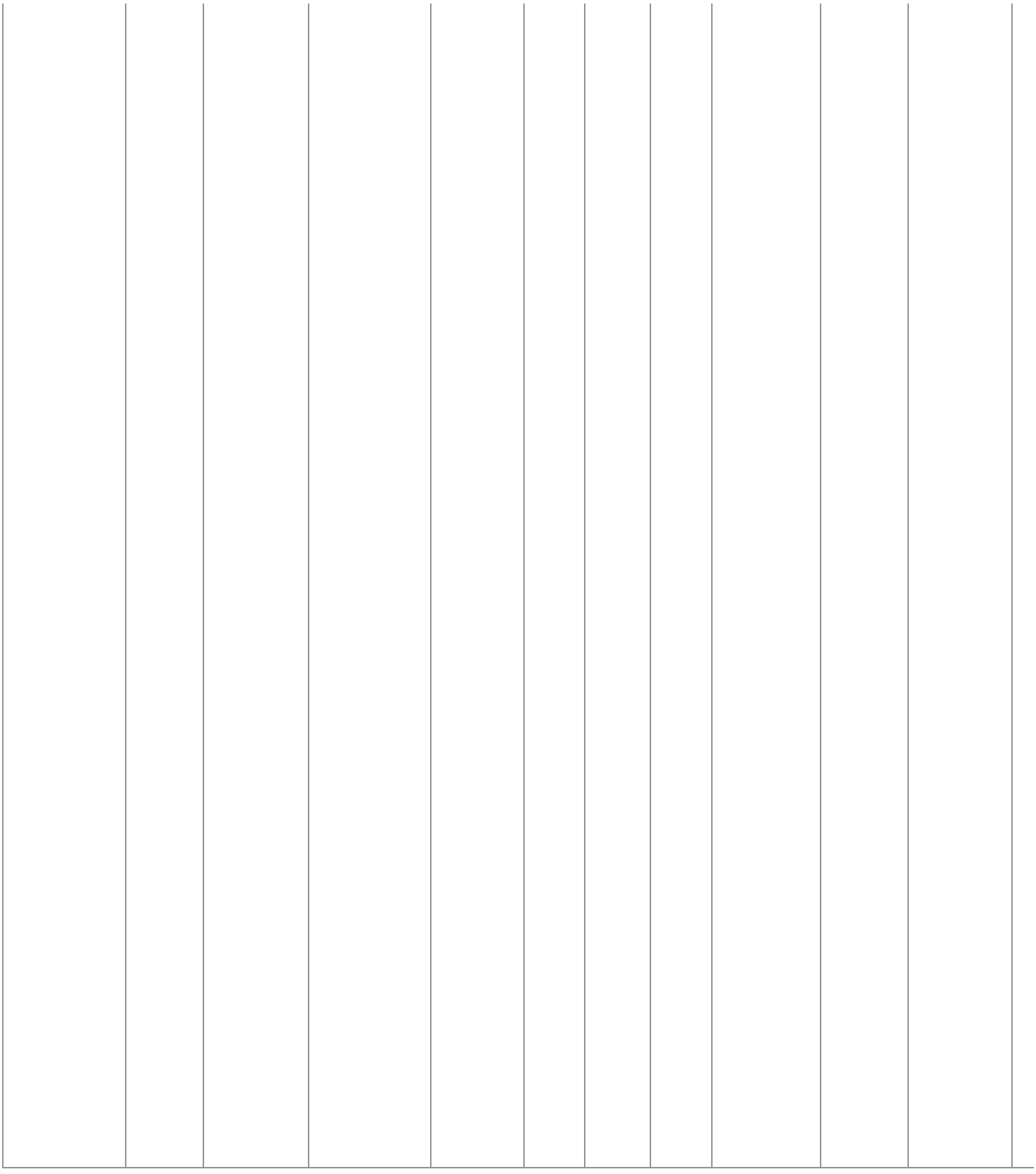
(Price Checks are not included in printed reviews)

Approval Status Product Name Suggested Servings	Contained Claimed Amounts of Nutrients Tested	Heavy Metals Disintegrated Properly	Cost Per Serving Price Size of Pill	Vitamin A	Vitamin B-6 Vitamin B-12	Vitamin C Vitamin D	Vitamin E Vitamin K	Folate Niacin	Other Vitamins	Calcium Iron	Ma Po
General (Adult) Products:											

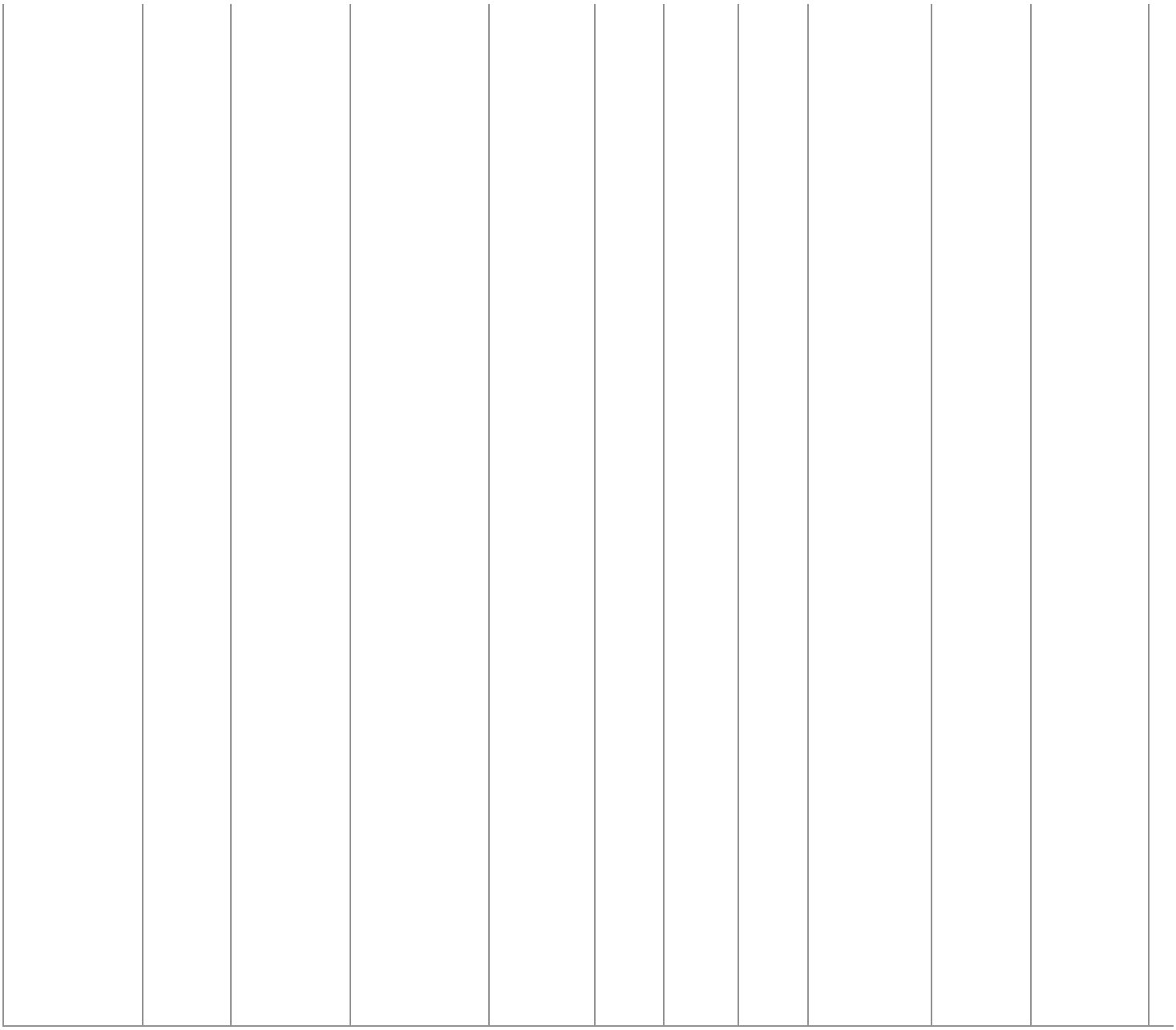
APPROVED 21st Century® Sentry  Mfd. by 21st Century HealthCare, Inc. Adults take one (1) tablet daily with any meal or as directed by your healthcare provider. Do not exceed recommended dosage.	✓	Heavy metals: ✓ Disintegration: ✓	$0.03/tablet $4.49/130 tablets Large tablet	1,050 mcg (29% as beta-carotene)	2 mg 6 mcg	60 mg 25 mcg (D3) (1,000 IU)	13.5 mg (S) (13.5 IU) 25 mcg (K1)	667 mcg DFE (400 mcg folic acid) 20 mg NE (20 mg) (niacinamide)	Thiamin 1.5 mg, riboflavin 1.7 mg, biotin 30 mcg, pantothenic acid 10 mg	200 mg (dicalcium phosphate, calcium carbonate) 18 mg (ferrous fumarate)	50 (m oxi 80 (pc ioc



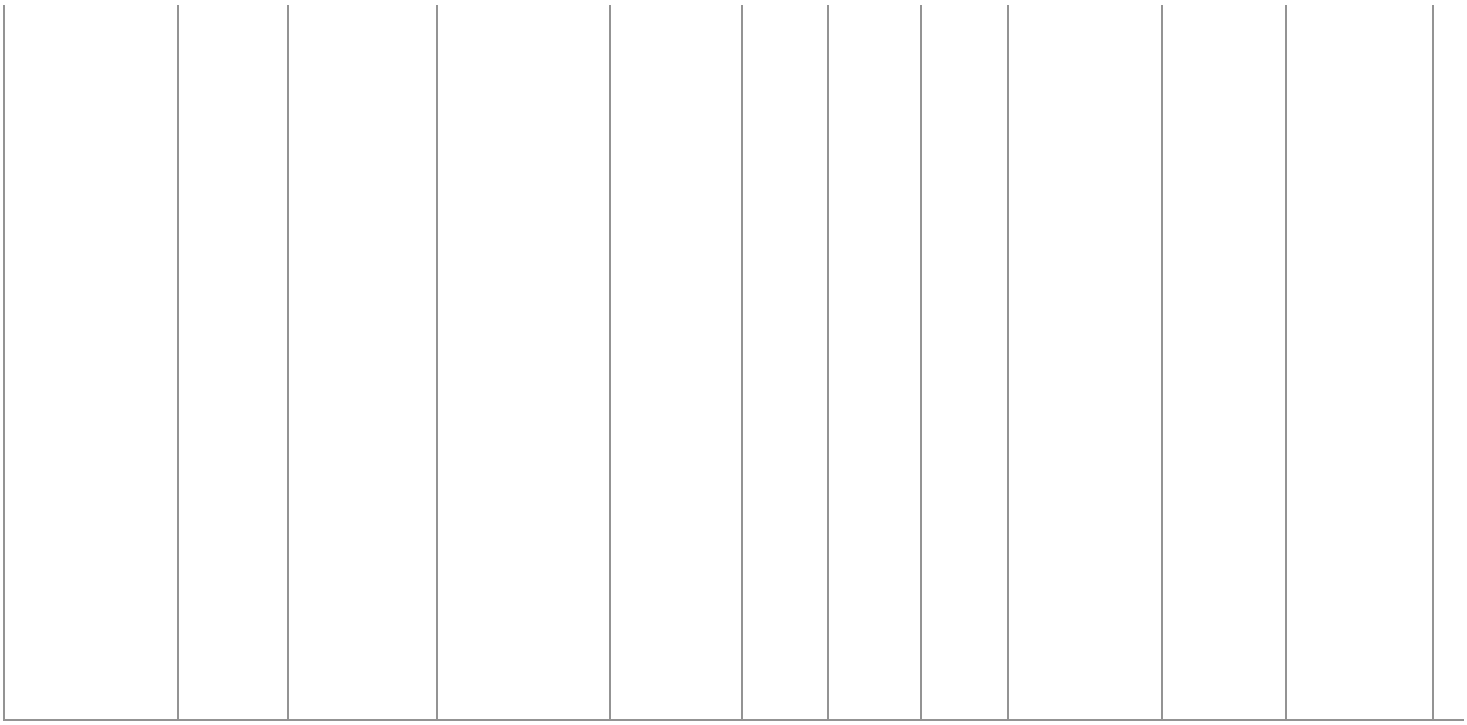
APPROVED Altipure Complete Multivitamin  Dist. by Altipure Take four (4) capsules daily or as recommended by your healthcare practitioner. For better absorption, take two (2) capsules twice with meals.	✓	Heavy metals: ✓ Disintegration:	$1.17/4 capsules $34.99/120 capsules Large capsule	2,000 mcg (% as beta-carotene not provided)	25 mg 200 mcg	500 mg 25 mcg (D3) (1,000 IU)	67 mg (N) (81.1 IU) 180 mcg (K2 as MK-7)	680 mcg DFE (400 mcg (6S)-5-methyltetra-hydrafolic acid glucosamine salt and calcium folinate) 65 mg NE (65 mg) (niacinamide, niacin)	Thiamin 100 mg, riboflavin 25 mg, biotin 325 mcg, pantothenic acid 125 mg	NA NA	50 (m ma NA



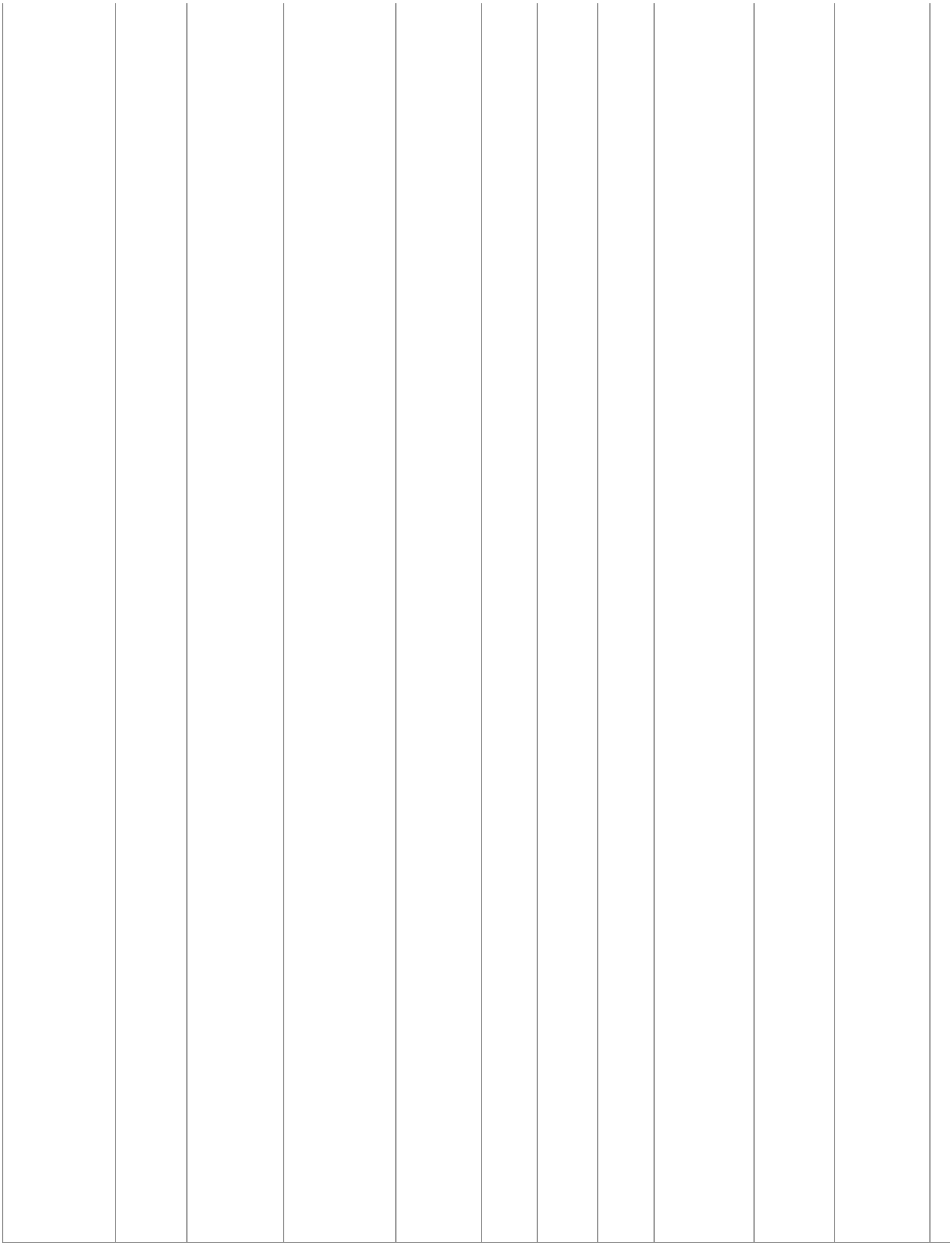
APPROVED Top Pick for vegan General Adult DEVA® Vegan Multivitamin & Mineral Supplement  Dist. by DEVA Nutrition LLC For adults, take one (1) tablet daily with food or as directed by a doctor.	✓	Heavy metals: ✓ Disintegration: ✓	$0.23/coated tablet $20.79/90 coated tablets Large coated tablet	1,500 mcg RAE (% as beta-carotene not provided)	12.75 mg 100 mcg	150 mg 20 mcg (D2) (800 IU)	30 mg (N) (44.7 IU) NA	400 mcg DFE (235.3 mcg folic acid) 50 mg NE (50 mg) (niacinamide)	Thiamin 12 mg, riboflavin 13 mg, biotin 75 mcg, pantothenic 25 mg. Choline 15 mg.	100 mg (calcium carbonate) 18 mg (iron amino acid chelate)	40 (m oxi NA



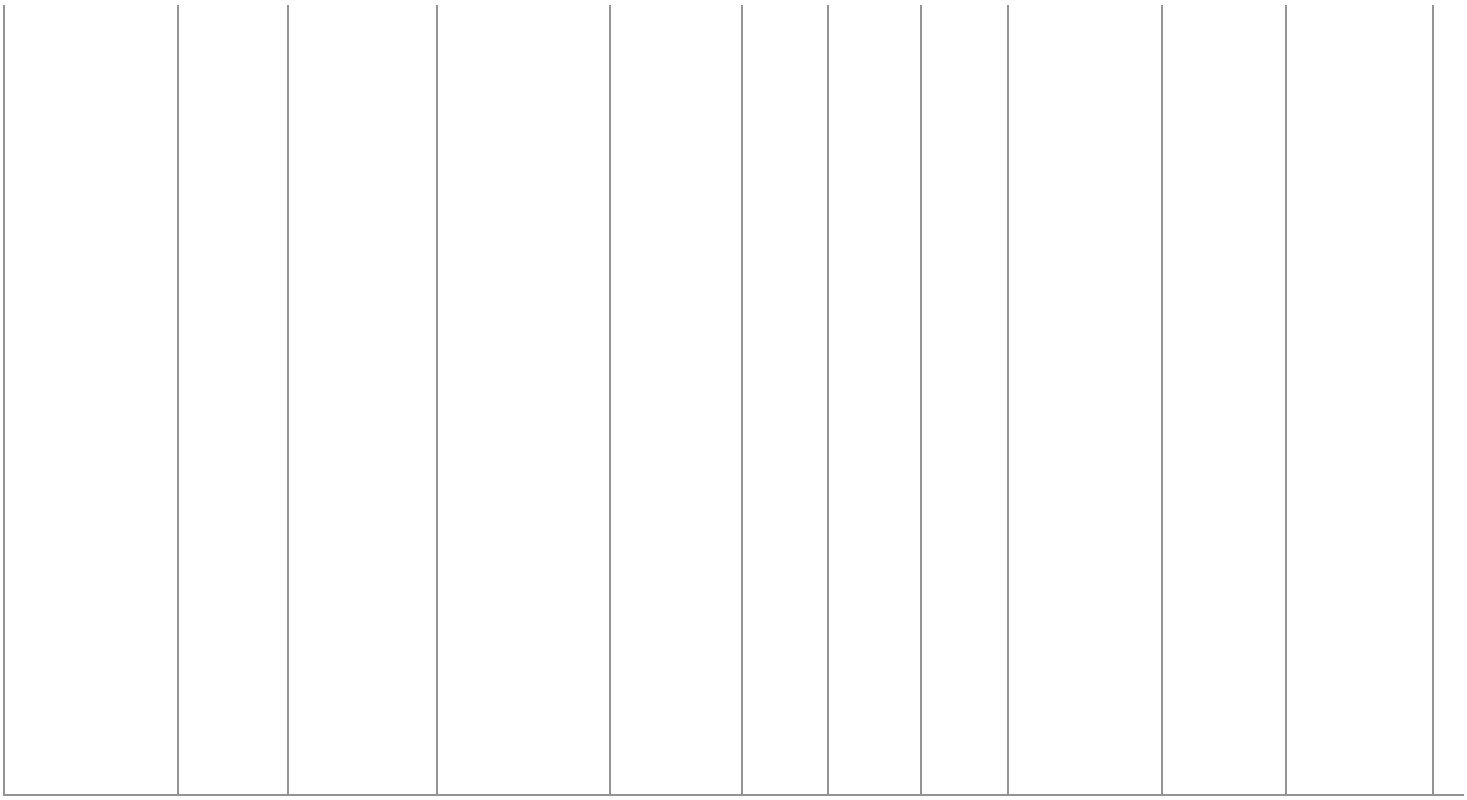
APPROVED Top Pick for General Adult Kirkland Signature [Costco] Daily Multi  Dist. by Costco Wholesale Corporation Adults - Take one (1) tablet daily, preferably with a meal.	✓	Heavy metals: ✓ Disintegration: ✓	$0.03/tablet $13.99/500 tablets Large tablet	1,050 mcg (29% as beta-carotene)	2 mg 6 mcg	90 mg 10 mcg (D3) (400 IU)	13.5 mg (S) (13.5 IU) 25 mcg (K1)	833 mcg DFE (500 mcg folic acid) 20 mg NE (20 mg) (niacinamide)	Thiamin 1.5 mg, riboflavin 1.7 mg, biotin 30 mcg, pantothenic acid 10 mg	200 mg (calcium phosphate, calcium carbonate) 18 mg (ferrous fumarate)	10 (m oxi 80 (pc chl



APPROVED Life Extension® Two-Per-Day Multivitamin  Dist. by Quality Supplements and Vitamins, Inc. Take two (2) tablets daily in divided doses with meals, or as recommended by a healthcare practitioner.	✓	Heavy metals: Disintegration: ✓	$0.27/2 tablets $16.25/120 tablets Large tablet	1,500 mcg RAE (5,000 IU) (% as beta-carotene not provided)	75 mg 300 mcg	470 mg 50 mcg (D3) (2,000 IU)	67 mg (N) (81.1 IU) NA	680 mcg DFE (400 mcg L-5-methyltetra-hydrafolate calcium salt) 50 mg NE (50 mg) (niacinamide, niacinamide ascorbate)	Thiamine 75 mg, riboflavin 50 mg, biotin 300 mcg, pantothenic acid 50 mg. Choline <10 mg.	NA NA	10 (m oxi NA

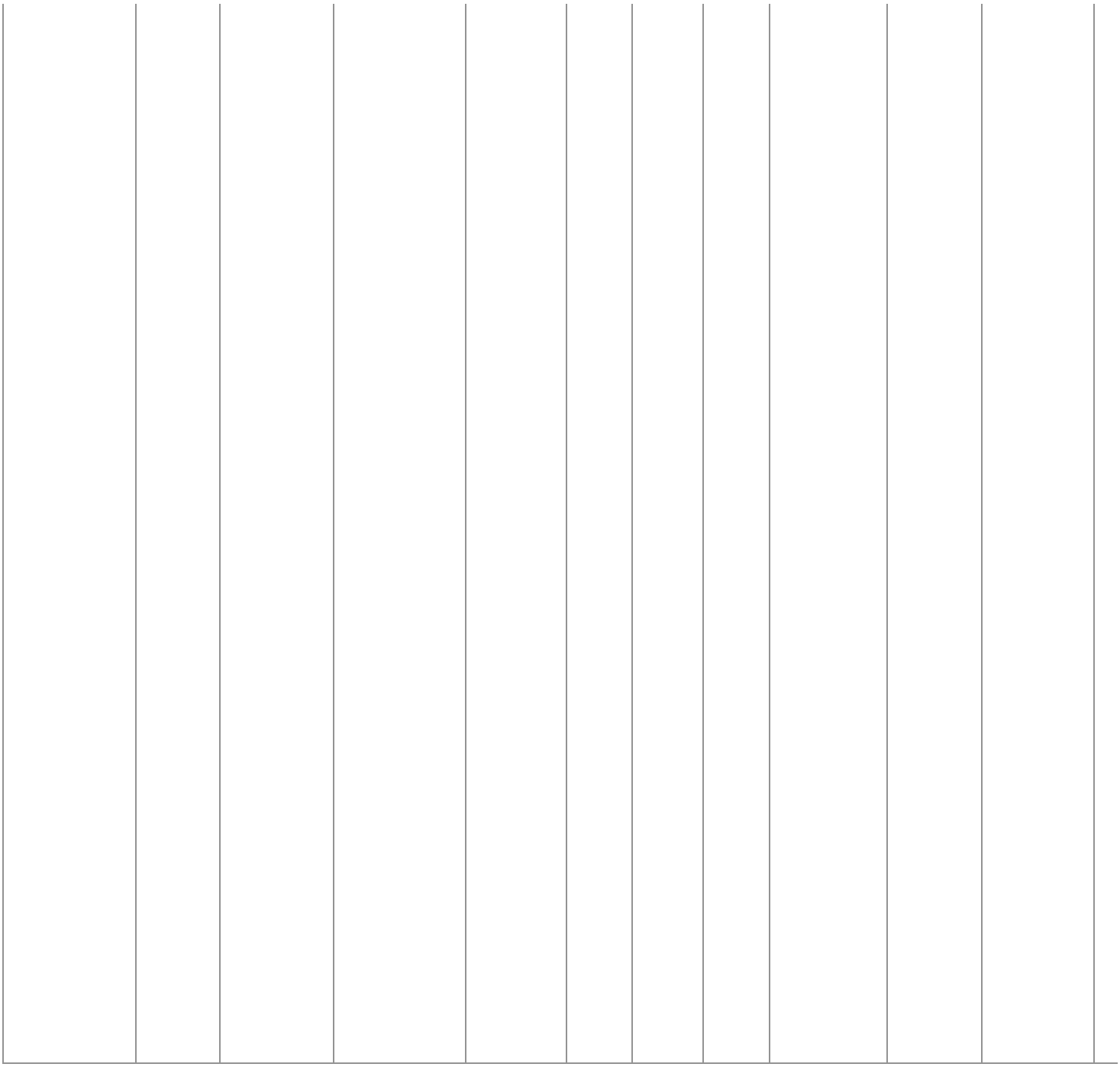


APPROVED Pure Encapsulations® O.N.E.™ Multivitamin  Mfd. by Pure Encapsulations Take 1 capsule daily, with a meal.	✓	Heavy metals: Disintegration:	$0.65/capsule $39.00/60 capsules Large capsule	1,125 mcg (73% as beta-carotene)	4 mg 500 mcg	180 mg 50 mcg (D3) (2,000 IU)	20 mg (N) (24.2 IU) NA	667 mcg DFE (400 mcg L-5-MTHF) 20 mg NE (20 mg) (niacinamide)	Thiamin 3 mg, riboflavin 3 mg, biotin 300 mcg, pantothenic acid 10 mg. Choline 25 mg.	NA NA	NA NA



APPROVED Puritan's Pride® ABC Plus® Multi  Mfd. by Puritan's Pride, Inc. For adults, take one (1) tablet daily, preferably with a meal.	✓	Heavy metals: ✓ Disintegration: ✓	$0.07/coated tablet $7.19/100 coated tablets Large coated tablet	1,050 mcg (% as beta-carotene not provided)	2 mg 6 mcg	90 mg 10 mcg (D3) (400 IU)	13.5 mg (S) (13.5 IU) 25 mcg (K1)	833 mcg DFE (500 mcg folic acid) 20 mg NE (20 mg) (niacinamide)	Thiamin 1.5 mg, riboflavin 1.7 mg, biotin 30 mcg, pantothenic acid 10 mg	200 mg (calcium phosphate, calcium carbonate) 18 mg (ferrous fumarate)	10 (m oxi 80 (pc chl

APPROVED Thorne® Basic Nutrients 2/Day  Mfd. by Thorne Research, Inc. Take 2 capsules daily or as recommended by your health-care practitioner.	✓	Heavy metals: Disintegration:	$0.97/2 capsules $29.00/60 capsules Large capsule	1,050 mcg (43% as beta-carotene)	20 mg 600 mcg	250 mg 50 mcg (D3) (2,000 IU)	16.5 mg (N) (20 IU) 400 mcg (200 mcg K1 and 200 mcg K2 as MK-4)	667 mcg DFE (400 mcg L-5-methyltetra-hydrofolate) 80 mg NE (80 mg) (niacinamide)	Thiamin 50 mg, riboflavin 12 mg, biotin 500 mg, pantothenic acid 45 mg	52 mg (TRAACS® calcium bisglycinate chelate, dicalcium phosphate, calcium laurate, calcium pantothenate) NA	20 (TR ma bis ch NA

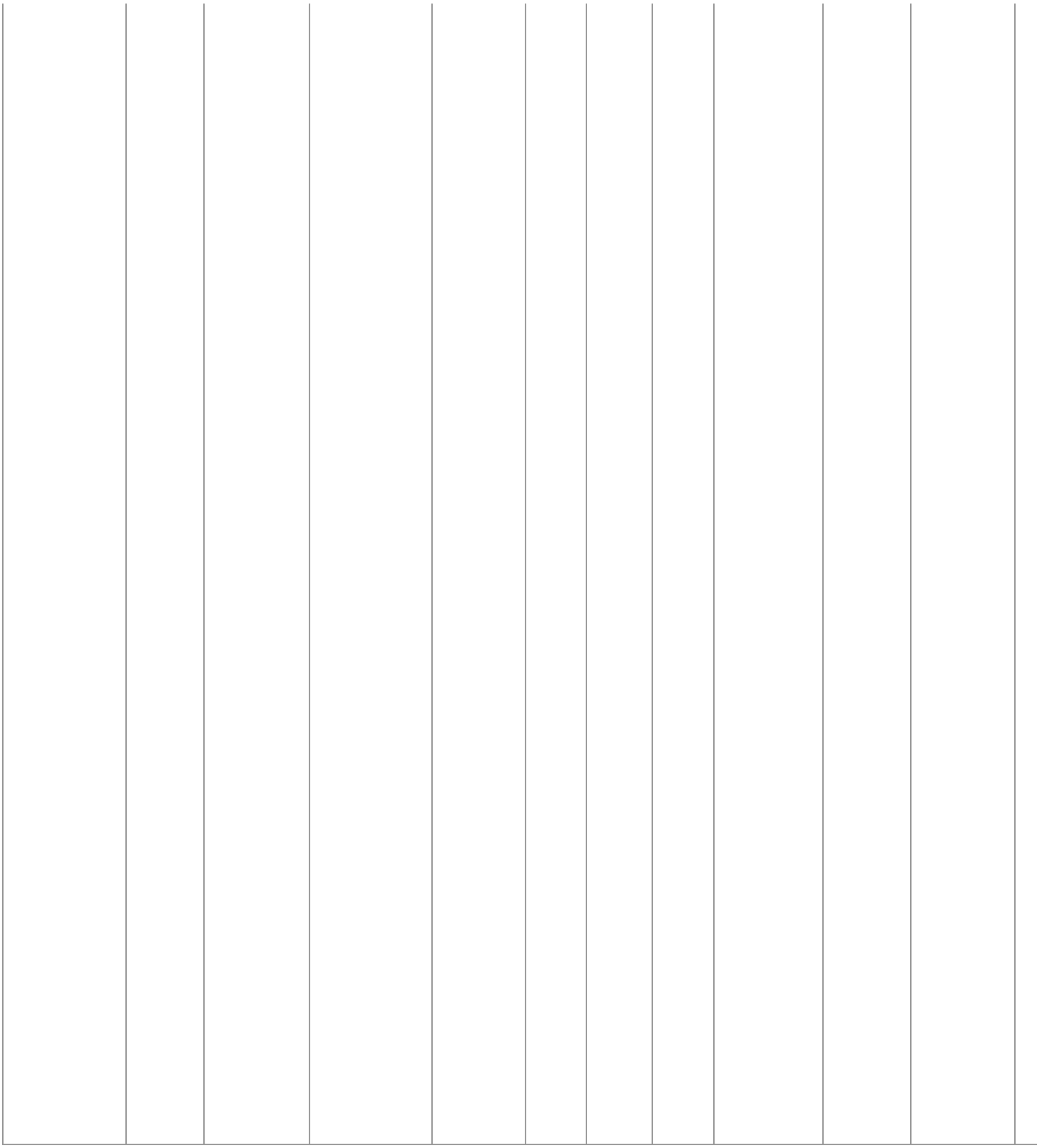


APPROVED USANA® Core Minerals  Mfd. by USANA Health Sciences, Inc. Take two (2) tablets twice daily, preferably with food.	✓	Heavy metals: ✓ Disintegration: ✓	$0.50/2 tablets $55.95/one bottle of Core Minerals 112 tablets and one bottle of Vita Antioxidant 112 tablets (224 tablets total) Large tablet *Sold with USANA® Vita Antioxidant*	NA	NA NA	600 mg NA	NA NA	NA NA	NA	226 mg (calcium citrate, calcium ascorbate) NA	22 (m cit ma as NA

APPROVED USANA® Vita Antioxidant  Mfd. by USANA Health Sciences, Inc. Adults take two (2) tablets twice daily, preferably with food.	✓	Heavy metals: Disintegration: ✓	$0.50/2 tablets $55.95/one bottle of Vita Antioxidant 112 tablets and one bottle of Core Minerals of 112 tablets (224 tablets total) Large tablet *Sold with USANA® Core Minerals*	3,608 mcg RAE (75% as beta-carotene)	32 mg 200 mcg	400 mg 50 mcg (D3) (2,000 IU)	134 mg (N) (162.1 IU) 540 mcg (480 mcg K1 and 60 mcg K2 as MK-7)	1,000 mcg DFE (600 mcg folic acid) 40 mg NE (40 mg) (niacin, niacinamide)	Thiamin 30 mg, riboflavin 30 mg, biotin 300 mcg, pantothenic acid 90 mg. Choline 102 mg.	NA NA	NA NA

Adults 50+ Products - General:											

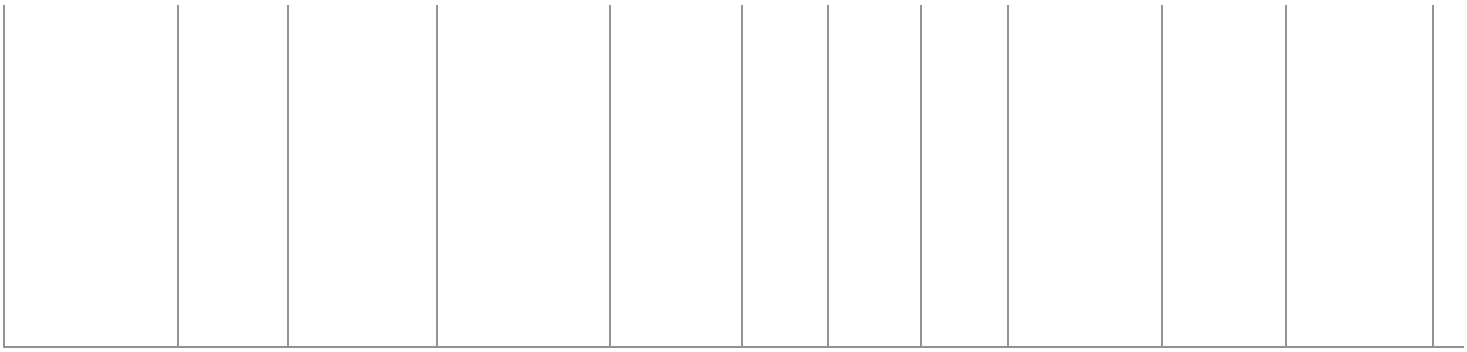
APPROVED Equate Complete Multivitamin Adults 50+  Dist. by Walmart Inc. Adults - One tablet daily with food as a dietary supplement.	✓	Heavy metals: ✓ Disintegration: ✓	$0.04/tablet $8.88/220 tablets Large tablet	750 mcg (40% as beta-carotene)	3 mg 25 mcg	60 mg 25 mcg (D3) (1,000 IU)	22.5 mg (S) (24.8 IU) 30 mcg (K1)	680 mcg DFE (400 mcg folic acid) 20 mg NE (20 mg) (niacinamide)	Thiamin 1.5 mg, riboflavin 1.7 mg, biotin 30 mcg, pantothenic acid 10 mg	220 mg (calcium carbonate, dibasic calcium phosphate) NA	50 (m oxi 80 (pc ioc



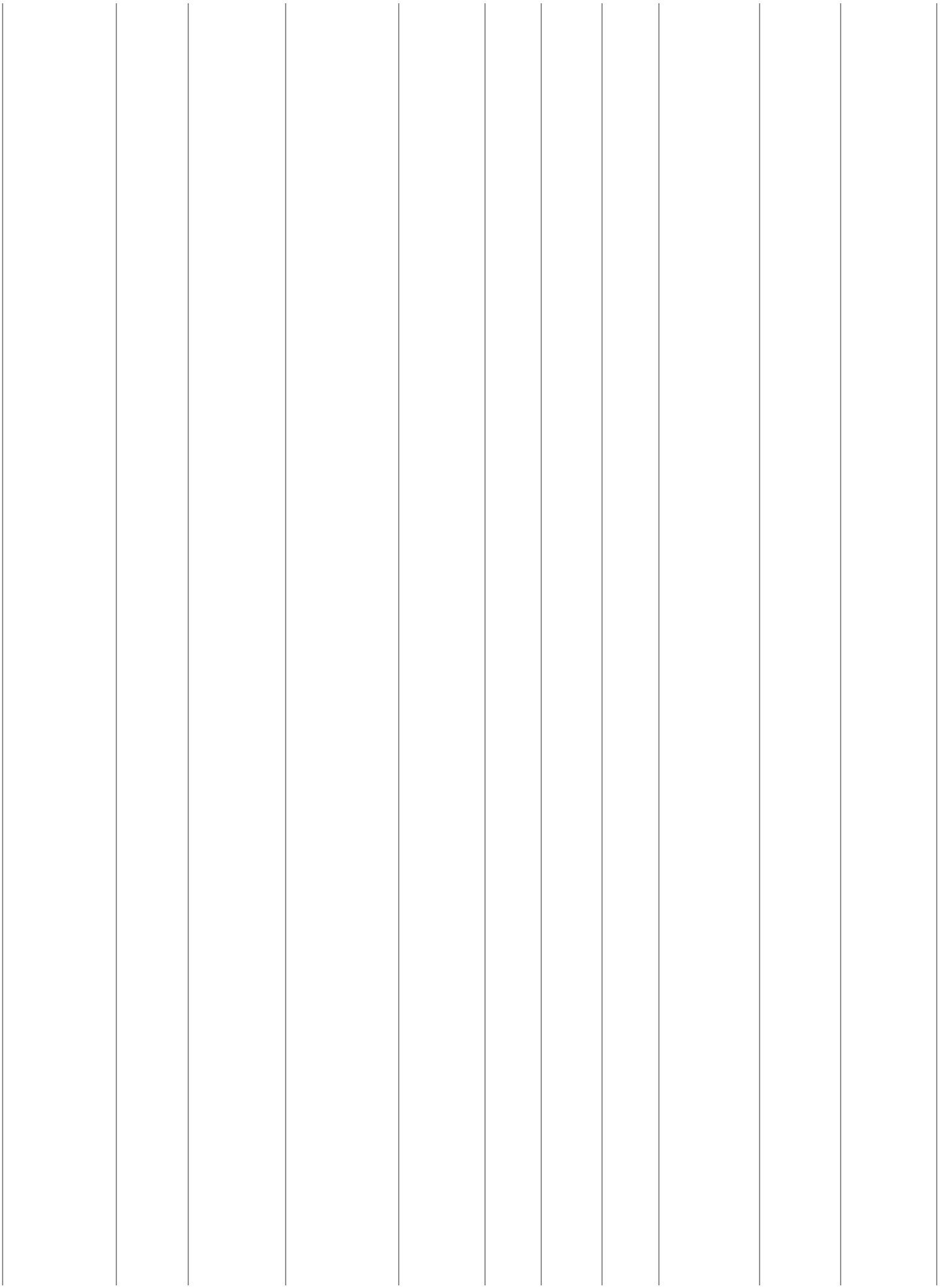
APPROVED Top Pick for Adult 50+ Kirkland Signature [Costco] Mature Multi  Dist. by Costco Wholesale Corporation Take one (1) tablet daily, preferably with a meal.	✓	Heavy metals: ✓ Disintegration: ✓	$0.03/tablet $11.99/400 tablets Large tablet	750 mcg (as beta-carotene)	3 mg 25 mcg	90 mg 25 mcg (D3) (1,000 IU)	22.5 mg (S) (24.8 IU) 30 mcg (K1)	833 mcg DFE (500 mcg folic acid) 20 mg NE (20 mg) (niacinamide)	Thiamin 1.5 mg, riboflavin 1.7 mg, biotin 30 mcg, pantothenic acid 10 mg	220 mg (calcium carbonate, dibasic calcium phosphate) NA	50 (m oxi 80 (pc chl

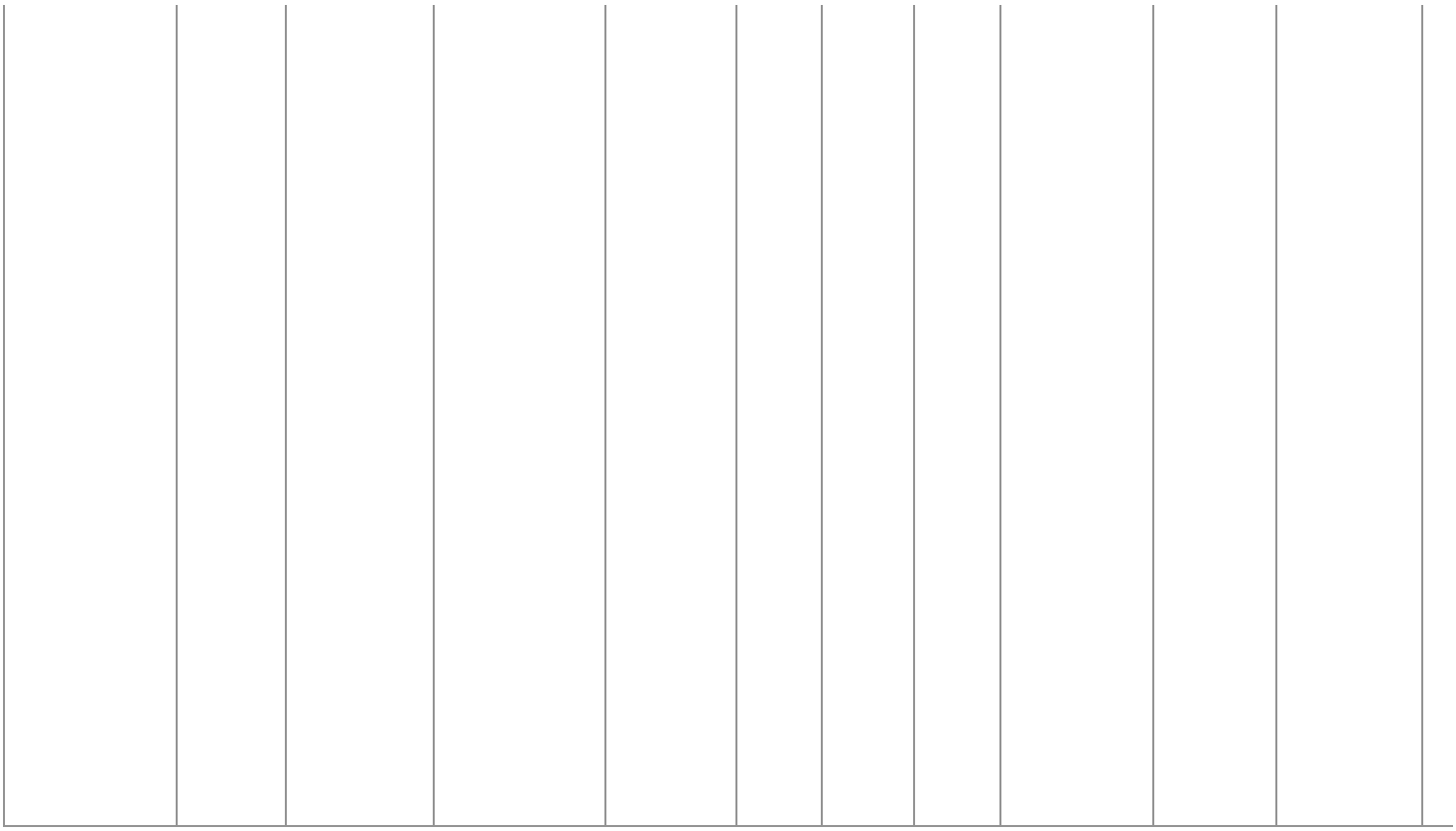
Women's Products:											

APPROVED Top Pick for Women's Bayer One A Day® Women's  Dist. by Bayer HealthCare LLC Adults: One tablet daily, with food. **REFORMULATED**	✓	Heavy metals: ✓ Disintegration: ✓	$0.09/tablet $8.84/100 tablets Large tablet	700 mcg (10% as beta-carotene)	1.7 mg 6 mcg	84 mg 25 mcg (D3) (1,000 IU)	7.5 mg (S) (7.5 IU) 25 mcg (K1)	665 mcg DFE (400 mcg folic acid) 16 mg NE (16 mg) (niacinamide)	Thiamin 1.2 mg, riboflavin 1.3 mg, biotin 30 mcg, pantothenic 5 mg	400 mg (calcium carbonate) 18 mg (ferrous fumarate)	NA NA



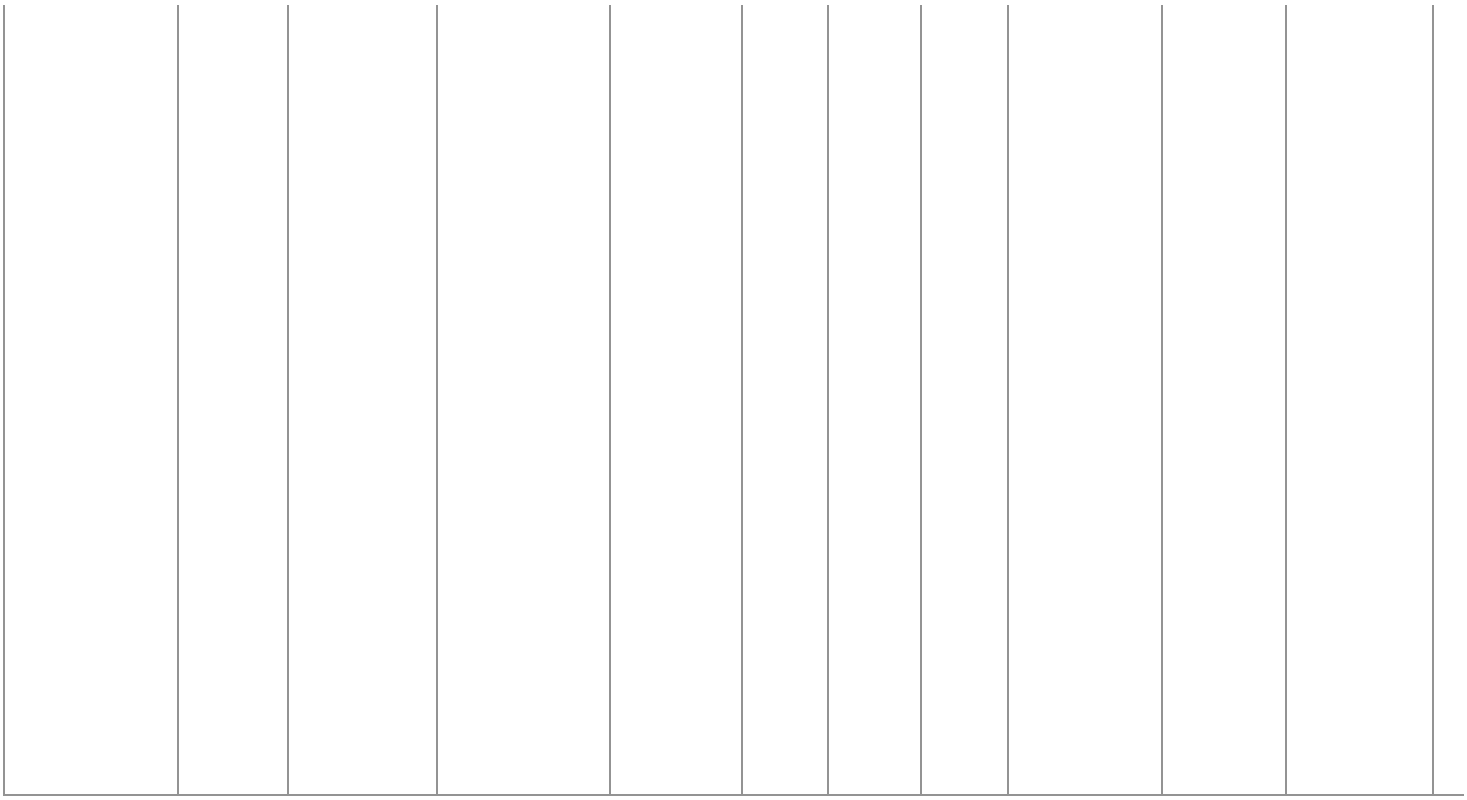
APPROVED GNC Women's Multivitamin Ultra Mega  Dist. by General Nutrition Corporation Take two caplets daily with food.	✓	Heavy metals: ✓ Disintegration:	$0.56/2 caplets $24.99/90 caplets Large caplet	1,500 mcg (50% as beta-carotene)	50 mg 50 mcg	200 mg 40 mcg (D3) (1,600 IU)	20.1 mg (N) (27.3 IU) 80 mcg (K1)	680 mcg DFE (400 mcg folic acid) 50 mg NE (50 mg) (niacin, niacinamide)	Thiamin 50 mg, riboflavin 50 mg, biotin 300 mcg, pantothenic acid 50 mg. Choline 10 mg.	500 mg (calcium carbonate, dicalcium phosphate, calcium d-pantothenate, calcium ascorbate) 18 mg (ferrous fumarate)	50 (m oxi NA



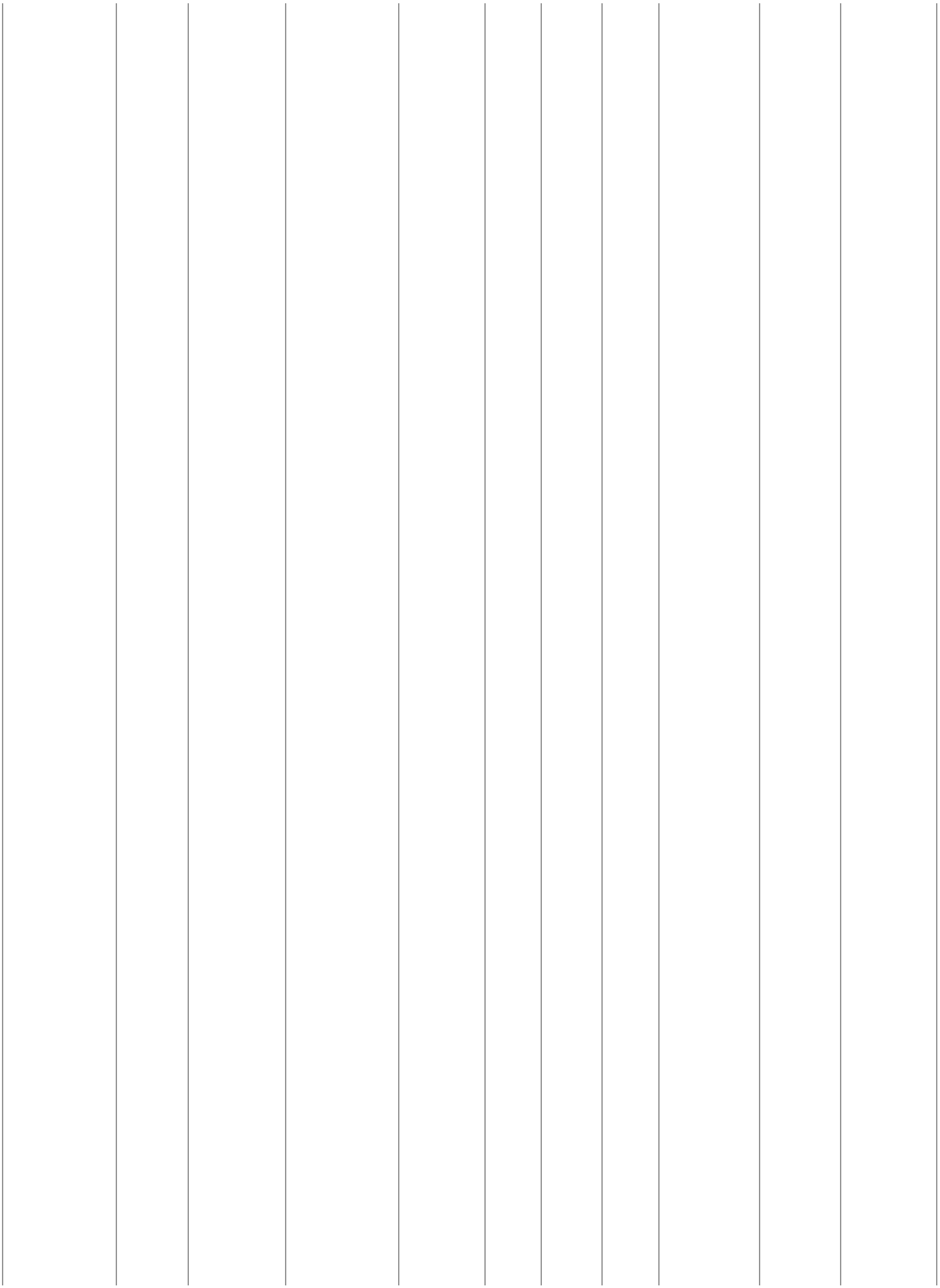


APPROVED Nature's Way® Alive!® Zero Sugar Women's Gummy Multivitamin - Strawberry Flavored  Dist. by Nature's Way Brands, LLC Women chew 2 gummies daily.	✓	Heavy metals: ✓ Disintegration:	$0.50/2 gummies $12.49/50 gummies Large strawberry shaped gummy	450 mcg (as retinyl palmitate)	1.7 mg 3.6 mcg	22.5 mg 25 mcg (D3) (1,000 IU)	7.5 mg (S) (7.5 IU) NA	400 mcg DFE (240 mcg folic acid) 4 mg NE (4 mg) (niacinamide)	Biotin 150 mcg	13 mg (tribasic calcium phosphate) NA	NA NA

NOT APPROVED New Chapter® Women's Multivitamin Gummy  Dist. by New Chapter, Inc. Adults, Chew Three Gummies Daily. Can Be Taken On An Empty Stomach.	Found 182.3% of folate	Heavy metals: ✓ Disintegration:	$0.80/3 gummies $19.99/75 gummies Medium/large gummy	520 mcg (as beta-carotene)	3.4 mg 3.6 mcg	63 mg 25 mcg (D3) (1,000 IU)	12 mg (N) (17.9 IU) 66 mcg (K1)	400 mcg DFE (as 115 mcg folic acid and 120.3 mcg methylfolate) Found 729 mcg DFE (182.3% of listed amount), from 174.5 mcg folic acid (151.9% of listed amount) and 254.4 mcg methylfolate (211.4% of listed amount) 9.6 mg NE (9.6 mg) (niacinamide, nicotinic acid)	Thiamin 0.12 mg, riboflavin 0.26 mg, biotin 60 mcg, pantothenic acid 4 mg	NA NA	NA NA

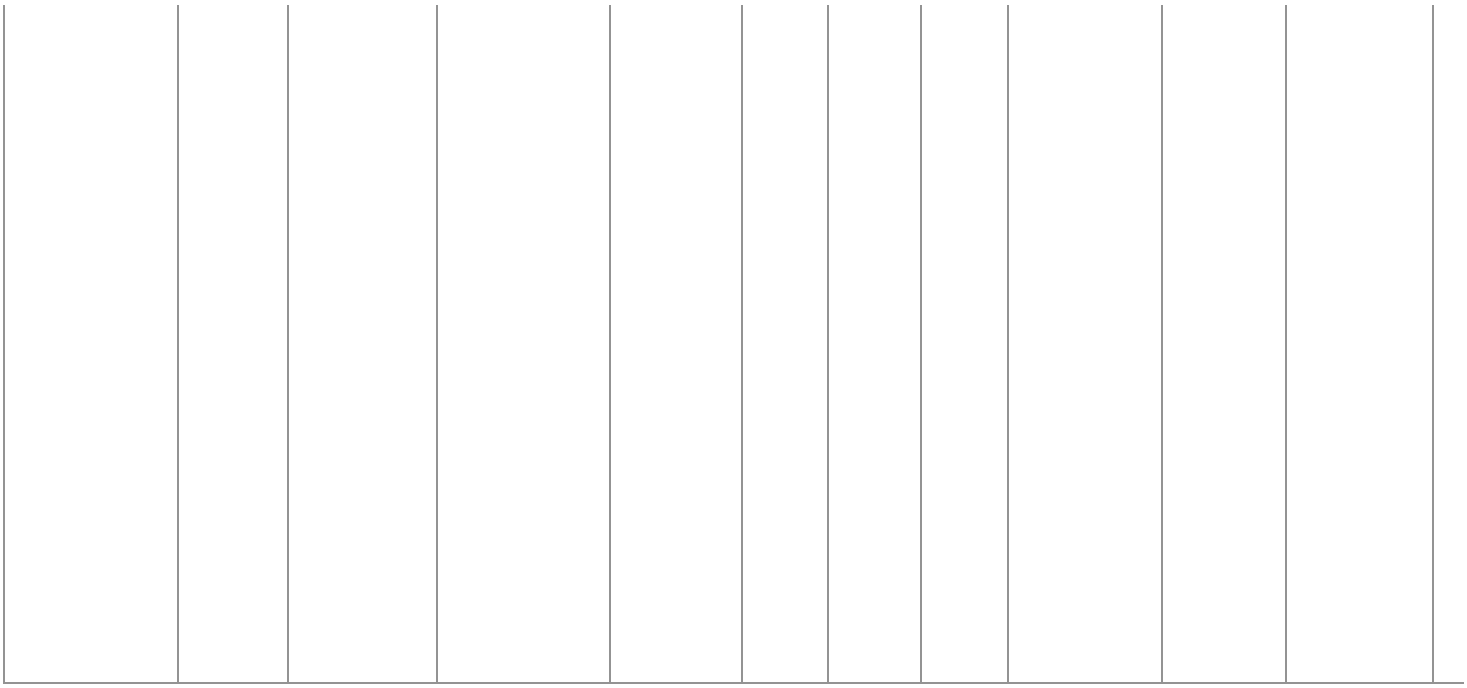


APPROVED Rainbow Light™ Women's One  Mfd. by Nature's Products, Inc. Take one tablet per day, with or between meals.	✓	Heavy metals: ✓ Disintegration: ✓	$0.27/tablet $16.01/60 tablets Large tablet	1,800 mcg (as beta-carotene)	20 mg 10 mcg	60 mg 50 mcg (D3) (2,000 IU)	15 mg (N) (18.2 IU) 120 mcg (K1)	400 mcg DFE (240 mcg folic acid) 20 mg NE (20 mg) (niacinamide)	Thiamin 20 mg, riboflavin 20 mg, biotin 30 mcg, pantothenic acid 13 mg. Choline 55 mg.	100 mg (from mineral-rich red algae) 6 mg (iron amino acid chelate)	10 (m ma ext sea NA

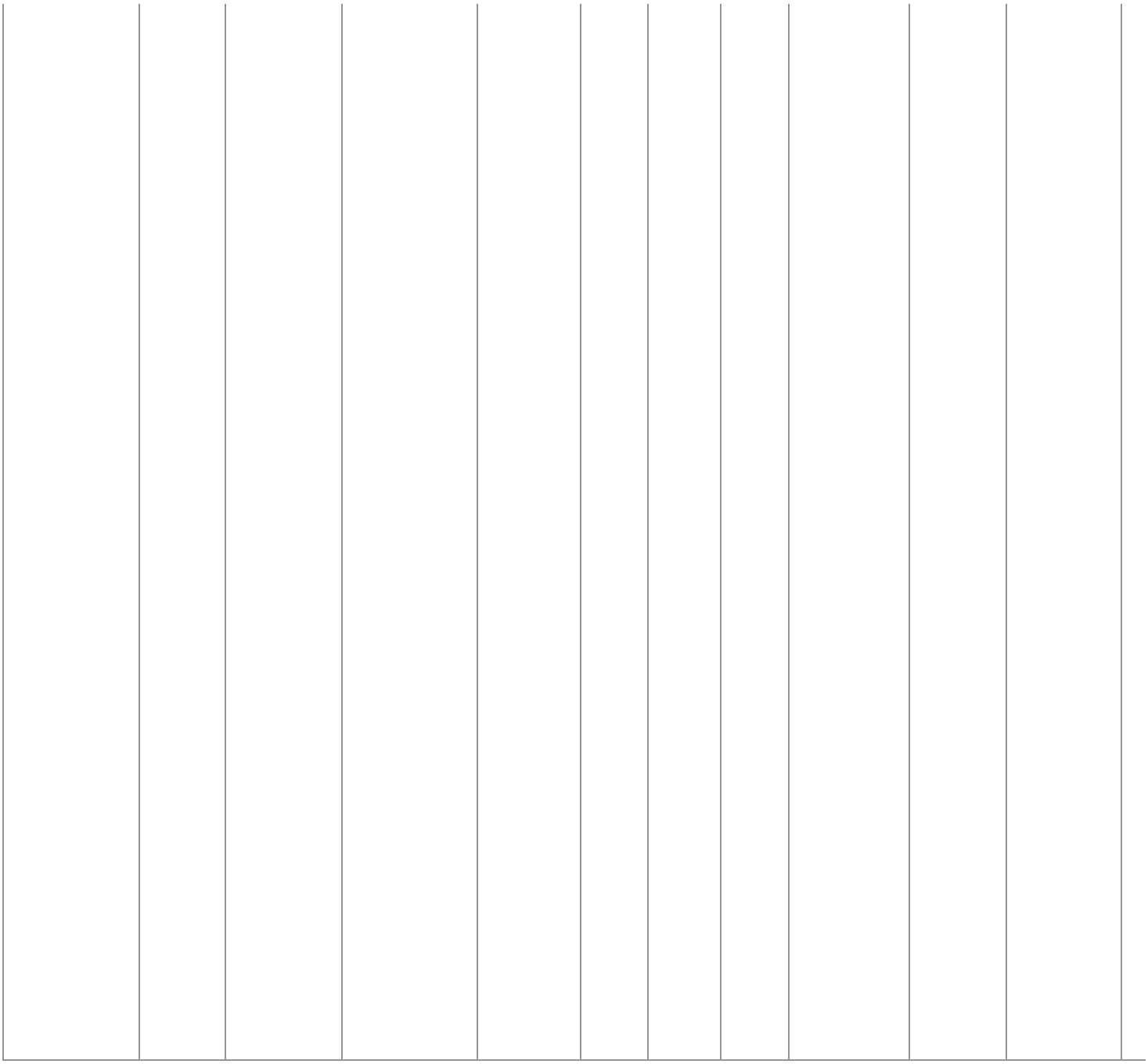


Women 50+ Products:											

APPROVED Bayer One A Day® Women 50+  Dist. by Bayer HealthCare LLC Adults: One tablet daily, with food.	✓	Heavy metals: ✓ Disintegration: ✓	$0.12/tablet $12.49/100 tablets Large tablet	940 mcg (11% as beta-carotene)	6 mg 25 mcg	120 mg 25 mcg (D3) (1,000 IU)	13.5 mg (S) (13.5 IU) 20 mcg (K1)	665 mcg DFE (400 mcg folic acid) 20 mg NE (20 mg) (niacinamide)	Thiamin 4.5 mg, riboflavin 3.4 mg, biotin 30 mcg, pantothenic acid 15 mg	300 mg (calcium carbonate) NA	50 (m oxi NA



APPROVED Top Pick for Women's 50+ if still menstruating Centrum Silver Women 50+  Dist. by GSK Consumer Healthcare Adults: Take one (1) tablet daily with food.	✓	Heavy metals: ✓ Disintegration: ✓	$0.13/tablet $12.79/100 tablets Large tablet	1,050 mcg (43% as beta-carotene)	5 mg 50 mcg	100 mg 25 mcg (D3) (1,000 IU)	15.8 mg (S) (15.8 IU) 50 mcg (K1)	667 mcg DFE (400 mcg folic acid) 14 mg NE (14 mg) (niacinamide)	Thiamin 1.1 mg, riboflavin 1.1 mg, biotin 30 mcg, pantothenic acid 5 mg	300 mg (calcium carbonate, dibasic calcium phosphate) 8 mg (ferrous fumarate)	10 (m oxi 80 (pc chl

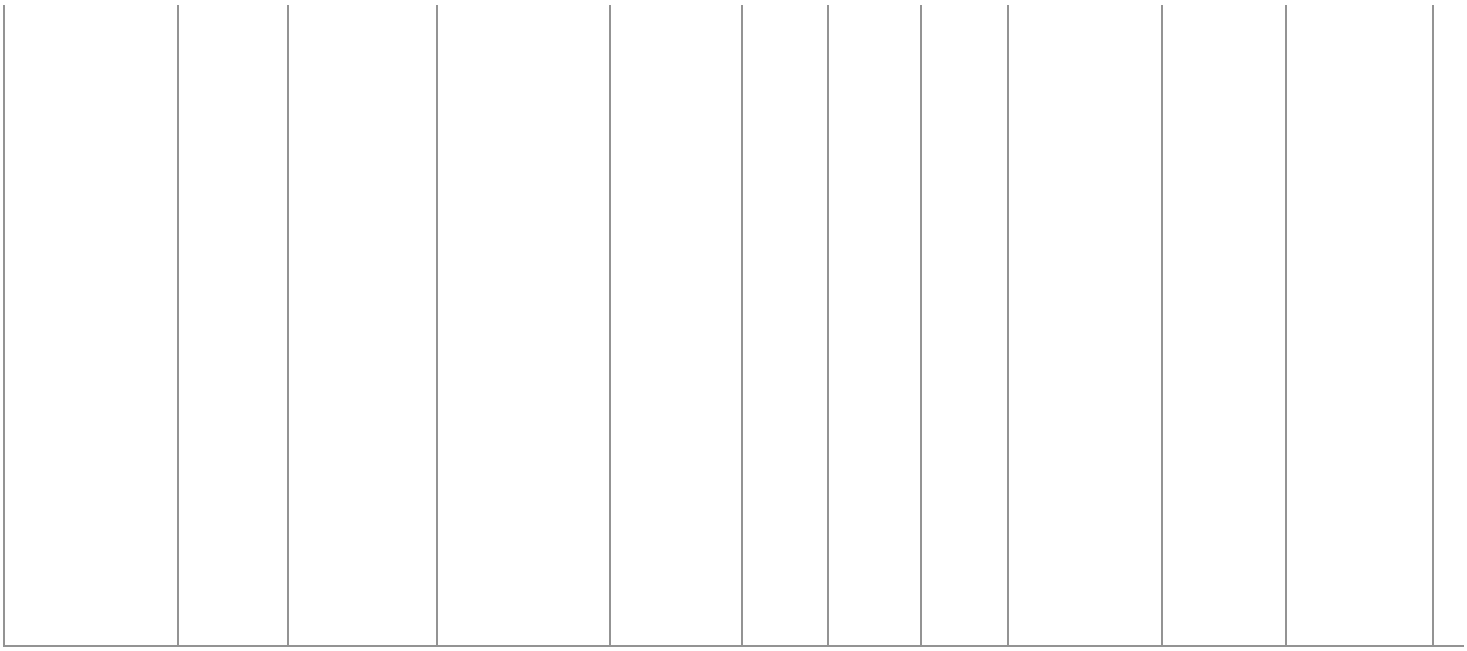


APPROVED Top Pick for Women's 50+ Nature Made® Multi For Her 50+  Dist. by Nature Made Nutritional Products Adults, take 1 tablet daily with water and a meal.	✓	Heavy metals: ✓ Disintegration: ✓	$0.10/tablet $9.29/90 tablets Large tablet	750 mcg (60% as beta-carotene)	6 mg 25 mcg	180 mg 25 mcg (D3) (1,000 IU)	27 mg (S) (27 IU) 80 mcg (K1)	665 mcg DFE (400 mcg folic acid) 20 mg NE (20 mg) (niacinamide)	Thiamin 1.5 mg, riboflavin 1.7 mg, biotin 30 mcg, pantothenic acid 10 mg	200 mg (calcium carbonate) NA	10 (m oxi NA

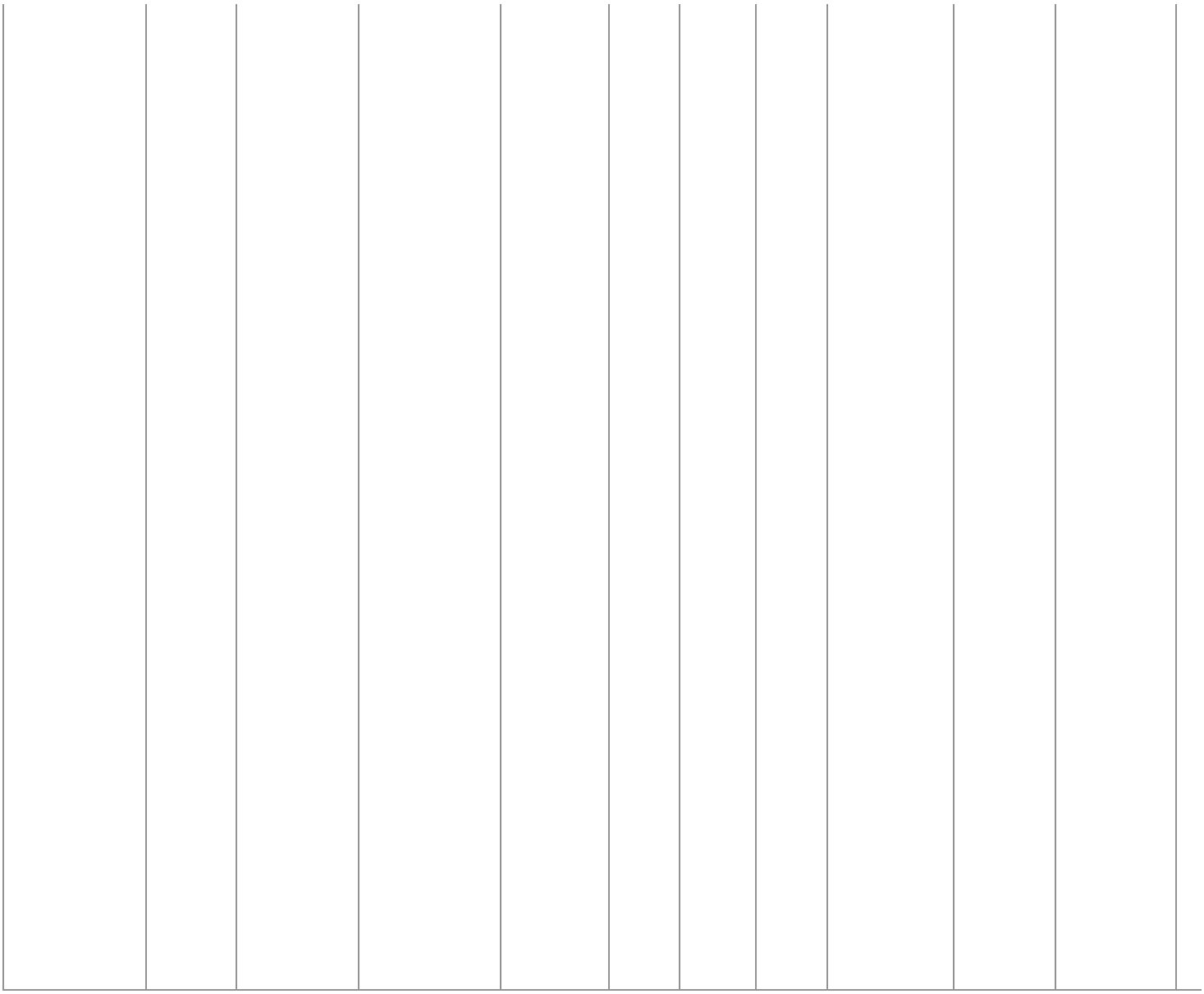
APPROVED Top Pick for vegan Women's 50+ Naturelo® One Daily Multivitamin For Women 50+  Dist. by Naturelo Premium Supplements Adults take one (1) capsule daily with a meal and a full glass of water.	✓	Heavy metals: ✓ Disintegration:	$0.37/vegetarian capsule $21.95/60 vegetarian capsules Large vegetarian capsule	900 mcg RAE (as beta-carotene)	1.9 mg 2.4 mcg	90 mg 22 mcg (D3) (880 IU)	15 mg (N) (22.4 IU) 120 mcg (K2 as MK-7)	400 mcg DFE (240 mcg L-5-methylfolate) 16 mg NE (16 mg) (niacinamide)	Thiamin 1.5 mg, riboflavin 1.3 mg, biotin 45 mcg, pantothenic acid 5 mg	60 mg (plant-based Aquamin® from marine algae, dicalcium phosphate) NA	60 ba Aq fro alg NA

Prenatal Products:											

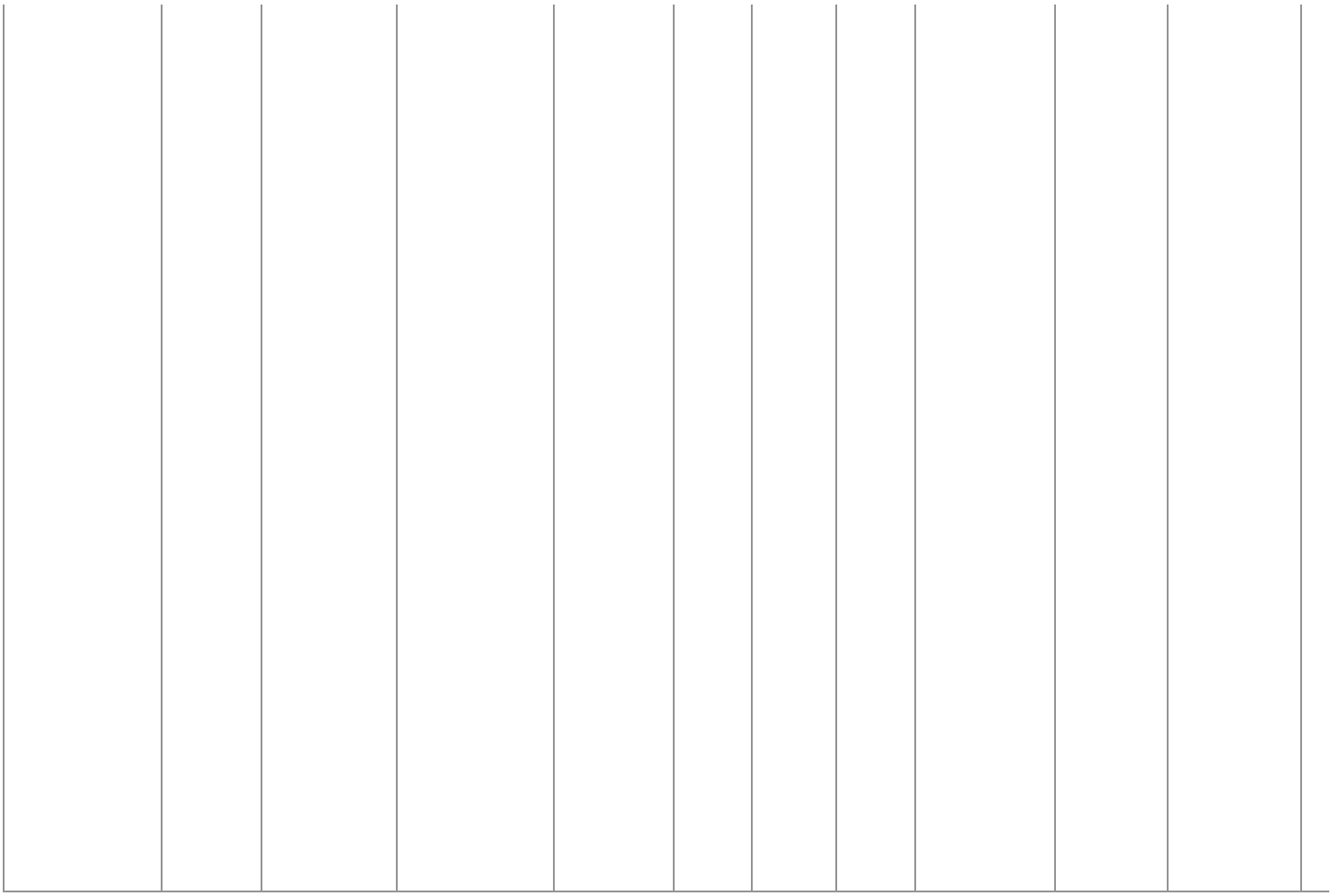
APPROVED Top Pick for Prenatal Bayer One A Day® Prenatal Advanced  Dist. by Bayer HealthCare LLC Adults, take one softgel and one tablet daily with food.	✓	Heavy Metals: ✓ Disintegration: ✓	$0.48/softgel and tablet $28.99/60 softgels and 60 tablets Large softgel and medium/large tablet	650 mcg (50% as beta-carotene)	2 mg 2.8 mcg	85 mg 15 mcg (D3) (600 IU)	19 mg (N) (23 IU) NA	1,330 mcg DFE (800 mcg folic acid) 18 mg NE (18 mg) (niacinamide)	Thiamin 1.4 mg, riboflavin 1.6 mg, biotin 35 mcg, pantothenic acid 7 mg. Choline 110 mg.	NA 27 mg (carbonyl iron)	40 (m oxi NA



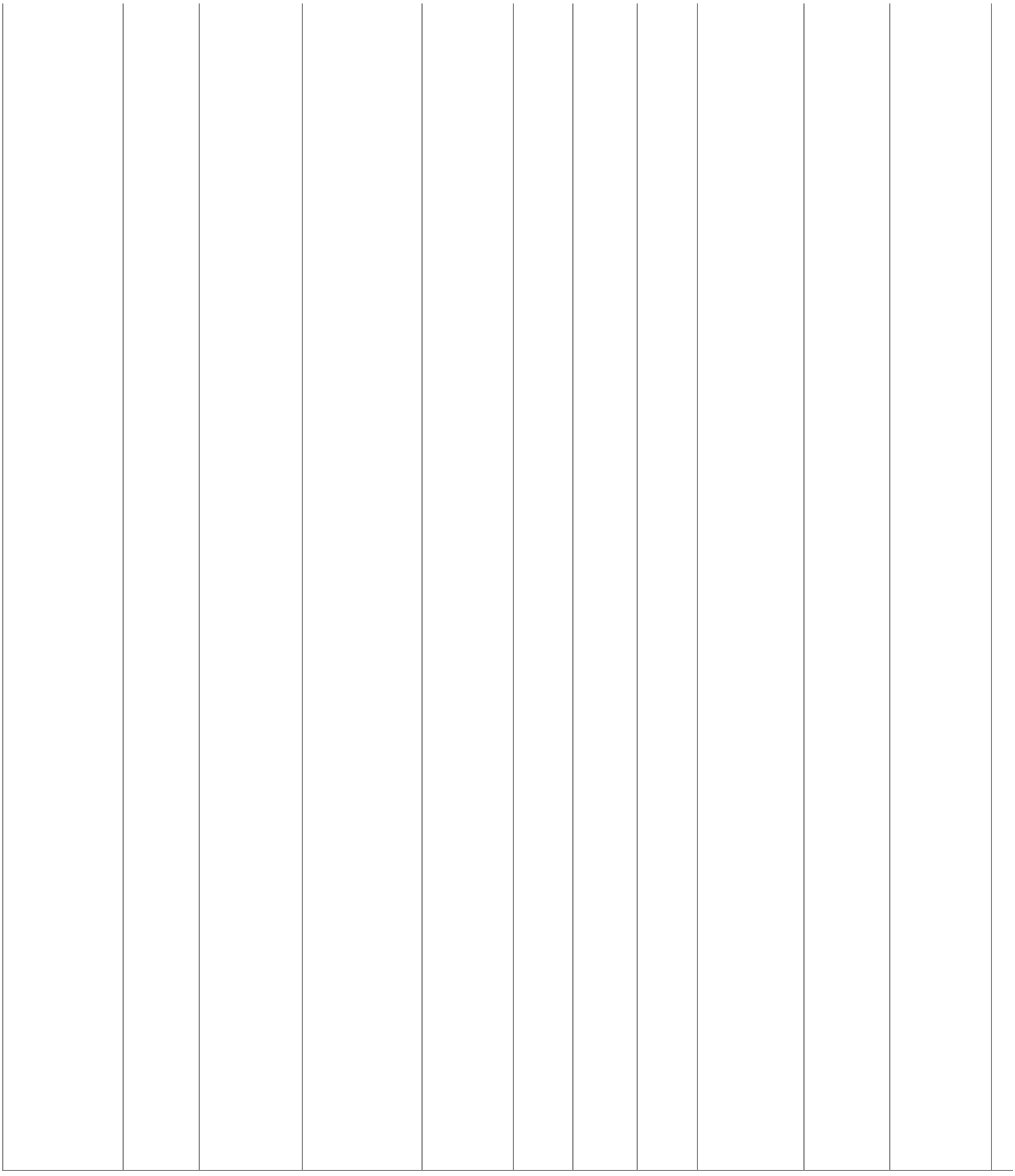
APPROVED MegaFood Baby & Me 2  Mfd. by MegaFood 2 tablets daily with a beverage. May be taken anytime throughout the day, even on an empty stomach.	✓	Heavy metals: ✓ Disintegration: ✓	$0.93/2 tablets $55.56/120 tablets Large tablet	750 mcg RAE (as beta-carotene)	8 mg 8 mcg	100 mg 15 mcg (D3) (600 IU)	20 mg (N) (29.8 IU) 90 mcg (60 mcg K1 and 30 mcg K2 as MK-7)	1,020 mcg DFE (600 mcg L-5-MTHF) 20 mg NE (20 mg) (niacinamide)	Thiamin 1.5 mg, riboflavin 1.7 mg, biotin 300 mcg, pantothenic acid 10 mg. Choline 300 mg.	NA 18 mg (fermented iron bisglycinate)	NA NA



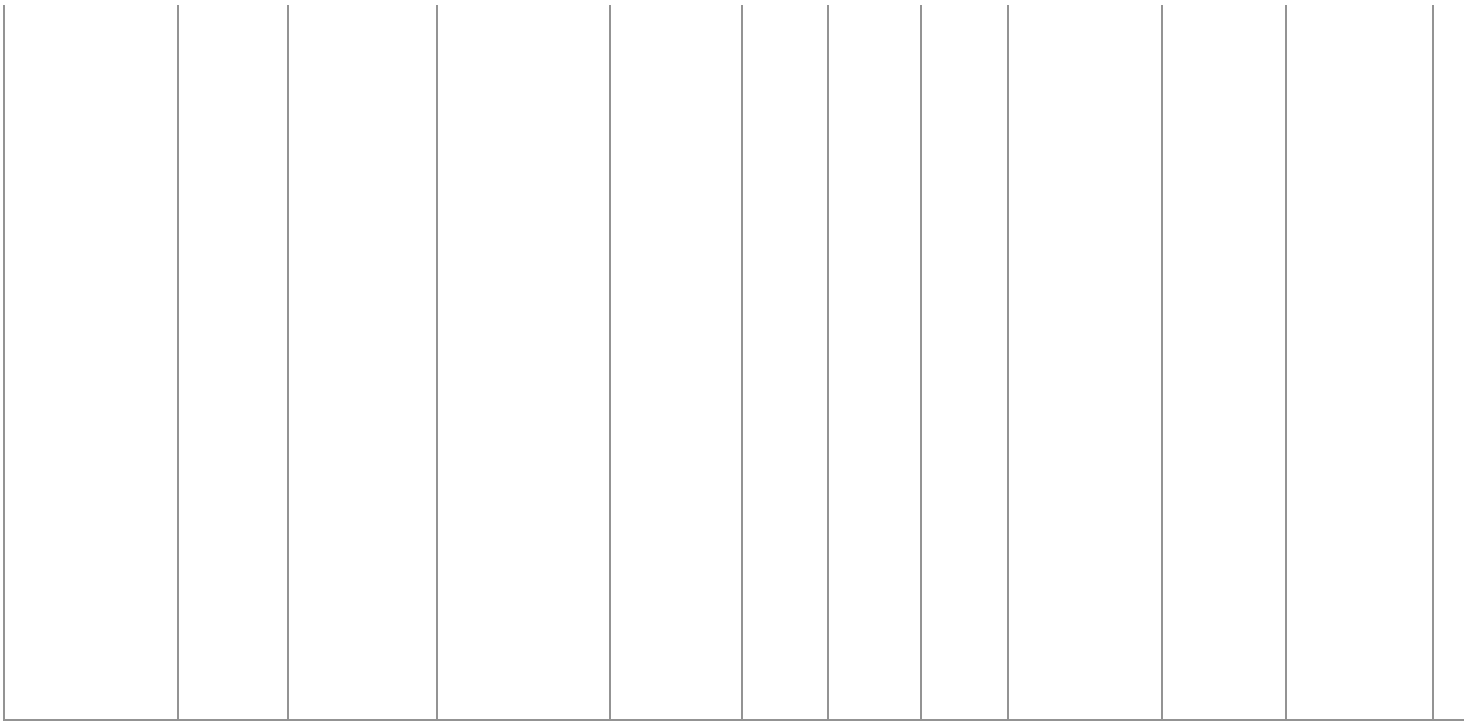
APPROVED **2024** MegaFood® Baby & Me 2™  Mfd. by MegaFood Adults take 2 tablets daily with a beverage. May be taken any time of day, even on an empty stomach.	✓	Heavy Metals: ✓ Disintegration: ✓	$0.50/tablet $29.99/60 tablets Large tablet	750 mcg RAE (as beta-carotene)	8 mg 8 mcg	100 mg 15 mcg (D3) (600 IU)	20 mg (N) (24.2 IU) 90 mcg (60 mcg K1 and 30 mcg K2 as MK-7)	1,020 mcg DFE (612 mcg L-5-methyltetra-hydrofolate) 20 mg NE (20 mg) (niacinamide)	Thiamin 1.5 mg, riboflavin 1.7 mg, biotin 300 mcg, pantothenic acid 10 mg. Choline 300 mg.	NA 18 mg (fermented iron bisglycinate)	NA NA



NOT APPROVED Rainbow Light™ Prenatal One  Mfd. by Nature's Products, Inc. Take one tablet per day, with or between meals, while trying to conceive, pregnant or nursing.	Found 188.4% iodine	Heavy metals: ✓ Disintegration: ✓	$0.27/tablet $23.99/90 tablets Large tablet	2,600 mcg (as beta-carotene)	10 mg 9 mcg	65 mg 15 mcg (D2) (600 IU)	9.5 mg (N) (11.5 IU) 90 mcg (K1)	600 mcg DFE (360 mcg folic acid) 18 mg NE (18 mg) (niacinamide)	Thiamin 8 mg, riboflavin 8 mg, biotin 35 mcg, pantothenic acid 10 mg. Choline 55 mg.	50 mg (calcium citrate) 27 mg (iron chelate)	50 (m ma ext sea NA



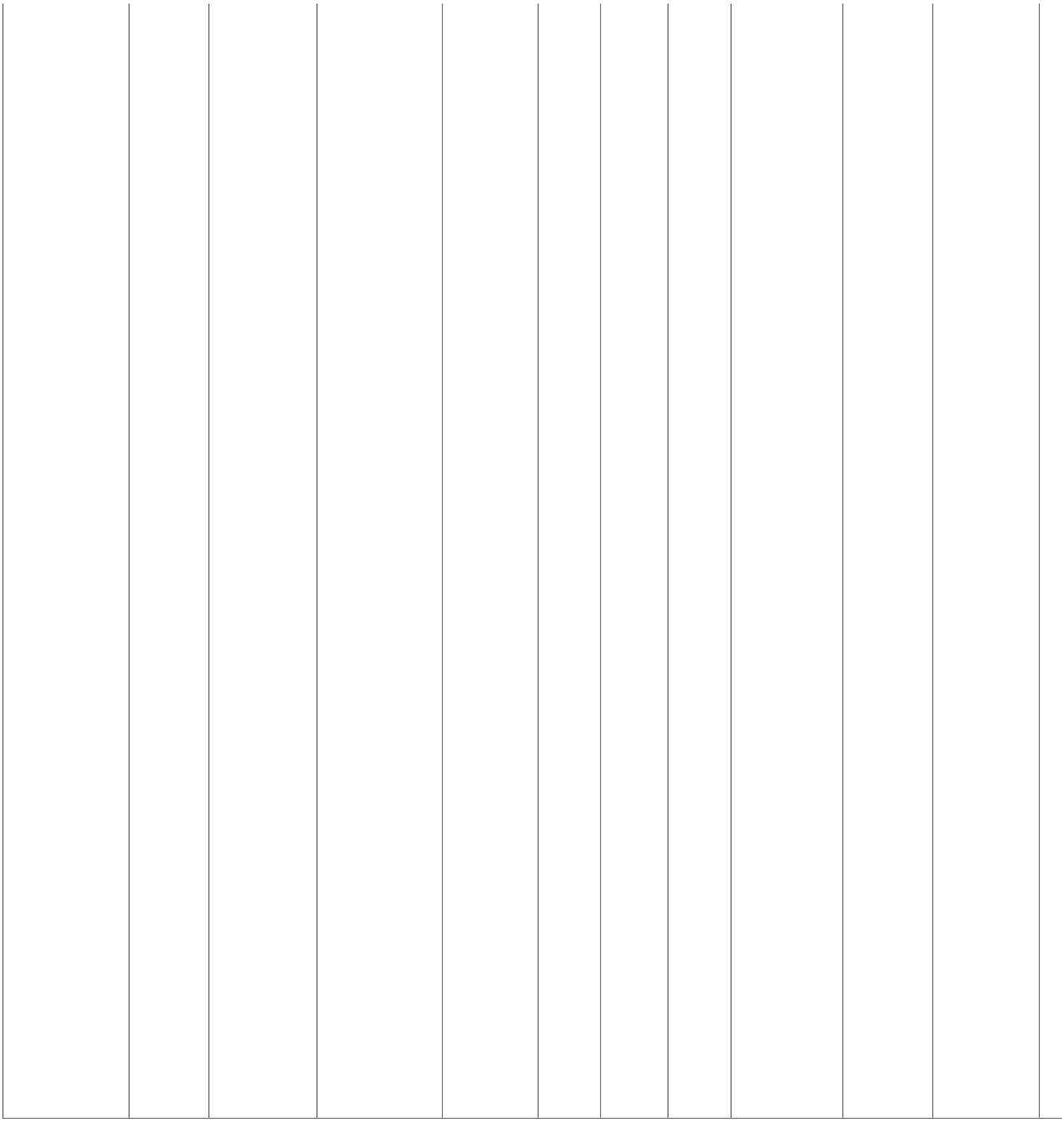
NOT APPROVED Smarty Pants® Prenatal Formula  Dist. by SmartyPants, Inc. Adults take four (4) gummies daily, with or without food. May be taken all at the same time or split throughout the day as desired.	Found only 78.3% vitamin D3	Heavy metals: ✓ Disintegration:	$0.86/4 gummies $25.86/120 gummies Large gummy	520 mcg (50% as beta-carotene)	2 mg 4.7 mcg	48 mg 30 mcg (D3) (1,200 IU) Found only 23.5 mcg (939.2 IU) (78.3% of listed amount)	14.3 mg (N) (21.3 IU) 40 mcg (24 mcg K1 and 16 mcg K2 MK-7)	600 mcg DFE (360 mcg L-methylfolate) 18 mg NE (18 mg) (inositol niacinate)	Thiamin 0.14 mg, riboflavin 0.16 mg, biotin 17.5 mcg. Choline 55 mg.	NA NA	NA NA



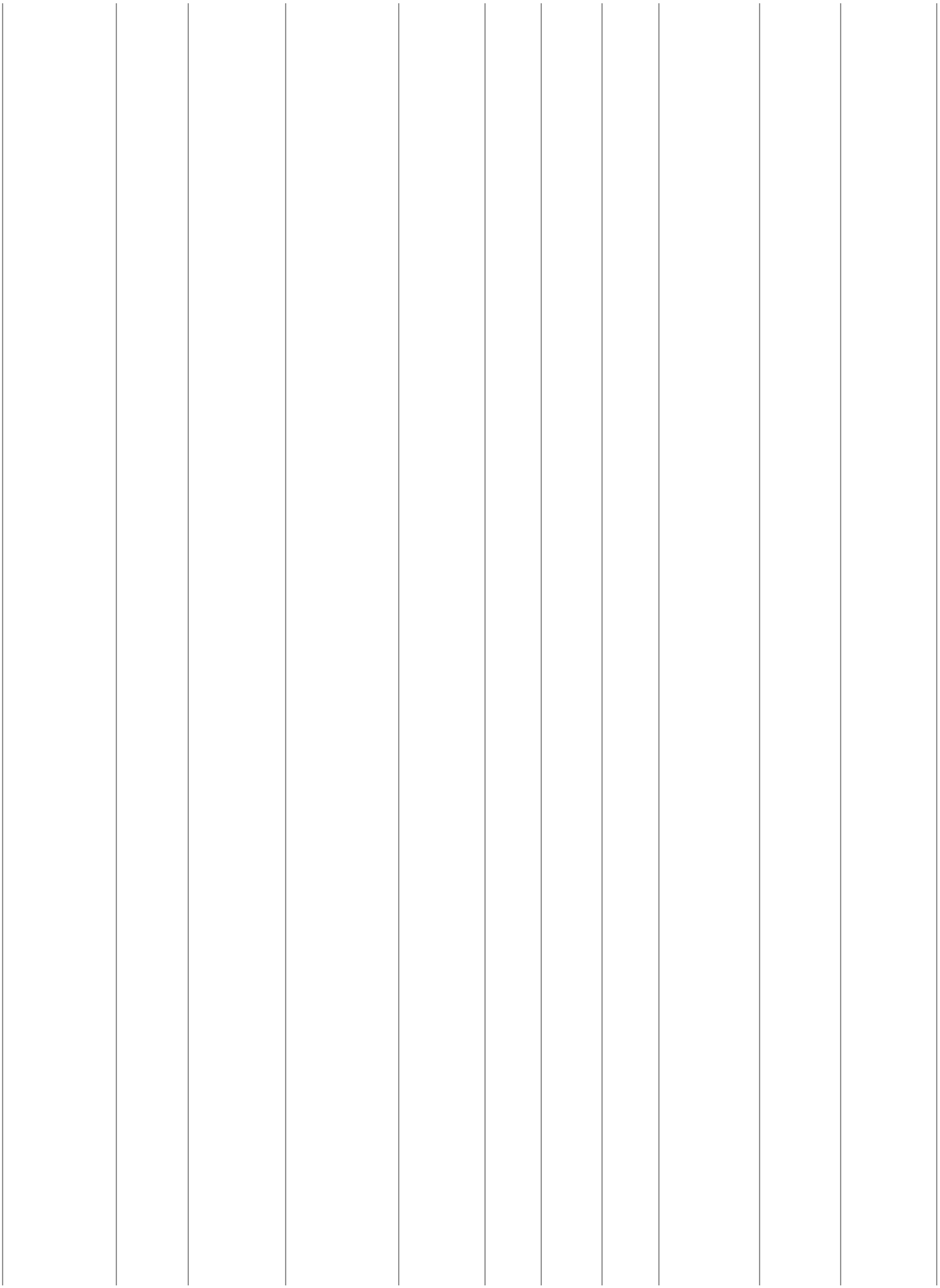
APPROVED Solgar® Prenatal Nutrients  Dist. by Solgar Inc. As a dietary supplement for pregnant and lactating women, take four (4) tablets daily, preferably with a meal or as directed by a healthcare practitioner.	✓	Heavy metals: ✓ Disintegration: ✓	$0.93/4 tablets $27.86/120 tablets Large tablet	1,500 mcg RAE (as beta-carotene)	2.5 mg 8 mcg	100 mg 10 mcg (D2) (400 IU)	20.1 mg (N) (24.3 IU) NA	1,333 mcg DFE (800 mcg folic acid) 20 mg NE (20 mg) (niacinamide)	Thiamin 1.7 mg, riboflavin 2 mg, biotin 300 mcg, pantothenic acid 10 mg	1,300 mg (calcium carbonate, calcium citrate) 27 mg (ferrous bisglycinate chelate)	45 (m oxi ma cit 50 (pc glu po an co

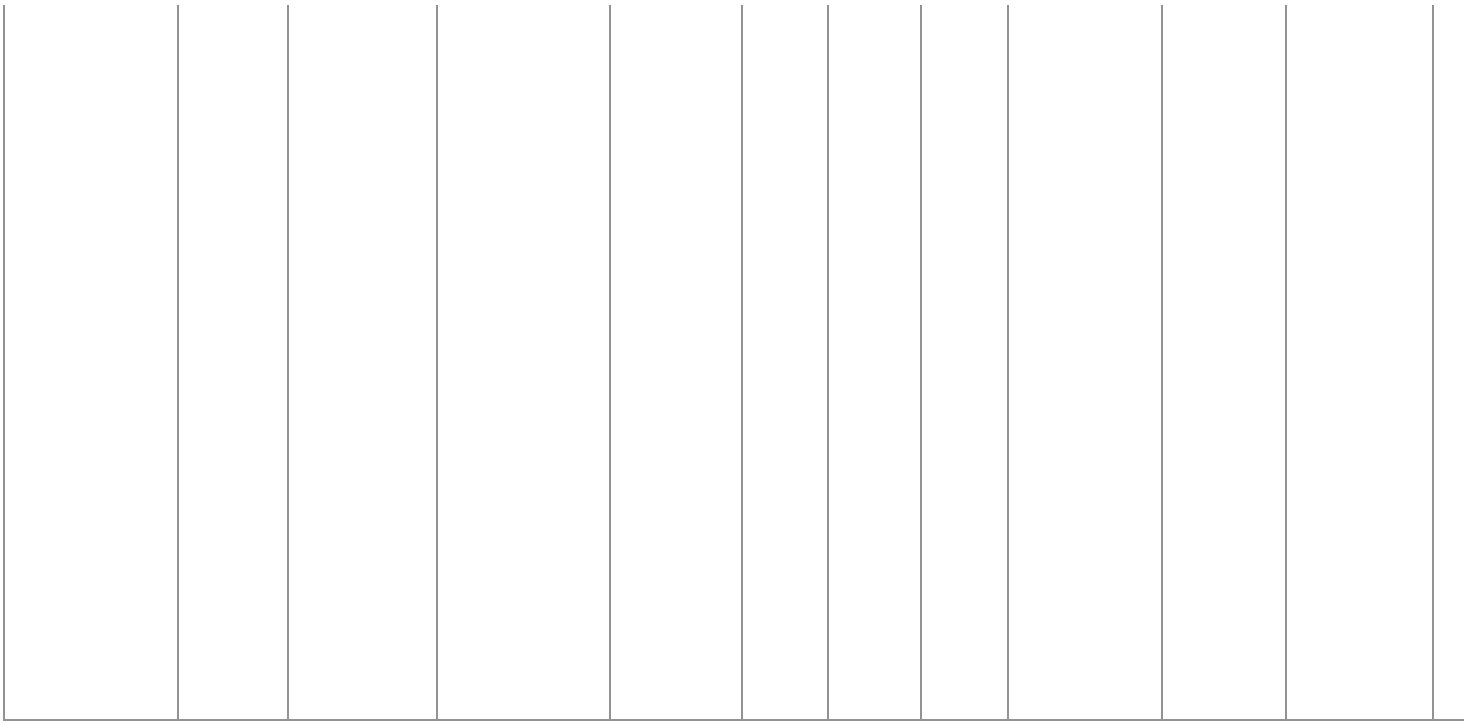
Men's Products:											

APPROVED AlphaSperm® Men's Prenatal +  Dist. by AlphaSperm Inc. Take two (2) capsules twice daily, preferably with food. Label suggests "starting nine months prior to desired conception, however even one month may afford benefits."	✓	Heavy metals: ✓ Disintegration:	$3.33/4 capsules $99.99/120 capsules Large capsule	1,500 mcg RAE (amount beta-carotene not listed)	10 mg 1,000 mcg	300 mg 25 mcg (D3) (1,000 IU)	15 mg (N) (22.4 IU) 100 mcg (K1)	1,333 mcg DFE (784.1 mcg 5-methyltetrahydrofolate) 30 mg NE (30 mg) (niacinamide)	Thiamin 4 mg, riboflavin 5 mg, biotin 300 mcg, pantothenic acid 10 mg, inositol 10 mg	NA NA	40 (m citi NA

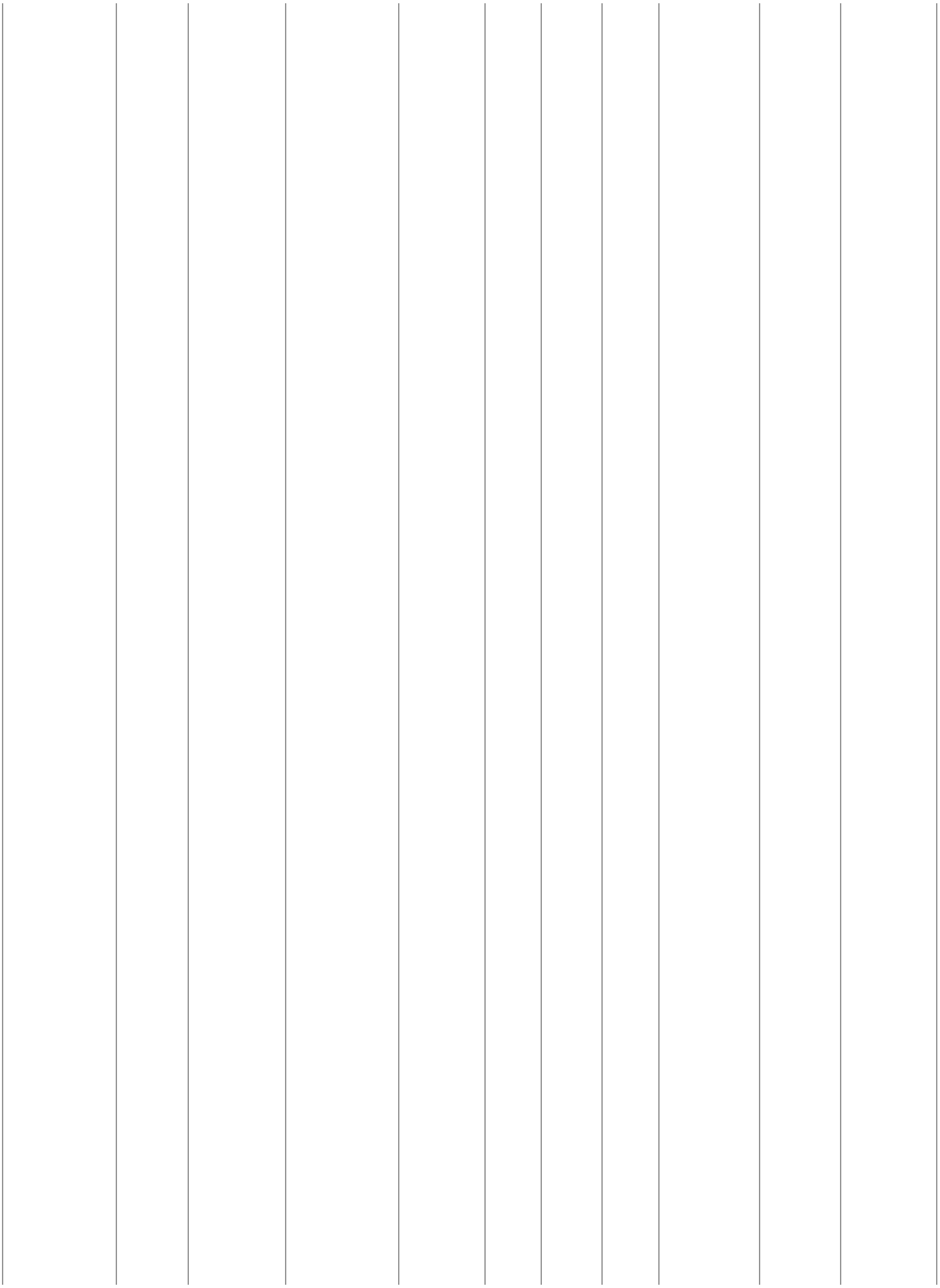


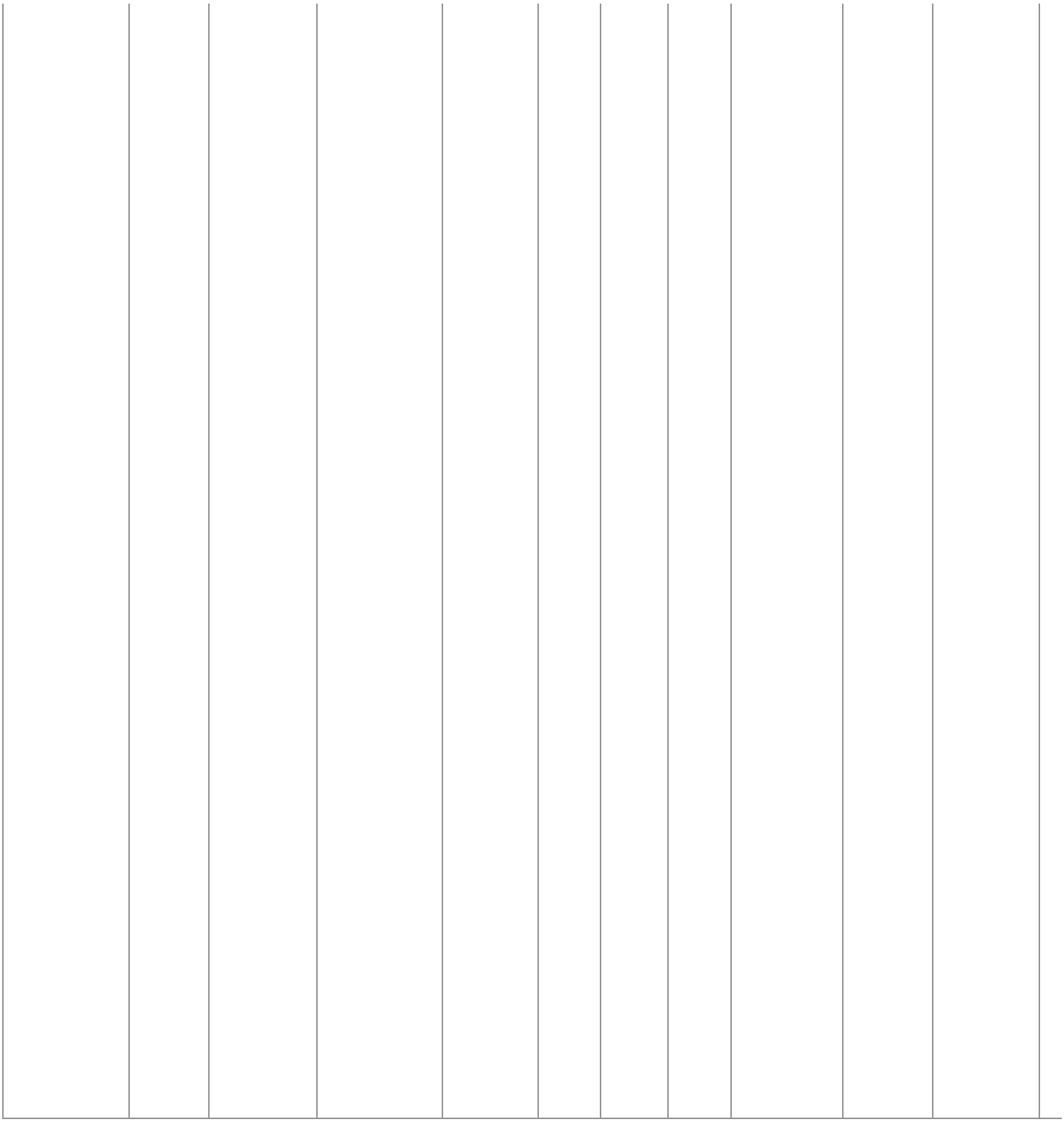
APPROVED GNC Mega Men®  Dist. by General Nutrition Corporation Take two caplets daily with food.	✓	Heavy metals: ✓ Disintegration:	$0.56/2 caplets $24.99/90 caplets Large caplet	1,500 mcg (50% as beta-carotene)	50 mg 50 mcg	300 mg 40 mcg (D3) (1,600 IU)	20.1 mg (N) (27.3 IU) 80 mcg (K1)	680 mcg DFE (400 mcg folic acid) 50 mg NE (50 mg) (niacin, niacinamide)	Thiamin 50 mg, riboflavin 50 mg, biotin 300 mcg, pantothenic acid 50 mg. Choline 10 mg.	200 mg (calcium carbonate, calcium d-pantothenate, calcium ascorbate) NA	10 (m oxi NA



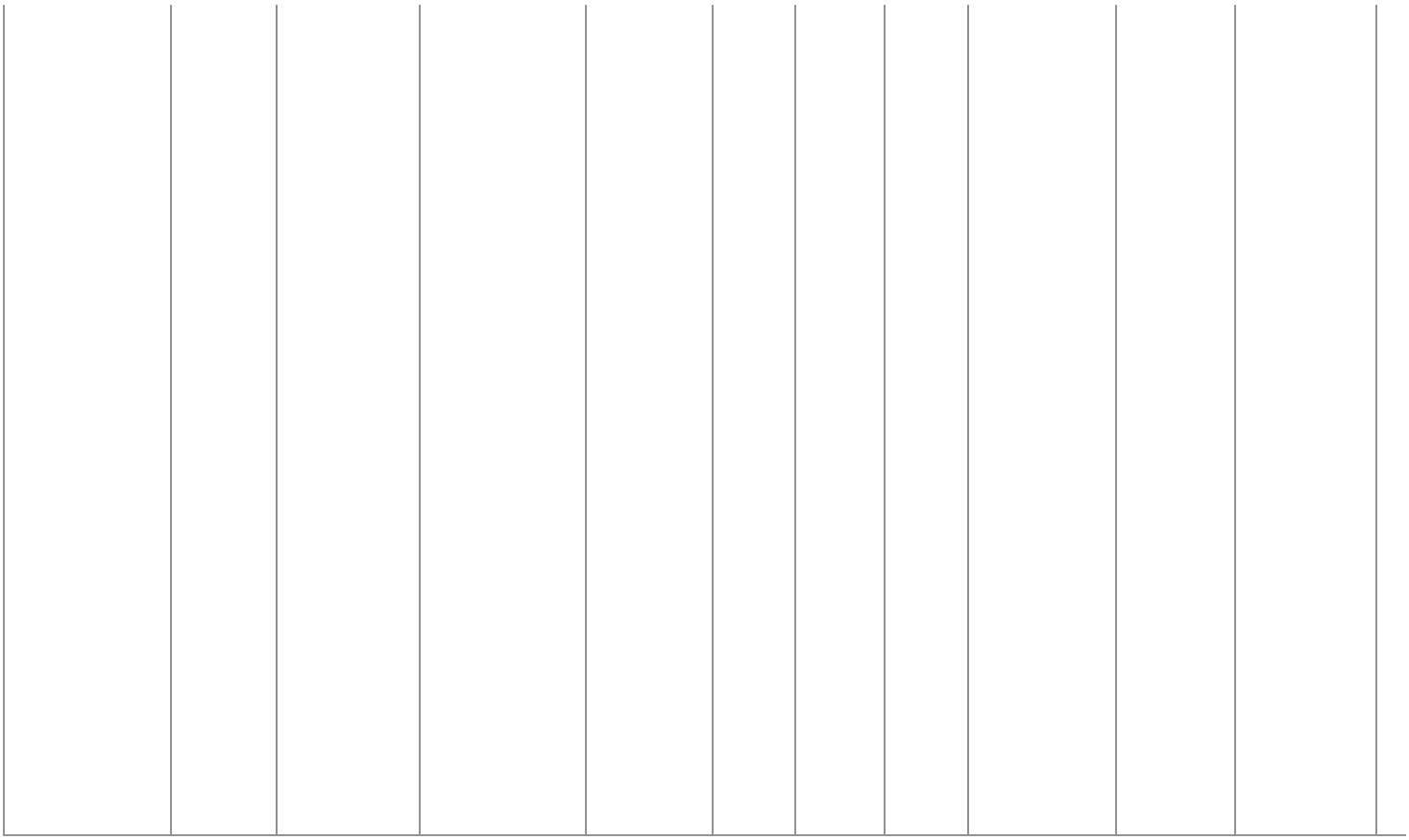


NOT APPROVED Source Naturals® Men's Life Force® Multiple  Dist. by Source Naturals, Inc 3 tablets 1 to 2 times daily with meals. This product is intended for men.	✓	Heavy metals: ✓ Disintegration: Required 40 minutes to fully disintegrate	$1.00/3 tablets $30.10/90 tablets Large tablet	3,750 mcg - 7,500 mcg (80% as beta-carotene)	50 mg - 100 mg 100 mcg - 200 mcg	480 mg - 960 mg 10 mcg - 20 mcg (D3) (400 IU -800 IU)	134 mg - 268 mg (N) (162.1 IU - 324.3 IU) 120 mcg - 240 mcg (K1)	680 mcg DFE - 1,360 mcg DFE (300 mcg - 600 mcg folic acid, calcium folinate) 50 mg NE - 100 mg NE (50 mg - 100 mg) (niacinamide, niacin)	Thiamin 50 mg - 100 mg, riboflavin 50 mg - 100 mg, biotin 400 mcg - 800 mcg, pantothenic acid 50 mg - 100 mg. Choline 50 mg - 100 mg.	117 mg - 234 mg (calcium carbonate, dicalcium malate, calcium malate, calcium citrate, naturally occurring calcium) NA	10 mg (m an co 50 mg (pc cit





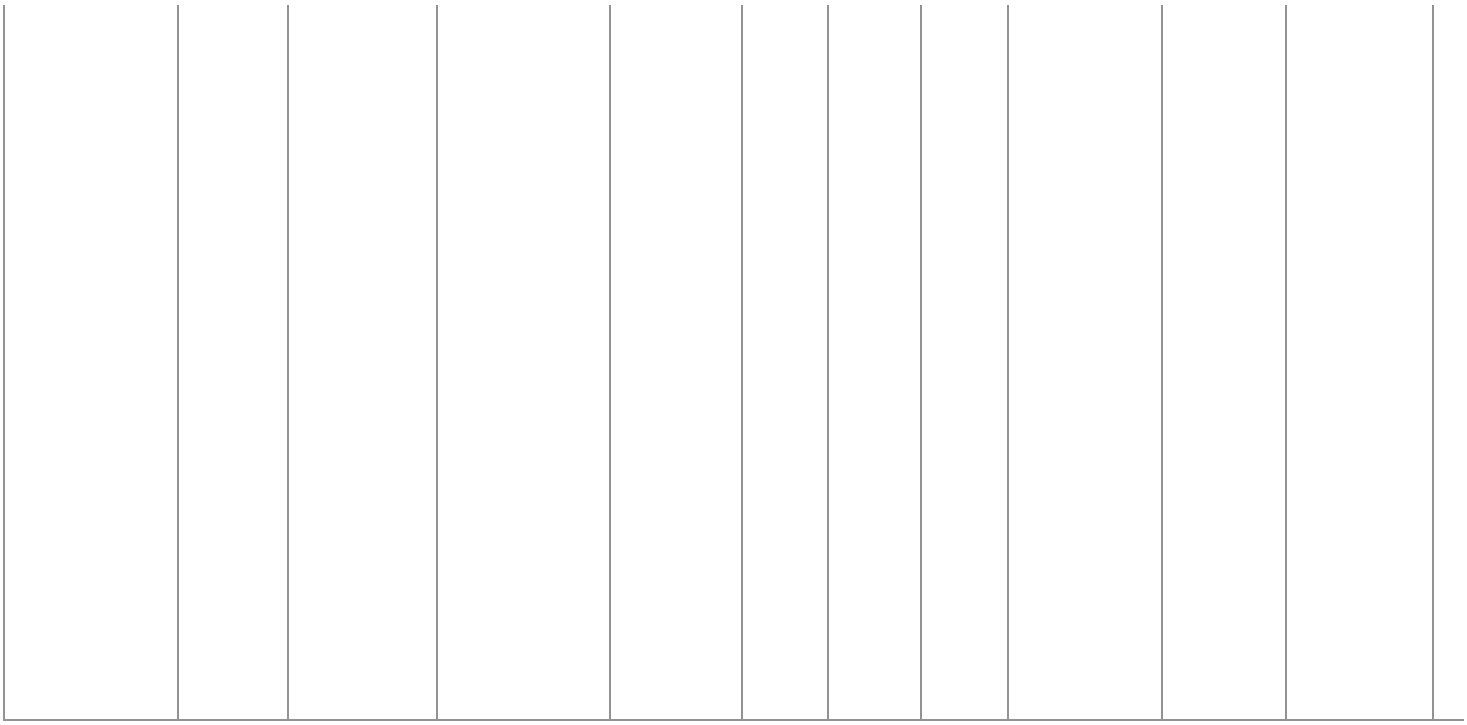
NOT APPROVED Swanson® Real Food Multi - Men's Daily  Dist. by Swanson Health Products Take three veggie capsules per day with water.	Found 171.9% folate	Heavy metals: ✓ Disintegration:	$0.67/3 veggie capsules $20.16/90 veggie capsules Large veggie capsule	1,501 mcg RAE (as beta-carotene)	1 mg 3 mcg	45 mg 7.5 mcg (D2) (300 IU)	33.5 mg (N) (49.9 IU) 50 mcg	200 mcg DFE (117.6 mcg from PANMOL® B-Complex (from quinoa sprouts)) Found 343.7 mcg DFE (171.9% of listed amount), from 202.2 mcg folic acid 10 mg NE (10 mg) (from quinoa sprouts)	Thiamin 0.75, riboflavin 0.84 mg, biotin 150 mcg, pantothenic acid 5 mg	128 mg (from Aquamin® algae minerals (from *Litothamnion spp.*)) NA	9 r (fr Aq alg mi (fr *Lit* *sp* NA



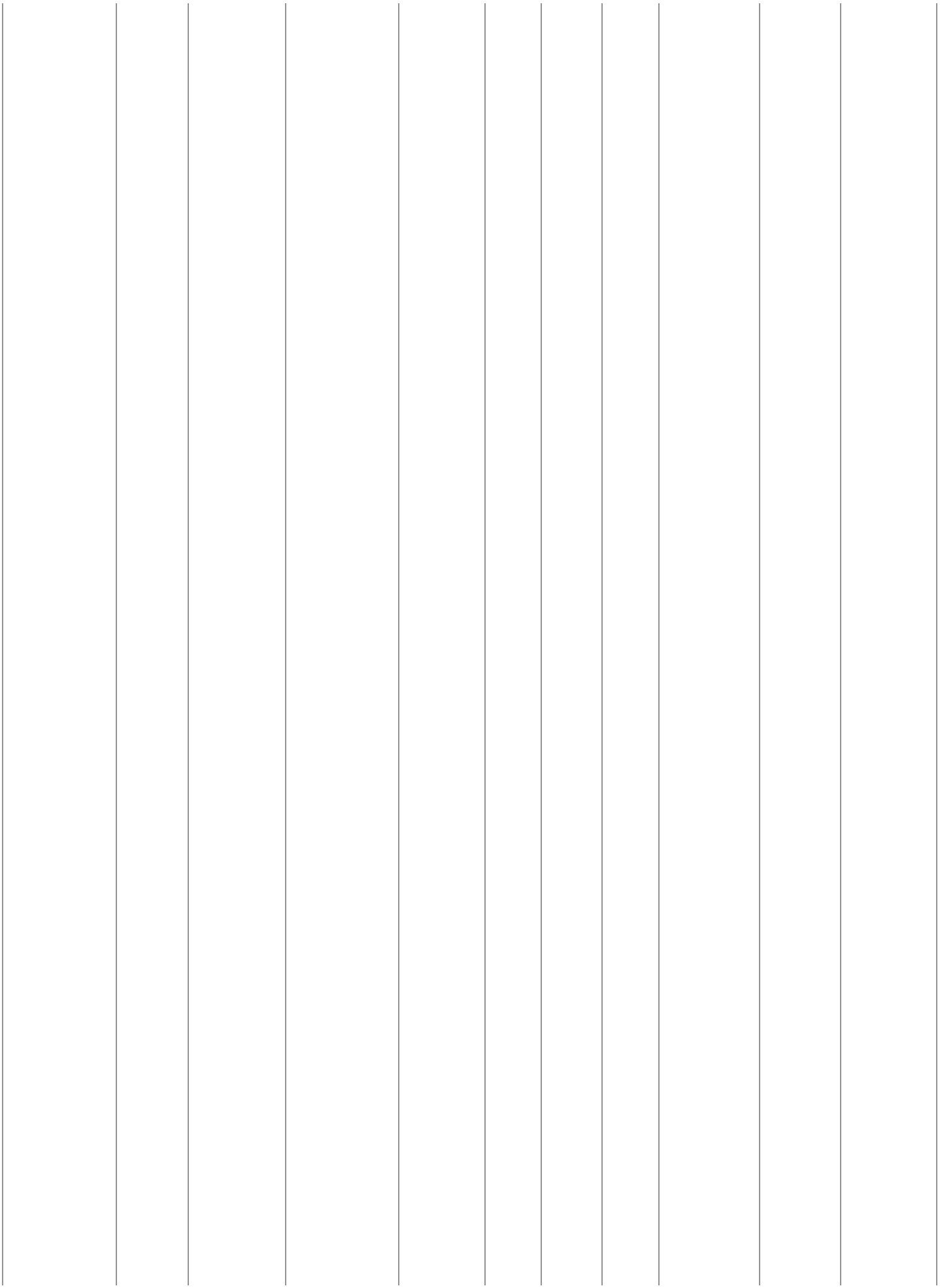
NOT APPROVED VitaFusion™ Men's Multi  Dist. by Church & Dwight Co., Inc. Adults take two (2) gummy vitamins per day. Chew thoroughly before swallowing.	Found 197.2% folate	Heavy metals: ✓ Disintegration:	$0.18/2 gummies $26.96/2 bottles of 150 gummies (300 gummies total) Medium/large gummy	720 mcg RAE (as retinyl palmitate)	4.3 mg 7.2 mcg	30 mg 25 mcg (D3) (1,000 IU)	15 mg (S) (15 IU) NA	400 mcg DFE (240 mcg folic acid) Found 788.8 mcg DFE (197.2% of listed amount), from 464 mcg folic acid NA	Biotin 30 mcg, pantothenic acid 2.5 mg	NA NA	NA NA

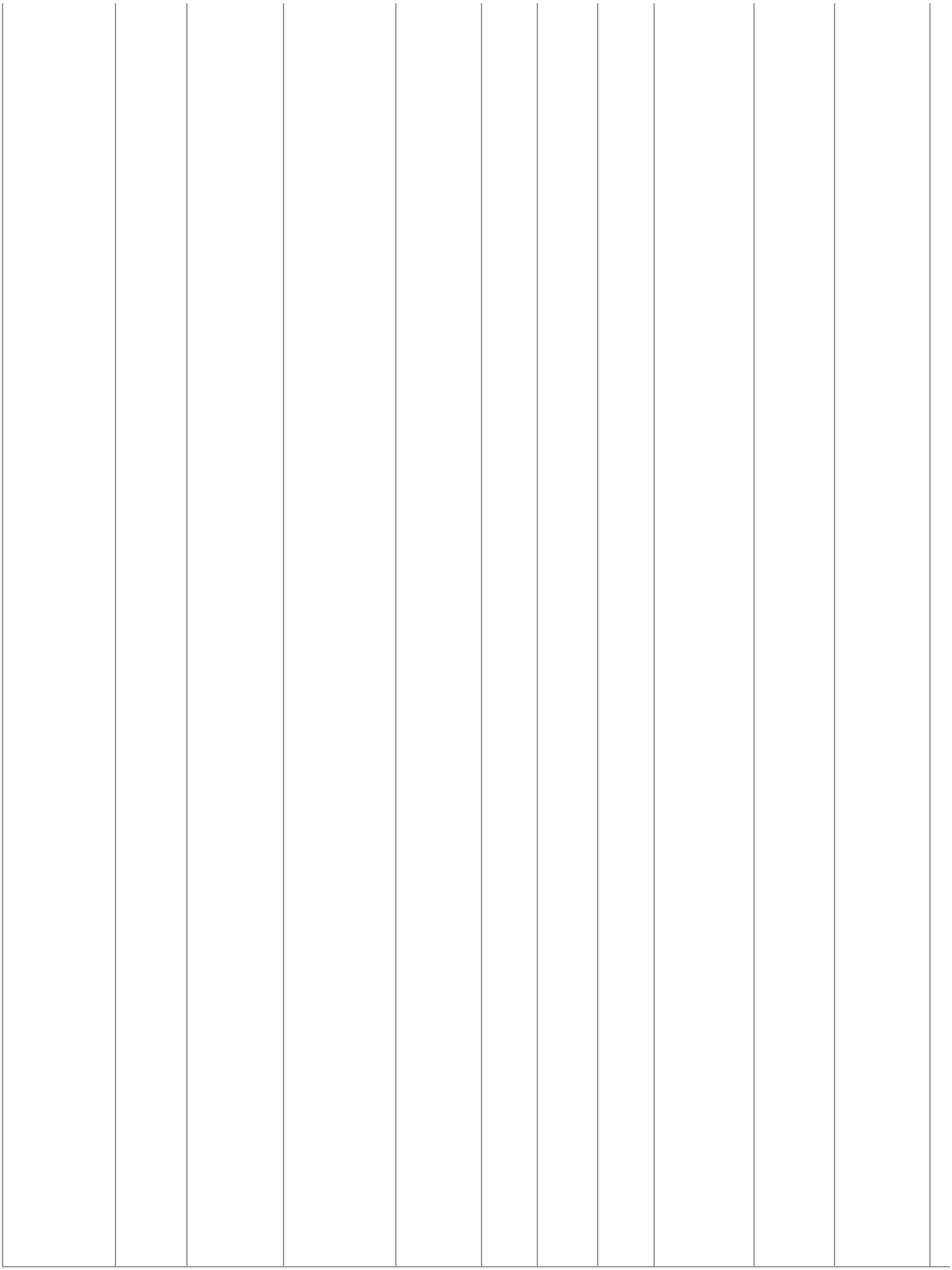
Men 50+ Products:											

APPROVED Top Pick for Men's 50+ CVS Health® Spectravite Men 50+  Dist. by CVS Pharmacy, Inc. Adults - Take one tablet with food as a dietary supplement. **Renamed**	✓	Heavy metals: ✓ Disintegration: ✓	$0.09/tablet $17.49/200 tablets Large tablet	1,050 mcg (29% as beta-carotene)	6 mg 100 mcg	120 mg 25 mcg (D3) (1,000 IU)	27 mg (S) (27 IU) 60 mcg (K1)	510 mcg DFE (300 mcg folic acid) 20 mg NE (20 mg) (niacinamide)	Thiamin 1.5 mg, riboflavin 1.7 mg, biotin 30 mcg, pantothenic acid 10 mg	210 mg (calcium carbonate) NA	75 (m oxi 80 (pc chl



APPROVED Nature's Way® Alive!® Men's 50+ Ultra Potency  Dist. by Nature's Way Brands, LLC Men take 1 tablet daily, preferably with food.	✓	Heavy metals: ✓ Disintegration: ✓	$0.24/tablet $14.24/60 tablets Large tablet	1,350 mcg (50% as beta-carotene)	20 mg 90 mcg	203 mg 50 mcg (D3) (2,000 IU)	60 mg (N) (72.6 IU) 120 mcg (K1)	800 mcg DFE (837 mcg (6S)-5-Methyltetra-hydrofolate glucosamine salt (Quatrefolic®)) 40 mg NE (40 mg) (niacinamide)	Thiamin 20 mg, riboflavin 20 mg, biotin 33 mcg, pantothenic acid 20 mg. Choline 20 mg.	130 mg (from Aquamin® calcified mineral source Red Algae *Lithothamnion sp.* [whole plant], dicalcium phosphate) NA	55 (fr Aq cal mi so Alg *Lit* *sp.* pla ma oxi NA



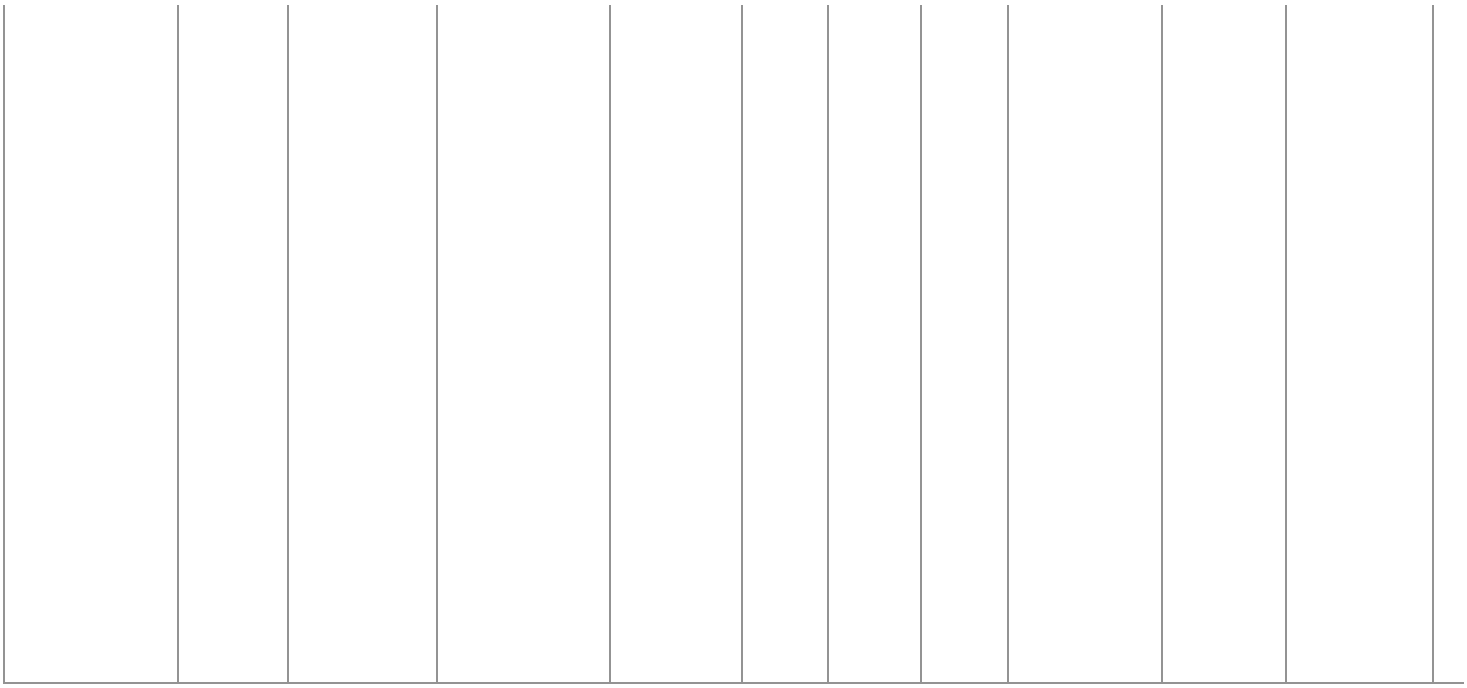


Diabetes (Adult) Products:

APPROVED Nature's Way® Alpha Betic®  Dist. by Nature's Way Brands, LLC Adults take 1 tablet daily in the morning, preferably with food.	✓	Heavy metals: ✓ Disintegration: ✓	$0.40/tablet $11.99/30 tablets Large tablet	1,500 mcg (as retinyl acetate)	21 mg 150 mcg	120 mg 10 mcg (D3) (400 IU)	40.2 mg (N) (48.6 IU) NA	400 mcg DFE (240 mcg folic acid) 32 mg NE (32 mg) (niacin)	Thiamin 30 mg, riboflavin 30 mg, biotin 300 mcg, pantothenic acid 20 mg	NA NA	15 (m oxi 75 (pc chl

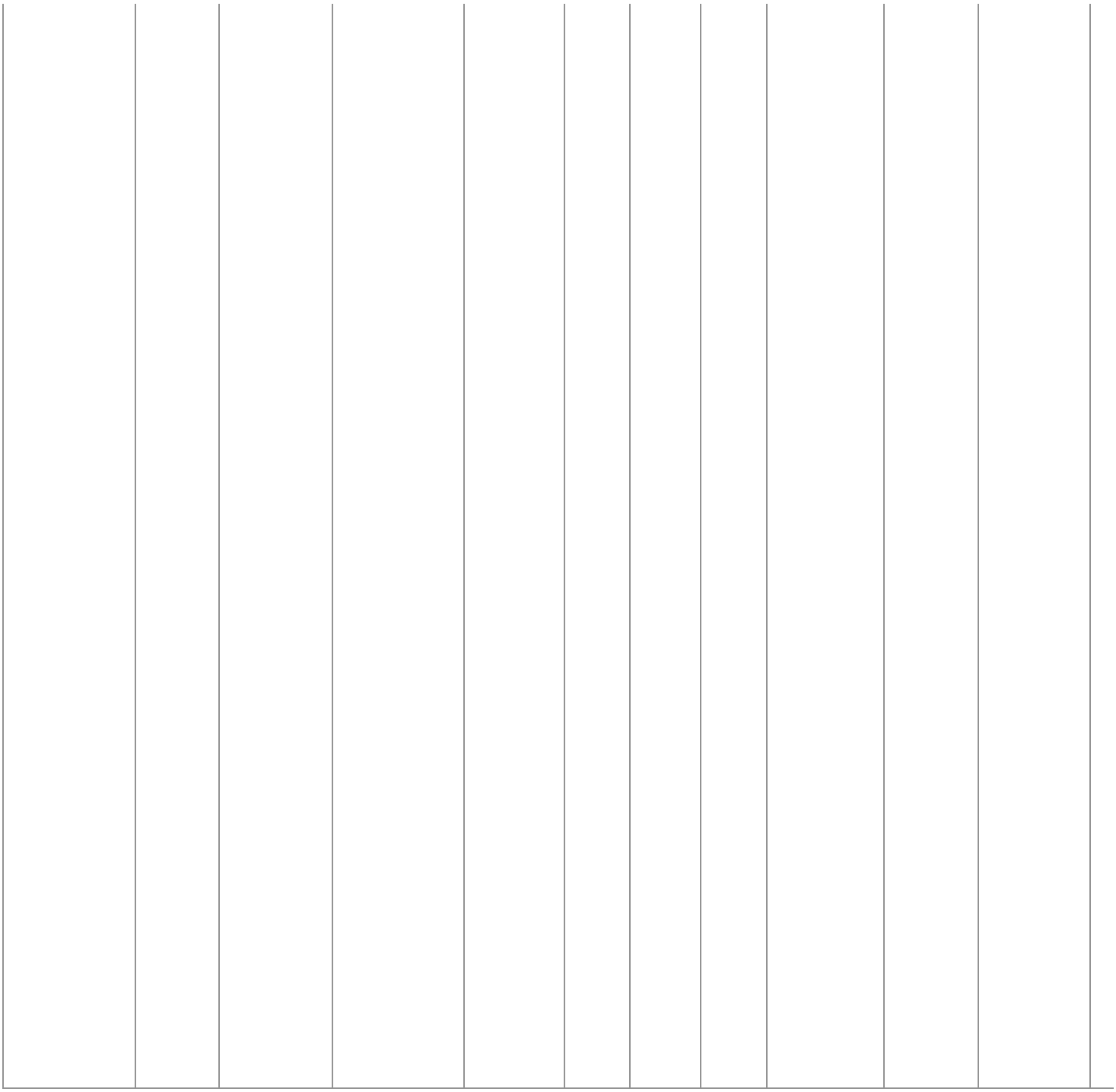
Children's Products:											

APPROVED Top Pick for Children's Bayer Flintstones™ Complete  Dist. by Bayer HealthCare LLC Under adult supervision should be fully chewed or crushed. Children 2 & 3 years of age: Fully chew one-half tablet daily, with food. Adults and children 4 years of age and older: Fully chew one tablet daily, with food.	✓	Heavy metals: ✓ Disintegration:	$0.15/chewable tablet $8.99/60 chewable tablets Large chewable tablet	200 mcg - 400 mcg (10% as beta-carotene)	0.85 mg - 1.7 mg 1.2 mcg - 2.4 mcg	45 mg - 90 mg 10 mcg - 20 mcg (D3) (400 IU -800 IU)	3.75 mg - 7.5 mg (S) (3.75 IU - 7.5 IU) 30 mcg - 60 mcg (K1)	200 mcg DFE - 400 mcg DFE (120 mcg - 240 mcg folic acid) 6 mg NE - 12 mg NE (6 mg - 12 mg) (niacinamide)	Thiamin 0.6 mg - 1.2 mg, riboflavin 0.65 mg - 1.3 mg, biotin 15 mcg - 30 mcg, pantothenic acid 2.5 mg - 5 mg	70 mg - 140 mg (calcium carbonate) 5 mg - 10 mg (ferrous sulfate)	NA NA

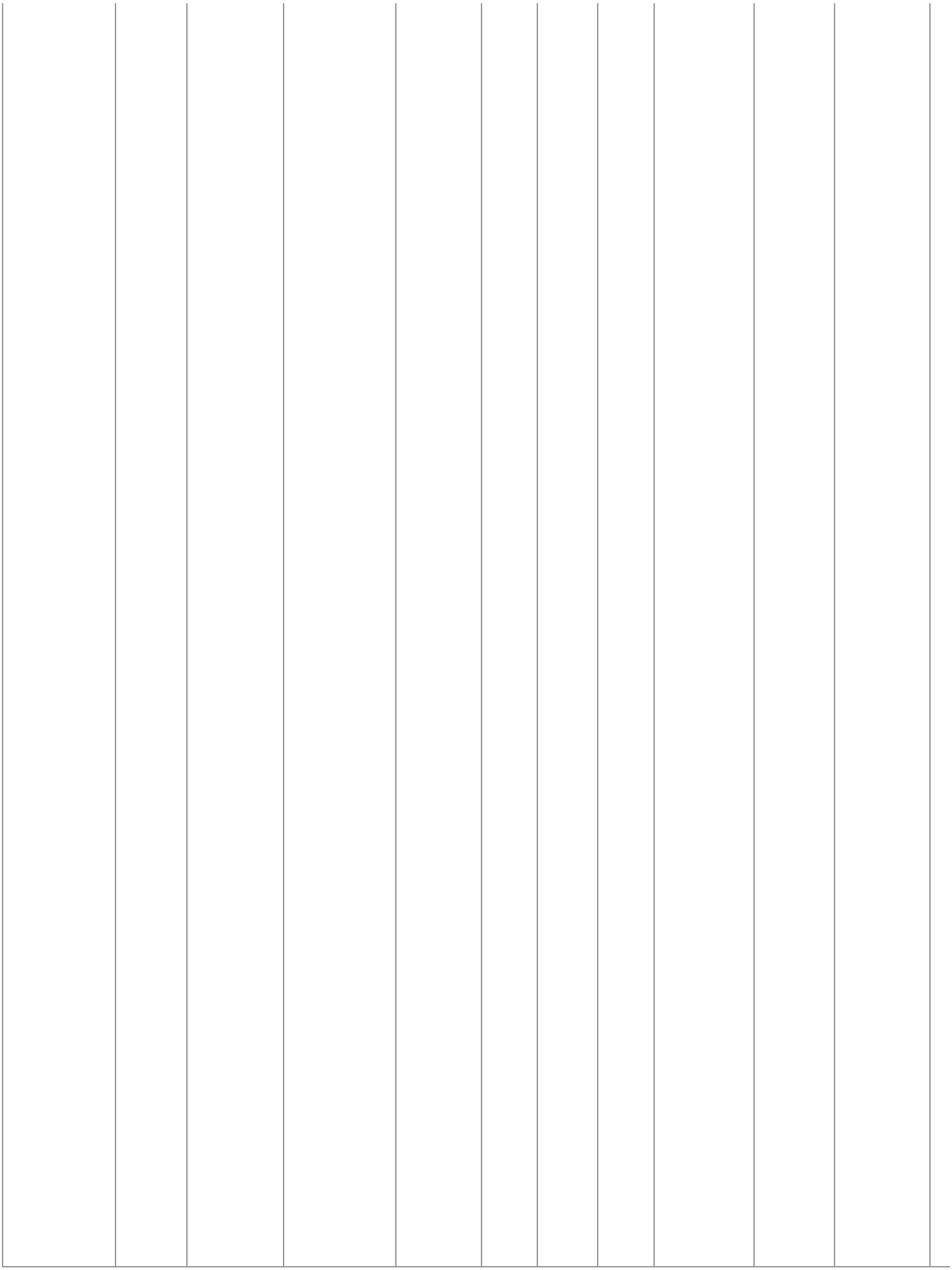


NOT APPROVED Olly® Kids Multi - Gummy Worms - A Peppy Punch of Orange and Strawberry  Dist. by Olly Public Benefit Corp. Ages 2-3, take 1 gummy daily. Ages 4+, take 2 gummies daily. Chew thoroughly before swallowing.	Found 190.4% folate	Heavy metals: Disintegration:	$0.18/gummy worm $12.88/70 gummy worms Very large gummy worm	150 mcg - 300 mcg (as retinyl palmitate)	0.5 mg - 1 mg 1.2 mcg - 2.4 mcg	15 mg - 30 mg 10 mcg - 20 mcg (D3) (400 IU - 800 IU)	3.75 mg - 7.5 mg (N) (5.1 IU - 10.2 IU) NA	100 mcg DFE - 200 mcg DFE (60 mcg - 120 mcg folic acid) Found 190.4 - 380.8 mcg DFE (190.4% of listed amount), from 112 - 224 mcg folic acid NA	Biotin 15 mcg - 30 mcg, pantothenic acid 2.5 mg - 5 mg. Choline 5 mg - 10 mg.	NA NA	NA NA
Pet Products:											

APPROVED Top Pick for Pets - Cats Healthy Promise™ Multi-Vitamin - Savory Chicken Flavor - Cat  Dist. by Four Paws Products, Ltd. Up to 10 lb: 1 Soft Chew Daily; 11 - 30 lbs: 2 Soft Chews Daily.	✓	Heavy metals: ✓ Disintegration:	$0.15/soft chew $17.96/120 soft chews Medium soft chew	30 mcg RAE - 60 mcg RAE (100 IU - 200 IU) (as vitamin A supplement)	0.8 mg - 1.6 mg 6 mcg - 12 mcg	NA 0.625 mcg - 1.25 mcg (D3) (25 IU -50 IU)	5 mg - 10 mg (S) (5 IU - 10 IU) NA	17 mcg DFE - 34 mcg DFE (10 mcg - 20 mcg folic acid) 2 mg NE - 4 mg NE (2 mg - 4 mg) (niacinamide)	Thiamin 1 mg - 2 mg, riboflavin 0.1 mg - 0.2 mg, pantothenic acid 1 mg - 2 mg	6.1 mg - 12.2 mg (minimum) 15.8 mg - 31.7 mg (maximum) (dicalcium phosphate) 0.5 mg - 1 mg (ferrous fumarate)	0.4 mg (m sul 0.1 mg (pc ioc



APPROVED Top Pick for Pets - Dogs Pet Honesty 10-For-1 Multivitamin - Flavor: Chicken - Dog  Dist. by Pet Honesty Give 1 chew daily per approx. 25-35 lbs of weight. Give with food. 1-25 lbs: 1 chew; 26-75 lbs: 2 chews; >75 lbs: 3 chews.	✓	Heavy metals: ✓ Disintegration:	$0.30/soft chew $26.99/90 soft chews Large soft chew	330 mcg RAE - 990 mcg RAE (1,100 IU - 3,300 IU) (as vitamin A supplement)	NA NA	24 mg - 72 mg 1.9 mcg - 5.6 mcg (D3) (75 IU - 225 IU)	5 mg - 15 mg (S) (5 IU - 15 IU) NA	NA 11 mg NE - 33 mg NE (11 mg - 33 mg) (niacin supplement)	Thiamin 0.5 mg - 1.5 mg	NA NA	NA NA



↴ *NOT* APPROVED ↳ Pet-Tabs® - Dog  Dist. by Zoetis Inc. Puppies and dogs under 10 lb - 1/2 tablet daily. Dogs over 10 lbs - 1 tablet daily.	Found only 13.8% vitamin D3	Heavy metals: ✓ Disintegration:	$0.23/chewable tablet $41.85/180 chewable tablets Large chewable tablet	150 mcg RAE - 300 mcg RAE (500 IU - 1,000 IU) (as retinyl acetate)	0.05 mg - 0.1 mg 0.25 mcg - 0.5 mcg	NA 12.5 mcg - 25 mcg (D3) (500 IU -1,000 IU) Found only 1.7 - 3.4 mcg (68.9 - 137.9 IU) (13.8% of listed amount)	1 mg - 2 mg (S) (1 IU - 2 IU) NA	NA 5 mg NE - 10 mg NE (5 mg - 10 mg) (niacinamide)	Thiamin 0.405 mg - 0.81 mg, riboflavin 0.5 mg - 1 mg	38.8 mg - 77.6 mg (minimum) 54.3 mg - 108.6 mg (maximum) (dicalcium phosphate) 1.5 mg - 3 mg (iron proteinate)	2.3 mg (m ste 6.2 mg (di ph

Products tested in 2023, 2024 and 2025

ConsumerTips™:

Choosing the right amounts of vitamins and minerals:

In addition to product quality, a critical issue with multivitamin/multimineral products is choosing the formula that's right for you or your family members. Here's a useful, although far from comprehensive, guide to the ingredients often found in multis. As required by the FDA, dietary supplements must list the percent of the Daily Value for certain vitamins and minerals. But as previously discussed, Daily Values (DVs) can be misleading. The numbers that consumers really should know are the Recommended Dietary Allowances (RDAs), Adequate Intakes (AIs), and the Tolerable Upper Intake Levels (ULs). These values (RDAs, AIs, and ULs) are collectively known as Dietary Reference Intakes (DRIs) and are established by the Institute of Medicine of the National Academies. A **Recommended Dietary Allowance (RDA)** is the average daily dietary intake level that is thought to be sufficient to meet the nutrient requirement of nearly all healthy individuals in a particular life stage and gender. An **Adequate Intake (AI)** is an approximation used when there is not sufficient information to develop an RDA. A **Tolerable Upper Intake Level (UL)** is the highest level of daily intake of a nutrient that is likely to pose no risk of adverse health effects for most people. As intake increases above the UL, the risk of adverse effects may increase. Like the RDAs and AIs, the ULs vary according to one's age and gender. Individuals are advised not to regularly exceed the UL without a doctor's advice and supervision.

Keep in mind that 1,000 mcg (*micro*grams) is the same as 1 mg (*milli*gram), and 1,000 mg equals 1 gram. IU stands for International Units and is used for certain ingredients measured by their activity rather than weight.

Vitamins and minerals have many important functions in the body, but that doesn't necessarily mean that a multi will deliver immediate health benefits. For example, vitamin A is necessary for vision, but if you are not severely vitamin A deficient, taking more vitamin A will not help you see any better. Since few people today are severely deficient in any nutrient, the actual benefits of multivitamins are generally subtle.

Many people take megadoses of vitamins or minerals that go far beyond what the body needs for normal functioning. This may or may not be justified. For more detailed information about dosage, see the links to Reviews of specific vitamins and minerals.

You may also use our quick reference chart showing RDAs and ULs for vitamins and minerals.

Avoiding nausea:

Some people may experience nausea after taking a multivitamin. Mineral ingredients such as iron or zinc can cause stomach upset or nausea in some people, so consider taking a multivitamin that does not contain these ingredients if you experience these symptoms. If you need supplemental iron, look for a multivitamin that provides a form of iron less likely to cause stomach upset, or take a separate iron supplement that provides one of these forms. Taking your multivitamin with food can also help to reduce the risk of nausea.

Also, be aware that excessive doses of certain vitamins and minerals, including vitamin B-3 (niacin), vitamin A and vitamin D, magnesium and copper can cause nausea or other gastrointestinal symptoms. Be sure you are not getting too much of these vitamins and minerals from your multivitamin or other supplements you may be taking (see Recommended Daily Intakes and Upper Limits for specific vitamins and minerals).

Taking a multivitamin that contains citrus bioflavonoids may also increase the risk of nausea and/or vomiting in a small percentage of women, particularly those taking oral contraceptives or hormonal replacement therapy, possibly by causing an increase in estrogen levels due to an enzyme interaction (which may also affect drugs such as calcium channel blockers and benzodiazepines). When 50 mg of citrus bioflavonoids was added to a multivitamin taken daily by 88,000 women participating in a national weight loss program in the U.S., reports of nausea and/or vomiting increased from just 2 women to 166 women (Greenway, Am J Ther 2011). Be aware that about half of multivitamins contain citrus bioflavonoids. If this is of concern, you can check the last column of the results table above to see which contain them.

Special formulations:

Some multis are **"timed-release"** or **"extended-release" formulations**, possibly to reduce gastrointestinal disturbance or provide more persistent blood levels of certain ingredients. However, applying such a formulation to a wide range of ingredients does not seem prudent, and delaying release of some ingredients could potentially reduce their overall absorption. In most cases, it is unlikely that the benefits and risks of such formulations have been clinically evaluated.

A clinical study of a single dose of a **liposomal multivitamin** (*Solaray Liposomal Multivitamin Universal* by Nutraceutical Corp, which funded the study) taken after consuming a granola snack did not significantly increase the overall absorption of any of vitamins or minerals compared to a similar, non-liposomal multivitamin. The formulation did, however, seem to slow the absorption of iron and magnesium (Ko, Nutrients 2023).

Dark "spots" on multis: Should you be concerned?

Dark "spots" have been reported on some multivitamin supplements including *Deva Prenatal One Daily* and *Flintstones Complete* (chewable tablets). Despite concern that these may be "mold," this discoloration is more likely to be "spots" of ingredients such as iron and vitamin C that have become oxidized after an opened bottle has not been properly stored. The spots are most apparent in light-colored tablets or clear capsules and less apparent in pills that are speckled, dark, or opaque. Although unlikely to be a safety issue, spots due to oxidation of ingredients could affect potency and efficacy, so it is best to discard such products. To prevent these spots, multivitamins should always be stored in a cool, dry place.

Vitamins:

- **Vitamin A** is necessary to maintain good vision and skin. In supplements, "Vitamin A" usually refers to retinol (including retinyl palmitate and retinyl acetate) as well as beta-carotene. Retinol is found in animal sources such as dairy foods and liver. Beta-carotene comes from fruits and vegetables such as carrots and spinach. It is thought that beta-carotene is converted in the body into vitamin A based on the body's needs and, therefore, may be a safer source of the nutrient. While supplement labels generally combine beta-carotene and retinol in calculating their vitamin A content, many will also note the percent of vitamin A that is contributed by beta-carotene.
    - Be aware that the amount of vitamin A in supplements is usually shown in IUs. Labels may alternatively (and actually more correctly) list their vitamin A content in micrograms (shown as mcg). The microgram equivalent of one IU of vitamin A depends upon the form of vitamin A. For the "retinol" form, 0.3 mcg equals 1 IU. For the "retinyl acetate" form, 3.44 mcg equals 1 IU. For the "retinyl palmitate" form, 0.55 micrograms equals 1 IU.
    - The RDA for vitamin A is 1,000 IU for children 1 to 3 years old, 1,333 IU for those 4 to 8, and 2,000 IU for those 9 to 13. For males 14 years and up, the RDA is 3,000 IU. For females 14 years and older, 2,333 IU is recommended. These amounts can be obtained from the food sources mentioned above.
    - Too much vitamin A can be a problem. The most important risk involves pregnant women. Vitamin A given in modestly excessive doses can cause birth defects. Much higher doses of vitamin A can potentially damage the liver, central nervous system, bone and skin. The UL for daily intake should not exceed 2,000 IU for children 1 to 3 years old, 3,000 IU for those 4 to 8, 5,666 IU for those 9 to 13, 9,333 IU for those 14 to 18, and 10,000 IU for adults. To minimize the risk of birth defects such as cleft palate, heart defects, and hydrocephalus, the March of Dimes recommends that a pregnant woman should not use a multivitamin or prenatal supplement that contains more than 5,000 IU of preformed vitamin A. It also advises that a pregnant woman should not take any vitamin A supplements beyond that amount and minimize consumption of liver, which contains preformed vitamin A. However, these ULs apply only to vitamin A consumed from supplements, fortified foods, and animal sources, and do not include vitamin A as beta-carotene or intake from fruits and vegetables.
    - One must be aware that some products, especially those designed for a broad range of individuals, may exceed the ULs for certain subgroups. For example, a multivitamin for "children" may be appropriate for older children but exceed ULs for younger children. (See ConsumerLab.com's Vitamin A Supplements Review for more information.)

- **B Vitamins:** For detailed information about each vitamin, click on links below to sections of ConsumerLab.com's B Vitamin Supplements Review.
    - **Thiamin (Thiamine or B-1)**
    - **Riboflavin (B-2)**
    - **Niacin (Nicotinic acid or B-3)**
    - **Pantothenic Acid (B-5)**
    - **Pyridoxine (Pyridoxal-5-phosphate, P-5-P, or B-6)**
    - **Biotin (B-7)**
    - **Folate (Folic Acid, Folacin, Metafolin, Quatrefolic, or B-9)**
    - **Cobalamin (B-12)**

- **Vitamin C (ascorbic acid)** is required for healthy blood vessel walls, gums, and bones. It is also a strong antioxidant. Vitamin C is found in many vegetables, such as broccoli and Brussels sprouts, as well as citrus and other fruits, so a healthful diet should allow one to meet the RDA. The RDA is 15 mg for children 1 to 3, 25 mg for those 4 to 8, and 45 mg for those 9 to 13. For males 14 to 18 the RDA is 75 mg, and it is 90 mg for those ages 19 and higher. For females 14 to 18 the RDA is 65 mg, and it is 75 mg for those ages 19 and higher. However, the RDA for pregnant women 18 years and younger is 80 mg and 85 mg if 19 or older, and the RDA for lactating women 18 years and younger is 115 mg and 120 mg if 19 or older. Too much vitamin C can cause diarrhea and other gastric disturbances. It may also increase the risk of cataracts and blunt some of the beneficial effects of endurance exercise. The UL for vitamin C is 400 mg for children 1 to 3, 650 mg for those 4 to 8, 1,200 mg for those 9 to 13, 1,800 mg for those 14 to 18, and 2,000 mg for individuals 19 years and older. Dosages of vitamin C far above nutritional needs have been recommended for a great many illnesses, including the common cold, but the benefits of megadoses are largely unproven and controversial. See ConsumerLab.com's Vitamin C Supplements Review for more information.

- **Vitamin D (cholecalciferol)** helps the body absorb calcium to promote strong bones and teeth. It can be obtained in sufficient amounts from fortified milks and foods and from exposure to sunlight. However, people who live in northern climates may easily become vitamin D deficient during the winter, especially if they are dark-skinned. Also, increased concern about skin cancer has caused people to avoid the sun, and this creates a potential risk of reduced vitamin D. There is some evidence that inadequate vitamin D intake can lead to increased risk for heart attack, depression, Parkinson disease, rheumatoid arthritis, falls and fracture, influenza A, and death from certain cancers. Vitamin D is measured as micrograms of cholecalciferol or in International Units (IUs) of vitamin D activity. One microgram equals 40 IU. The RDAs for vitamin D intake are based on amounts required for bone health and are 600 IU for individuals ages 1 to 70 and 800 IU for those aged 71 and older. For infants up to 1 year old, an Adequate Intake (AI) level of 400 IU is recommended but is only relevant if an individual is not getting adequate exposure to sunlight. Excessive intake of vitamin D as a supplement can potentially result in hypercalcemia (too much calcium in the blood) with symptoms including constipation, confusion, weakness, loss of appetite and painful calcium deposit. Taking too much during pregnancy can cause abnormalities in the fetus. There is also concern that blood levels of vitamin D that are too high may actually increase the risk of adverse events (including overall mortality, some cancers, cardiovascular disease, and fractures and falls). The ULs are 1,000 IU for infants up to 6 months, 1,500 IU for infants 6 months to 12 months, 2,500 IU for children 1 to 3 years, 3,000 for children 4 to 8 years, and 4,000 IU for all other people. (See ConsumerLab.com's Vitamin D Supplements Review for more information.)

- **Vitamin E (tocopherol)** is an antioxidant. Most diets provide enough vitamin E to meet RDAs as it is easily obtained from food sources such as nuts, seeds, whole grains, vegetable oils, and the fatty part of meats. For a time, megadoses of this nutrient (much higher than could be reasonably obtained through diet) were widely recommended in the belief that it would help prevent cancer and cardiovascular disease. Unfortunately, accumulating evidence has largely dashed this hope, at least regarding the most common form of vitamin E supplements (alpha tocopherol, whether synthetic or natural). There is still some possibility that high dosages of vitamin E may reduce risk of prostate cancer, or that other forms of vitamin E, such as gamma tocopherol, might offer benefits not seen with vitamin E supplements. High-dose vitamin E has also shown promise for slowing the progression of Alzheimer's disease and enhancing the immune response to vaccinations in seniors. There are literally hundreds of other proposed uses of high dose vitamin E, but they generally lack strong scientific support. Vitamin E is measured as IUs of vitamin E activity or, more recently, in milligrams of active alpha-tocopherol. Most supplements are still labeled using IUs. Complicating matters a bit, the conversion factor between IUs and milligrams differs for natural vitamin E versus synthetic vitamin E. Most multis contain synthetic vitamin E, for which the conversion rate is 1 IU for each 0.45 mg of active alpha-tocopherol. The conversion rate for natural vitamin E is 1 IU for each 0.67 mg of active alpha-tocopherol.

  The RDA for vitamin E as active alpha tocopherol for children 1 to 3 is 6 mg (13 IU synthetic or 9 IU natural), for those 4 to 8 it is 7 mg (16 IU synthetic or 10 IU natural), and for those 9 to 13 it is 11 mg (24 IU synthetic or 16 IU natural). The RDA for individuals ages 14 and older is 15 mg (33 IU synthetic or 22 IU natural). However, the RDA for lactating women is 19 mg (42 IU synthetic or 28 IU natural). There are some concerns that high doses of vitamin E may impair platelet activity and lead to increased risk of bleeding. This risk would be expected to increase if high doses of vitamin E were combined with drugs that impair clotting. High doses may also blunt some of the beneficial effects of endurance exercise. The ULs for vitamin E apply only to that consumed from supplements and fortified foods and are as follows: for children 1 to 3 it is 200 mg, for children 4 to 8 it is 300 mg, for those 9 to 13 it is 600 mg, and for those 14 to 18 it is 800 mg. The UL for individuals 19 and older is 1,000 mg. One must also be aware that the 1,000 mg per day adult UL translates into about 1,500 IU of natural vitamin E, but only 1,100 IU of synthetic vitamin E because both the active and inactive forms of alpha-tocopherol found in synthetic vitamin E may contribute to this effect on blood clotting. The ULs therefore translate approximately into the following IU amounts: for children 1 to 3 the UL is 220 IU synthetic or 300 IU natural, for those 4 to 8 it is 330 IU synthetic or 450 IU natural, for those 9 to 13 it is 660 IU synthetic or 900 IU natural, and for those 14 to 18 it is 880 IU synthetic or 1,200 IU natural. (See ConsumerLab.com's Vitamin E Supplements Review for more information.)

- **Vitamin K** plays a central role in blood clotting as well as bone formation. Foods, such as green leafy vegetables, can provide sufficient amounts, and intestinal bacteria also produce vitamin K. True deficiency is rare; however, there is some evidence that vitamin K supplements at doses higher than nutritional needs may help fight osteoporosis. The AI (Adequate Intake) of vitamin K is measured in micrograms (shown as mcg). The AI is 30 mcg for children ages 1 to 3, 55 mcg for children 4 to 8, 60 mcg for those ages 9 to 13, and 75 mcg for those ages 14 to 18. For males 19 years and older, it is 120 mcg. For females 19 years and older, it is 90 mcg. There is no UL established for vitamin K. (See ConsumerLab.com's Vitamin K Supplements Review for more information.)

Minerals and Other Ingredients:

- **Calcium** is critical for strong bones and teeth. But because calcium is very bulky, most multis do not contain the total recommended daily intake amount in a pill. Consequently, people should consider getting their calcium from a separate calcium supplement or fortified food or beverage. The RDA for calcium is 700 mg for children 1 to 3, 1,000 mg for children 4 to 8, and 1,300 mg for children 9 to 18. For adults aged 19 to 50, it is 1,000 mg. For those 51 years and older it is 1,200 mg per day. The UL for calcium is 2,500 mg per day for most people 1 year and over but 3,000 mg for those ages 8 to 18 and 2,000 mg for those over 50. (IOM, 2011). Excessive use of calcium supplements might raise the risk of kidney and bladder stones. (See ConsumerLab.com's Calcium Supplements Review for more information.) Be aware that high doses of calcium can interfere with the absorption of iron (see "Iron" below).

- **Chromium** plays a role in the body's regulation of blood sugar. Chromium is found in liver and whole-wheat products. Some people might have a slight deficiency of chromium. Chromium supplementation (especially in doses considerably above nutritional needs) has shown some promise for helping to regulate blood sugar levels in people with type 2 diabetes. Chromium is also sold as a weight-loss aid, but there is little evidence that it really works. AIs for chromium are measured in micrograms (shown as mcg) and are 11 mcg for children ages 1 to 3, and 15 mcg for children ages 4 to 8. For boys ages 9 to 13, it is 25 mcg, while for girls it is 21 mcg. For males ages 14 to 50 it is 35 mcg. For females ages 14 to 18 it is 24 mcg, rising to 25 mcg for those ages 19 to 50. For men 51 years and older it is 30 mcg, and for women aged 51 and older it is 20 mcg. Women who are pregnant need more 29 mcg if 18 or younger and 30 mcg if 19 and older, while lactating women need 44 mcg if 18 or younger and 45 mcg if 19 or older. There is no UL established for chromium, but there are concerns that excessive intake could cause kidney and other organ damage in certain susceptible people. (See ConsumerLab.com's Chromium Supplements Review for more information.)

- **Copper** is necessary for proper development of connective tissue, nerve coverings, and skin pigment. Copper is found in foods such as oysters (4,850 mcg per 3 oz.), shiitake mushrooms (650 mcg per ½ cup) sunflower seeds (614 mcg per ¼ cup), 70% - 85% cacao dark chocolate (501 mcg per oz.), wild-caught salmon (273 mcg per 3 oz), and avocado (219 mcg per ½ raw fruit) (NIH 2021) and can be obtained in sufficient quantity from a good diet. People who take zinc supplements, particularly at high doses or for long periods of time, may need to take extra copper (see our Zinc Supplements and Lozenges Review for more information). Copper in supplements may be shown in milligrams (mg) or micrograms (mcg). One milligram is equal to 1,000 micrograms. The RDAs are: 340 mcg for children ages 1 to 3, 440 mcg for children ages 4 to 8, 700 mcg for those ages 9 to 13, 890 mcg for those 14 to 18. For people over 19 years of age, the RDA is 900 mcg. For women who are pregnant the RDA is 1,000 mcg, while for lactating women it is 1,300 mcg. Excessive consumption of copper may cause nausea and liver damage.

  The daily upper limits for copper are 1,000 mcg for children ages 1 to 3, 3,000 mcg for those 4 to 8, 5,000 mcg for those 9 to 13, 8,000 mcg for those 14 to 18, and 10,000 mcg for people 19 years and older. Interestingly, the European Food Safety Authority in 2023 cut by more than half the acceptable daily intake for copper, which had been similar to those in the U.S., lowering it 70 mcg per kilogram of body weight (about 5,000 mcg per day for a person weighing 155 lbs). The reduction was based on evidence that copper intakes of 6,000 to 8,000 mcg daily could cause excess copper retention in the liver (causing progressive liver damage) and, possibly, neurological symptoms (EFSA Scientific Committee, EFSA J 2023). Keep in mind that all of the multivitamins tested in this Review contained 2,200 mcg or less of copper, which remains below the European limit for anyone weighing at least 70 lbs.

  People with Wilson's disease, a disorder that causes excessive copper to build up in the body's tissues, may be advised to avoid foods high in copper or supplements containing copper (NIDDK 2018). Some experts have recommended that people at risk for Alzheimer's disease consider avoiding copper-containing multivitamins, due to limited evidence that copper from supplements (but not from food) may contribute to cognitive decline and increase Alzheimer's disease risk (Barnard, Neurobiol Aging 2014). For example, an observational study found an association between excess copper intake (about 2,750 mcg per day) and accelerated mental decline, but there was no association between cognitive

decline and copper intake *from food only*, and the link was significant *only among those who also consumed a high-fat diet* (Morris, Arch Neurol 2006). Copper has been identified in amyloid plaques in people with Alzheimer's disease (Everett, Sci Adv 2021), and laboratory studies have shown that copper can bind to amyloid proteins, causing them to aggregate and increase oxidative stress, which may contribute to neurotoxicity (Opazo, J Biol Chem 2002). On the other hand, a small clinical study among 68 people with Alzheimer's disease found that taking 8,000 mcg of copper as copper-(II)-orotate-dihydrate once daily for 12 months did *not* affect cognitive decline compared to placebo despite copper supplementation increasing blood levels of copper (Kessler, J Neural Transm (Vienna) 2008).

Animal studies have shown that one form of copper called copper (or cupric) oxide may not be well absorbed. Other forms, such as copper sulfate, cupric acetate, and alkaline copper carbonate, may, therefore, be preferable. Copper oxide is common in supplements (including some that have "passed" CL's testing) because it is less bulky and allows for smaller pills.

- **Iodine** is needed for making thyroid hormones, and iodine deficiency causes hypothyroidism (low thyroid activity). Interestingly, too much iodine can also cause hypothyroidism. Iodine is found in seaweed (232 mcg in 10 grams, dried) , seafood (150 mcg in 3 oz. of baked cod, 93 mcg in 3 cooked oysters), yogurt (116 mcg in 1 cup plain, nonfat Greek yogurt), milk (85 mcg in one cup, nonfat) and eggs (26 mcg in 1 hardboiled egg) (USDA 2020). Most table salt is iodized, representing a good dietary source of iodine. However, while iodized salt has helped make iodine deficiency less common in the developed world, the salt in processed foods is generally not iodized. Specialty salts, such as Himalayan salt, are also typically not iodized. The RDAs for iodine are given in micrograms and are: 90 mcg for children ages 1 to 8, and 120 mcg for children ages 9 to 13. For both males and females ages 14 and older, the RDA is 150 mcg. However, for pregnant women it is 220 mcg, and for lactating women it is 290 mcg. ULs for iodine are 200 mcg for children ages 1 to 3, 300 mcg for those 4 to 8, 600 mcg for those 9 to 13, 900 mcg for those 14 to 18, and 1,100 mcg for all people 19 years and older.

  Following a "Paleo" diet may result in mild iodine deficiency, as it excludes table salt and dairy products. A study found that six months of this diet resulted in a mild iodine deficiency, although thyroid hormone levels were essentially stable. Iodine (as found in some multivitamins in this Review and kelp supplements) supplementation should be considered with this diet (Manousou, Eur J Clin Nutr 2017), and for people following a vegan diet or mainly plant protein-based diet who do not use iodized table salt or another iodine source (see **Protein Supplements Review** for details).

  Too much iodine intake during pregnancy can cause problems in infants, but so can too little. Three cases were reported of infants born with congenital hypothyroidism apparently due to their mothers having taken the high potency iodine supplement *Iodoral* (Optimox, Corp.) which contains 12.5 mg (12,500 mcg) of iodine/iodide per tablet - more than 11 times the UL and nearly 57 times the RDA for iodine for pregnant women (Connelly, J Pediatr 2012). Congenital hypothyroidism has also been reported in infants born to mothers taking an herbal supplement high in iodine-containing kelp (Stagi, Horm Res Paediatr 2010). On the other hand, iodine deficiency can interfere with normal brain development in offspring. There is growing concern about inadequate iodine intake among pregnant and breastfeeding women in the U.S. due to increased use of processed foods in which salt is not iodized. Approximately one-third of pregnant women in the U.S. are marginally iodine deficient. In May 2014, the American Academy of Pediatrics issued a policy statement advising pregnant women to take an iodine-containing supplement providing 150 mcg of elemental iodine (from 197 mcg of potassium iodide).

  In the UK and Australia, observational studies have reported decreased IQ scores and poorer educational outcomes in children 9 years of age whose mothers were mildly deficient during pregnancy (Hynes, J Clin Endocrinol Metab 2013; Bath, Lancet 2013). An analysis by researchers in the UK noted that mild iodine deficiency is also quite common there, and estimated that if all women in the UK took supplemental iodine while pregnant, it would result in an increase of 1.22 IQ points per child, potentially leading to better educational achievement as well as lower health care costs (Monahan, Lancet Diabetes & Endocrinol 2015).

  Excessive iodine intake can cause rash, acne, and other skin reactions in sensitive individuals (see the Concerns and Cautions section of the Kelp Supplements Review).

  (See the CL Answer about supplements promoted as "Nascent Iodine.")

- **Iron** deficiency is the leading cause of anemia. Deficiency is most common in menstruating woman and is also seen in some children and pregnant women. Adult men are seldom deficient in iron, and many multivitamins for adult men specifically leave out iron, because there are concerns that excess iron intake might increase risk of heart disease. Meat, poultry and fish are rich in iron. Dried fruits, grains and green leafy

vegetables are also good sources, although iron from plant sources is absorbed only half as well as that from animal sources. The RDA is 7 mg for children 1 to 3 years and 10 mg for those 4 to 8. It then falls to 8 mg for those 9 to 13. For males 14 to 18 it is 11 mg, and for those 19 years and older the RDA again falls to 8 mg. For females 14 to 18 it is 15 mg, and for those 19 to 50 it is 18 mg, falling to 8 mg for women ages 51 and higher. However, because of the needs of the fetus, the RDA for pregnant women is 27 mg. For lactating women 18 years old and younger, the RDA is 10 mg, or 9 mg for lactating women 19 and older. Also, post-menopausal women taking hormone replacement therapy may need more iron if the therapy causes periodic uterine bleeding. Oral contraceptives may reduce menstrual blood losses, so women taking them may need less daily iron. High daily amounts of iron can cause gastrointestinal distress, especially when consuming iron supplements on an empty stomach. The UL is 40 mg for children 13 years and younger, and 45 mg for all other people, although people who have undergone certain types of bariatric ("stomach-reducing") surgery may need to take 40 to 65 mg daily, and even higher doses may be needed to prevent iron deficiency anemia among these people (see **Iron Supplements Review**). However, these limits may be too high for people with hereditary hemochromatosis, who are at risk for accumulating harmful levels of iron. Taking calcium at doses of 300 mg or more can reduce absorption of iron from supplements and foods; if you tend to be deficient in iron, take calcium at least 2 hours apart from iron (See ConsumerLab.com's Iron Supplements Review for more information).

- **Magnesium** assists metabolism and the nervous system. There is some controversy regarding whether marginal magnesium deficiency is a rare or a common occurrence. Whole grains, nuts and beans are good sources of magnesium. The RDA is 80 mg for children 1 to 3, 130 mg for those 4 to 8, and 240 mg for those 9 to 13. For males 14 to 18 it is 410 mg, for those 19 to 30 it falls to 400 mg, and for those 31 years and older it is 420 mg. For females 14 to 18 it is 360 mg, for those 19 to 30 it falls to 310 mg, and for those 31 years and older it is 320 mg. However, for pregnant women it is 400 mg if they are 18 years or younger, 350 mg if 19 to 30, and 360 mg if 31 or older. For lactating women it is 360 mg if they are 18 years or younger, 310 mg if they are 19 to 30, and 320 mg if 31 or older. People with diabetes are thought to have an increased need for magnesium. Magnesium supplements around or above the levels of the ULs have shown some promise for the treatment of migraine headaches and high blood pressure, as well as for preventing kidney stones. Excessive magnesium intake can cause nausea and vomiting, low blood pressure, and muscle weakness. The UL for magnesium applies only to that consumed from supplements or other medication and is 65 mg for children 1 to 3 and 110 mg for those 4 to 8. For individuals 9 years and older the UL is 350 mg. (See ConsumerLab.com's Magnesium Supplements Review for more information.)

- **Manganese** is involved in bone formation and in the metabolism of glucose, carbohydrates and fats. Some observational research suggests that people with the highest (≥ 6.84 mcg/L) or lowest (≤ 4.21 mcg/L) blood levels of manganese may be at increased risk of **type 2 diabetes** compared to those with levels in the mid-range (4.21 to 6.84 mcg/L) (Shan, Environ Health Perspect 2016). However, it's not known if manganese supplementation helps prevent or treat type 2 diabetes.

  Observational research has found that people with **tinnitus** have a 47% greater risk of *regularly* experiencing it if blood levels of manganese are low (<7 mcg/L), although blood levels of manganese are *not* associated with having tinnitus itself (Narayanan, Am J Otolaryngol 2022). However, taking 8 mg of manganese daily (about four times the daily requirement) for 6 months was *not* found to be beneficial in study of 40 adults (average age 57) with tinnitus. Half of the participants took the manganese along with a product called ***Lipoflavonoid Plus*** while a control group took only *Lipoflavonoid Plus*. Furthermore, seven of the eight participants in the entire study who reported side effects — including nausea, vomiting, worsening of tinnitus, and shaking — were those who took the manganese. These side effects resolved when the supplements were discontinued. It is unclear if any of the participants in this study had low levels of manganese before treatment (Rojas-Roncancio, J Am Acad Audiol 2016).

  Manganese deficiency is very rare, and there are no known groups of people that are at increased risk of manganese deficiency. There are no established symptoms of manganese deficiency, although several reports suggest it may cause demineralization and poor growth in children; skin rashes, hair depigmentation, increased alkaline phosphatase (ALP) in men, and mood and altered mood and increased premenstrual pain in women (NIH 2021; Dietary Reference Intakes, National Academies Press 2001).

  Nuts such as hazelnuts (1.6 mg per oz), pecans (1.1 mg per oz), brown rice (1.1 mg per ½ cup, cooked) and other whole grains, legumes such as chickpeas (0.9 mg per ½ cup, cooked), and black tea (0.5 mg per 1 brewed cup), are rich sources of manganese and can provide adequate amounts. The daily AI for manganese is 1.2 mg for children 1 to 3 years and 1.5 mg for those 4 to 8. It is 1.9 mg for males 9 to 13, 2.2 mg for those 14 to 18, and 2.3 mg for those 19 years and older. For females 9 to 18, the level is 1.6 mg, increasing to 1.8 mg for those 19 years and older. Pregnant women need 2.0 mg per day and lactating women need 2.6 mg per day. Too much manganese may cause neurological side effects. The UL for manganese is 2 mg for children 1 to 3, 3 mg for children 4 to 8, 6 mg for children 9 to 13, and 9 mg for children 14 to 18. The

UL for adults 19 years and older is 11 mg. There is some indication that high manganese intake in drinking water is associated with neuromotor deficits similar to Parkinson's disease.

- **Molybdenum** is a constituent of various enzymes in the body that metabolize certain substances, like purines, as well as some drugs and toxins. Deficiency is very rare in the U.S. and has generally only been reported in people with a genetic mutation known as molybdenum cofactor deficiency and, in one case, in someone receiving long-term parenteral nutrition lacking molybdenum. In this case, tachycardia, tachypnea, headache, night blindness, and coma occurred but were resolved when molybdenum was given (Abumrad, Am J Clin Nutr 1981).

  Molybdenum can be obtained from legumes such as black-eyed peas (288 mcg per ½ cup), grain products (15 mcg in ½ cup of Cheerios or Shredded wheat cereal), yogurt (26 mcg per 1 cup plain, nonfat) and peanuts (11 mcg per 1 oz) in the diet (Hunt, J Am Diet Assoc 2001). RDAs for molybdenum are given in *micro*grams and are: 17 mcg for children 1 to 3 years, 22 mcg for those 4 to 8, 34 mcg for those 9 to 13, and 43 mcg for those 14 to 18. Individuals 19 years and older need 45 mcg per day, except woman who are pregnant or nursing should get 50 mcg per day. Extremely high intakes (10 to 20 *milli*grams per day) have been associated with gout-like symptoms and high blood levels of uric acid in people living in an area of Armenia with very high levels of molybdenum in the soil (Novotny, J Evid Compl Alt Med 2011). The UL for molybdenum is 300 mcg for children 1 to 3, 600 mcg for those 4 to 8, 1,100 mcg for those 9 to 13, 1,700 mcg for those 14 to 18, and 2,000 mcg for people 19 years and older.

- **Phosphorus** is an essential mineral and a component of bones, teeth, DNA, and cell membranes (in the form of phospholipids). Few people don't get enough phosphorus from their diets, as it is easily obtained from a wide variety of foods. The RDA is 460 mg for children 1 to 3, 500 mg for those 4 to 8, and 1,250 mg for those 9 to 18, and for those 19 and older, 700 mg. You can get these amounts from a combination of foods such as yogurt (245 mg per 6 oz. plain, low-fat), milk (226 mg per 1 cup, 2% fat), salmon (214 mg per 3 oz.), chicken breast (182 mg per 3 oz.), kidney beans (115 mg per ½ cup), peas (94 mg per ½ cup) and long-grain brown rice (102 mg per ½ cup). Almonds are also a good source, providing 650 mg per cup, dry roasted (USDA 2018).
- Nevertheless, **phosphorus deficiency (hypophosphatemia)** can occur in preterm infants, people with genetic phosphate regulation disorders, people with severe malnutrition, chronic alcoholism, diabetic ketoacidosis, sepsis, high levels of parathyroid hormone, and vitamin D deficiency (Sharma, StatPearls: Hypophosphatemia 2022; Liamis, QJM 2010). Prolonged, high intake of aluminum, calcium, or magnesium from food or supplements can also cause phosphorus deficiency, as these can bind to phosphate in the intestines, forming nonabsorbable salts (Heaney, J Am Coll Nutr 2002). Interestingly, *low* levels of magnesium or potassium in the blood can also cause low phosphate by increasing excretion of phosphorus by the kidneys. Drugs can also lower phosphate levels, including certain diuretics (e.g., thiazides, acetazolamide), bisphosphonates (e.g., pamidronate, zoledronate), certain anticancer drugs (e.g., ifosfamide, streptozocin, azacitidine, suramin, imatinib mesylate), tetracycline and aminoglycoside antibiotics, valproic acid, antiviral drugs (e.g., cidofovir, adefovir, tenofovir), high-dose estrogen or mestranol therapy, long-term use of the proton-pump inhibitor (PPI) pantoprazole, and overdoses of acetaminophen (Losurdo, J Clin Med 2023; Liamis, QJM 2010). People with low blood levels of phosphorus can be asymptomatic, but some people — particularly those with severe cases — may experience symptoms including anorexia, anemia, muscle weakness, bone pain and rickets, and increased risk of infection.
- On the other hand, people with chronic kidney disease (CKD) may have reduced ability to excrete phosphorus, leading to high blood levels of phosphate, which is associated with an increased risk of death and can negatively affect bone health and lead to calcified arteries (Moe, Adv Chronic Kidney Dis 2007). Consequently, people with chronic kidney disease often need to follow a low-phosphorus diet (Barreto, Kidney Int Rep 2019) and should take into account that fact that phosphorus is commonly added to multivitamins, either as an active ingredient (typically in doses ranging from 20 to 100 mg) or in smaller amounts as part of an excipient, such as dicalcium phosphate. The National Kidney Foundation provides a list of *herbal* supplement ingredients that can contain phosphorus.
- **Selenium** is used by the body in its antioxidant system. There is some preliminary evidence that selenium supplements may help prevent certain forms of cancer, but this benefit appears to be limited to those who are deficient in the mineral, and deficiency is thought to be relatively uncommon in the developed world. Foods containing selenium include nuts, wheat germ, whole wheat, and orange juice. The RDA is 20 mcg for children 1 to 3, 30 mcg for those 4 to 8, and 40 mcg for those 9 to 13. For individuals 14 and older the RDA is 55 mcg. However, the RDA for pregnant woman is 60 mcg and for nursing women it is 70 mcg per day. At very high doses selenium can cause hair loss and tissue damage. The UL for selenium is 90 mcg for children 1 to 3, 150 mcg for those 4 to 8, and 280 mcg for those 9 to 13. The UL for individuals 19 years and older is 400 mcg (See ConsumerLab.com's Selenium Supplements Review for more information).

- **Zinc** plays a role in brain function, wound healing, and sperm production. Many breakfast cereals are fortified with zinc and it is naturally abundant in red meats, certain seafood, and whole grains. However, mild zinc deficiency is thought to be fairly common. Zinc supplements at nutritional doses may enhance immunity in people who are extremely deficient in the mineral, such as seniors in nursing homes and people who live in developing countries. The RDA of zinc is 3 mg for children ages 1 to 3, 5 mg for those 4 to 8, and 8 mg for those 9 to 13. For males 14 and older the RDA is 11 mg. For females 14 to 18 it is 9 mg, while for those 19 years and older it is 8 mg per day. The RDA for pregnant women who are 18 years or younger is 13 mg, while it is 11 mg for pregnant women 19 years and older. For lactating women the RDAs are 14 mg if 18 years and younger or 12 mg if 19 years or older. High doses of zinc have shown promise for treatment of acne, macular degeneration and sickle cell disease. However, too much zinc can be toxic, and people have harmed themselves by taking large doses for these conditions. Excessive zinc impairs the absorption of copper and can cause copper deficiency, immune deficiency, heart problems and anemia. Weak evidence associates long-term zinc supplementation at high doses (over 100 mg per day) with an increased risk of prostate cancer.

  ULs for zinc are 7 mg for children ages 1 to 3, 12 mg for those 4 to 8, 23 mg for those 9 to 13, 34 mg for those 14 to 18, and 40 mg for individuals 19 years and older. NOTE: Zinc is widely used in the form of a lozenge or nasal spray to kill cold viruses. This use has no relationship to the effects of zinc taken as an oral supplement. (See ConsumerLab.com's Zinc Pills and Lozenges Review for more information).

+ 68 sources

back to top