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Forté White Paper

Forté Prenatal+™

Science-based, Advanced Nutritional Support for Mother and Baby During Pregnancy

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Providing Optimal Nutritional Support During Pregnancy

Maternal nutrition is essential for the health and wellness of both the expectant mother and the baby. The nutritional status of the mother before and during pregnancy may influence the course of the pregnancy, the development of the fetus, and the health of the child, even into adult life.[1]

Vitamins and minerals—referred to collectively as micronutrients—have significant influences on the health of the pregnant woman and the growing fetus.[2] A balanced diet that provides an adequate supply of micronutrients before and during pregnancy is essential. However, many women consume diets that are insufficient to meet the nutritional demands of pregnancy. Thus, safe and appropriate supplementation of key vitamins, minerals and trace elements may help to improve maternal and infant outcomes.

Key Vitamins Needed During Pregnancy

Vitamin A

Vitamin A is essential for cell growth and differentiation, as well as the normal formation and maintenance of the heart, lungs, kidneys and other organs.[3] During pregnancy, vitamin A plays an important role in healthy fetal development, including lung development and maturation.[4] In fact, the American Pediatrics Association considers vitamin A to be one of the most critical vitamins during pregnancy. Yet, a clinical study in pregnant women with short birth intervals or multiple births showed that nearly one-third had plasma retinol concentrations below 1.4 μmol/L, representing borderline insufficiency.

Pregnant women with lower vitamin A intakes are more likely to give birth to children with low birth weight.[5]

Two forms of vitamin A are available in the human diet:

- Preformed vitamin A (retinol and retinyl ester), which is found in foods from animal sources, including fish, meat and dairy products
- Provitamin A carotenoids (most importantly, β-carotene), which are found in orange and dark green vegetables and are converted into vitamin A in the body

1– Szostak-Wegierek D. Importance of proper nutrition before and during pregnancy. Med Wieku Rozwoj 2000;4(3 Suppl 1):77-88.
2– Black RE. Micronutrients in pregnancy. Br J Nutr 2001 May;87 Suppl 2:S193-S197.
3– National Institutes of Health, Office of Dietary Supplements. Vitamin A. Available at https://ods.od.nih.gov/factsheets/VitaminA-HealthProfessional/.
4– Strobel M, Tinz J, Biesalski H-K. The importance of β-carotene as a source of vitamin A with special regard to pregnant and breastfeeding women. Eur J Nutr 2007;46(Suppl 1):I/1-I/20.
5– Doyle W, et al. Inter-pregnancy folate and iron status of women in an inner-city population. Br J Nutr 2001;86:81-87.

Both forms of vitamin A must be metabolized intracellularly into the active forms of vitamin A—retinal and retinoic acid—in order to support important biological functions.[1,2]

The recommended dietary allowance of vitamin A, according to the Food and Nutrition Board at the Institute of Medicine of the National Academies, is 750-770 mcg retinol activity equivalents (RAE) for pregnant women. Although vitamin A and its provitamin carotenoid β-carotene are readily available in food, risk groups for low vitamin A supply do exist, including women with multiple births, short birth intervals, or low socioeconomic status. Pregnant women may need extra vitamin A for fetal growth and tissue maintenance, as well as for supporting their own metabolism.[3] Since the bioavailability of β-carotene from supplements is better than from food, dietary β-carotene supplements are the recommended form of supplementation.[4]

Figure 1. Recommended Dietary Allowances and Adequate Intakes During Pregnancy: Vitamins[4]

Life Stage Group	Vitamin A (μg/d)[a]	Vitamin C (mg/d)	Vitamin D (μg/d)[b,c]	Vitamin E (mg/d)[d]	Vitamin K (μg/d)	Thiamin (mg/d)	Riboflavin (mg/d)	Niacin (mg/d)[e]	Vitamin B_6 (mg/d)	Folate (μg/d)[f]	Vitamin B_{12} (μg/d)	Pantothenic Acid (mg/d)	Biotin (μg/d)	Choline (mg/d)[g]
Infants														
0 to 6 mo	400*	40*	10	4*	2.0*	0.2*	0.3*	2*	0.1*	65*	0.4*	1.7*	5*	125*
6 to 12 mo	500*	50*	10	5*	2.5*	0.3*	0.4*	4*	0.3*	80*	0.5*	1.8*	6*	150*
Children														
1–3 y	**300**	**15**	**15**	**6**	30*	**0.5**	**0.5**	**6**	**0.5**	**150**	**0.9**	2*	8*	200*
4–8 y	**400**	**25**	**15**	**7**	55*	**0.6**	**0.6**	**8**	**0.6**	**200**	**1.2**	3*	12*	250*
Males														
9–13 y	**600**	**45**	**15**	**11**	60*	**0.9**	**0.9**	**12**	**1.0**	**300**	**1.8**	4*	20*	375*
14–18 y	**900**	**75**	**15**	**15**	75*	**1.2**	**1.3**	**16**	**1.3**	**400**	**2.4**	5*	25*	550*
19–30 y	**900**	**90**	**15**	**15**	120*	**1.2**	**1.3**	**16**	**1.3**	**400**	**2.4**	5*	30*	550*
31–50 y	**900**	**90**	**15**	**15**	120*	**1.2**	**1.3**	**16**	**1.3**	**400**	**2.4**	5*	30*	550*
51–70 y	**900**	**90**	**15**	**15**	120*	**1.2**	**1.3**	**16**	**1.7**	**400**	**2.4**[h]	5*	30*	550*
> 70 y	**900**	**90**	**20**	**15**	120*	**1.2**	**1.3**	**16**	**1.7**	**400**	**2.4**[h]	5*	30*	550*
Females														
9–13 y	**600**	**45**	**15**	**11**	60*	**0.9**	**0.9**	**12**	**1.0**	**300**	**1.8**	4*	20*	375*
14–18 y	**700**	**65**	**15**	**15**	75*	**1.0**	**1.0**	**14**	**1.2**	**400**[i]	**2.4**	5*	25*	400*
19–30 y	**700**	**75**	**15**	**15**	90*	**1.1**	**1.1**	**14**	**1.3**	**400**[i]	**2.4**	5*	30*	425*
31–50 y	**700**	**75**	**15**	**15**	90*	**1.1**	**1.1**	**14**	**1.3**	**400**[i]	**2.4**	5*	30*	425*
51–70 y	**700**	**75**	**15**	**15**	90*	**1.1**	**1.1**	**14**	**1.5**	**400**	**2.4**[h]	5*	30*	425*
> 70 y	**700**	**75**	**20**	**15**	90*	**1.1**	**1.1**	**14**	**1.5**	**400**	**2.4**[h]	5*	30*	425*
Pregnancy														
14–18 y	**750**	**80**	**15**	**15**	75*	**1.4**	**1.4**	**18**	**1.9**	**600**[j]	**2.6**	6*	30*	450*
19–30 y	**770**	**85**	**15**	**15**	90*	**1.4**	**1.4**	**18**	**1.9**	**600**[j]	**2.6**	6*	30*	450*
31–50 y	**770**	**85**	**15**	**15**	90*	**1.4**	**1.4**	**18**	**1.9**	**600**[j]	**2.6**	6*	30*	450*
Lactation														
14–18 y	**1,200**	**115**	**15**	**19**	75*	**1.4**	**1.6**	**17**	**2.0**	**500**	**2.8**	7*	35*	550*
19–30 y	**1,300**	**120**	**15**	**19**	90*	**1.4**	**1.6**	**17**	**2.0**	**500**	**2.8**	7*	35*	550*
31–50 y	**1,300**	**120**	**15**	**19**	90*	**1.4**	**1.6**	**17**	**2.0**	**500**	**2.8**	7*	35*	550*

NOTE: This table (taken from the DRI reports, see www.nap.edu) presents Recommended Dietary Allowances (RDAs) in **bold type** and Adequate Intakes (AIs) in ordinary type followed by an asterisk (*). An RDA is the average daily dietary intake level; sufficient to meet the nutrient requirements of nearly all (97-98 percent) healthy individuals in a group. It is calculated from an Estimated Average Requirement (EAR). If sufficient scientific evidence is not available to establish an EAR, and thus calculate an RDA, an AI is usually developed. For healthy breastfed infants, an AI is the mean intake. The AI for other life stage and gender groups is believed to cover the needs of all healthy individuals in the groups, but lack of data or uncertainty in the data prevent being able to specify with confidence the percentage of individuals covered by this intake.

[a] As retinol activity equivalents (RAEs). 1 RAE = 1 μg retinol, 12 μg β-carotene, 24 μg α-carotene, or 24 μg β-cryptoxanthin. The RAE for dietary provitamin A carotenoids is two-fold greater than retinol equivalents (RE), whereas the RAE for preformed vitamin A is the same as RE.

[b] As cholecalciferol. 1 μg cholecalciferol = 40 IU vitamin D.

[c] Under the assumption of minimal sunlight.

[d] As α-tocopherol. α-Tocopherol includes *RRR*-α-tocopherol, the only form of α-tocopherol that occurs naturally in foods, and the 2*R*-stereoisomeric forms of α-tocopherol (*RRR*-, *RSR*-, *RRS*-, and *RSS*-α-tocopherol) that occur in fortified foods and supplements. It does not include the 2*S*-stereoisomeric forms of α-tocopherol (*SRR*-, *SSR*-, *SRS*-, and *SSS*-α-tocopherol), also found in fortified foods and supplements.

[e] As niacin equivalents (NE). 1 mg of niacin = 60 mg of tryptophan; 0–6 months = preformed niacin (not NE).

[f] As dietary folate equivalents (DFE). 1 DFE = 1 μg food folate = 0.6 μg of folic acid from fortified food or as a supplement consumed with food = 0.5 μg of a supplement taken on an empty stomach.

[g] Although AIs have been set for choline, there are few data to assess whether a dietary supply of choline is needed at all stages of the life cycle, and it may be that the choline requirement can be met by endogenous synthesis at some of these stages.

[h] Because 10 to 30 percent of older people may malabsorb food-bound B_{12}, it is advisable for those older than 50 years to meet their RDA mainly by consuming foods fortified with B_{12} or a supplement containing B_{12}.

[i] In view of evidence linking folate intake with neural tube defects in the fetus, it is recommended that all women capable of becoming pregnant consume 400 μg from supplements or fortified foods in addition to intake of

Vitamin B_6

Vitamin B_6 (pyridoxine) plays a vital role in numerous metabolic processes, including nervous system development and functioning. It is thought that vitamin B_6 may play a role in the prevention of pre-eclampsia and pre-term birth. More recently, maternal supplementation with vitamin B_6 has been associated with possible decreases in cardiovascular malformations and orofacial clefts.[5]

1– Ross CA. Vitamin A. In: Coates PM, et al., eds. Encyclopedia of Dietary Supplements. 2nd ed. London and New York: Informa Healthcare;2010:778-791.

2– Ross A. Vitamin A and Carotenoids. In: Shils M, et al., eds. Modern Nutrition in Health and Disease. 10th ed. Baltimore, MD: Lippincott Williams & Wilkins;2006:351-375.

3– van den Broek N, et al. Vitamin A supplementation during pregnancy for maternal and newborn outcomes. Cochrane Database Syst Rev 2010:CD008666.

4– Food and Nutrition Board, Institute of Medicine, National Academies. Dietary Reference Intakes (DRIs): Recommended Dietary Allowances and Adequate Intakes, Vitamins and Elements. Available at http://www.nationalacademies.org/hmd/~/media/Files/Activity%20Files/Nutrition/DRI-Tables/2_%20RDA%20and%20AI%20Values_Vitamin%20and%20Elements.pdf?la=en

5– Salam RA, Zuberi NJ, Bhutta ZA. Pyridoxine (vitamin B6) supplementation during pregnancy or labour for maternal and neonatal outcomes. Cochrane Database Syst Rev 2015 Jun 3;6:CD000179.

Folate

Folate is a B vitamin that functions as a co-enzyme or co-substrate in single-carbon transfers in nucleic acid synthesis and amino acid metabolism. It is critical for normal cell division, tissue growth, and DNA methylation.[1] During pregnancy, fetal growth results in a need for extra blood volume and an increase in the total number of rapidly-dividing cells, leading to an increased requirement for folate.[2] Taken before conception and during the first trimester, folate helps prevent neural tube defects.[3,4] Taken throughout pregnancy, folate reduces the risk of maternal megaloblastic anemia.[1,2] Its synthetic monoglutamate form—folic acid—has also been shown to increase mean birthweight and to decrease the risk of preterm delivery.

Serum folate concentration is sensitive to recent dietary intake, so erythrocyte folate concentration may provide a more accurate longer-term measure of folate intake. The recommended daily dose of folate or folic acid throughout pregnancy is 800 micrograms (μgm). As birth defects commonly occur within the first three to four weeks of pregnancy, women should consider beginning folic acid supplementation while they are trying to conceive. In addition, folate concentrations continue to decrease for several weeks following delivery, and by the second or third post-partum month, one-third of all mothers may have below-normal concentrations of folate in both serum and erythrocytes.[5,6] Therefore, ongoing folate supplementation in the post-natal period may be advisable.

Key Elements Needed During Pregnancy

Figure 2. Recommended Dietary Allowances and Adequate Intakes During Pregnancy: Elements[7]

Life Stage Group	Calcium (mg/d)	Chromium (μg/d)	Copper (μg/d)	Fluoride (mg/d)	Iodine (μg/d)	Iron (mg/d)	Magnesium (mg/d)	Manganese (mg/d)	Molybdenum (μg/d)	Phosphorus (mg/d)	Selenium (μg/d)	Zinc (mg/d)	Potass-ium (g/d)	Sodium (g/d)	Chloride (g/d)
Infants															
0 to 6 mo	200*	0.2*	200*	0.01*	110*	0.27*	30*	0.003*	2*	100*	15*	2*	0.4*	0.12*	0.18*
6 to 12 mo	260*	5.5*	220*	0.5*	130*	11	75*	0.6*	3*	275*	20*	3	0.7*	0.37*	0.57*
Children															
1–3 y	700	11*	340	0.7*	90	7	80	1.2*	17	460	20	3	3.0*	1.0*	1.5*
4–8 y	1,000	15*	440	1*	90	10	130	1.5*	22	500	30	5	3.8*	1.2*	1.9*
Males															
9–13 y	1,300	25*	700	2*	120	8	240	1.9*	34	1,250	40	8	4.5*	1.5*	2.3*
14–18 y	1,300	35*	890	3*	150	11	410	2.2*	43	1,250	55	11	4.7*	1.5*	2.3*
19–30 y	1,000	35*	900	4*	150	8	400	2.3*	45	700	55	11	4.7*	1.5*	2.3*
31–50 y	1,000	35*	900	4*	150	8	420	2.3*	45	700	55	11	4.7*	1.5*	2.3*
51–70 y	1,000	30*	900	4*	150	8	420	2.3*	45	700	55	11	4.7*	1.3*	2.0*
> 70 y	1,200	30*	900	4*	150	8	420	2.3*	45	700	55	11	4.7*	1.2*	1.8*
Females															
9–13 y	1,300	21*	700	2*	120	8	240	1.6*	34	1,250	40	8	4.5*	1.5*	2.3*
14–18 y	1,300	24*	890	3*	150	15	360	1.6*	43	1,250	55	9	4.7*	1.5*	2.3*
19–30 y	1,000	25*	900	3*	150	18	310	1.8*	45	700	55	8	4.7*	1.5*	2.3*
31–50 y	1,000	25*	900	3*	150	18	320	1.8*	45	700	55	8	4.7*	1.5*	2.3*
51–70 y	1,200	20*	900	3*	150	8	320	1.8*	45	700	55	8	4.7*	1.3*	2.0*
> 70 y	1,200	20*	900	3*	150	8	320	1.8*	45	700	55	8	4.7*	1.2*	1.8*
Pregnancy															
14–18 y	1,300	29*	1,000	3*	220	27	400	2.0*	50	1,250	60	12	4.7*	1.5*	2.3*
19–30 y	1,000	30*	1,000	3*	220	27	350	2.0*	50	700	60	11	4.7*	1.5*	2.3*
31–50 y	1,000	30*	1,000	3*	220	27	360	2.0*	50	700	60	11	4.7*	1.5*	2.3*
Lactation															
14–18 y	1,300	44*	1,300	3*	290	10	360	2.6*	50	1,250	70	13	5.1*	1.5*	2.3*
19–30 y	1,000	45*	1,300	3*	290	9	310	2.6*	50	700	70	12	5.1*	1.5*	2.3*
31–50 y	1,000	45*	1,300	3*	290	9	320	2.6*	50	700	70	12	5.1*	1.5*	2.3*

NOTE: This table (taken from the DRI reports, see www.nap.edu) presents Recommended Dietary Allowances (RDAs) in **bold type** and Adequate Intakes (AIs) in ordinary type followed by an asterisk (*). An RDA is the average daily dietary intake level; sufficient to meet the nutrient requirements of nearly all (97-98 percent) healthy individuals in a group. It is calculated from an Estimated Average Requirement (EAR). If sufficient scientific evidence is not available to establish an EAR, and thus calculate an RDA, an AI is usually developed. For healthy breastfed infants, an AI is the mean intake. The AI for other life stage and gender groups is believed to cover the needs of all healthy individuals in the groups, but lack of data or uncertainty in the data prevent being able to specify with confidence the percentage of individuals covered by this intake.

1– Scholl TO, Johnson WG. Folic acid: influence on the outcome of pregnancy. Am J Clin Nutr 2000;71:1295-303.

2– Lassi ZS, et al. Folic acid supplementation during pregnancy for maternal health and pregnancy outcomes. Cochrane Database of Systematic Reviews 2013, Issue 3.

3– National Institute for Health and Clinical Excellence. NICE public health guidance 11: Improving the nutrition of pregnant and breastfeeding mothers and children in low-income households. London: NICE, July 2011.

4– De-Regil LM, et al. Effects and safety of periconceptional folate supplementation for preventing birth defects. Cochrane Database of Systematic Reviews 2010, Issue 10.

5– Bruinse HW, Van den Berg H. Changes of some vitamin levels during and after normal pregnancy. European Journal of Obstetrics & Gynecology and Reproductive Biology 1995;61:31-7.

6– Açkurt F, et al. Biochemical assessment of nutritional status in pre- and post-natal Turkish women and outcome of pregnancy. European Journal of Clinical Nutrition 1995;49:613-22.

7– Food and Nutrition Board, Institute of Medicine, National Academies. Dietary Reference Intakes (DRIs): Recommended Dietary Allowances and Adequate Intakes, Vitamins and Elements. Available at http://www.nationalacademies.org/hmd/~/media/Files/Activity%20Files/Nutrition/DRI-Tables/2_%20RDA%20and%20AI%20Values_Vitamin%20and%20Elements.pdf?la=en

Calcium

Calcium—the most abundant mineral in the body—has a multitude of functions, from aiding in muscle relaxation, blood coagulation, and nerve transmission, to promoting tooth and bone health and preventing osteoporosis. Serum calcium is very tightly regulated and does not fluctuate with changes in dietary intake. The body uses bone tissue as a reservoir for calcium to maintain constant concentrations in blood, muscle, and intracellular fluids.[1]

Hypertension, with or without proteinuria, is a major cause of maternal and perinatal morbidity and mortality.[2,3] 5% of all pregnancies and 11% of first pregnancies are complicated by hypertension with or without proteinuria. This is a major source of maternal death and morbidity as well as perinatal morbidity and mortality. Shockingly this accounts for up to 40,000 maternal deaths each year. Maternal hypertension is the leading cause of early neonatal death and infant mortality. Significant resources have invested in finding a solution to this tragic complication. In one Cochrane Review, high dose calcium supplementation was evaluated as a possible therapy to prevent hypertensive disorders during pregnancy.[4] Studies evaluating a total of 15,730 pregnant women were reviewed in a meta-analysis. It was demonstrated that supplementation of at least 1,000 mg/day was associated with a significant reduction in the risk of pre-eclampsia and maternal hypertension, particularly in women who had low calcium diets at baseline. Another pooled analysis showed that calcium supplementation during pregnancy, reduced the risk of pre-eclampsia by 53% and that of severe pre-eclampsia by 25%.[5] Most prenatal supplements contain only 200 – 250 mg of calcium, failing to meet the 1,000 mg minimum requirement defined in the literature as necessary to reduce the risk of pre-eclampsia.

The recommended dietary allowance of calcium during pregnancy is 1,300 milligrams for women ages 14-18 and 1,000 milligrams for women aged 19 and older. In the U.S., mean dietary calcium intake for women ranges from 748-968 mg/day and females are less likely than males to get adequate amounts of calcium from food alone.[67] During the prenatal period, a 400-800 mg/day dose of calcium to supplement dietary intake may be appropriate for achieving the recommended daily allowance, and should be given with 400-800 IU of vitamin D to facilitate absorption

Iron

Iron deficiency is thought to be the most common nutrient deficiency among pregnant women, and the global prevalence of anemia among pregnant women was estimated to be 38.2 percent in 2011.[8,9] There is evidence that maternal anemia during the second trimester is associated with an increased risk of premature delivery and low birthweight.[10] In addition, moderate or severe maternal anemia has been associated with an increased risk of maternal and child mortality and infectious diseases.[11]

Due to the increased nutrient requirements of pregnancy, iron and folic acid supplementation has been the preferred intervention to improve iron stores and prevent anemia among pregnant women. The Institute of Medicine recommends that women consume 27 mg/day of iron during pregnancy.[12]

1- Committee to Review Dietary Reference Intakes for Vitamin D and Calcium, Food and Nutrition Board, Institute of Medicine. Dietary Reference Intakes for Calcium and Vitamin D. Washington, DC: National Academy Press, 2010.

2- Khan KS, et al. WHO analysis of causes of maternal death: a systematic review. Lancet 2006;367:1066–74.

3- Langenveld J, et al. Neonatal outcome of pregnancies complicated by hypertensive disorders between 34 and 37 weeks of gestation: a 7 year retrospective analysis of a national registry. American Journal of Obstetrics and Gynecology 2011;205(6):540.e1-- 540.e7

4– Hofmeyer GJ et al. Calcium supplementation during pregnancy for preventing hypertensive disorders and related problems. The Cochrane Library 2014, Issue 6

5– Imdad A., Bhutta ZA. Effects of calcium supplementation during pregnancy on maternal, fetal and birth outcomes. Pediatric Perinatal Epidemiology. 2012 Jul;26 Suppl 1:138 – 52.

6- Bailey RL, et al. Estimation of total usual calcium and vitamin D intakes in the United States. J Nutr 2010;140(4):817--822.

7- Ervin RB, et al. Dietary intake of selected minerals for the United States population: 1999--2000. Advance Data from Vital and Health Statistics, number 341. Hyattsville, MD: National Center for Health Statistics, 2004.

8– World Health Organization. The Prevalence of Anaemia in Women: a Tabulation of Available Information. 2nd Edition. Geneva: World Health Organization, 1992.

9– World Health Organization. Global Prevalence of Anaemia in 2011. Geneva: World Health Organization, 2015.

10– Burke R, Leon J, Suchdev P. Identification, prevention and treatment of iron deficiency during the first 1000 days. Nutrients 2014;6(10):4093-4114.

11– International Nutritional Anemia Consultative Group (INACG). Why is iron important and what to do about it: a new perspective. Report of the 2011 INACG Symposium; 2001 February 15-16: Hanoi, Vietnam. 2002:1-50.

12– Institute of Medicine. Iron. Dietary Reference Intakes for Vitamin A, Vitamin K, Arsenic, Boron, Chromium, Copper, Iodine, Iron, Manganese, Molybdenum, Nickel, Silicon, Vanadium, and Zinc. Washington DC: National Academy Press, 2001:290-393.

Most women need supplemental iron, as well as sufficient iron stores, to prevent iron deficiency.[1] Current recommendations for all pregnant women include the provision of a standard daily dose of 30-60 milligrams of elemental iron and 400 µgm of folic acid starting as soon as possible after gestation begins and continuing throughout pregnancy. For women who have been clinically diagnosed with anemia, the daily dose of iron may be increased to 120 milligrams.[2]

A recent systematic review including data from 44 trials of daily oral iron supplementation during pregnancy revealed that preventive iron supplementation:[3]

- Reduced maternal anemia at term by 70 percent
- Reduced iron deficiency anemia at term by 67 percent
- Reduced iron deficiency at term by 57 percent

While the review found that iron supplements reduced the prevalence of low birthweight and preterm birth, the difference did not achieve statistical significance.

Magnesium

Magnesium is an essential mineral required for regulation of body temperature, nucleic acid, and protein synthesis and maintenance of nerve and muscle cell electrical potentials. During pregnancy, magnesium supplementation if given before the 25th week of gestation may reduce fetal growth restriction and pre-eclampsia, as well as increase birthweight.[4,5] Maternal magnesium supplementation is also linked to higher APGAR scores at five minutes.[6] The recommended dietary allowance for magnesium during pregnancy is 350-400 mg/day, depending on maternal age.[7] However, more than half of the U.S. population has insufficient magnesium consumption, with an average intake of less than 245 milligrams per day. Consequently, modest supplementation of magnesium is reasonable to support good prenatal health.[8]

Zinc

Zinc is an essential trace element needed for normal fetal growth and development, as well as for milk production during lactation.[9] Pregnancy affects how the body absorbs zinc, and the amount of absorbed zinc required to replace endogenous losses increases in the second and third trimesters to support the gain of maternal tissue, amniotic fluid and fetal growth.[10] Zinc deficiency alters the circulating levels of a number of hormones associated with the onset of labor and may also contribute to systemic and intrauterine infections, both known risk factors for premature birth.[11]

The recommended dietary allowance for zinc during pregnancy is 15 mg/day. However, the average dietary zinc intake of U.S. women aged 20 to 40 is only 9.6 mg/day and it is estimated that more than 80 percent of pregnant women worldwide have inadequate zinc intake.[12,13]

1– Bothwell TH. Iron requirements in pregnancy and strategies to meet them. Am J Clin Nutr 2000;72(1Suppl):257S-264S.

2– World Health Organization. Guideline: daily iron and folic acid supplementation in pregnant women.

3– Peña-Rosas JP, et al. Cochrane Database Syst Rev 2015 July 22;7:CD004736.

4– Conradt A, Weidinger H, Algayer. On the role of magnesium in fetal hypotrophy, pregnancy induced hypertension and pre-eclampsia. Magnesium Bulletin 1984;6:68-76.

5– Doyle W, Crawford MA, Wynn AH, Wynn SW. Maternal magnesium intake and pregnancy outcome. Magnesium Research 1989;2:205-10.

6– Makrides M, et al. Magnesium supplementation in pregnancy (review). Cochrane Database Syst Rev 2014 April 3;4:CD000937.

7- Food and Nutrition Board, Institute of Medicine, National Academies. Dietary Reference Intakes (DRIs): Recommended Dietary Allowances and Adequate Intakes, Vitamins and Elements. Available at http://www.nal.usda.gov/fnic/DRI/DRI_Tables/RDA_AI_vitamins_elements.pdf.

8– Vormann J. Magnesium: nutrition and metabolism. Mol Aspects Med 2003;24(1-3):27-37.

9– Fung EB, et al. Zinc absorption in women during pregnancy and lactation: a longitudinal study. Am J Clin Nutr 1997;66(1):80-88.

10– King JC, Turnlund JR. Human zinc requirements. In: Mills, CF, ed. Zinc in human biology. New York: Springer-Verlag, 1989:335-350.

11– Chaffee BW, King JC. Effect of zinc supplementation on pregnancy and infant outcomes: a systematic review. Paediatr Perinat Epidemilo 2012;26(Suppl 1):118-137.

12– Alaimo K, et al. Dietary intake of vitamins, minerals and fiber of persons ages 2 months and over in the United States: Third National Health and Nutritional Examination Survey, phase 1, 1988-1991. Atlanta: Centers for Disease Control and Prevention, 1994.

13– Caulfield, et al. Potential contribution of maternal zinc supplementation during pregnancy to maternal and child survival. Am J Clin Nutr 1998;68:499S-508S.

A recent systematic review concluded that maternal zinc supplementation was associated with a statistically significant 14 percent reduction in pre-term birth, which may be due to a reduction in the incidence or severity of maternal infections.

Supporting the Nutritional Status of Pregnant Women

The overall nutritional status of the mother during pregnancy is a significant contributor to both maternal and perinatal morbidity and mortality. In fact, maternal undernutrition contributes to 800,000 neonatal deaths worldwide each year due to low birthweight and micronutrient deficiencies are estimated to underlie nearly 3.1 million child deaths annually.[1]

Improving the nutrient density of the mother's diet is known to improve pregnancy outcomes, and appropriate supplementation of nutritional deficiencies can be beneficial.[2] A recent systematic review including data from 21 trials found that multiple-micronutrient supplementation resulted in a statistically significant decrease in the number of low birthweight and small-for-gestational age babies.[3]

Forté Elements Prenatal+ Supplement

The Forté Elements Prenatal supplement is a mediceutical supplement designed specifically for prenatal women– women who are preparing to conceive and women who are pregnant. A pioneer in the development of condition-specific combinations of vitamins, minerals, and essential trace elements, Forté Elements has defined a new category of nutritional support that is based on rigorous quality standards and evidence-based research. These mediceuticals are pharmaceutical-grade supplements formulated in conjunction with licensed physicians using clinically-proven ingredients that are based on published science.

The mediceutical difference is seen in Forté Elements' careful attention to the delivery formulation and dosage of each ingredient in the Forté Elements Prenatal product to ensure safe and effective supplementation. For example, increased maternal levels of pre-formed vitamin A have been associated with miscarriage and with malformations involving the cardiac and central nervous systems and dietary β-carotene supplements are the recommended form of vitamin A supplementation due to their superior

Supplement Facts

Serving Size: 2 Capsules and 2 Tablets

Servings Per Container: 30

	Amount	% DV		Amount	% DV
Vitamin A (Beta-Carotene & Acetate)	4000 IU	80%	Biotin	100mcg	33%
Vitamin C (Ascorbic Acid)	75 mg	125%	Pantothenic Acid	10 mg	100%
Vitamin D (Cholecalciferol)	1000 IU	250%	Calcium (Carbonate and Phosphate)	1000 mg	100%
Vitamin E (d-Alpha Tocopheryl)	15 IU	50%	Iron (Fumarate)	30 mg	167%
Vitamin K (Fat Soluble)	80 mcg	100%	Magnesium (Hydroxide)	400 mg	100%
Thiamin (Vitamin B1)	1.5 mg	100%	Zinc (Sulfate)	15 mg	100%
Riboflavin (Vitamin B2)	1.7 mg	100%	Copper (Sulfate)	2 mg	100%
Niacin (Vitamin B3)	20 mg	100%	Molybdenum	75 mcg	100%
Vitamin B6 (Pyridoxine)	2 mg	100%	Boron	200 mcg	**
Folic Acid	800 mcg	200%	Vanadium (Sulfate)	50 mcg	**
Vitamin B12 (Methylcobalamin)	6 mcg	100%			

** Daily Value not established.
Percent Daily Value based on a 2,000 calorie diet.

Other Ingredients: Rice flour, cellulose, vegetable lubricants, gelatin (capsule),magnesium stearate and silica.

WARNING: ACCIDENTAL OVERDOSE OF IRON-CONTAINING PRODUCTS IS A LEADING CAUSE OF FATAL POISONING IN CHILDREN UNDER 6. KEEP THIS PRODUCT OUT OF REACH OF CHILDREN. IN CASE OF ACCIDENTAL OVERDOSE, CALL A DOCTOR OR POISON CONTROL CENTER IMMEDIATELY.

THIS STATEMENT HAS NOT BEEN EVALUATED BY THE FOOD AND DRUG ADMINISTRATION. THIS PRODUCT IS NOT INTENDED TO DIAGNOSE, TREAT, CURE, OR PREVENT ANY DISEASE

Supplement Facts

Serving Size 2 Softgel
Servings Per Container 60

Amount Per Serving	% Daily Value*
Calories 20	1%
Calories from Fat 20	
Total Fat 2g	3%
Polyunsaturated Fat 0.5g	**
Vitamin E 1.1 IU (d-Alpha Tocopherol plus d-Alpha, d-Beta, d-Gamma, & d-Delta)	4%
Fish Oil 2,000mg	**
EPA (Eicosapentaenoic Acid) 360mg	**
DHA (Docosahexaenoic Acid) 240mg	**

*Percent Daily Values are based on a 2,000 calorie diet. Your Daily Values may be higher or lower depending on your calorie needs.
**Daily Value not established.

OTHER INGREDIENTS: GELATIN AND GLYCERIN

1– Bhutta ZA, et al. Evidence-based intervention for improvement of maternal and child nutrition: what can be done and at what cost? Lancet 2013;382(9890):452-477.

2– Koblinsky MA. Beyond maternal mortality – magnitude, interrelationship and consequence of women's health, pregnancy related complications and nutritional status on pregnancy outcomes. Int

3– Haider BA, Bhutta ZA. Multiple-micronutrient supplementation for women during pregnancy (review). Cochrane Database Syst Rev 2012 Nov 14:11:CD004905.

bioavailability.[1] The Forté Elements Prenatal supplement contains both preformed vitamin A and β-carotene, at concentrations that have been deemed safe by the World Health Organization and the Institute of Medicine.[2] In the case of calcium, the percentage of calcium absorbed depends on the total amount of calcium consumed at one time. As the amount consumed increases, the percentage absorption decreases, with highest absorption at doses less than 500 milligrams.[17] The Forté Elements Prenatal supplement contains 1,000 milligrams of calcium (along with vitamin D), an amount sufficient to help prenatal women achieve their recommended calcium intake with optimal intestinal absorption.

By providing a specific blend of vital micronutrients that have been carefully selected to support maternal health, the Forté Elements Prenatal supplement offers optimal prenatal nutritional support, when taken in conjunction with a balanced diet before conception and throughout pregnancy.

What is a Mediceutical?

An emerging category in nutrient supplementation, a Mediceutical is a nutritional support system that provides condition-specific combinations of vitamins, minerals, amino acids and other nutrients for common clinical conditions, such as pregnancy and the post-partum period. Unlike nutraceuticals, Mediceuticals are subject to strict guidelines for quality and safety and are supported by evidence-based research. In order to qualify as a mediceutical, a supplement must:

1. Be formulated to support a specific health condition or situation
2. Contain only non-synthetic,pharmaceutical-grade ingredients that are Generally Recognized as Safe (GRAS)
3. Contain elements that have been validated by clinical research for the specific health condition or situation, as published in peer-reviewed journals
4. Conform to pharmaceutical grade dosage standards for the specific health condition or situation
5. Be produced in FDA-compliant manufacturing facilities using pharmaceutical-grade manufacturing practices
6. Product has a Certificate of Analysis available confirming that product ingredients meet the Mediceutical standard and are as listed on the product label.

The Forté Elements Prenatal+ supplement contains appropriate, but not excessive, amounts of the nutrients pre-pregnant and pregnant women need to support their own health, as well as the health of their growing baby.

1– Miller RK, et al. Periconceptional vitamin A use: how much is teratogenic? Reproductive Toxicology 1998;12(1):75-88.
2– World Health Organization. Safe vitamin A dosage during pregnancy and lactation. Recommendations and report of a consultation. Geneva: WHO (WHO/NUT/98), 1998. Geneva: WHO, 1998.

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