

Formulation and Evaluation of Multivitamin Gummies

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Abstract: *A multivitamin is a medication intended to serve as a salutary supplement with vitamins, salutary minerals, and other nutritive rudiments. Multivitamin formula contain vit C, B2, Zinc, Calcium, Magnesium, Potassium. gummy vitamins are designed to be a further palatable(read sweeter) volition to regular vitamins in the expedients that people will be more inclined to take them. numerous people prefer sticky vitamins to capsules due to their gooey flavours and delicacy- suchlike taste. Dissolvable, chewable, greasepaint or sticky vitamins tend to be easier to digest. Like capsules and capsules, gummies supply the vitamins. Vitamin C and Vitamin B2(riboflavin) are the idol constituents of multivitamin gummies, both gives the antioxidant exertion, Photoprotection, crack mending, ameliorate hair growth and remedial uses on eye related conditions, migraine and exertion on healthy skin/ hair independently. Citric acid have defensive goods in the body. It's used in sticky, can kill bacteria and lower the acid in urine. Agar is extensively used as gelling, thickening, stabilizing and density controlling agent for gummies. Pure honey is a enhancing agent that makes gummies delicious to eat. Orange juice shows antioxidant exertion and gives delicious flavour to sticky.*

Keywords: Vitamin C, Riboflavin, Multivitamin, Antioxidant, Gummies, Agar, Salutary Minerals

REFERENCES

- [1]. Sudha J. Devaki and Reshma Lila Raveendran 2017, Additional information is available at the end of the chapter <http://dx.doi.org/10.5772/intechopen.7016>.
- [2]. Food and Nutrition Board. Dietary Reference Intakes for Vitamin C, Vitamin E, Selenium, and Carotenoids. Washington, DC: National Academy Press; 2000
- [3]. Nutrient Data Laboratory. USDA National Nutrient Database for Standard Reference, Release 24 [Internet]. Available from <http://www.ars.usda.gov/ba/bhnrc/nd>
- [4]. Committee on Medical Aspects of Food Policy; 1991
- [5]. Food and Nutrition Board: Institute of Medicine; 2000
- [6]. Food and Agricultural Organization, World Health Organization; 2002
- [7]. Khan A, Rashid A, Younas R, Chong R. A chemical reduction approach to the synthesis of copper nanoparticles. International Nano Letters. 2016;6:21-26
- [8]. 8.Abhay Solunke, Encyclopedia of Microbial Media ; 2018
- [9]. 9.Ryoko Ushikoshi-Nakayama,Koufuchi Ryo,Tomoe Yamazaki,Mie Kaneko,Tomoko Sugano,Yumi Ito,Naoyuki Matsumoto,Ichiro Saito Effect of gummy candy containing ubiquinol on secretion of saliva: A randomized, double-blind, placebo-controlled parallel-group comparative study and an in vitro study; April 2019
- [10]. Cassolato SF, Turnbull RS. Xerostomia: Clinical aspects and treatment. Gerodontology. 2003;20: 64–77. Pmid: 14697016, View Article PubMed/NCBI/Google Scholar
- [11]. Gloré RJ, Spiteri-Staines K, Paleri V. A patient with dry mouth. Clin Otolaryngol. 2009; 34: 358–363. Pmid: 19673984, View Article PubMed/NCBI/Google Scholar
- [12]. Hibberd J, Fraser J, Chapman C, McQueen H, Wilson A. Can we use influencing factors to predict aspiration pneumonia in the United Kingdom? Multidiscip Respir Med. 2013; 8: 39. Pmid: 23758693, View Article PubMed/NCBI/Google Scholar
- [13]. Gil-Montoya JA, de Mello ALF, Barrios R, Gonzalez-Moles MA, Bravo M. Oral health in the elderly patient and its impact on general well-being: a nonsystematic review. Clin Interv Aging. 2015; 10: 461–467. Pmid:

- 25709420, View ArticlePubMed/NCBIGoogle Scholar
- [14]. Elliott C [Author]Assessing Vitamins, Minerals and Supplements Marketed to Children in Canadathor], Published online 2019 Nov 6
 - [15]. Kamangar F[Author] ,Vitamin and Mineral Supplements: Do We Really Need Them?, 2012 Mar; 3
 - [16]. Kevin B Comerford, Recent Developments in Multivitamin/Mineral Research, November 20131. Dashora N, Sodde V, Bhagat J, Kirti SP, Labo R. Antitumor activity of Dendrophoe falcate against Ehrlich ascites carcinoma in Swiss albino mice. Pharm Crops. 2011;7:1. [Google Scholar]
 - [17]. Adebolu TT. Effect of natural honey on local isolates of diarrhea causing bacteria in Southwestern Nigeria. Afr J Biotechnol. 2005;4:1172–4. [Google Scholar]
 - [18]. Ashrafi S, Mastronikolas S, Wu CD. Use of Honey in Treatment of Aphthous Ulcers IADR/AADR/CADR 83rd General Session. Baltimore, MD., USA: 2005. pp. 9–12. [Google Scholar]
 - [19]. James H. Papyrus Harris, donation to the temple of re at Heliopolis. In: Birch S, editor. Breasted ancient records of Egypt part four pSalt 825, Egyptian magical text. 1876. [Google Scholar]
 - [20]. Bansal V, Medhi B, Pandhi P. Honey – A remedy rediscovered and its therapeutic utility. Kathmandu Univ Med J (KUMJ) 2005;3:305–9. [PubMed] [Google Scholar]
 - [21]. Bell SG. The therapeutic use of honey. Neonatal Netw. 2007;26:247–51. [PubMed] [Google Scholar]
 - [22]. Hassapidou M, Fotiadou E, Maglara E, Papadopoulou SK. Energy intake, diet composition, energy expenditure, and body fatness of adolescents in Northern Greece. Obesity (Silver Spring) 2006;14:855–62. [PubMed] [Google Scholar]
 - [23]. Babacan S, Rand AG. Characterization of honey amylase. J Food Sci. 2007;72:C050–5. [PubMed] [Google Scholar]
 - [24]. Pataca LC, Borges Neto W, Marcucci MC, Poppi RJ. Determination of apparent reducing sugars, moisture and acidity in honey by attenuated total reflectance-Fourier transform infrared spectrometry. Talanta. 2007;71:1926–31. [PubMed] [Google Scholar]
 - [25]. Inglett GE. A history of sweeteners – Natural and synthetic. J Toxicol Environ Health. 1976;2:207– [PubMed] [Google Scholar]
 - [26]. Ahmed S, Othman NH. Honey as a potential natural anticancer agent: A review of its mechanisms. Evid Based Complement Alternat Med. 2013;2013:829070. [PMC free article] [PubMed] [Google Scholar]
 - [27]. Khalil I, Moniruzzaman M, Boukraâ L, Benhanifia M, Islam A, Islam N, et al. Physicochemical and antioxidant properties of Algerian honey. Molecules. 2012;17:11199–215. [PMC free article] [PubMed] [Google Scholar]
 - [28]. 28. Attia WY, Gabry MS, El-Shaikh KA, Othman GA. The anti-tumor effect of bee honey in Ehrlich ascite tumor model of mice is coincided with stimulation of the immune cells. J Egypt Public Health Assoc. 2008;15:169–83. [PubMed] [Google Scholar]
 - [29]. Estevinho L, Pereira AP, Moreira L, Dias LG, Pereira E. Antioxidant and antimicrobial effects of phenolic compounds extracts of Northeast Portugal honey. Food Chem+ Toxicol. 2008;46:3774–9. [PubMed] [Google Scholar]
 - [30]. Abdulrhman M, El-Hefnawy M, Ali R, El-Goud AA. Honey and type 1 diabetes mellitus. In: Liu CP, editor. Type Diabetes – Complications, Pathogenesis, and Alternative Treatments. Croatia: In Tech; 2008. [Google Scholar]
 - [31]. Ghosh S, Playford RJ. Bioactive natural compounds for the treatment of gastrointestinal disorders. Clin Sci (Lond) 2003;104:547–56. [PubMed] [Google Scholar]
 - [32]. Mijanur Rahman M, Gan SH, Khalil MI. Neurological effects of honey: Current and future prospects. Evid Based Complement Alternat Med. 2014;2014:958721. [PMC free article] [PubMed] [Google Scholar]
 - [33]. Newman TG. Honey Almanac. Chicago, IL: Newman; 1983. [Google Scholar]
 - [34]. Molan PC. The potential of honey to promote oral wellness. Gen Dent. 2001;49:584–9. [PubMed] [Google Scholar]
 - [35]. Bergman A, Yanai J, Weiss J, Bell D, David MP. Acceleration of wound healing by topical application of honey. An animal model. Am J Surg. 1983;145:374–6. [PubMed] [Google Scholar]
 - [36]. Irving TB, Ahmad K, Ahsan MM. The Qur'an-Basic Teachings. Ch. 5. Bath: Pitman Press; 1987. The story of

- creation. [Google Scholar]
- [37]. Lay-flurrie K. Honey in wound care: Effects, clinical application and patient benefit. *Br J Nurs.* 2008;17:S30, S32–6. [PubMed] [Google Scholar]
- [38]. Betts J. The clinical application of honey in wound care. *Nurs Times.* 2008;104:43–4. [PubMed] [Google Scholar]
- [39]. Helmy N, El-Soud A. Honey between traditional uses and recent medicine. *Maced J Med Sci.* 2012;5:205–14. [Google Scholar]
- [40]. White JW. Composition of American Honeys. Washington, DC, USA: Agricultural Research Service, USDA; 1962. [Google Scholar]
- [41]. White JW., Jr Detection of honey adulteration by carbohydrate analysis. *J Assoc Off Anal Chem.* 1980;63:11–8. [PubMed] [Google Scholar]
- [42]. Islam A, Khalil I, Islam N, Moniruzzaman M, Mottalib A, Sulaiman SA, et al. Physicochemical and antioxidant properties of Bangladeshi honeys stored for more than one year. *BMC Complement Altern Med.* 2012;12:177. [PMC free article] [PubMed] [Google Scholar]
- [43]. Manyi-Loh CE, Clarke AM, Ndip RN. Identification of volatile compounds in solvent extracts of honeys produced in South Africa. *Afr J Agric Res.* 2011;6:4327–34. [Google Scholar]
- [44]. Sato T, Miyata G. The nutraceutical benefit, part iii: Honey. *Nutrition.* 2000;16:468–9. [PubMed] [Google Scholar]
- [45]. Abrams SA, Wen J, Stuff JE. 1997. Absorption of calcium, zinc, and iron from breast milk by five- to seven-month-old infants. *Pediatr Res* 41:384–390. [PubMed]
- [46]. Aggett PJ. 1989. Severe zinc deficiency. In: Mills CF, editor. , ed. *Zinc in Human Biology* . New York: Springer-Verlag. Pp.259–279.
- [47]. Alexander D, Ball MJ, Mann J. 1994. Nutrient intake and haematological status of vegetarians and age-sex matched omnivores. *Eur J Clin Nutr* 48:538–546. [PubMed]
- [48]. Alexander FW, Clayton BE, Delves HT. 1974. Mineral and trace-metal balances in children receiving normal and synthetic diets. *Quart J Med* 169:89–111. [PubMed]
- [49]. Allen JC, Keller RP, Archer P, Neville MC. 1991. Studies in human lactation: Milk composition and daily secretion rates of macronutrients in the first year of lactation. *Am J Clin Nutr* 54:69–80. [PubMed]
- [50]. Anderson BM, Gibson RS, Sabry JH. 1981. The iron and zinc status of long-term vegetarian women. *Am J Clin Nutr* 34:1042–1048. [PubMed]
- [51]. Anderson RR. 1993. Longitudinal changes of trace elements in human milk during the first 5 months of lactation. *Nutr Res* 13:499–510.
- [52]. Aquilio E, Spagnoli R, Seri S, Bottone G, Spennati G. 1996. Trace element content in human milk during lactation of preterm newborns. *Biol Trace Elem Res* 51:63–70. [PubMed]
- [53]. Artacho R, Ruiz-Lopez MD, Gamez C, Puerta A, Lopez MC. 1997. Serum concentration and dietary intake of Zn in healthy institutionalized elderly subjects. *Sci Total Environment* 205:159–165. [PubMed]
- [54]. August D, Janghorbani M, Young VR. 1989. Determination of zinc and copper absorption at three dietary Zn-Cu ratios by using stable isotope methods in young adult and elderly subjects. *Am J Clin Nutr* 50:1457–1463. [PubMed]