

School of Sport, Health & Outdoor Education

Assessment Feedback Sheet

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Module Code: SHSS4068

Module: The Science of Nutrition

Personal Evaluation – to support your academic progress please complete the section below BEFORE submitting your work.									
What do you consider to be the best aspects of this work?									
Which aspects do you consider could have been improved in this piece of work?									
What have you found most satisfying whilst undertaking this submission?									
ASSESSMENT CRITERIA	Learning Outcome	GRADE							
		Poor 0-25%	Unsatisfactory 26-39%	Satisfactory 40 – 49%	Good 50 – 59%	Very Good 60 – 69%	Excellent 70 – 85%	Exceptional 86– 100%	%
Theoretical explanation	1								70%
Use and appropriateness of references	2								20%
Structure and flow of answer	1								10%
It is expected that students will present work that is proof read, correctly referenced and adheres to the Assessment Checklist . Therefore a range of 0 – 10 marks will be deducted for non-completion of any of the points on the checklist below .									
TUTOR COMMENTS:									
Submission date: via Turnitin		Return date: (at least within 4 weeks)		Tutor:			Mark:		

The implications of Vitamin C deficiency and toxicity.

Vitamin C also known as ascorbic acid, is a water -soluble vitamin naturally supplied by fruit and vegetables such as oranges, blackcurrants, strawberries, green peppers, broccoli, cauliflower and potatoes (Report 41, 1991). It is also available in a dietary supplement as humans are unable to synthesize vitamin C endogenously, therefore is an essential dietary component (Lean and Combet, 2017). The main functions are to prevent scurvy, aid cells, healthy skin, blood vessels, cartilage and help with wound healing; as Vitamin C is required for biosynthesis of collagen, which is essential component for connective tissues which are used in wound healing; L-carnitine, certain neurotransmitters and is used in protein metabolism (Office of Dietary Supplements - Vitamin C, 2020). It also improves absorption on non- haem iron and is an important antioxidant because of its potential for reaction with destructive free radical containing oxygen (Report 41,1991). Vitamin C is the least stable of all vitamins in the diet as it is easily destroyed by oxygen, metal ions, heat, light and alkali therefore is usually lost in foods during cooking and processing (Lean and Combet, 2017).

Table 1- Dietary Reference Values for Vitamin C (mg/d)

Age	Lower Reference Nutrient Intake	Estimated Average Requirement	Reference Nutrient Intake
0-12months	6	15	25
1-10 years	8	20	30
11-14 years	9	22	35
15-50+years	10	25	40

The minimum dose of 10mg is enough to prevent scurvy in men but the requirements has not been determined in woman as they maintain higher blood levels of vitamin C for a given intake (Report 41, 1991). However further increases in intake do not increase plasma levels until intake reaches 40mg/d to maintain measurable amounts in the plasma, and this is available for transfer between the tissues and to sites of depletion or damage (Lean and Combet,2017). On average 2,7% of the exchangeable body pool of vitamin C is degraded each day, therefore at zero intake there is a first- order rate of loss from the tissues and when the body pool falls to 300mg or less there is impaired functions (Report 41, 1991). During the reproductive cycle woman may need more vitamin C to maintain a body pool of about 900mg which can provide at least 1 month's safety interval (Report 41, 1991). It is suggested that the difference uptake and excretion up to the point of saturation following prolonged deprivation of vitamin C can be revived if doses are appeared up to 2500 to 3000mg (O'Hara and Hauck, 1936). Studies also suggest that smokers have a lower plasma and a higher turnover of vitamin C than non-smokers therefore they should have a higher intake of up to 80mg/d (Office of Dietary Supplements - Vitamin C, 2020). Infants may also be at risk of deficiency as it is common for them to be fed heated cow's milk which doesn't contain much vitamin C and as stated heat destroys the vitamin (Office of Dietary Supplements - Vitamin C, 2020). However supplementation may help reduce risk of complications in pregnancy such as pre-eclampsia, intrauterine growth restriction and maternal anaemia (Cochrane systematic review, 2015).

With low levels of vitamin C in the body it may cause a skin condition called keratosis pilaris can develop which are small acne like bumps or dry and damaged skin as vitamin C helps protect skin from oxidative damage caused by sun exposure. Other signs of low levels of

vitamin C include ruptured hair follicles causing bright red spots, weakness of blood vessels causing to bruise easily, wounds to taking longer to heal, bleeding gums and tooth loss, bone deficiency, low immune system causing fatigue and low mood (Office of Dietary Supplements - Vitamin C, 2020)

If too much vitamin C is consumed than your body need's the excess vitamin C is excreted through oxalate in urine. However as Vitamin C produces more oxalate it may bind to minerals and form crystals that can lead to kidney stones (Report 41, 1991). Taking 1000mg twice daily for 6 days increases the amount of oxalate by 20% and consuming more than 2000mg per day may lead to gastrointestinal upset or the most common side effect is digestive distress such as diarrhea and nausea (Does Too Much Vitamin C Cause Side Effects? 2020). As previously stated Vitamin C is known to enhance iron absorption and taking excess amounts of it may lead to iron overload, causing damage to the heart, pancreas, liver, thyroid and nervous system and may also reduce levels of vitamin B-12 and copper in the body (Does Too Much Vitamin C Cause Side Effects? 2020). A study carried out by the arthritis foundation found that presence of high vitamin C increase the likely hood of a person developing painful bone spurs (Arthritis.org,2020).

Overall generally with a balanced diet people can consume enough Vitamin C from food to reach the recommended daily dosage of 40mg/d. People who take Vitamin C supplement are more likely to experience side effects of overdose symptoms; also further research should include studies of requirements of different groups of people and further classification of functions of vitamin C (Report 41, 1991).

References;

Arthritis.org. 2020. [online] Available at: <<https://www.arthritis.org/health-wellness/treatment/complementary-therapies/supplements-and-vitamins/vitamin-and-mineral-guide-for-arthritis>> [Accessed 13 april 2020].

Cochrane Systematic Review - Intervention Version published: 29 September 2015

Great Britain: Department of Health (1991) *Dietary Reference Values for food energy and nutrients for the United Kingdom: Report of the panel on dietary reference values of the committee on medical aspects of food policy*: 5TH edn. LONDON: Stationary Office Books
Healthline. 2020. *Does Too Much Vitamin C Cause Side Effects?*. [online] Available at: <<https://www.healthline.com/nutrition/side-effects-of-too-much-vitamin-c#dosage>> [Accessed 11 April 2020].

Lean, M. and Combet, E., 2017. *Barasi's Human Nutrition*. Boca Raton: CRC Press, Taylor & Francis.

Ods.od.nih.gov. 2020. *Office Of Dietary Supplements - Vitamin C*. [online] Available at: <<https://ods.od.nih.gov/factsheets/VitaminC-HealthProfessional/>> [Accessed 25 April 2020].

Patricia H. O'Hara, Hazel M. Hauck, Storage of Vitamin C by Normal Adults Following a Period of Low Intake: One Figure, *The Journal of Nutrition*, Volume 12, Issue 4, October 1936, Pages 413–427