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Health Fact Sheets

Vitamin C levels of Canadians, 2012 to 2013

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. not available for any reference period
.. not available for a specific reference period
... not applicable
0 true zero or a value rounded to zero
0^s value rounded to 0 (zero) where there is a meaningful distinction between true zero and the value that was rounded
^{p} preliminary
^{r} revised
x suppressed to meet the confidentiality requirements of the *Statistics Act*
^{E} use with caution
F too unreliable to be published
* significantly different from reference category ($p < 0.05$)

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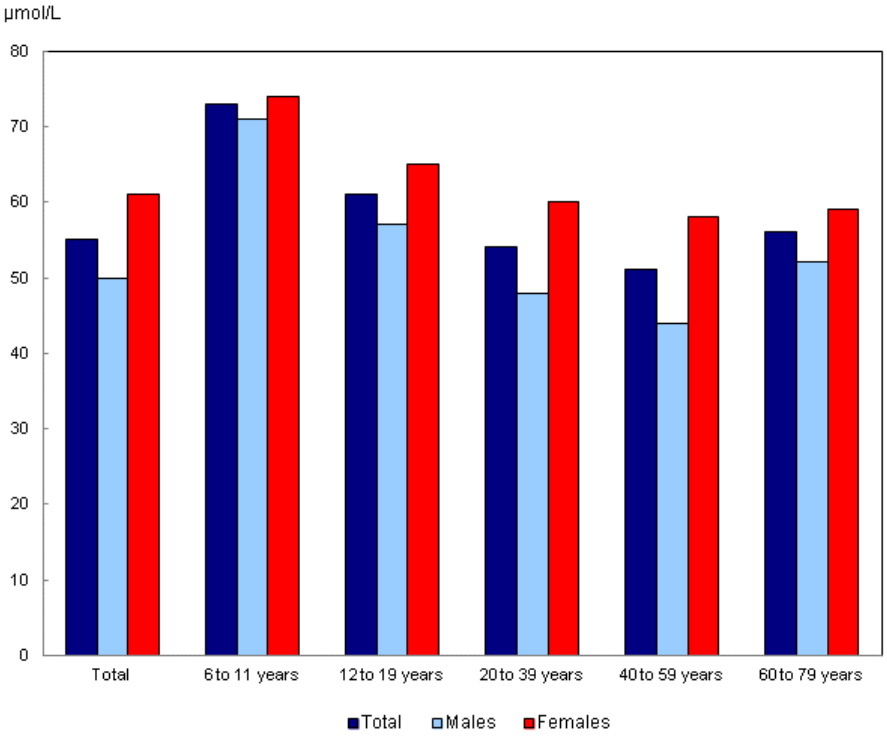
Vitamin C levels of Canadians, 2012 to 2013

Vitamin C (L-ascorbic acid) is a water-soluble nutrient that is essential in the growth and maintenance of the human body. For example, vitamin C helps with the absorption of other nutrients such as iron[1,2] and is important in the structural components of the body's cells.[1,2,3] Vitamin C cannot be manufactured in the human body. In order to maintain sufficient levels for normal body functioning, vitamin C must be obtained through diet, or through the use of supplements.

In 2012 to 2013, the average concentration of vitamin C in blood was 55 µmol/L for Canadians aged 6 to 79 (Chart 1). Overall, males had lower vitamin C concentrations (50 µmol/L) compared to females (61 µmol/L). This was true for all age groups, except for children aged 6 to 11, where there was no significant difference between males and females. Six to 11 year olds had the highest levels of vitamin C (73 µmol/L).

Chart 1
Concentration of vitamin C for individuals aged 6 to 79, by age group and sex, household population, Canada, 2012 to 2013

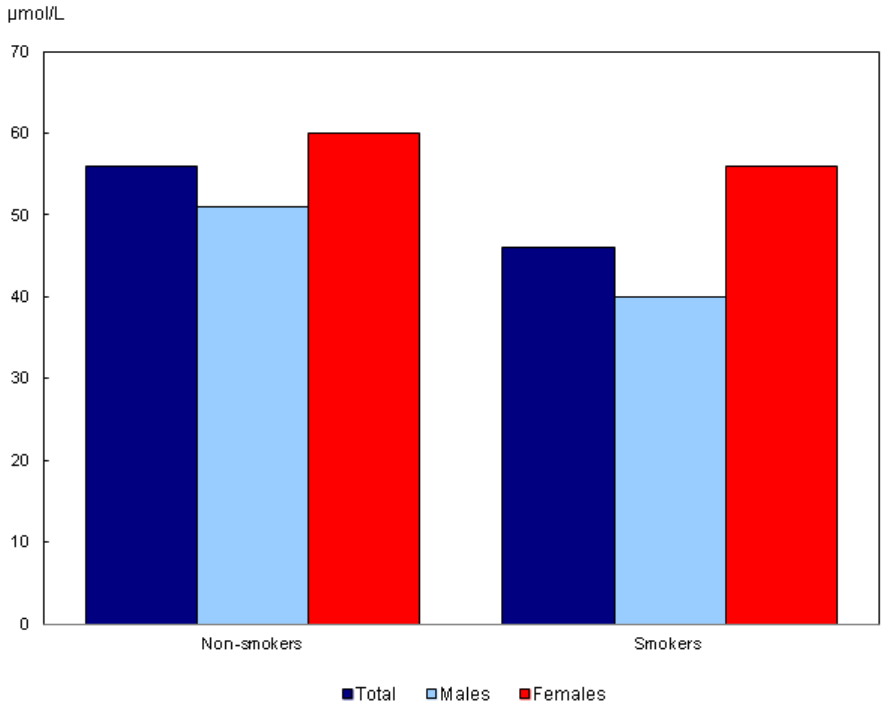


Source: Canadian Health Measures Survey, 2012 to 2013.

Smoking status, body mass index and vitamin C

Studies have shown that smokers have lower concentrations of vitamin C in blood, as smoking likely causes the body to use certain nutrients such as vitamin C at a faster rate.[1,2] Based on self-reported smoking status for individuals aged 12 to 79, smokers had lower vitamin C levels compared to non-smokers (46 µmol/L vs. 56 µmol/L) (Chart 2).

Chart 2
Concentration of vitamin C for individuals aged 12 to 79, by smoking status and sex, household population, Canada, 2012 to 2013

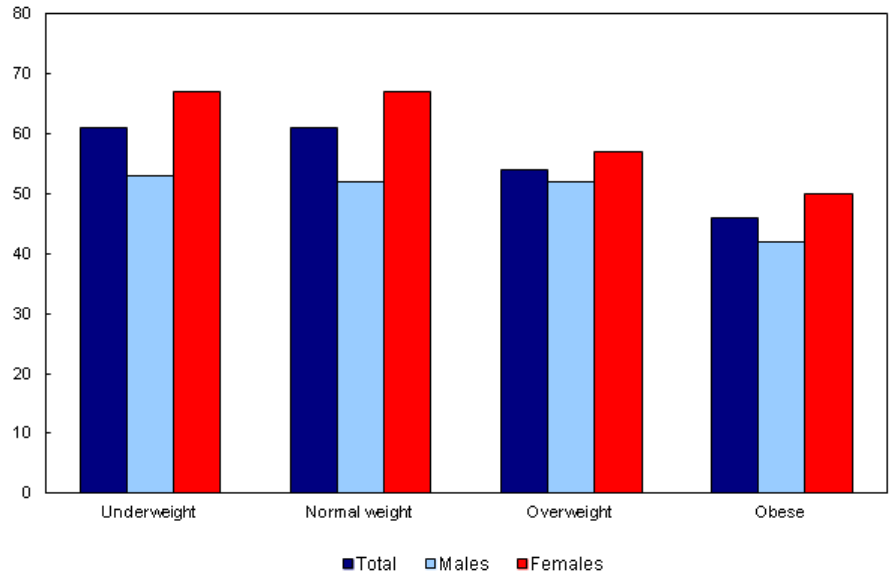


Source: Canadian Health Measures Survey, 2012 to 2013.

Individuals who were normal weight or underweight had the highest concentration of vitamin C (61 µmol/L; Chart 3). Individuals who were overweight had the next highest concentration (54 µmol/L). Individuals who were obese had the lowest concentration (46 µmol/L). The same trends were found with females. For males, the only difference was with individuals who were obese; they had a lower concentration of vitamin C than all other males.

Chart 3
Concentration of vitamin C for individuals aged 6 to 79, by body mass index (BMI)[1] and sex, household population, Canada, 2012 to 2013

µmol/L



1. Body mass index (BMI) is based on cut-points from Health Canada (2003) for adults aged 18 to 79 and on de Onis et al. for children and youth less than 18 years.
Note: "Underweight" includes children and youth classified as "Thinness" and "Overweight" includes children classified as "Overweight" and "At risk of overweight" according to de Onis et al.
Source: Canadian Health Measures Survey, 2012 to 2013.

About vitamin C

Vitamin C (L-ascorbic acid) is an essential vitamin which can come from a variety of food sources. The table below outlines some sources of vitamin C.[4]

Food	Vitamin C content (per 100g)
Dark green leafy vegetables	100 mg to 150 mg
Bright coloured peppers	80 mg to 128 mg
Oranges	50 mg

Vitamin C is also added as a preservative to some foods.[2]

Vitamin C concentration was measured as part of the Canadian Health Measures Survey in plasma, which is a component of blood (in micromoles per litre - µmol/L). There are currently no agreed upon guidelines to establish sufficiency of vitamin C levels to use with the CHMS (Canadian Health Measures Survey) data.

Notes

1 Schleicher, R.L., Carroll, M.D., Ford, E.S., and D.A. Lacher. 2009 "Serum vitamin C and the prevalence of vitamin C deficiency in the United States: 2003-2004 National Health and Nutrition Examination Survey (NHANES).• The American Journal of Clinical Nutrition. Vol. (volume) 90, p. (page) 1252 to 1263

2 Institute of Medicine. 2000. Dietary Reference Intake for Vitamin C, Vitamin E, Selenium and Carotenoids. Washington DC: The National Academies Press

3 Lordish, H., Berk, A., Zipursky S.L., et al. (and others) 2000. Molecular Cell Biology 4th edition, New York, W.H. Freeman

4 Health Canada. Canadian Nutrient File Available at: http://webprod3.hc-sc.gc.ca/cnf-fce/index-eng.jsp. (Accessed October 1, 2014).Vol. (volume) 137, p. (page) 1757 to 1762

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de Onis, M., Onyango, A.W., Borghi, E., Siyam, A., Nishida, C., and J. Siekmann. 2007. “Development of a WHO growth reference for school-aged children and adolescents.” *Bulletin of the World Health Organization*. Vol. (volume) 85, nº (numéro) 9, p. (page) 660 to 667.

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Data

Additional Canadian Health Measures Survey data on this topic are available from CANSIM table 117-0018.

For more information on the Canadian Health Measures Survey, please contact Statistics Canada's Statistical Information Service (toll-free 1-800-263-1136; 514-283-8300; infostats@statcan.gc.ca).

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