

**“New Nutrition Recommendations: Capitalizing on New
Opportunities”**

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Achieving Optimal Health Through Supplementation

“Bridging the Gap”

Summary:

Vitamins serve a vital role in metabolism, protection, growth, repair and reproductive functions. They are required almost daily to maintain levels for human health and well being. Optimal health is the goal of nutritionists and the emerging science for chronic diseases, neural tube defects and immunity, suggest that supplementation can be an appropriate strategy.

Dietary intakes of many vitamins and minerals as reported from nationwide surveys in USA indicate eating habits are poor, variety is lacking and many vitamins and minerals are below recommended levels. A similar picture is likely in Canada. The data available for Canada are lacking in many key areas since dietary surveys lack scope and have not been carried out on a regular basis. Strategies to improve the nutritional status are therefore based on incomplete or scant data.

Forty percent of the population in the United States and Canada take supplements on a daily or almost daily basis. They appear to be taken on a reasonable basis generally as a multivitamin/mineral tablet. Use of antioxidant supplements such as vitamins C and E continues to grow based on the growing scientific findings. Assuming eating habits in Canada are similar to those in the USA, expansion of food fortification, and supplementation could go a long way to “bridging the gap” to nutrient intakes recommended by nutritionists, improve health status and possibly reduce overall national health costs.

As background, Roche Vitamins has been a worldwide manufacturer and bulk supplier of vitamins for animal and human nutrition since the early discovery years of the 1930's.

On the human side, Roche supplies bulk vitamins for both food enrichment and fortification and for inclusion into dietary supplements. Although in the US and Canada, you will not find a food or supplement product on the retail shelf bearing our company name, Roche has always had a long-standing commitment to vitamin nutrition research and to consumer awareness and understanding of the role and health benefits of vitamins.

Vitamins and minerals are essential nutrients that we consume with our food everyday. Our bodies requires these essential nutrients almost on a daily basis. The most natural way to deliver such nutrients is with food since they come with all of the other micro and macro ingredients necessary for metabolism, growth and health. It is in the area of health that often is of concern to nutritional scientists, since many chronic diseases have their etiology in nutrition.

Vitamins are essential for five key functions in the human body. Metabolism, protection, growth and repair, basal requirements and reproduction. Unless the nutrient requirements are met over a period of days, disturbances in any of these areas can and will occur. Today in North America and indeed in all industrialized countries our diets are changing. Time pressures encourage more eating out, there are more two parent working families, processed foods continue to grow as a part of our diets and the population is aging,. All in all dietary intakes of many key nutrients are at sub-optimal levels. Fat intake still remains persistently high, fruit and vegetables remain at about half of what nutritionists recommend and grains and fiber should be further increased. There are no "dead bodies in the streets" because of these poor eating habits but cardiovascular disease, cancer and diabetes and continue to dominate morbidity and mortality records and nutrition is thought to be a prime cause in these chronic diseases. Diabetes is rapidly reaching major

proportions perhaps mainly due to eating habits. Close to two million Canadians have or will be diagnosed.

Food fortification in Canada is based on restoration principles with few examples of foods used as carriers of special nutrients for disease prevention. The legislation is cumbersome, in general the most restrictive in the world and regarded by food manufacturers as restrictive to trade. The most recent extensions cover minor uses such as vitamin A addition to goats milk and vitamin D and Calcium to soyamilk. Temporary Marketing Letters (TML's) are rarely used due to restrictions and hassle to the marketer. The addition of folic acid to foods has been debated for many years and still the population is denied an easy way to achieve reasonable levels of intake and help prevent neural tube defects.

In studying the dietary patterns in USA where the data is reliable, collected at regular intervals and covers all population groups, some conclusions can be made(1,2). Eating habits are getting worse with declines seen in several key categories such as milk, 33% decline and French fried potatoes make up half the potato intake for children. Soft drink intake is twice that of milk for adolescents and half the population do not eat even one fruit or one vegetable on any given day. What about Canada? Are eating habits here any better? Perhaps, but there is such a paucity of data it is like a "black hole". Most researchers agree we eat out nearly as much as in the USA, variety of intake is as bad and intake of fat is at similar levels, about 35% of calories. In both Quebec and Nova Scotia caloric intake in some parts of the population are dangerously low and the likelihood of deficiencies is high (3). At the risk of being wrong I will say it is likely a similar picture as in the US and some correlation's can be made.

One area we however do not measure up to the US is in obesity. It is quickly obvious upon arrival down south that Americans are bigger and more overweight. Overweight persons and those categorized as obese are in far

greater numbers. This is due to both a lack of exercise and poor diet. There are now approximately 50% of the population with BIM's of 25 or more (1).

Education, health awareness and the flow of information on nutrition continues apace. There is not one day when we are not bombarded with lectures from nutritionists and writings from health communicators. The truth of the matter is we do not take much notice.

Recent Food Consumption Survey data (USA) reveal that about half of the men and women take the time to read the label on packages for nutrition information (2). The importance of nutrition has declined for both men and women from 1994, there is a perceived decline in eating habits, and 75% of the population skips breakfast, regarded by many as the most important meal of the day.

Tracking Nutrition Trend data (Canada) shows that nutrition is important but only 35% of men believe this versus 57% for women. Reductions seen in fat intake may decline and the increase in fiber intake may flatten off in the coming year if we are to believe the respondents (4). So where does this all lead us? To a generally poor nutritional intake for most vitamins which is unlikely to change in the near future, even with adequate education and promotion.

Using as an example Vitamin E, intake continues to decline as intake of fat slowly declines with "fat free" and "reduced fat" products readily available. Yet the science says that vitamin E is one of the critical nutrients in the fight against certain chronic diseases. People continue to shun fat products where Vitamin E is found, or more likely choose the reduced fat version. For many other vitamins much of the population comes up short. Depending on the nutrient 40-70% of men and women have intakes below one RDA (1). The same likely exists in Canada.

In elderly populations where intake, bioavailability and atrophic gastritis and other factors compound the problem, many persons are below 50% of the RDA (5,6).

Chronic disease often have in their etiology in nutrition. Particularly those conditions with inflammation or immunological function as a root cause. Many studies continue to add to the already large data base on cataracts where vitamins C, E or even green tea reduce cataracts. Cataract prevalence in the elderly is significant and growing (7). Reductions in the order of 30-50% are not uncommon using antioxidant vitamins (8). For chronic heart disease modest doses (400IU) of vitamin E are shown to reduce dramatically the incidence (9).

Recent Canadian (10) and very large US surveys (11-14) indicate CHD can be reduced with vitamin supplementation. In general a 30-40% reductions are not uncommon. These data are supported by fruit and vegetable consumption studies from the UK (15). Finally, a good study on immunological function and status from Dr. Chandra's work in Newfoundland on infection and antibiotics use in the elderly confirmed the physiological data (16). Thus the science for vitamin E is sound and continues to grow together with the populations awareness. Paradoxically the intakes remain low or are even declining.

What of supplementation use? There is the mistaken belief that consumers take vitamins by the handful, are overdosing or worse taking many different types. Government believes they must be controlled by all means. The truth is consumers seem to be reasonable in their consumption habits. Firstly, only 40% of persons in the USA and Canada take vitamin supplements daily or almost daily basis (17). This has increased gradually over the last decade from around 30%. The majority take a multivitamin tablet which contains 1-3 DRI's, and is complete with vitamins and minerals. In addition a further 18% take a second supplement , often antioxidants or single entity vitamin C or E and an additional 12% take mineral supplements, mainly women.

The use of antioxidants has occurred in the last 5 years primarily based on the growing science with vitamin C and E and natural antioxidants. In Canada the word "Antioxidant" is banned from use on supplement labels by Health Protection Branch, Health Canada, since it is thought by the Department to be a

health claim. The term is recognized and used in government documents, is scientifically correct and well documented, and has awareness in the population of 49% in USA and 53% in Canada. However the HPB in their wisdom have ruled that the term not be permitted. The lower use of AOV in Canada is perhaps due to the protectionism stance of HPB and a disservice to the general population where education via labeling may be of some benefit.

Gallup studies carried out by Hoffmann La Roche show that doctors are a good source of information for consumers in the US and Canada, more in the USA. Doctors also recognize the benefits of supplementation and as a group take more vitamins than the general public. Particularly of antioxidant vitamins. Reasons for supplement use are in general the same in the USA as Canada. They are to “keep healthy or feel better” ie as insurance. Secondly, to “supplement the diet” which most people know is poor and thirdly for “energy and strength” or on “doctors advice”. Purchase location is primarily via drug stores in Canada or a variety of outlets in the USA, however drug stores predominate in the US as well.

An additional example of the benefits of supplement use can be shown using Neural Tube Defect data. NTD's are a devastating birth defect affecting about 2-6 births per 1000 in many industrialized countries. They occur generally due to poor nutrition or genetic disorders. The use of a folic acid supplement is well documented and shown to reduce the occurrence by 50% or more. Education is not reaching the population on the critical need early in pregnancy. Perhaps more importantly 50% of births are unplanned and folic is needed by the fetus in the first 30-40 days following conception, often before pregnancy is determined. Fortification of several cereals is now finally, after a decade of debate to be permitted optionally in food products. However the level of addition may not be sufficient to bring the population up to recommended intake. Supplementation may therefore be a better targeted choice. Statistics for Neural Tube defects in Canada plotted against the use of supplements by province shows an interesting pattern (18). Provinces with highest supplement

use have the lowest occurrence of NTD's. Dietary intake by province should also be taken into account, but since the use of a simple multivitamin/mineral tablet has been shown to reduce NTD's the data appear to fit the scientific findings.

It is now becoming recognized that high homocysteine levels are a factor in cardiovascular disease and that folic acid, vitamin B6, and vitamin B12 can reduce homocysteine levels. The fortification of folic to more foods will be a additional benefit. It is estimated that 20% of people living in Ontario have abnormally high homocysteine and are at elevated risk of CVD (19). In this case a simple B-Complex or multivitamin tablet could help in reducing these levels.

Finally, the ever increasing health care costs are perhaps a compelling reason why the use of supplements benefit the general population. It is estimated in the USA that the use of a multivitamin supplement could save some twenty billion dollars annually through a reduction in NTD's, cardiovascular disease and complications of low birth weight babies (20). Now, some Healthcare Management Organizations are reimbursing for supplement cost since they see the general population benefits. Further, malnutrition within the hospital system is endemic, particularly for long stay situations. Patients entering in a malnourished state are not only likely to have poorer outcomes but to cost more to the system (21). The aging population, due often to a compromised immune system, needs better nutrition for a healthier lives and it can also perhaps reduce overall health costs (22).

The solution to improve nutritional status of Canadian's is by utilizing a triad approach. Education, targeted appropriately and allowing health claims where there is scientific consensus is a good start. Food fortification should be considerably opened up so that perhaps 25% of key vitamins and minerals are delivered per serving in appropriate foods and to permit manufacturers to produce for the North American market. Harmonization of recommendations on intakes, food fortification and health claims should be viewed as a benefit to the general population so that they can make informed choices and not seen as a

loss of government control as some seem to view it. Finally, supplementation can provide benefits to many sectors of the population where food fortification is not feasible or permitted and when education is not making any significant change in eating practices. Risk groups or specific populations can then attain the optimal nutrition required.

The consumers choice of supplements appears reasonable and based on science from a variety of sources. Rampant over supplementation as some would imply is rare. Finally, having the consumer able to improve their health status and perhaps reduce chronic diseases of latter life is a worthwhile and achievable goal.

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