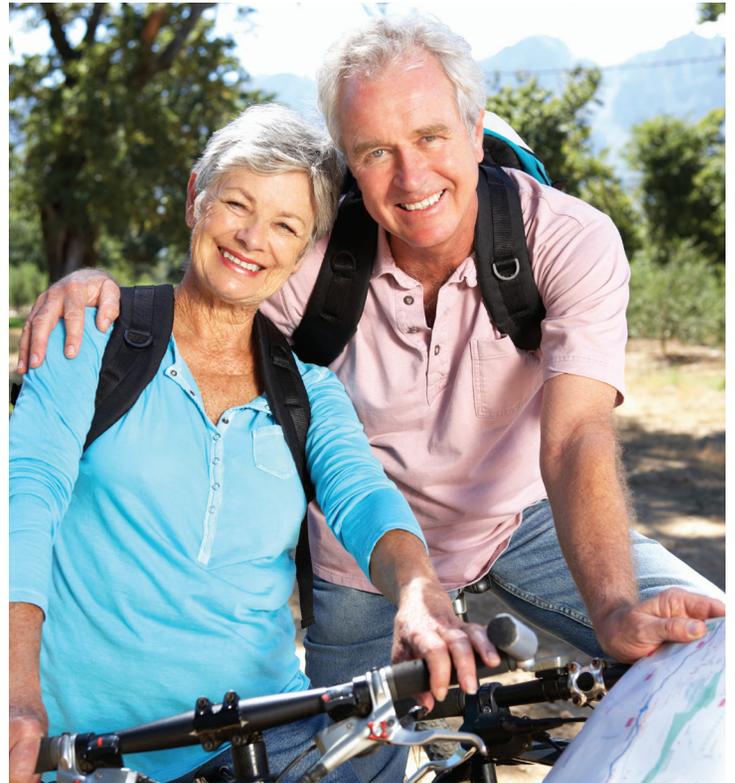


Dear AHS-2 Member,

We are now 9-14 years into this study, a number that differs depending on which years participants enrolled. Studies such as AHS-2 are often called longitudinal studies as they need to follow people through significant periods of their lifespan. There by now have been many publications from AHS-2, and you will be especially interested in those that deal with diet and cancer — the original focus. These publications are slowly trickling out, and we anticipate several more interesting findings being published in the next 9-12 months. We have decided to only report here findings that are already published, as during publication reviews results may change somewhat. Several interesting reports are summarized in this newsletter. We are once again at that time where we need to obtain funding for the next five years (it comes in five year blocks). Projects such as AHS-2 are very expensive (\$2-2.5 million/year) and our federal funding agency scrutinizes the project very carefully — particularly as we are now seeking a significant expansion. In the next five years we hope to be running clinics in many churches around the country to establish a bank of blood, urine and perhaps other products. This will greatly increase our ability to advance notions of “causality” rather than just “statistical associations”, which is so important. In our first attempt at this funding we came very close, but in the end were required to try again with an application just submitted July 2016. Recent discussions with the National Cancer Institute confirmed that there is great interest in our results so far and in continuing the study well into the future. The greatest threat that we face is losing contact with many of you, the study members. People often move house as they grow older, and understandably do not always remember to let us know. We also occasionally



need to call you. It will be of huge assistance and savings of resources (tracing is very expensive and often unsuccessful) if you can once again give us updates of changed addresses and phone numbers. Many thanks for your continued

loyalty over many years. We appreciate your support and prayers, and we pray for your continued good health and a long life!

Gary E. Fraser, MD, PhD

*Principal Investigator, AHS-2
Loma Linda University
School of Public Health*



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Eating Right for Ourselves and the Planet

We know that what we eat affects our health, but did you know it also affects the health of the planet? We tend to think of cars, planes, trucks, the factories that make our goods and the energy we use to light, heat and cool our homes to be the main problems when it comes to environmental damage. But what we eat is the main contributor to our most serious environmental issues. For example, removing rainforests in favor of creating farm land; polluting our lands, waterways and oceans with fertilizers and pesticides; species loss due to habitat destruction, fishing and giving land over to livestock; and climate change, by adding heat trapping emissions to the atmosphere.

These environmental issues have direct health impacts and can also have domino effects, leading to other serious health problems. For example, climate change is considered to be our biggest health threat due to excess heat and storms, and also by increasing droughts and reducing food availability, leading and adding to malnourishment. According to leading scientists, we need to act quickly to turn things around and make sure the planet continues to adequately and reliably support current and future generations.

At Loma Linda University, we have one of the few teams in the world focusing on the relationships between what we eat and how this impacts our health and our planet, which we

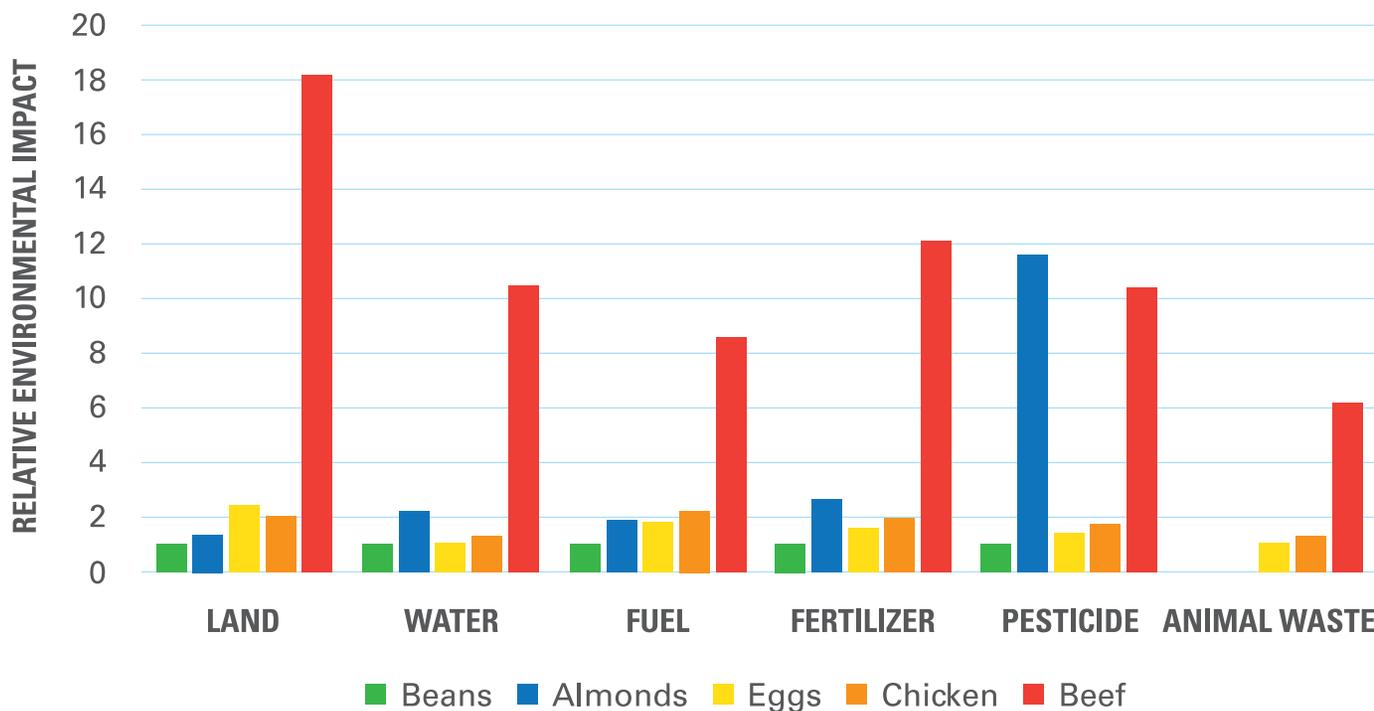
have called “environmental nutrition”. We have published key relationships using the Adventist Health Study. We found that people who eat the least planet friendly diets also have the shortest lives. This finding has since been supported by the work of other leading scientists in the field.

Just as for our health, some foods are better for the planet and some foods are very detrimental. Our work continues to show that “what is good for us is also good for the planet”. See the example chart of our findings for a range of high protein foods. Beans are not only one of the best foods for us, but also for the planet. Producing the same amount of protein from beef requires 18 times more land, 10 times more water, nine times more fuel, 12 times more fertilizer and 10 times more pesticide.

The emerging area of environmental nutrition has shown that diets based on plant foods, such as grains, legumes, fruits and vegetables, result in a win-win situation for us and the planet. Going forward, we have the best resources available to lead this front, by combining the richness and high quality of the Adventist Health Study with the most comprehensive data on the environmental impacts of food. For more about our team, including our publications, visit our website (environmentalnutrition.org).

Helen Harwatt, PhD

Relative environmental impact to produce protein from plant and animal sources.





A Vegan Advantage for Men!

The most common cancer in men is prostate cancer. In fact most men by the time they reach 75 years of age have it, though usually quite small in size and often very slow-growing. Thus, it often never comes to attention and is most often never diagnosed. Yet about 20% of men with this cancer have a faster growing more aggressive variety right from its first diagnosis. In addition, those with the “slow-growing indolent” variety are at some risk of having an acceleration in their cancer’s growth after a few years. Black men have nearly twice the risk as White men for developing this cancer for unknown reasons. This is also so among Adventists. So it is of great interest that we found that vegan Adventist men have about a 35% reduction in risk of prostate cancer (aggressive and indolent varieties combined) when compared to non-vegetarian Adventists. Unfortunately lacto-ovo vegetarians did not seem to derive any benefit. If we looked only at the aggressive form of the cancer, or at prostate cancer in Black men, similar reductions were found in the vegans, although in these much smaller groups we could no longer be sure that this was not a chance result (not statistically significant). We will need to await more cases to be sure in these subgroups of men. So why may there be a vegan advantage? How do vegans differ from other Adventist vegetarians (who generally were no better off than the non-vegetarian Adventists)? In several ways, as they replace dairy and eggs by plant foods. This result places some spotlight on dairy products, and we are presently directly testing whether these foods may increase risk. Look for a report next year! Vegans also eat more of many fruits and vegetables, and soy, so this may also be important. Does it matter? Yes, particularly for those who have a history of prostate cancer in their father or brothers as then the risk is somewhat higher. You may consider trying a vegan diet, that although a little more trouble to prepare, can be very tasty and varied.

Yessenia Tantamango-Bartley

New DNA Sequencers for AHS-2 Research

Adventist Health Study-2 researchers are working with other scientists at Loma Linda University in new areas of biological research. It is important to discover associations (or correlations) between aspects of diet and the risk of cancers or other diseases. But to demonstrate that the dietary factor really causes an increased or decreased risk of the disease, it is important to try to understand how it does so at the biological level — the level of our cells and our genes. We are now starting to explore questions at this level, and we hope to do so more and more in the future.

New developments at Loma Linda University are making this possible. The School of Medicine has established the Center for Genomics, which is now headed by an accomplished gene-science specialist, Dr. Charles Wang. Dr. Wang and the Center have now obtained two powerful, modern gene sequencer machines. The first, an Illumina NexSeq 550, funded by a \$280,000 NIH grant, can sequence an entire human genome — the complete chromosomal set containing all inheritable traits of a person — in just 1.5 days. The second, an Illumina HiSeq 4000, is considerably more powerful. Dr. Wang says it allows researchers to carry out very large projects, such as those using data and specimens from AHS-2, to determine the effects of lifestyle on gene regulation (epigenetics), which can affect disease risk and longevity. This newer, more advanced model can sequence 12 whole human genomes in less than four days. Purchase of the \$1.1 million sequencer was made possible by the generosity of the Ardmore Institute of Health and by Charles A. Sims, MD. We look forward to the exciting potential of AHS-2 research made possible by these new technologies!

James Ponder



Dr. Charles Wang explaining the DNA sequencers to leaders from Loma Linda University and the Ardmore Institute of Health.



Contact AHS-2 at 1-800-247-1699 or
Website: ahs2.com | Email: ahs2@llu.edu

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Lifestyle and Risk of Hip Fractures in the AHS-2

As people age, the risk of hip fractures becomes an increasing worry as bone structure often weakens and subjects become osteoporotic. We know that regular physical activity lowers the risk of hip fractures. However, as we get older, it is quite common to let go of a regular exercise program that includes walking or running. Some people transition into a very sedentary lifestyle. A recent paper from the AHS-2 found that, compared to a sedentary lifestyle, any kind of weight-bearing activity was associated with a significant 60% reduction in hip fractures among men and a 48% reduction in females (paper 1). The benefit did not increase significantly when doing more intensive physical activity. Thus it seems that as one ages, it is important to avoid sedentary activities and instead be “out and about”. Further studies are needed to find out whether the observed reduction is due to stronger bones or to stronger muscles or better balance. We suspect it is a combination of these.

Diet is also important for bone health. For many decades there has been a discussion of the role of vegetable versus animal protein. We studied the role of high protein foods among vegetarians and non-vegetarians in the AHS-2 (paper 2). Legumes were protective for hip fractures in both

diet groups with a 82% reduction in hip fractures among non-vegetarians and a 52% reduced hip fracture risk among vegetarians in those eating legumes daily compared to those who rarely eat legumes. Further, among vegetarians, eating meat analogs daily reduced the risk of hip fractures by 66% compared to those who rarely ate these foods. And among non-vegetarians, eating meat at least three times a week reduced risk of hip fractures by 46% compared to those who rarely ate meat. Our findings seem to indicate that we need regular protein intake in order to maintain strong bones, and we can get such protein from several sources, including legumes and meat analogues.

Synnové Knutsen

1. Lousuebsakul-Matthews V, Thorpe D, Knutsen R, Beeson WL, Fraser GE, Knutsen SF. Non-sedentary lifestyle can reduce hip fracture risk among older Caucasian adults: The Adventist Health Study-2. *BJMMR*. 2015. 8(3):220-9.
2. Lousuebsakul-Matthews V, Thorpe D, Knutsen R, Beeson WL, Fraser GE, Knutsen SF. Legumes and meat analogues consumption are associated with hip fracture risk independently of meat intake among Caucasian men and women: The Adventist Health Study-2. *Pub.Health Nutr*. 2014 October; 17(10):2333-43.