

AGING REVERSED?

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In this column, we have discussed many things about nutrition, vitamins, exercise, stress management, and other ways to create a slowing down of the aging process to improve health and longevity. In past articles, I have written about caloric restriction (CR) and have noted all of the benefits as well as the difficulties of compliance to this dietary pathway or lifestyle. In the recent magazine *Science*, University of Wisconsin researchers noted that after 20 years on a caloric-restriction diet, 37% of the non-CR group had died whereas 13% of the caloric-restricted group had died. Also, the lower-calorie group had fewer cases of heart disease, diabetes, cancer, and Alzheimer's disease. In a parallel group of humans studied by Washington University Medical School, the caloric-restricted group had lower cholesterol, lower blood pressure, less body fat, and lower blood sugar levels.

While it is repetitive to talk again about caloric restriction, this is probably the single most important pathway that can be followed to improve aging. This, however, is not new information. As far back as Luigi Cornaro in the 15th Century, caloric restriction has been followed by some who advocated it for maintaining good health and longevity. Luigi himself died at the ripe old age of 102 after predicting this outcome 30 years before as he steadfastly maintained his lower caloric intake. Of course, his friends kept telling him that he was too thin and that he would not be healthy if he persisted in this. However, he outlived them all by many years. There were many others throughout recorded history who engaged in reduced caloric intake, some of them choosing the vegetarian pathway to accomplish this. Pythagoras, a pre-Socratic Greek philosopher of the 5th Century BC, was noted for his writings about food intake and other aspects of human lifestyle. "Do not neglect the health of the body, keeping measure in eating and drinking, and every exercise of the body." Avoiding unhealthy foods today translates as high density, high glycemic, sugar and fat filled foods which are part of the standard American diet.

Over 60 years ago scientific experiments revealed that caloric restriction increases life expectancy of laboratory animals. Throughout the years following this, it has been postulated by researchers that a change in the "gene expression" of certain diseases occurs with minimal to moderate caloric restriction. Recently Dr. Stephen R. Spindler was able to examine changes in genes, including the ones that are involved in DNA repair and antioxidant metabolism. He showed that caloric restriction inhibited cell death, increased protein synthesis, increased secretion of growth hormone, and increased the resistance of neurons in the brain to premature aging changes. You may, for example, have a gene for heart disease or Alzheimer's, but CR may help you avoid expression of that gene.

If you look at the studies of prostate cancer, it is noted that slower tumor growth of prostate cancer is seen when diets are changed from high fat levels to low fat. Serum PSA levels follow these reductions in calories on a downward scale. Essential fatty acids improve the level of eicosanoids (good hormones) and high intakes of these can lower the risk of prostate cancer substantially. Natural sources of these omega-3 fatty acids include cold water fish such as salmon, tuna, sardines, herring, and swordfish. A good intake of these foods in

association with reduced caloric intake, particularly of saturated and trans-fat, can lead to a health benefit for those who have prostate cancer.

CR has also been shown to augment the immune system and improve longevity by reducing available free radicals. There is less damage to the DNA and increased levels of glutathione, melatonin, DHEA, and other good enzymes and hormones in the body. It also reduces the levels of cortisol, the stress hormone in humans. Eating processed carbohydrates increases the insulin production, which in itself is also a known risk factor for many diseases.

As you might suspect, caloric restriction is not the total answer to good health. CRON (caloric restriction with optimal nutrition) is the pathway that researchers have utilized to increase lifespan and reduce health risks. Many of the people in this country and others are nutritionally deficient, even though they ingest an excess of calories. This is because the high density calories constitute a large part of our diet, and the nutritionally rich foods such as fruits and vegetables, nuts, and grains and other food substances simply are not eaten as much as they should be.

We know that CR laboratory studies have been precisely measured and have shown to improve longevity and wellness, but how precise are human studies? We know that there is an improvement in humans when caloric restriction has been followed, mainly in weight loss, cardiac improvement, diabetes improvement, and improvement in cerebral function. However, we don't know exactly what the best BMI is for any particular individual and exactly how much food they should eat. However, the best indicator that CR would be helpful for any person is if they are overweight.

One of the reasons that the new diets presented each year to the American public are successful is because they represent a "gimmick" way to lose weight and be healthier. However, by not eating as much and eating more highly nutrient foods, one can lose weight and be healthier. Ninety-five percent of diets fail because they give the "easy" way out temporarily, but are not followed long term.

If you are a candidate for a caloric restriction diet, the best thing to do is to learn about nutrition and foods. Choosing foods with high antioxidant value or low toxin value are important. For example, sugar and hydrogenated vegetable oil would be bad components of a diet, whereas high nutrients and reduced sugar as found in fruits and vegetables would be a positive benefit. If you can reduce your caloric intake by 10% and choose more highly nutrient foods, then weight loss and a better energy level will follow. In studies comparing the benefits of CR to exercise, caloric restriction is more important than exercise in maintaining health, but both are important.

There are studies that compare intermittent fasting as an alternative method to daily caloric restriction. Interestingly, laboratory animals placed on intermittent fasting were able to delay onset of diseases and live 10-15% longer than free ranging animals. In addition, some brain studies were done that showed that the alternate-day fasting preserved brain cells better than a fixed percentage diet group. Another study showed that adult asthmatics following CR showed marked improvement in oxidative stress and inflammation as well as severity of the disease. It appears certain from the literature that alternate-day caloric restriction without weight loss can prolong life and improve health in humans.

In summary, caloric restriction, when indicated by excess body fat, can have good health benefits and improve the aging process. Try it!