

## **CALORIC RESTRICTION IN HUMANS**

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Caloric restriction (CR) has been shown to slow primary aging, as evidenced by an increase in maximal lifespan, in *c. elegans*, *drosophila*; fish, mice and rats. There is currently no information regarding whether or not CR slows primary aging in humans or any other long-lived mammals. However, it is clear from information obtained on individuals who have been practicing severe CR for longer than 3 years (3-14 yr) that CR has a powerful protective effect against some of the major causes of secondary aging, including type 2 diabetes, atherosclerosis and hypertension. The caloric restricted (CR) individuals have very low serum triglyceride, total cholesterol and LDL cholesterol, insulin and glucose levels and extremely low blood pressure. Most of the decreases in these variables occurred during the first year after starting CR. CR humans also show some of the same adaptive responses observed in CR rats and mice, including very low total white blood cell and lymphocyte counts, low levels of inflammatory cytokines and markers of inflammation, and low levels of a number of growth factors and hormones involved in cell growth and proliferation. On the negative side, the CR individuals have lost their sex drive and are very cold sensitive. It seems possible that within the next 60 to 70 years sufficient longevity data will become available on severely CR humans to show whether or not CR increases maximal life span in humans. In the mean time, we hope that it will be possible to determine whether the rate of aging is slowed in humans on CR by means of serial measurements of physiological functions that decline at a linear rate of ~1% per year.