

# Essential information to avoid Cancer

Great progress has been made in understanding how calorie restriction slows aging and protects against disease. Although we do not know the exact age-slowing mechanism of calorie restriction, research provides many clues that anyone who wants to prevent disease – especially cancer should know – whether or not they choose to limit calories.

Take a look at one the longest lived peoples in the world, elderly Okinawans, who are famous for following a nutrient-dense, low-calorie diet. Apparently their regimen pays off. Excellent research by Dr. Bradley Wilcox, expert on Okinawan longevity, with a team of scientists reveals that elderly Okinawans have a longer average and maximum life span than most human populations. The incidence of age-related disease is also much lower in this group.

In addition to limiting calories, protein makes up only 9% of the total calories of their daily diet. This is radically different from the 15.6 percent of protein in typical western diets.<sup>1</sup>

Research at School of Medicine at Washington University in Saint Louis indicates that protein intake makes a difference in an important hormone that acts as a key mediator of growth, cancer and longevity. According to the lead researcher, Luigi Fontana, M.D., Ph.D., excessive protein intake raises insulin-like growth factor 1 (IGF-I), a hormone that is linked to increased incidence of cancer and more rapid cancer progression.<sup>2</sup>

Dr. Fontana's concerns about IGF-I are strongly supported by many experts including a 2002 study by Michelle D. Holmes and colleagues at Harvard Medical School:

Plasma levels of insulin-like growth factor I (IGF-I) have been associated with risk of several cancers...

...We conclude that higher energy, protein, and milk intakes were associated with higher levels of IGF-I. These associations raise the possibility that diet could affect cancer risk through influencing IGF-I level.”<sup>3</sup>

Use your NutriBase CR Way edition software to test whether your dietary protein intake raises IGF-I excessively. You will find IGF-I is conveniently listed under “CR Way Benchmarks in the tracking section. Testing IGF-I against protein intake is easy. Simply arrange with your doctor to test IGF-I (or somatomedin C, as it is called on many lab requisition forms) twice – first after eating a low protein diet for at least two weeks and after eating a high protein diet for the same length of time. Change nothing else. Watch your IGF-I jump. Make sure to use your CR Way software to analyze your dietary intake so that **all** the protein you eat is recorded.

## IGF-I and Longevity

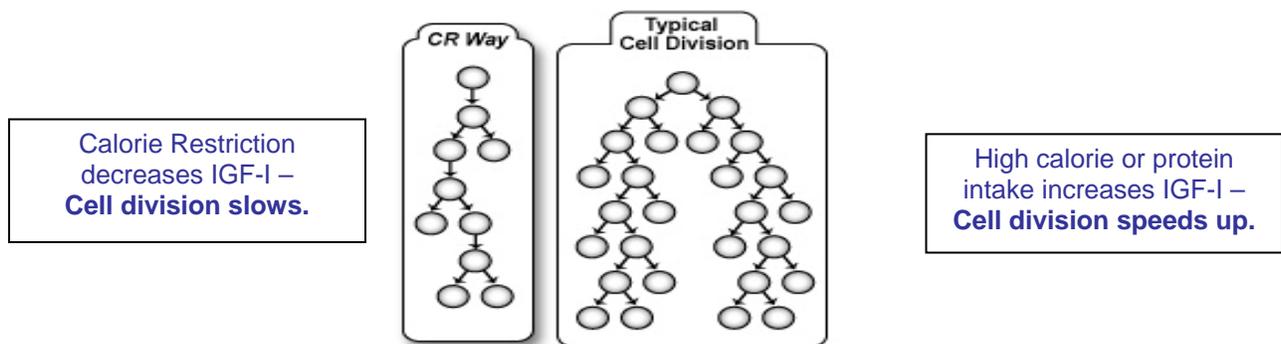
In addition to association with cancer risk, IGF-I has been well established as a regulator of longevity. Animals, living on calorie-restricted diets, consistently show lower IGF-I levels and live longer<sup>4</sup>. This motivated researchers to further establish IGF-I and its partner growth

hormone (known together as the IGF-I /growth hormone axis) as age regulators by genetically manipulating animals to lower the effect of one or both of these hormones. These animals don't grow as large and have an extended life span.

Research on Ashkenazi Jews, who are known to live exceptionally long lives, supports that lowering the effect of IGF-I in humans can extend life. A study at Albert Einstein College of Medicine shows that women in this group who survived past age 95 were much more likely than their peers to possess one of two similar mutations in the gene for the insulin-like growth factor 1 receptor (IGF1R). The mutations make cells less responsive to IGF-I<sup>5</sup>.

The age-slowing effect of less IGF-I may be related to a reduced rate of cell proliferation.

Here's how we illustrate it in *The CR Way* (HarperCollins, 2008):



Slowing cell proliferation also gives the body more time to repair or eliminate cells that may otherwise become cancerous mutations.

The IGF-I /growth hormone axis has been proven to be a key mediator of longevity as well as cancer risk. Given that protein intake significantly increases secretion of these two hormones, knowing how much protein to include in your diet is important.

Since we know that in most Western diets protein intake is excessively high, a good place to start would be to aim for total protein intake at levels recommended by the NIH: 0.8 g per kg of body weight<sup>6</sup> (0.36 g per pound of body weight)<sup>7</sup>. This is 46 grams for most women and 56 grams for most men. Please note that these are grams of protein not grams of proteinaceous food. To know how much protein you're getting, enter your food intake into the NUTRIBASE CR WAY EDITION. The software tracks your protein intake on a day-to-day basis and by the week or month – whatever you prefer. It also shows the amount of protein in each food and, when available, gives the amino acid breakdown.

Remember that not only do protein-associated foods such as meats and beans count towards total protein intake – but also protein in foods like vegetables and fruits must also be

included when calculating total daily protein. For example, the strawberry and walnut dessert snack that “The CR Way™ for a Better Life” in THE CR WAY EXPERT ARTICLES suggests contains 2.83 grams of protein.

The CR Way™ complex carbohydrate diet with moderate protein has many similarities to the intake of the long-lived Okinawans in the previously cited study. Meal plans and recipes from The CR Way make living this lifestyle easy and fun. Whether or not you choose to limit calories, understanding how much protein makes up your food selections is important for anyone who wants to reduce cancer risk.

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<sup>1</sup> Willcox BJ, Willcox DC, Todoriki H, et al. **Caloric restriction, the traditional Okinawan diet, and healthy aging: the diet of the world's longest-lived people and its potential impact on morbidity and life span.** *Annals of the New York Academy of Sciences*. 2007 Oct;1114:434-55. PMID: 17986602

<sup>2</sup> Fontana L, Klein S, Holloszy JO. **Long-term low-protein, low-calorie diet and endurance exercise modulate metabolic factors associated with cancer risk.** *American Journal of Clinical Nutrition*. 2006 Dec;84(6):1456-62. PMID: 17158430

<sup>3</sup> Holmes MD, Pollak MN, Willett WC, Hankinson SE. **Dietary correlates of plasma insulin-like growth factor I and insulin-like growth factor binding protein 3 concentrations.** *Cancer Epidemiology, Biomarkers & Prevention*. 2002 Sep;11(9):852-61 PMID: 12223429

<sup>4</sup> Shimokawa I, Higami Y, Tsuchiya T, Otani H, Komatsu T, Chiba T, Yamaza H. **Life span extension by reduction of the growth hormone-insulin-like growth factor-1 axis: relation to caloric restriction.** *FASEB Journal*. 2003 Jun;17(9):1108-9. Epub 2003 Apr 8. PMID: 12692087

<sup>5</sup> Suh Y, Atzmon G, Cho MO, Hwang D, Liu B, Leahy DJ, Barzilai N, Cohen P. **Functionally significant insulin-like growth factor I receptor mutations in centenarians.** *Proceedings of the National Academy of Sciences of the U S A*. 2008 Mar 4;105(9):3438-42. Epub 2008 Mar 3. PMID: 18316725

<sup>6</sup> U.S. Institute of Medicine. **Dietary Reference Intakes: Macronutrients, RDA/AI Table, 2002/2005.** <http://www.iom.edu/Object.File/Master/7/300/Webtablemacro.pdf> , accessed June 12, 2008

<sup>7</sup> McGlothlin P and Averill M. **Excess Protein Increases IDF-I.** *The CR Way*. New York: HarperCollins, 2008, p. 16