

LE Magazine July 2007

## REPORT

### The Calorie Restriction Society Research Project

By Paul McGlothlin and Meredith Averill



The life-extending and disease-preventing benefits of calorie restriction (CR) are often used as the gold standard for animal research on aging. In such studies, calorie-restricted animals are compared to controls to see if an intervention like a drug or supplement has a life-extending effect or other disease-preventing benefit similar to CR.

This made us wonder if such a standard could be established in humans. The problem, of course, is that unlike favorite research animals like mice, flies, or worms, humans have a long life span, so waiting a lifetime to see if calorie restriction really works is not practical. People who want to slow aging need answers now. They need to know what works and what doesn't, and they need a standard that can be used to evaluate any longevity intervention worth considering. This is the reason for the Calorie Restriction Society Research Project, which began in 2002.

Initially, we started with a pilot study run by the eminent Dr. Richard Lord at the Metamatrix Clinical Laboratory. Subsequently, we formed a partnership with Drs. Luigi Fontana and John Holloszy at the Washington University at Saint Louis Medical School. Here, Dr. Holloszy has developed a superb research laboratory that is perfect for human CR studies. Thus, the Calorie Restriction Society's Research Project was off and running.

To provide subjects, we rallied the Calorie Restriction Society membership to participate, and we developed a method of screening participants that required proof of health status and limitation of calories. We were able to form a cohort of CRS members who had practiced CR for six or more years.

The principal investigator of the CRS Research Project is Dr. Luigi Fontana, whose passion is the science of aging. Dr. Fontana has gained special insights on human health from his experience as a practicing physician and as a researcher in metabolism. Dr. Fontana has already made medical history with the first two phases of the project by showing that calorie restriction does indeed have age-slowng effects in humans.

Dr. Fontana's published results have attracted worldwide attention. In a study published in 2004, individuals who practiced calorie restriction showed virtually no evidence of atherosclerosis risk. Many evaluative measures, such as total cholesterol, low-density lipoprotein (LDL), triglycerides, insulin, and high sensitivity C-reactive protein were significantly lower in the CR group than in adults consuming a typical American diet. Additionally, the CR group displayed higher levels of cardio-protective high-density lipoprotein (HDL). Carotid artery wall thickness, a diagnostic indicator for coronary artery disease, was 40% less in the CR group compared with the control group. The CR group showed no evidence of plaque accumulation.<sup>1</sup>

Decline in the heart's diastolic (relaxation) function occurs with age. In 2006, Dr. Fontana and his colleagues showed that the diastolic function of the CR cohort resembled that found in people about 15 years younger.<sup>2</sup>

Data from long-lived rodent studies shows that CR decreases serum concentrations of T(3), the thyroid hormone that mediates most of the functions of the thyroid gland. Thyroid hormones influence cell respiration, free radical production, and energy homeostasis.

A 2006 report showed that the serum level of the thyroid hormone triiodothyronine, or T(3), may be an indicator of human aging. Consistent with the studies of calorie-restricted animals, the T(3) levels of the calorie-restricted group were lower than those in the control group.<sup>3</sup>

Just this year, Drs. Fontana and Klein reviewed findings from their work and other studies to set parameters for healthy calorie



restriction—essential for anyone who wishes to practice the CR lifestyle.<sup>4</sup>

## DR. STEPHEN R. SPINDLER TO LEAD THE GENETIC TESTING

Dr. Stephen Spindler, whose genetic analysis of calorie-restricted animals has garnered worldwide acclaim, will lead the exploration of the genetic and cell-signaling patterns of human calorie restrictors for phase three of the Calorie Restriction project. Building on years of studying calorie restriction in animals, Dr. Spindler and his lab will provide an incisive look into how CR affects genetic expression in calorie-restricted humans.

For those interested in finding out more about Dr. Spindler's work, take a look at these two research papers that report on the genetic expression patterns of calorie-restricted animals.<sup>5</sup>

Dr. Spindler and his colleagues showed in 2004 that CR acts rapidly, even in old mice, to extend remaining lifespan by 42% and to dramatically reduce tumors as a cause of death. They found that gene expression also changes rapidly to a new pattern that is closely associated with lower cancer mortality and better health.

In findings published in 2006, Dr. Spindler and his research team used Affymetrix microarrays as well as biochemical and histological studies to show that CR rapidly changes cardiac gene expression and physiology to reduce cardiovascular damage, fibrosis, and blood pressure, and to enhance cardiac contractility and energy production. These results indicate that CR rapidly produces beneficial effects on the heart.<sup>6</sup>

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### References

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# REPORT

## Calorie Restriction Experts to Reveal Secrets of Slowing Aging

Scientists, Committed Practitioners and People Interested in Life-Extending Benefits of Calorie Restriction to Meet in Tarrytown, NY, August 10-12, 2007

People from all over the world will converge from Friday, August 10, through Sunday, August 12, 2007 on the village of Tarrytown, New York, near Sleepy Hollow, where Washington Irving spun his yarn of the headless horseman. But this is a meeting of facts, not fiction. It is a workshop on calorie restriction (CR), the best documented way to slow aging.

Millions of people of moderate weight are already limiting calories, but they may not be activating the longevity biology needed to get the life-transforming benefits of calorie restriction. This workshop will show people how to do just that. The workshop is sponsored by the Calorie Restriction Society (<http://calorierestriction.org/>) and will be held at the Sheraton Tarrytown.

Foremost practitioners conducting the workshop include Meredith Averill, the Calorie Restriction Society's Chairman of the Board, and Paul McGlothlin, the Society's Vice President of Research. They will share their experience in putting the newest scientific discoveries about calorie restriction into practice. McGlothlin and Averill are authors of a new book, *The CR Way*, to be released March, 2008.

"We are here to share the secrets of successful calorie restriction as one of the happiest, most rewarding lifestyles imaginable," says Meredith Averill. "Just think how much fun it is to have the maturity that living a long life gives you, while still enjoying a youthful body. I have maintained more energy for work and play than I ever thought possible."

Recent research has revealed that along with calorie restriction, maintaining low glucose levels is critical to slowing the aging process. Many factors—including food

selection, how foods are prepared, how rapidly meals are eaten, the stress a person is under, and strong emotions like anger or fear—can send glucose levels soaring. In the workshop atmosphere, people will learn how a strategy of limiting calories and keeping glucose levels low activates genes associated with longevity. Participants will enjoy delicious CR meals\* and learn about lifestyle practices that are not only satisfying to the palate and mind, but may also help slow their rate of aging.

\*compliments of the CR Society for donors of \$5000 or more.

### WORKSHOP TO BENEFIT RESEARCH

The workshop is a benefit to continue a milestone research project on the effects of calorie restriction on humans. Initiated in cooperation with the Calorie Restriction Society by Drs. Luigi Fontana and John Holloszy of Washington University's School of Medicine, the first two phases of the research have revealed new findings that allow people everywhere to better understand how to prevent diseases associated with aging.

Highlights of the workshop will be presentations by Dr. Fontana and Dr. Stephen Spindler, whose genetic analysis of calorie-restricted animals has garnered worldwide acclaim. Dr. Spindler will lead the exploration of the genetic and cell signaling patterns of human calorie-restrictors in phase three of the research, whose funding is spearheaded by the Calorie Restriction Society.

Contributions of \$1,000 or more for the research project are requested from those who wish to register for the workshop. As a special "thank you" for this support, workshop attendees will receive a glucose control kit that includes a glucometer, testing strips, and stylus. A copy of NutriBase, the leading dietary tracking software, will be available for participants to use while they are at the workshop and to try at home. Participants will also receive a bibliography and copies of the charts presented at the workshop.

All who are interested in slowing the ravages of aging are invited to take part in the warm, friendly, immersion experience of the Calorie Restriction Workshop. Here they can meet kindred spirits, exchange ideas, and make friendships that may last for a very long lifetime. Attendance is limited so that a personal experience can be provided to all attendees. To make a donation of \$1000 or more and to secure your space, send contributions along with your personal information (including mailing address, e-mail, and phone number) to:

**Bob Cavanaugh,**

**Managing Director  
Calorie Restriction Society  
187 Ocean Drive  
Newport, NC 28570**

Register for the workshop now, and join us to gain new ideas that you can put into practice immediately that just might give you a longer, happier life.

**For more information on this research, visit [www.calorierestriction.org/ResearchOnAging](http://www.calorierestriction.org/ResearchOnAging) or call 1-866-894-1812.**

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