



The Road to Aging is Paved With Calories

CRON: The Only Proven Anti-Aging Therapy

It's always something you eat, somehow.

In the modern West, the most familiar version of the story is of Adam and Eve, who are barred from Paradise by an angry god, who bars the way back “lest he put forth his hand, and and take also of the Tree of Life, and eat, and live forever.”²¹ But the legend is found across cultures. After witnessing the death of the wildman Ekindu, his friend and foil, the Sumerian hero Gilgamesh sets forth to find eternal youth. And he finds it, in the form of the Vine of Immortality — only to have it stolen by a serpent while he bathes.

The *Amrita* of the Hindu epics, the *Ambrosia* of the ancient Greek gods, the *Haoma* of the Zoroastrian tradition, the cryptic references to the Philosophers’ Stone in the alchemical texts, the whispered inner secrets of modern mystery schools ... everywhere you look, the human imagination has, from time immemorial, been sparked by a common vision: that aging can be delayed, youth preserved, and death itself put on hold, by partaking of the Food of the Gods.

In some ways, we latter-day pill-poppers, eating organic foods and washing down our antioxidant supplements, are the modern incarnations of these ancient myth-makers. Fortunately, science has come a long way since our alchemical predecessors. Thus, although we still have our speculators, frauds, and fools, we also have many solidly-researched pills and potions. Thanks to the work of scientists around the world, we now know that many orthomolecules and herbal supplements have profound benefits in maintaining health and providing nutritional support against age-related diseases like **cancer, atherosclerosis, osteoarthritis, and osteoporosis.**

Aging vs. Disease

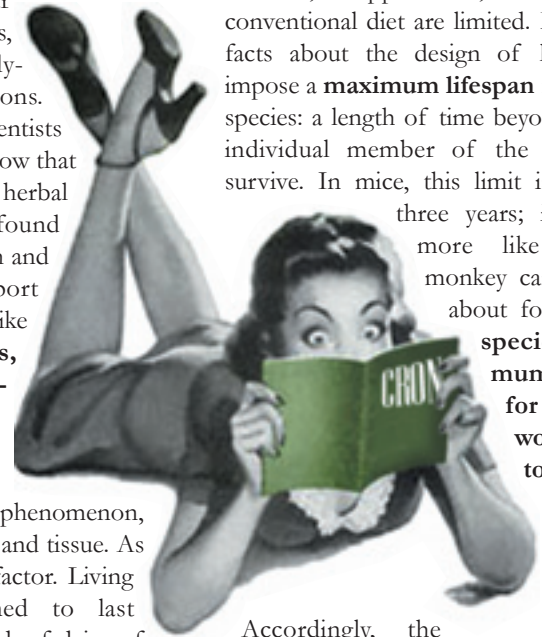
But aging is a whole-body phenomenon, that affects every cell, organ, and tissue. As such, it is the ultimate risk factor. Living beings just aren’t designed to last forever, and reducing your odds of dying of any *particular* disease doesn’t affect the fact that the body *as a whole* still deteriorates with the passing of the years. It’s this whole-organism decay process that we call **aging.**

As such, aging can be a case of “if it ain’t one thing, it’s another.” When the body, viewed as an integrated whole, begins to decay, it matters less and less what your odds are of developing any *specific* age-related disease. If you aren’t killed by a heart attack, you may still be claimed by cancer;

avoid cancer, and kidney failure may lead you to die of your own metabolic by products; and so forth.

There is a dramatic illustration of this fact. The biggest killer in modern, industrialized societies is the heart attack, followed by other cardiovascular deaths (like strokes), cancer, and then several less commonly fatal disorders, such as diabetes. Yet **utterly eradicating heart attack and cancer would only add seven years to the average person’s life.** Throwing in all cardiovascular disease and diabetes to boot only brings the figure up to fifteen years.^{1a}

So while health-conscious people may, on average, live longer than the rest of the population, the gains to be made by exercise, supplements, and a good conventional diet are limited. Fundamental facts about the design of living things impose a **maximum lifespan** for any given species: a length of time beyond which no individual member of the species will survive. In mice, this limit is just under three years; in dogs, it’s more like seven; a monkey can live up to about forty; and **the species maximum lifespan for men and women seems to be about a hundred and twenty.**



Accordingly, the scientists who worked out the statistics we just reviewed on disease, aging, and longevity came to a simple, depressing conclusion: “Barring major advances in the development and use of life-extending technologies or the alteration of human aging at the molecular level, the period of rapid increases in life expectancy in the developed nations has come to an end.”^{1a}

What are we Looking For?

These facts sharpen our focus. If we really want to preserve our health for the long

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term, and live beyond our allotted “threescore and ten,” it won’t be enough to just look at ways to reduce the chance that cancer or heart disease will claim us. **We need an intervention slows aging itself.** We need a way to prevent not just one, or even many, of the diseases of aging: **we need a therapy slows them all.** And there’s only one sure way to prove this. If you have really managed to step in and contain the floodgates of biological aging, **the maximum lifespan of the species should be broken.**

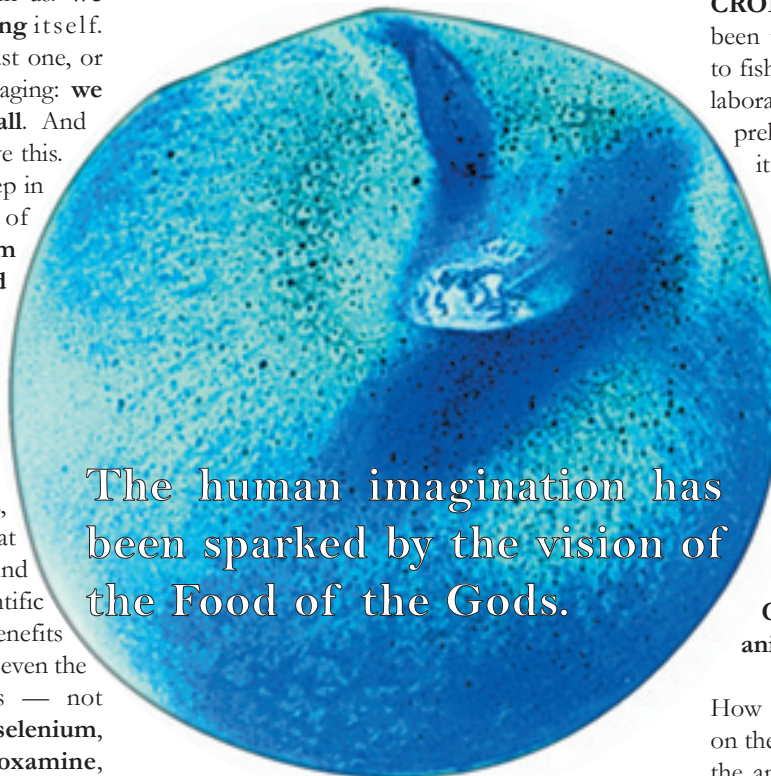
This isn’t news. Since the middle of the century, and especially since the 1960s, scientists have been feeding their lab rats nutrients, botanicals, and drugs, on a quest for the substance that will pack a true anti-aging bang. And yet, despite the extensive scientific research supporting the health benefits of many of these substances, not even the best-backed anti-aging potions — not antioxidants like **melatonin** and **selenium**, not the AGE-inhibitor **Pyridoxamine**, (this is *not* the “**pyridoxine**” in your multivitamin!), not the remarkable cellular rejuvenator **Carnosine**, and not the Parkinson’s drug **deprenyl** — *not one* has yet been *proven* to actually slow down the aging process *itself* — that is, to clearly and repeatedly break the maximum lifespan barrier in mammals. Scientists are now working at unravelling the mysteries of aging at the genetic level, but progress has been agonizingly slow, and many once-promising ideas (like the “cell clock” **telomerase**) have been reluctantly forced into the dustbin along the way. A true anti-aging therapy still looks to be generations into the future.

How ironic, then, that **science has been in possession of a method which has been proven to extend the maximum lifespan of mammals for sixty-five years.**

CRON: Eat to Live

You heard right. If six decades of careful scientific research can be trusted, there *is*

one proven way to genuinely slow down aging *itself*. And it ties in to the archetype of the “Food of the Gods” — but with a twist.



The human imagination has been sparked by the vision of the Food of the Gods.

What this research shows, in a way, is that we’ve been looking at slowing aging *upside-down*. The key, according to this massive body of research, is not to eat *more* of the right food, or even to swallow the right pill. The key, according to this massive body of scientific evidence, is to **eat less food than the body thinks it needs, while maintaining adequate levels of all essential nutrients.** In other words, **minimize Calories, while maximizing nutrition.**

This program goes by many names, from the catchy “high/low diet” (high nutrition, low Calories) to the stoic “*undemutrition* without *malnutrition*,” but **Caloric Restriction (CR)** or **Caloric Restriction with Optimal Nutrition (CRON)** are the terms favored by most people practicing the program. The first research on **CRON** was performed by Dr. Clive McKay in 1935.² Since then, science has improved on McCay’s methods, fleshed out his findings,

and confirmed his conclusions hundreds of times.

CRON works every animal in which it’s been tested, from flatworms³ and spiders⁴, to fish⁵, and — over and over again! — in laboratory rodents.⁶ And, as we’ll see below, preliminary evidence powerfully suggests it will work in people, too. Feed an animal less food than it thinks it needs — less, that is, than its “**ad libitum**” (**AL**) food intake — while keeping the diet at full strength for essential minerals and vitamins, and the incidence of age-related diseases will be dramatically reduced. And more: you will slow aging *itself*, making the animals live longer and in some cases breaking the maximum lifespan of the species. In other words, **an animal eating the CRON way lives longer than that animal is supposed to be able to live.**

How much longer? Well, that depends — on the strain of animals used, on how long the animals are kept on the program, and on how well the animals are cared for. But the most important factor is the Calories. The fewer Calories the animals eat — provided they are kept from malnutrition or outright starvation — the longer they live. In fact, if the animals are started on the program early enough, and their Caloric intake kept low enough, **both their average and themaximum lifespan can be almost doubled.** In human terms, this would be the equivalent of the average person living 156 years, and our oldest old celebrating their two hundredth birthdays! More typical results are seen in **Figure 4.**

Younger at Every Age

Hard to believe? You bet! But true none the less. In experiment after experiment, by criterion after criterion, **CRON animals live longer, live healthier, and live younger than any other animals in the world.** That is, it’s not just a matter of adding more decades of the depressing decay which is too often seen on our streets, in



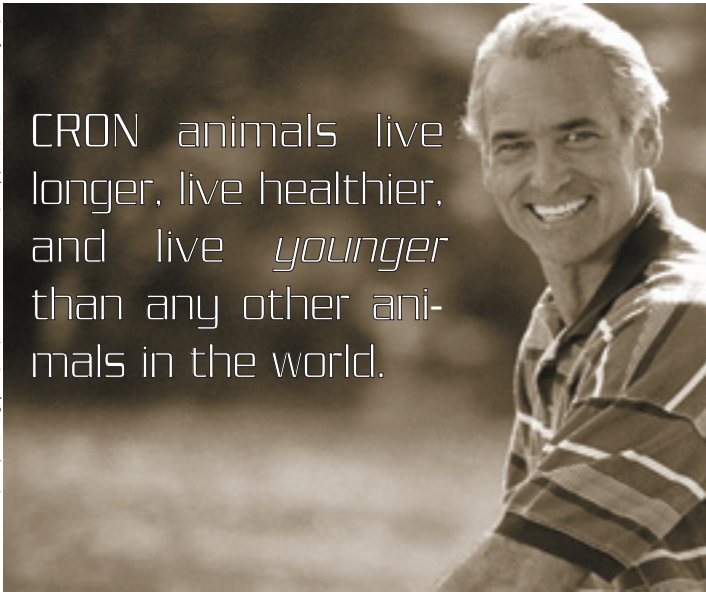
nursing homes, and sometimes in our loved ones — the decrepitude which wrenches the stomach and breaks the heart. Instead, **the added years are healthy ones**, with actual period of downhill sliding being no longer in the **CRON** animals than it is in their more full-bellied littermates. **Animals on the CRON program get less cancer,⁷ osteoporosis,⁸ kidney disease,^{8a} and diabetes;⁹ they suffer fewer cataracts¹⁰ and less hearing loss¹¹** than animals eating a regular diet. And while the relevant experiments have only just begun, certainly **the risk factors for atherosclerosis are considerably improved** in primates living the **CRON** lifestyle.^{11a}

Plus, **CRON animals maintain more youthful strength and agility^{12,15,15a}** and — if tests like solving mazes,^{13,15a} finding a hidden platform in water,^{14,15} and behavioral flexibility (trying new solutions to problems)¹⁴ are any measure — have **more youthful mental function** throughout their lives. Underlying this fact, **CRON clearly preserves the brain itself with age**, maintaining a better brain blood supply¹⁶ and a better ability of brain cells to produce, and respond to, brain messenger molecules (**neurotransmitters**).¹⁷⁻²³ **CRON** also helps maintain the function of the pineal gland, including a more youthful output of the antioxidant neurohormone **melatonin**.²⁴ And the **CRON** brain also contains less **lipofuscin**, the cell-clogging gunk that accumulates in brain cells with age.^{13,25}

The health of the immune system is preserved by CRON. The immune cells of **CRON** animals respond more vigorously to most invading organisms, cancer cells, and foreign molecules,^{26-27a} plus, the disorders and imbalances which occur with “normal” aging are nearly halted by **CRON**. Thus, as we age, it’s “normal” for the immune system to accumulate more and more **“memory” T-cells** (cells which can only respond to a pathogen they’ve encountered before), leaving behind fewer and fewer **“naive” T-cells** (cells which are

ready to respond to new immunological threats). **CRON** animals much less of a shift in this direction.²⁷ Likewise, the aging immune system tends to produce more and more inflammation-promoting signal-molecules like **interleukin-6 (IL-6)** and **tumor necrosis factor alpha (TNF-alpha)**; **CRON** animals produce

CRON animals live longer, live healthier, and live *younger* than any other animals in the world.



less of both at any given age.²⁷

Beyond this, **CRON prevents the development of autoimmune disorders.** While most of us are familiar with full-blown autoimmune disorders like **rheumatoid arthritis** or **lupus**, “normal” aging also brings a certain level of autoimmunity with it, as the immune system begins to attack the very body it was designed to defend. But both healthy and disease-prone animals will develop fewer of these deranged immune cells if they undergo **CRON**.²⁸ And in those animals which are genetically prone to autoimmune disorders, **CRON** slows the progression of the disease,²⁹ maintains a healthier balance of different immune responses (**Th1** and **Th2**)³⁰ and extends life considerably.³¹

What’s the Secret?

How does **CRON** do it? How does simply reducing the number of Calories to which an organism is exposed manage to so dramatically and completely slow the aging

process? The truth is, no one knows. But the National Institutes of Health in the US is investing millions of dollars every year to find out. The question is not just a fascinating academic puzzle: once we know *what it is about CRON* that slows aging, we’ll probably be just a few steps away from knowing what *causes* aging in the first place.

Armed with that information, scientist may then be able to develop anti-aging therapies other than **CRON**, using drugs, gene therapy, or some other trick to simulate its anti-aging miracle.

Some reasonable-sounding explanations of the effects of **CRON** have already been tested and discarded. For instance, it’s now clear that **maintaining or restoring a healthy weight or percentage body fat does not explain the CRON effect.** In fact, if you look at a group of animals which have been put on **CRON**, some will tend to maintain a bit more fat than others, even though they’re eating the exact same number of Calories — and it’s these slightly heavier animals which live the longest!^{42a,b}

The most extreme case is the genetically obese “**ob/ob**” or “**Lep^{ob}**” mouse, which — if it follows its inclinations with food — lives a much shorter life than its close cousins with luckier genes. **Lep^{ob}** mice die early of disease just as morbidly obese humans do. These are *fat* mice. When fed ad lib, their normal-weight littermates weigh in at about 33 grams, of which about 22% is body fat — a figure not too far removed from the average ad lib North American human. Yet the **Lep^{ob}** mice tip the scale at 59 grams, of which a whopping 67% is body fat!

Indeed, even after cutting back their Caloric intake dramatically on a **CRON** plan, **Lep^{ob}** mice are no lighter overall than their conventionally-fed, but genetically normal, littermates — and they *still* carry around over *twice as much fat mass*. Yet even with all this extra fat, **genetically obese mice whose Caloric intake has been cut will**

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live dramatically longer than naturally-slim mice which eat more food. In fact, if groups of Lep^{ob} and normal-weight mice are *both* put on a CRON program, with an equally low number of Calories, the Lep^{ob} animals will both stay fatter — and live longest.^{43,44}

Another example: exercise helps lab animals stay slim, which in turn means that they live longer, on average, than their sedentary peers. But how does fat loss from exercise compare with fat loss from CRON? An experiment by Washington University School of Medicine physiologists^{44a} looked into this question by comparing exercised animals to non-exercised CRON animals whose program cuts Calories by *just enough* to give the sedentary CRON animals a body weight similar to that of exercised animals who eat a conventional diet.

The results: couch-potato CRON animals lived longer than animals with equal body weights given exercise and standard chow. In fact, the additional lifespan gained by the CRON animals was, on average, a doubling of the extra rodent-years of life that were gained from the exercise! And, while exercise did not lead to the

breaking of the maximum lifespan barrier, wall came tumbling down for CRON group. Further experiments^{44b,c} suggest that adding exercise to CRON may further enhance the benefits of the special diet — but by no more (and probably a little less!) than is gained by a further reduction in Calories.

That is: while it's clearly unhealthy to be overweight, and while shedding excess fat will significantly reduce your odds of developing many age-related diseases, being overweight doesn't accelerate aging *itself*. The flip side of this coin: while having a sleek body composition may keep you from dying prematurely of a heart attack, it won't slow aging. What the science has proven is that, no matter what your body weight, **Calories, not body fat, are the key to the anti-aging power CRON.**

Let Me Count the Ways...

But if simple slimness isn't the reason for the astounding power of CRON, what *is*? As mentioned before, when it comes to possible mechanisms of action, we run into an embarrassment of riches. Scientists investigating many different theories of aging have found evidence to back their ideas in the CRON phenomenon. Whether

you believe that aging is driven by the production of **free radicals** in the cell's tiny "power plants" (**mitochondria**),^{11,32-37} or by the accumulation of bodily proteins which have been warped by exposure to blood sugar (**Advanced Glycation Endproducts [AGEs]**),^{9,38-42} or by loss of control over proper gene expression through **inadequate DNA methylation**,^{5,46} or by **errors in, and damage to, the DNA code itself**,^{7,48,49} or by changes in the levels of, cellular sensitivity to, or feedback loops governing the body's **hormones**⁵⁰⁻⁵⁷ — the fact is, **for every proposed mechanism of aging, there is evidence that CRON steps in to check the process in question.**

Thus, *how* CRON manages to slow down aging so remarkably is still an open question. All that's sure at this point is that it *does* — at least, in lab animals. The effect has been demonstrated hundreds of times. In addition to the many experiments done using rodents, CRON has been shown to slow aging in an astounding variety of *other* creatures, from yeasts⁶¹ and flatworms³ through spiders⁴ and fish.⁵ Evidence also suggests that it works in cattle,⁶² although the experiment which suggested this was called off before the ultimate results were in.


The case that CRON truly slows aging in lab animals seems to be irrefutable. That just leaves us with one big question.

Will it work for humans?

It would be very surprising if a phenomenon which happens in so many different kinds of animals didn't also happen in people. Still, strictly speaking, the answer to this question is: *we don't know*. To really answer this question, we'd have to put a group of people on a CRON diet for long enough to show an extension in maximum lifespan: if we started a group of baby-boomers on the program tomorrow, we'd have to wait at least eighty years to know for sure that the anti-aging effects seen in lab animals will fully manifest themselves in humans. But a great deal of preliminary evidence strongly suggests that the

It's not the fat...

...or the exercise...



It's the calories!



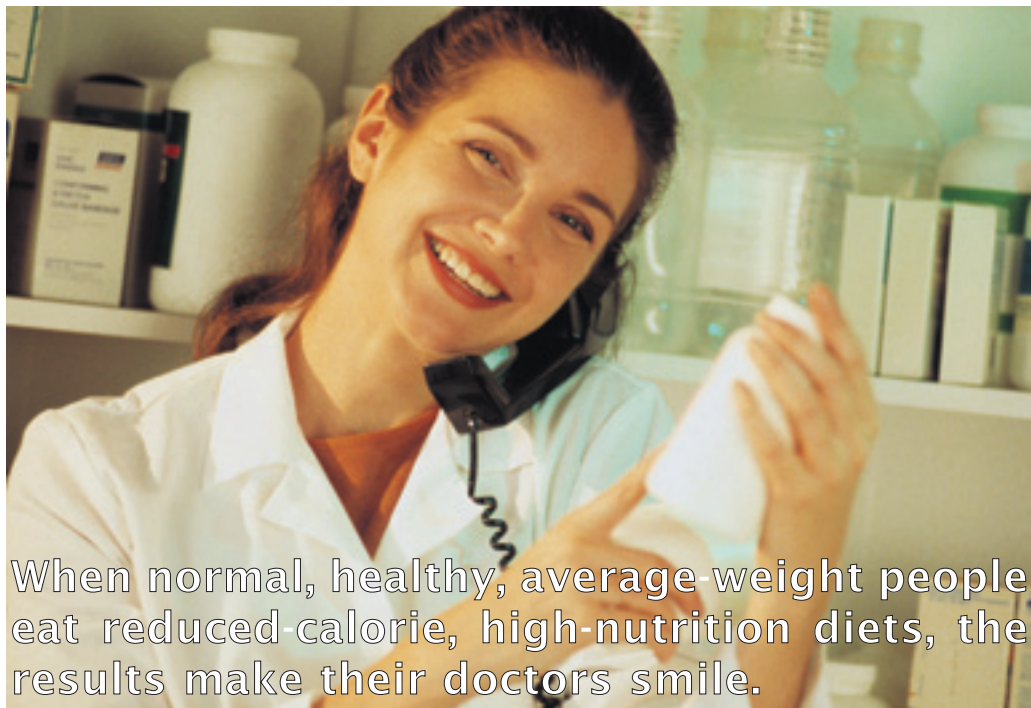
answer is *Yes*.

The Monkey Studies

Because they're so closely related to humans, sharing as much as 98.3% of humans' genetic code,^{62a} definitive proof that **CRON** works in nonhuman primates would be a very close second-best to definitive proof that it works in humans. In the late '80s, the National Institutes on Aging in the USA decided that the power and consistency of the **CRON** results in other species were strong enough evidence to demand a commitment to a long-term monkey study. A second study was started in the early '90s at the University of Wisconsin's Madison research center.

It will still take years to get in the final results of these experiments — but we can get them in two decades instead of the seven that would be required for a full-blown human study. In the meantime, evidence is coming in which powerfully suggests that **CRON is slowing aging in these primates**. Compared to monkeys fed according to their appetite, **CRON** monkeys are already getting less **diabetes** and showing reduced risk factors for **heart disease**;⁶³ their muscles show reduced free radical damage;⁶⁴ the “mother hormone” DHEA, believed by many to be a biomarker of aging, is remaining at more youthful levels for longer;⁶⁵ and **CRON monkeys are already living longer**, on average, than their AL counterparts.⁶⁶

The latest news: primates on the **CRON** plan appear to be getting a lot less **cancer**. Things were already looking this way late last year,⁶⁷ but researchers have just announced newer, stronger findings on this point.⁶⁸ Between the two experimental groups, there have been sixteen diagnosed cases of cancer among the animals eating in the usual monkey way, versus only two among the **CRON** groups. Likewise, **endometriosis** (a painful disease in which tissue resembling the lining of the uterus begins to grow in the ovaries, fallopian tubes, and elsewhere in the body) has been



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found in five of the normally-fed monkeys, but in only one of the **CRON** animals.

The Human Data

But there's also already some very suggestive evidence that CR will work in *humans*, too. Intrigued by the animal experiments, several research groups have performed studies on humans put on a **CRON** program for weeks or months. While far from conclusive, the evidence all points in the right direction. When normal, healthy, average-weight people eat reduced-calorie, high-nutrition diets, the results make their doctors smile: **improvements on the CRON program include better blood sugar,⁶⁹ insulin,⁷¹ cholesterol,^{72,73,74} and blood pressure.^{69,70,74}**

People eating **CRON**-style also have improved fibrinolysis compared to those that eat the standard industrialized countries' diet. “Fibrinolysis” is the body's process of dissolving old blood clots. Removing clots is important, firstly because they make up part of the crusty gunk in arteriosclerotic plaques, and secondly because clots roaming around in the

circulation can block off an artery, triggering a heart attack. The main way the body accomplishes this housekeeping is by dissolving a protein in the blood clot called **fibrin**, which helps to hold the clot together. A recent clinical trial⁷⁵ suggested that **people on a CRON plan show overall better levels of proteins involved in fibrinolysis**.

Also, some changes which **CRON**-fed animals experience, yet which are not so obviously related to health, are also seen in **CRON**-fed humans: their leukocyte counts go down,⁶⁹ their body temperatures are reduced, their hormonal metabolism changes,⁷⁶ and their bodies take steps to use energy more efficiently.^{76,77}

Another trial⁷⁸ suggests that **CRON may prevent colon cancer in humans**. Samples of colon cells were taken from a group of men to see how rapidly the cells were reproducing themselves (the faster cells multiply, the greater the danger that a cancer cell will reproduce before the body's immune system has the chance to root it out). They were then placed on a Calorie-

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controlled diet for sixteen weeks, eating about a third fewer Calories than they had before starting the trial. At the end, another sample was taken. Depending on which cell type was looked at, men on the **CRON** plan saw reductions in cell proliferation of 39-57%.

Interestingly, although this trial was in *overweight* men, and although the men did all lose varying amounts of weight, the reductions in cell multiplication were found to be unrelated to either amount of initial overweight, body composition, or the speed of the men's metabolism: as the rodent data suggests, it's Calories, not body weight, that counts. The authors concluded that **"caloric restriction reduced rectal cell proliferation measurements — intermediate biomarkers related to colon carcinogenesis."**

Likewise, large population studies have repeatedly found that **women consuming fewer Calories get less breast cancer.**⁸⁵ This is in line with what we'd expect from the rodent studies; it would be great to see more work on the relationship between Calories and other cancers.

On top of these suggestive findings, there's also some more direct evidence that people practicing **CRON** actually do age more slowly, and live longer, than those eating a conventional diet.

The Longest-Lived Humans

The "gold standard" for **CRON** in humans would be a *controlled trial*, in which one group of people ate a conventional diet, and another group ate the **CRON** way, for most of their natural lives. We'd simply wait to see if the **CRON** eaters produced more extremely long-lived, healthy people.

No such controlled trial has been run, nor is one likely to: the results, after all, would not be in for the better part of a century. The costs of such a trial would be overwhelming, and the scientists running it would all be dead before the experiment

could be called a success. But accidents of history and politics seem to have handed us the next best thing to a controlled trial on the Japanese island of Okinawa.

The Okinawan people have always had a different diet and culture than the rest of Japan, and their isolation was preserved — and even enforced — by the virtual annexation of the island by the American military at the end of WW II. The important point is that, up to and including the end of the US military occupation in 1972, **Okinawans would appear to have traditionally eaten a diet very much in line with a mild CRON program.**⁷⁹⁻⁸³

The pre-1972 Okinawan diet was centered on a vegetable called *Goya*, a dark green squash, and included over three times the green and yellow vegetable content of the mainland diet. It also contained more high-quality protein, as the Okinawans have historically eaten twice as much meat as did mainlanders (but still much less than the average North American). And it was even

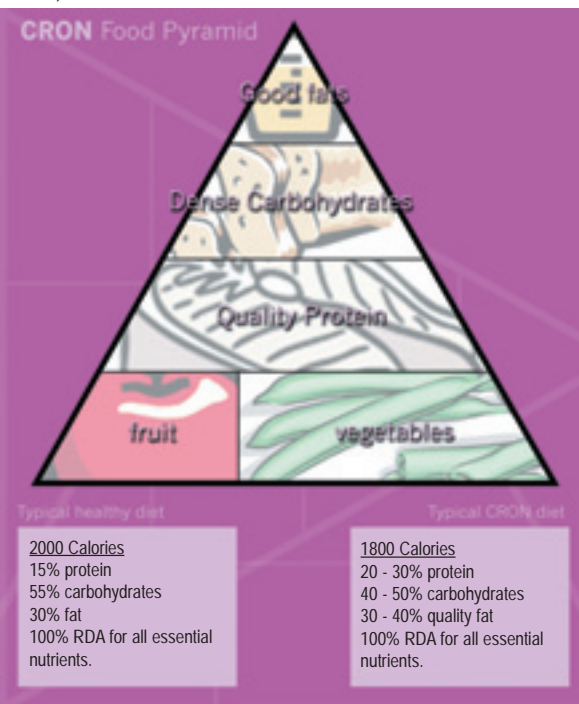
marginally (12%) higher in fat. Yet, crucially, **the traditional Okinawan diet contained one-sixth fewer Calories** than did the mainland equivalent, because of a reduction in the intake of grains and sugars. Vegetables just have many fewer Calories in them than does rice. Since the mainland Japanese already eat fewer Calories than do North Americans, this results in a diet which contains significantly more nutrition, and significantly fewer empty Calories, compared to standard North American fare.⁸³

This mild, voluntary **CRON** appears to have paid excellent longevity dividends. **Okinawans eating their traditional diet appear to have produced more centenarians per capita than any people on the planet**, before or since. In 1990, Japan as a whole averaged 21.6 hundred-plussers per 100 000 citizens⁷⁹ — none too shabby, considering the United States' 15.0 showing at that time.⁸⁴ But the Okinawans far outstripped both, with an astounding 133.8 centenarians per 100 000 souls.⁷⁹

That is, **there is a population of people who have been practicing a mild, imperfect form of CRON for long enough for us to see results — and the results look positive.** **CRON** seems to have extended the life and youth of the Okinawans during their period of isolation. And unlike the now-disproven longevity myths of the Caucasus, the Hunzas, or the Vilcabamba mountains of Ecuador, there are careful Japanese government census data available to back up these claims.

A Controlled Trial

On top of this, a more truly controlled trial on a **CRON**-type diet seems to have shown that cutting Calories, while maintaining a good intake of vitamins and minerals, directly reduces illness and mortality rates.⁸⁶ In 1955, a Spanish scientist collaborated with the staff of a religious institution for the elderly to perform a remarkable experiment. Sixty residents, of average age 72, took part in the trial. Half the group ate a standard 2300 Calorie diet





every day; the other half alternated days between the same 2300 Cal diet and one much lower in Calorie (885 Cal), averaging a Spartan 1593 Calories a day for three years.

Remarkably, the results were in line with what you'd expect from the animal experiments — *despite* the fact that nutrition on this plan was not very well-planned, and despite the fact that the residents had already aged considerably over the course of their natural lives. Over the course of the three year experiment, **seniors on the CRON plan only spent half as many days in the infirmary** as those eating a conventional diet (123 vs 219 days); and while the results were not strong enough to be considered meaningful from a statistical point of view, **only half as many seniors living the CRON lifestyle died** (6 vs. 13 deaths).

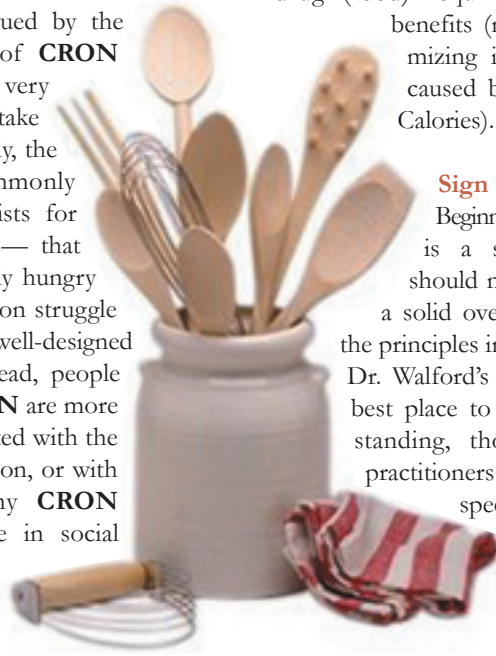
People Really Do This?

Aside from the Okinawans, there are a small group of life extensionists, in North America and around the world, who have *deliberately* taken up the **CRON** lifestyle as an anti-aging therapy. Most have done so precisely because it is the only scientifically-proven anti-aging therapy in mammals. That they have done so is largely thanks to the efforts of one man: Dr. Roy Walford, UCLA Professor Emeritus of Pathology.

The author of over 300 peer-reviewed scientific papers, many of them studies of the effects of the **CRON** program in both rodents and humans, Dr. Walford became convinced, in the early 1980s, that the **CRON** program would almost certainly work in humans, and made himself his own guinea pig. Shortly thereafter, Dr. Walford made the a popular “translation” of his research available, complete with dietary guidelines for a real human **CRON** program, in his recently updated popular book, *Beyond the 120 Year Diet*.⁸⁷ Most **human CRON practitioners report that they feel better on the program**, with more mental clarity, more reliable energy,

and a profound feeling of vitality flowing through every cell of the body.

By now, most people reading this article who are concerned with health and longevity will be intrigued by the tantalizing possibilities of **CRON** in humans. However, very few readers will actually take up the practice. Ironically, the one reason most commonly cited by life extensionists for not practicing **CRON** — that they would be constantly hungry — isn't the most common struggle for people practicing well-designed **CRON** programs. Instead, people actually practicing **CRON** are more likely to become frustrated with the hassle of meal preparation, or with the awkwardness many **CRON** practitioners experience in social eating situations, from “power lunches,” to “going for coffee,” to family dinners.



Likewise, while physical changes — which may include cold hands and feet, and less interest in sex — often accompany **CRON**, it is the long-term *psychological* adjustments involved in creating a new relationship with food that are often the most challenging adaptations which must be made in the first six months of a new **CRON** lifestyle. Quite simply, we are accustomed to turning to food out of boredom, or as a social lubricant, or as an emotional crutch, or for any number of reasons except its true and original purpose as a source of nutrition for the organism.

In short, as Plato used Socrates to say, most people *live to eat*; as **CRON** practitioners, we must transform our relationship with food, so that we instead *eat to live*. An even more powerful way to enter the **CRON** mindset is to take seriously what is now an empty cliché: Hippocrates' dictum to “let your food be medicine, and medicine be your food.” That is, *food is a drug* — and like

all drugs, food can be toxic at high doses. A well-designed **CRON** program, like a carefully-tailored drug prescription, finds the lowest possible dose (Calories) of the drug (food) required to maximize its benefits (nutrients) while minimizing its side-effects (aging caused by the metabolism of Calories).

Sign Me Up!

Beginning a **CRON** program is a serious endeavor. It should not be started without a solid overall understanding of the principles involved in such a diet. Dr. Walford's book is certainly the best place to gain such an understanding, though many **CRON** practitioners disagree with various specific recommendations in his book. In the meantime, persons interested in starting a **CRON** program should know that **CRON must be started gradually in order to get its effects**: animals started on **CRON** in adulthood do *not* experience life extension benefits unless their diets are changed *slowly*.⁸⁹⁻⁹¹ A good way to track this is through weight loss: a rule of thumb is that **you should not lose more than 1% of your body mass per month** at any phase of a **CRON** program. Go slow: if you're going to practice **CRON**, you're in this for the long haul.

While you're reading Walford's book, the best place to begin is to begin removing the obviously empty Calories — the refined sugar and saturated fat — from your diet, replacing foods high in these accelerators of aging with fruits and vegetables. Later, you may consider reducing your intake of grains and grain products as well: despite their place as the base of various “food pyramids,” grains are actually remarkably low in vitamins and minerals, as compared (again) to fruits and veggies. A month or two of sugar-free, low-saturated-fat,

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low-grain eating should give you a good idea whether you are really ready to take the plunge into a full-scale **CRON** program of the sort outlined in Walford's books.

While his grasp of the science of aging and **CRON** is often shaky, many **CRON** practitioners find that the eating plan outlined by Barry Sears in his *Zone* books is easier to follow than Walford's. The Zone plan is higher in protein, and lower in carbohydrate, than Walford recommends. Will this affect the anti-aging effect of CRON? Almost certainly not. The animal studies seem to show that the ratios of protein, carbohydrates, and fat in a meal make no difference to the "**CRON** effect," so long as the body's essential nutrient needs are met. So feel free to experiment — but watch those RDAs!

The Ultimate Lab Animal is You

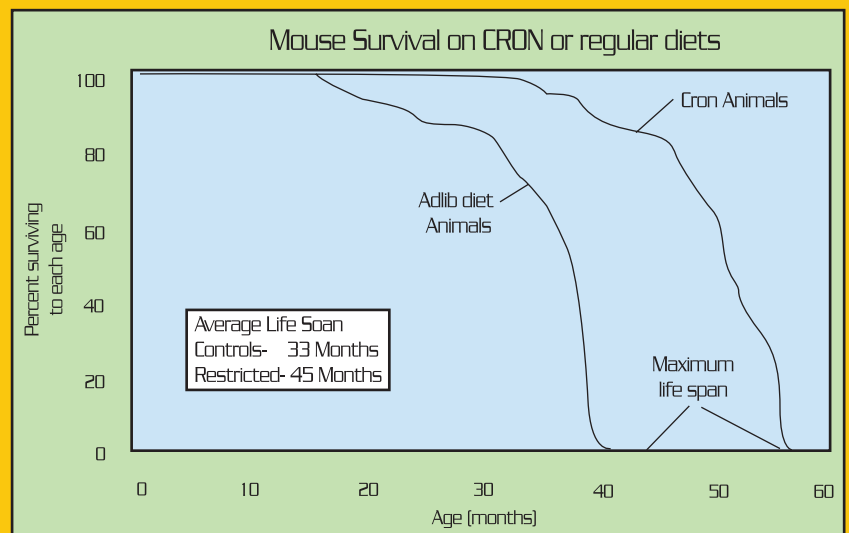
The great anti-aging experiment has begun. **CRON** is the *only* method which has been proven, again and again, to slow aging in laboratory animals. If you get on board

now, you will be taking on the role of being your own guinea pig. Your diet will change. Your body will change. And so will your mind.

You will be one of the first people in human history to truly and consciously

embark on a scientifically-grounded anti-aging program. And if CRON does, indeed, transform lifespan in humans as it does in other species, you will have found at last the Food of the Gods — by leaving behind the common fare and robotic eating habits of mere mortals.

Figure 4.



(Redrawn from [92]).



It's about time!

Most lipoic acid supplements lend you transient strength: potent, but fast-fading. Lipoic acid is a powerful antioxidant, but regular formulations are flushed from the body almost as quickly as they're taken up, leaving you high and dry within three hours of taking them.

Thiotene SR is different. Formulated with a special delivery system, **Thiotene SR** keeps lipoic acid flowing through your system on a sustained basis, staying by your side for a full six hours.

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