The BHT Book: A practical guide to resolving viral disease

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This book is an evolving work.
Organizational and editing suggestions are welcome.
Personal stories are invited.
About-the-Title Preface

This book offers a biologically sustainable solution to chronic viral disease.

That solution involves shifting your metabolism (i.e., correcting a metabolic imbalance that makes you vulnerable to viruses) by

1) taking a drug, BHT (butylated hydroxytoluene), an FDA-approved food preservative, and/or
2) using a “natural” combination of foods, nutrients, hormones, and/or lifestyle factors.

The metabolic shift is experientially subtle. Many people cannot tell that there is a change, other than through a cessation of symptoms. But some people will see other changes, like improvements in skin quality, reduced asthma symptoms, improved wellbeing, decreased sensitivity to cold weather, better sleep, and/or migraine headaches that decrease in severity and frequency.

The metabolic shift is sustainable. In other words, it is fully in accordance with “natural” processes of biology, which minimizes side effects that might otherwise be associated with therapies directed only at symptoms. When done properly, this metabolic shift does not induce compensation by body homeostatic mechanisms that are trying to restore “balance.”

The program is easy in that it can be as simple as taking one to four 250-mg capsules of BHT every day (90% effectiveness). Or it can be a bit more complicated, like combining the BHT with a few extra dietary supplements (99% effectiveness). Or, it can be even more complicated, by not taking BHT and relying entirely upon nutrition, exercise, supplements and hormone replacement therapies, probably with comparable results. Because human metabolism is complex, the program that you choose to implement can also be complex. But it can be simple and easy, if you need it to be simple and easy.

Bottom line, it doesn’t have to be any more complicated than what actually works for you.

You can accept the results by the mere cessation of symptoms, or you can verify the results by before-and-after PCR testing.

The program is broadly applicable to many viral conditions. It has been successfully applied to recurring herpes, shingles, herpes encephalitis, raging intestinal CMV, and hepatitis C.

The program is inexpensive in that a year’s supply of BHT typically costs about $10 (in bulk) or $50 (in capsules). The supplements and hormones could cost about $100 to maybe $1000 per year. The dietary changes might add a few hundred dollars, but could save a few hundred dollars. Such costs are inexpensive compared to the cost of medical insurance and the cost of medical expenses associated with the metabolic imbalance that is almost always associated with chronic viral disease. (BTW: This also relates to asthma, migraine headaches, autoimmune disease, hiccups, panic disorders and known risk factors for the majority of cancers.)

It will take the rest of this book to lay out the details of how, what, and why.

Please keep reading.
What if they gave a cure and nobody came?
(an appreciation-process message from the author)

Please take a moment to think about what this book cost you. Maybe you made a phone call to me, or to CERI, the Cognitive Enhancement Research Institute. Maybe it was a gift, forwarded to you by a close friend or family member. Maybe it was from a former lover, a colleague or a friend for whom you did a favor, years ago.

This book contains most of the content from an earlier book, *Wipe Out Herpes with BHT*, written back in 1983 by John A. Mann and myself and priced at $4.95 in 1980 dollars. It also contains 99% of the content from a supplementary pamphlet, the *BHT Toxicology Report*, which was updated every several years since 1984, which used to cost $5.

This new, rewritten book incorporates additional information and perspectives gleaned from 30 years of scientific inquiry and personal health investigation, and countless conversations with clients, readers of earlier books, and random people who heard about BHT, tried it for themselves, and tracked me down. What is that worth? What is that worth to you?

Experts say that this book is worth what you think it is worth. Right now, it’s worth the time and trouble that you have invested in tracking it down. For most readers, this is not trivial. But, more importantly, if you invest in reading it, it will become worth much, much more. How much is your time worth? What would you rather be doing? And when you implement some of the information contained within this book, your investment will grow higher. It takes effort to develop new habits, to break old routines, to actually have to think about things that used to be automatic. Change? That’s a high investment indeed.

Traditionally, in reading a book, you have to invest your hard cash before you get to read a book. The “danger” in this freeware-book approach, according to academic psychologists (who are supposed to know), is that you may not value this information as much as you would if you had to pay for it in advance. In addition, they opine you would value it more if you paid $69.95 than if you paid $9.95. Maybe the average person would value it more if the information were related by a $500-per-hour, middle-aged man in a white lab coat with a stethoscope draped on his shoulders. This is the wisdom behind the adage, “it’s worth what you pay for it.” So I have three suggestions.

First, be generous with investing your time and effort in understanding the options presented in this book, and in applying your chosen approach to your personal issues with viruses. This is an investment on your part that is as real as the cost of any cash you might have paid for this book, or cash you will pay for BHT or dietary supplements, or the effort you invest to change your lifestyle.

Second, be true to your values. If you need to check out what you read, do so. If you need to ask me a question, do so. If you need time to get comfortable with this approach, take it.

Third, when you get results, send me some money in appreciation of the benefits you see.

Just send a small portion of the value you receive, whatever you think it is, within the practical limits of what you can afford. If you don’t have money, give the book away to other people who will appreciate it.

And don’t forget to thank the person who gave you this book.

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Introduction

This book is written for several audiences.

First, it is written to inform herpes sufferers and health practitioners of the therapeutic use of BHT (butylated hydroxytoluene) against herpes and other viruses, as well as other, non-viral conditions (like heart disease, skin aging and free-radical pathology).

But it is also written for people who do not wish to use BHT against viruses, but are instead looking for a “natural” solution to viral infections. The natural options that will be discussed include herbal extracts, vitamins, amino acids, minerals, fats, mitochondrial nutrients and hormones. Examples include:

- Herbs: hypericin (an extract of St. John's wort),
- Vitamins: vitamins A, D, B6 and B12,
- Amino acids: cysteine, N-acetylcysteine (NAC) and glutathione (a cysteine-containing peptide),
- Minerals: selenium, magnesium, copper and strontium,
- Fats: polyunsaturated fatty acids (PUFAs) and medium-chain triglycerides (MCT fats),
- Mitochondrial nutrients: lipoic acid, low-dose B vitamins, NADH, coenzyme Q10 and carnitine,

This book will also include discussion of lifestyle factors that influence viral virulence and viral susceptibility, like breathing, diet, exercise, detoxification and sun exposure. Not all this information is the typical stuff you may have heard from thousands of sources, in books, magazines, television and the web. For example, many herpes sufferers are aware from personal experience that sun exposure (sunburn, or even mild sun-induced skin redness) can trigger herpes flare-ups. However, not nearly as many people know that the vitamin D from mid-day sunlight is a strong antiviral influence, and that avoiding sun completely (or automatically using sun-screen products) can increase the likelihood of having herpes flare-ups.

Of course, there is no reason that the BHT and non-BHT approaches cannot easily be combined into an integrated anti-viral program. In fact, that is the reason why this book is being written this way.

The remainder of this chapter deals with “setting the stage” for the following “nuts and bolts” information. If you are impatient to get on with the practical aspects, skip to chapter 2 (How Well Does BHT Work?, page 8) or chapter 4 (How to Use BHT, page 17).

World View, Politics and Ideology

What could how we think have anything to do with BHT or viruses?

Cognitive dissonance (thought conflicts, value conflicts) can disrupt body systems through the mind-body connection (the neuroendocrine regulatory system). So in a very real sense, you are what you eat, you are what you think, you are what you feel, and you are what you believe. Some readers may have a negative attitude towards BHT. BHT is a food preservative, and many people think or feel that preservatives are bad. BHT is a xenobiotic (a drug-like substance foreign to life, both plant life and animal life), and the very thought of using a drug may be repugnant. This is very relevant to the topic at hand.

Some readers may have read that BHT is a carcinogen (it isn’t), and that it causes birth defects (it doesn’t). The key point is not whether these views are true (as some say), or not (as I say), but whether you believe they are true—or merely harbor doubts about either “truth.” The point that I’d like you to understand is that we all are biologically compelled to be “true and faithful” to our thoughts and beliefs, whatever they may be, or may become in the future. Some very officious organizations are saying some wrong, prejudicial and inaccurate things about BHT. If you hold those organizations in esteem, your beliefs may undermine the effectiveness of BHT.

Some people reading this book may carry the common belief among long-standing health-food consumers that the FDA is hopelessly and irredeemably corrupt. I believe that myself. However, I do not believe that all FDA-banned dietary supplements are probably extraordinarily effective, and that all FDA-approved drugs (and preservatives) must be bad. I personally take two xenobiotic substances (deprenyl and piracetam) on a regular basis for health-enhancement purposes, and one just happens to be FDA approved. (I only use BHT intermittently.) In other words, even a thoroughly arbitrary and capricious organization like the FDA cannot be trusted to be wrong 100% of the time. And even reputable and politically correct organizations cannot be trusted to be right all the time.
It is my hope that some readers may overcome significant prejudices against BHT fostered by careless (or biased) organizations that have inadvertently (or purposefully) distorted the scientific/medical record on BHT.

It is also my hope that many readers will gain hope against the pervasive pessimism in modern Western medicine that there is nothing to do against viral infection but 1) take a toxic-and-almost-ineffectual pharmaceutical drug, or 2) learn to “just live with it.” There is a better way.

Using BHT is a better way (see How to Use BHT on page 17 and Optimizing Results on page 18).

Not using BHT is a better way (see the Metabolic Hypothesis in pages 21 through 32).

**The Logic and Emotion behind Changing One’s Mind**

If you believed that BHT was a carcinogen before I told you otherwise, what would it take for you to change your mind? For some, it takes only a straightforward explanation: for example, that an erroneous scientific experiment that couldn’t be replicated was later contradicted by follow-up experiments. If you are in this group, you have not necessarily formed strong emotional attachment to this particular belief. For others, emotional attachment to beliefs may be substantial, or even intense. If you are in this group, it may take reading the scientific papers themselves, and tracking the evidence from start to finish before you will change your mind. Or it may just take time—time for emotional attachments to reform to new information. However it works for you, take responsibility for the process for yourself (whatever you need). This may also mean allowing other people to do it their way. Husbands and wives may have divergent cognitive orientations (“feelers” versus “thinkers”). This may also involve consensus-group decisions (i.e., parents making a decision for a child, or a family making decisions for an incapacitated family member).

Even after reading the new information in this book and re-forming your opinion about BHT and viral diseases, you may decide not to use BHT, and instead, to use a more “natural” or “biological” approach (see pages 22-27). Even if you’ve taken BHT before, and feel quite positive about the literature on BHT, you might decide to forgo BHT in favor of dietary supplements, dietary changes, or non-mainstream medical treatments that produce metabolic shifts that are closely similar to or parallel to those produced by BHT. After all, why resort to a drug when it is not necessary?

When John Mann and I wrote Wipe Out Herpes with BHT in 1982 and 1983, we both believed that BHT worked by a direct chemical action against the physical structure of herpes viruses and that BHT was a unique antiviral substance in this mechanism. I no longer believe this. I believe that BHT’s efficacy against viruses is mediated by a concerted metabolic shift that can also be caused by countless other substances, like hypericin and pseudohypericin extracted from St. John’s wort, and like vitamins A, D, B6 and B12, and minerals selenium, sulfur, magnesium, calcium, strontium, vanadium, manganese and copper. I now believe that regular exposure to full-spectrum sunlight (red-shifted light at dawn and dusk, and blue-shifted light at noon) and the cultivation of aerobic exercise also produce similar metabolic shifts to those produced by BHT. Indeed, there are a plethora of options for treating viral infection or viral susceptibility without the need to resort to BHT, acyclovir (Zovirax), famciclovir (Famvir) or valacyclovir (Valtrex).

**Information Sources**

What you read in this book will be based upon either of two sources. Much of this information is founded on careful literature review of scientific and medical research that has been published over seven decades. Many aspects of this research still remain to be investigated, for reasons that will be discussed later.

A significant remainder of this information is based upon three decades of personal observations and anecdotal reports from many hundreds of herpes sufferers and a dozen physicians and scientists.

It has been 30 years since the first reports of BHT’s use in treating herpes were published, and many tens of thousands of people have already used BHT to treat their herpes (and other viral diseases) with varying degrees of success. The most memorable “miracle” cases include 1) three cases of reversal of herpes encephalitis coma, 2) multiple cases of complete elimination of chronic (painful) shingles, 3) successful treatment of intractable diarrhea from gastrointestinal CMV infection in an immune suppressed organ-transplant recipient (with restoration of normal bowel movements), and 4) multiple conversions of hepatitis C infection (seronegative by both antibody and PCR testing).
In most of these cases, the beliefs of the “patients” that BHT was responsible were discounted by their attending physicians, who preferred to provide alternative explanations, like “the lab must have made a mistake” or “it was a spontaneous remission.” However, in one case of hepatitis C infection, there were a half dozen viral workups over two years involving positive PCR and antibody tests, and repetition of negative antibody and PCR tests after BHT use. Yet, still, BHT could not have been responsible.

**Information: The Good, the Bad, and the Internet**

There is a lot of bad information out there.

For example, during the last year at least a dozen sites have repeated the error that “BHT contains toluene.” It may seem entirely obvious that since BHT is called butylated hydroxy toluene that it must contain toluene. But it does not. None at all. Zip. Nada. BHT can also be correctly called butylated para-cresol, but it does not contain any cresol. You could spend a lifetime trying to extract toluene or cresol from tons of BHT and not get even a microgram of toluene or cresol. Vitamins D and E are also derivatives of toluene and cresol, but, similarly, you cannot obtain any toluene or cresol from either without a fully equipped organic chemistry laboratory and drastic reaction conditions.

Why would there be hundreds of such pieces of bad information? Because there is one. Bad information is repeated just as easily as good information is. This may be especially true when the bad information is politically correct or self-serving on the part of the purveyor. The bottom line is that many purveyors of information are not qualified to judge the quality of the information they provide. It is equally true that many purveyors of product cannot manage their conflict of interest regarding the information they provide. Caveat emptor. Let the buyer beware!

Even scientists repeat bad information. There are thousands of sites that pronounce that BHT is a known carcinogen, or suspected carcinogen. Many of these sites are supposed to be reviewed by scientific, medical and technical experts, yet they get it wrong. Why? Because the original source of the information was wrong, and the subsequent correction did not get equal time. If a lie is repeated sufficiently, it becomes the TRUTH (i.e., a “big lie”). So please cultivate at least a modicum of disbelief about what you read, everywhere, including this book.

There is also a lot of good information out there that does not get the respect it deserves. Let’s face it, scientists and doctors tend to be snobs. For example, if it isn’t validated by double-blind, placebo-controlled studies, it is not real. Really? Any empiricist will tell you that it is either real or not real, regardless of what kind of studies have or haven’t been done. US doctors tend to be snobbier than foreign doctors. Lots of good information is dismissed because it “isn’t invented here.” Doctor Professor Vladimir Dilman presented clear evidence that insulin resistance increased risks of cancer back in the 1950s. But because he was a Russian and published his findings in a Russian medical journal, his finding was ignored until it was replicated decades later by US researchers, who repeatedly failed to cite his work or credit him for the insight. Samuelson won the Nobel Prize for work that Emanuel Revici (a Romanian immigrant researcher) performed 40 years earlier. 40 years!

I have spent much time investigating (and finding) fraud in modern American science. You don’t have to believe me, but I have to tell you that it is *not* a rare occurrence.

Scientific and medical prejudices against Internet-derived information—good or bad—are severe.

Just last month, while preparing a talk for the Smart Life Forum (smartlifeforum.org) on “Prevention and Reversal of Dementias and Alzheimer’s Disease” I found numerous stories in the popular press that “Herpes causes Alzheimer’s disease.” The truth is actually the other way around. Alzheimer’s disease is associated with opportunistic virulence of herpes and other viruses, as will be amply detailed in this book.

I also found Pediatrician Mary Newport’s report on her husband’s case of Alzheimer’s disease on the Internet. This is an excellent report of the beneficial effects of coconut oil in not only stopping but actually reversing a case of Alzheimer’s disease, supported by clinical assessments and cited scientific papers documenting the possible (probable?) mechanisms. It was an information gem, and not available through any medical journal. And does it get any respect? No.

Please do not automatically believe scientific, medical and media authorities and automatically disbelieve independent sources and anecdotal reports. Both provide a mixture of good and bad information.
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The trick is telling them apart, and even with a lifetime of training and effort, it is not easy.

Now, on to the meat of the book.

**How Well Does BHT Work?**

Some fortunate people respond phenomenally to even moderate doses of BHT. This might take the form of a week or two of BHT use, followed by months or years without flare-ups. For them, it looks like a miracle cure.

Most people merely get good results. This may take the form of 1) near-complete suppression of flare-ups with continuous BHT use, or 2) satisfactory control with intermittent use of BHT (like during times of “stress” or excessive sunlight exposure that would typically trigger an outbreak). Such viral-activating stresses might also include an on-the-job deadline, academic final exams, premenstrual hormone swings in women, chemical exposure to perfumes, paint solvents or adhesive fumes, or way-above-average sexual activity. Such stressors are largely anticipatable. So it is not too difficult to start taking BHT a few days before or a few hours after the stress is supposed to happen.

Other stresses may not be anticipatable, like automobile accidents, emotional grief from an unexpected death, or receiving a tax-audit notice in the mail. However, BHT’s effect on metabolism is so rapid as to be fairly effective even when taken shortly after a triggering event.

Then there are stresses that are basically “invisible,” such as transitory mercury toxicity from eating fish, formaldehyde poisoning from walking into a “sick” building, or catching a cold or flu. Sometimes a viral flare-up is the first obvious sign of the problem.

For an unfortunate minority of people (approximately one in ten or twenty), even continuous high-dose BHT does not produce effective control of outbreaks.

What accounts for such differences?

I believe that there are several biological factors that influence viral susceptibility (viral disease “caused” by the weakness of the host) and viral virulence (viral disease “caused” by the strength of the virus). (For more information about this difference, see page 20.) These may involve:

1) _metabolic imbalances_,
   a) pre-existing anaerobic/aerobic (anabolic/catabolic, alkaline/acid) imbalances (see page 22),
   b) measuring pH imbalances (cellular, tissue or blood) (see page 31),

2) _nutritional deficiencies or excesses_,
   a) iron overload (clinical or subclinical hemachromatosis, see page 26),
   b) zinc and/or selenium deficiency (see page 32),
   c) secondary copper deficiency (see page 27),
   d) deficiencies of vitamins A, D and B_{12} (see page 26),

3) _hormone swings or imbalances_,
   a) estrogen dominance (see page 29),
   b) hypothyroidism (see page 27),
   c) adrenal exhaustion (see page 29),
   d) hypercortisolemia (see page 29),

4) _chronic inflammation_,
   a) an unrecognized or unresolved chronic infection (see page 30),
   b) chronic allergy (including delayed hypersensitivities to foods) (see page 31),

5) _toxics exposures_,
   a) heavy metal poisoning (see page 31),
   b) oxidant exposure (bleach, chlorine, ozone, sulfite),
   c) cross-linker exposure (formaldehyde, acetaldehyde, alcohol), or

6) _any combination of the above_.
So if you don’t get phenomenal results with BHT, don’t despair. There are a plethora of adjunctive approaches that could change your results for the better. It just takes some time and trouble to figure out what the problem is. Then you can do something effective about it.

This book is very much different from *Wipe Out Herpes with BHT* due to the inclusion of this kind of information. It is also different in being frequently updated.

The good news is that, once you figure it out, the chances are excellent that you will not need to continue to take BHT to maintain control of viral outbreaks.

**Theory vs Practice. How does BHT Work?**

Just because BHT chemically disrupts the physical structure of lipid-enveloped viruses (fat-containing viruses) in a test tube does not necessarily mean that it does so in an animal or human being. This observation provides a concrete example of the difference between theory and practice. From a functional or empirical point of view, it really does not matter how BHT works against viral disease, but only that it works.

Does it work, or not? That is the practical question.

Knowledge or speculation about how something works is not particularly useful in determining whether something works. It either works or it doesn’t. That is the essence of simplicity; it works or it doesn’t. However, knowing how something works or believing how something works can influence how well something works. There are two reasons for this. First, as mentioned previously, the power of belief enables neuroendocrine mechanisms of body regulation. Belief is the necessary and essential component of the placebo response. Belief is also the foundation of hopefulness (as opposed to helplessness, which undermines efficacy). Second, understanding mechanisms of action enables the optimization of therapy, by modifying timing, dosing and adjunctive therapies to synergize with the mechanism of action. In other words, we can use theory to predict how to improve the therapeutic outcome in situations with which we have no direct experience.

I have spent the last 40 years learning about mechanisms of health and their influence on disease. This has allowed me to form new hypotheses about methods of controlling viral outbreaks, which, combined with user feedback from people using these methods, has grown into a global understanding of viral/host dynamics. This understanding now allows me to explain why...

1. BHT does not tend to work as well in vegetarians.
2. Viral outbreaks are more likely to plague younger women and older men.
3. Women tend to have flare-ups in synch with their menstrual periods.
4. Herpes sufferers tend to have the common symptoms of hypothyroidism.
5. High-dose vitamin E supplementation may significantly worsen herpes flare-ups.
6. Vitamin $B_{12}$ is particularly effective in enhancing antiviral response in BHT-nonresponsive cases.
7. Viral susceptibility is associated with a sedentary lifestyle.
8. Some of the most virulent viral pathogens (Hong Kong flu, Asian flu, SARS) come from China.
9. Most “deadly” viruses stop killing people with weeks to months of spreading into the US.

There is a clear thread that ties these observations together—the metabolic hypothesis (see page 19). Those readers who need to know the *why* of this approach can get their “mechanistic” fix. Practitioners who run into problems with certain clients can straightforwardly figure out what the glitch is.

The connection between vegetarianism and herpes could be from vitamin $B_{12}$, which is not found in vegetable foods. $B_{12}$ has important antiviral activities. Vegetarian diets can also contain excessive alkaline ash if not “balanced” by 1) fat-containing grains with acid ash, and/or 2) lots of aerobic exercise (see page 25 for more information about this, including an explanation of why cellular acidity is an essential aspect of health while tissue acidity is a sign of disease). In other words, you can get the “why” of what happens and have an understanding of “what” to do about it. People suffering from undiagnosed hypothyroidism (or to be more precise, hypometabolism, or low basal-metabolic rate) are more likely to have a serious herpes problem. Metabolic rate is primarily determined by mitochondrial metabolism, which is the largest single acid-generating metabolic mechanism. Therefore, this book describes the symptoms of hypothyroidism, and the best tests for its accurate diagnosis (which 99% of doctors will not tell you about). There are also ways to obtain thyroid
glandulars and thyroid hormones without a prescription, if your doctor will not practice medicine the way you want.

But there is another potential value to be had, for readers who do not really want to take BHT, but are presently desperate. The reasons may be:

1) because it is a *preservative* (heavy pejorative overtones),
2) because it is non-natural (i.e., a xenobiotic drug),
3) because it thins blood for two days at low doses, and for the duration of therapy at high doses,
4) because it causes cancer (it actually doesn’t),
5) because it can make you dizzy from lowered blood pressure after you take it,
6) because it is a promoter and antipromoter of carcinogens (slightly bad and very good, respectively), or
7) because the FDA approved it (and they have pretty much screwed up every other decision they have ever made regarding industry conflicts of interest).

Whatever the reason, these adjunctive therapies can easily be used as primary therapies. There is no requirement to use BHT at all!

Or, alternatively, readers could decide to limit their BHT use to topical applications (i.e., for surface lesions or shingles treatment). Dissolving 10-15% BHT into refined coconut oil is easy, takes only an hour or two, and is stable for months at room temperature and years in a refrigerator.

While the number of people using BHT is still increasing, it remains difficult to collect the information from which a systematic and quantitative evaluation of BHT’s efficacy might be made. What factors enhance BHT’s success? What factors impair its efficacy? The simple reality is that most people who choose to use BHT do so in the privacy of their own lives. There is no “reporting system” to collect their data, and there are significant privacy issues surrounding “sexually associated” diseases.

Some people have chosen to share their experiences with me, and this has strengthened my knowledge of practical issues dealing with BHT use. These “tips” will certainly be included in this book. However, there is a selection process involved in who chooses to talk to me and who does not. Does treatment success or failure increase or decrease the likelihood of reporting? How does personal embarrassment affect the decision? What about being male or female? Young or old? Rich or poor? Famous or anonymous?

The economics of BHT are just as difficult. BHT is a generic food preservative that costs about $10 per pound in the wholesale chemical market. A pound of BHT (approximately a half a kilogram) can be expected to last a person from a minimum of 6 months to as long as 4 years! No drug company is going to be interested in such poor profit potential, no matter how many millions of people might be customers. Furthermore, there is much to be lost. Drug companies might suffer financially were BHT to successfully compete with their current antiviral drugs that can cost dollars per day instead of pennies. Without a profit incentive, and with profit disincentives, it’s no wonder that drug companies haven’t exploited BHT.

Even if a drug company was willing to spend 20 million dollars (a very optimistic figure) to get FDA approval for BHT as an antiviral drug, and try to sell a high-markup FDA-approved brand of BHT, they could not prevent competing companies from selling BHT at low cost, or prevent disclosure of public information (like this book) about using generic BHT to treat herpes at a huge savings. The chemical patents on BHT expired decades ago. Even the “use patents” on antiviral applications of BHT have expired. At the present time, it’s a wide open market, and BHT is as thoroughly generic as it is possible to be.

This same “generic” liability also applies to dietary supplements. For example, the antiviral substance hypericin, a chemical substance that is extracted from the antidepressant herb *St. John’s wort*, has not been adequately investigated for its antiviral potential. Yet it has produced some spectacular results. Another example, the essential amino acid lysine is also well known to suppress herpes flare-ups. Yet it is rarely recommended by medical professionals. Why? Hypericin and lysine are natural substances. As natural substances, they cannot be patented as new chemical entities. Without patent control of the chemical, price competition between cheap generic products and high-markup pharmaceutical products cannot be prevented. Without high profit potential, drug companies are not interested in investing the research-and-development costs required for the FDA’s drug-approval process. Drug-approval costs now average a significant fraction of a billion dollars per drug.
companies are also not interested in promoting generic therapies that compete with their proprietary substances. It may be sad, but drug companies are one of the biggest sources of information to doctors.

Drug companies run on profits. Foundations and governments do not. Why haven’t any non-profit corporations or government grants been applied to researching the antiviral properties of BHT or hypericin? The answer to this question is more difficult to understand. It is easy to assume that a governmental agency like the Food and Drug Administration (FDA) would be interested in a treatment for an otherwise incurable viral disease. After all, these viruses cause immense human suffering and death. However, the FDA doesn’t work that way. The FDA is not empowered to independently develop therapeutic agents. They are legislatively empowered only to supervise the investigations of drugs brought to them by outside institutions, like drug companies. Generally, these companies only investigate therapeutic agents with large profit potential.

What about foundations? Well, this is even more complicated to explain and understand. It may seem cynical, but I have observed that foundations with a stated purpose to cure a disease spend lots of money on basic “research” and patient management (symptom-oriented “therapy”), but little on functional therapy (dealing with the cause(s) and mechanisms of their chosen disease). If one didn’t know better, one might assume that the cure for their disease is the last thing they want.

Many also spend considerable money on “educational” advertising and promotional activities that attack alternative approaches (alternative only in the sense of being different to theirs) as “quackery.” It is thinly disguised, politically motivated self preservation.

When you think about it, that actually makes twisted sense. If the cure is found, there is no more need for the foundation. Whatever the original good intentions of the founders, the survival of the foundation—and the people who earn their livelihoods from the foundation—becomes more important than the founder’s “goal” to cure the disease. Survival instincts win out over the long run.

It is unfortunate that BHT’s use against herpes has fallen through the cracks of institutional medicine and government bureaucracy. Regardless of how dysfunctional our institutions may be, they do not yet control the personal decisions of individuals in our society. Whatever their choices, you have yours. If you want to use BHT, hypericin, lysine or some other generic substance for a use of which the government disapproves, that is your decision. As long as the purchase is legal, the decision about how to use something is primarily yours.

I hope that this book will provide the necessary information such that you can better make a more fully informed decision about viral disease-treatment options.

**Dealing with Doctors**

The issue of medical supervision is especially troublesome for BHT and generic therapies. Few physicians know anything about BHT, and most medical education programs—and continuing education courses—are financially underwritten by pharmaceutical companies with vested interests in proprietary drug technologies.

Unless a physician is personally motivated by an interest in nutrition, biochemistry, herbology, chelation therapy, and/or environmental, orthomolecular, functional or traditional medicine, they are unlikely to discover the unorthodox educational opportunities that are made available by a variety of US and international medical societies.

With BHT, physician supervision is a good idea. BHT can cause liver enzyme abnormalities at higher doses. It can also change the way other drugs are metabolized (see page 38). Hypericin can cause photosensitivity (light toxicity) at higher doses (see page 25). Knowledgeable medical supervision can reduce these risks.

But where can anybody find a doctor who knows anything about these issues?

Maybe you can. Maybe you can’t. If you are lucky enough to have an open-minded physician with the time and the willingness to listen to you, maybe your suggestion that they read the technical sections at the back of this book will give them the necessary knowledge—or a personal curiosity.

If not, then you may be forced to resort to self care. Although I am a strong supporter of self-care options, I do feel that a lot of people can have difficulties telling where the line should be drawn between self care and supervised care. Since such lines are invariably influenced by the therapeutic circumstances and each individual’s
personal values, there is no universal advice I can give. However, I will endeavor to provide context whenever I can.

**Personal Responsibility**

I believe in the fundamental value of human choice. I think the right to make decisions which will affect our lives is an essential human right and a necessary aspect of human nature. The information in this book is provided to support this basic right. The decision to use BHT against herpes must be yours.

This book is for informational purposes only. It is not intended as a substitute for medical advice. It is not intended as a substitute for carefully considered judgment. It is simply an information resource.

You will have to judge for yourself whether BHT is an appropriate option for your personal circumstance.

**Herpes Basics**

Herpes simplex virus infection has long been a major epidemic problem throughout the world. Up to 10% of the US population has genital herpes and more than a half million new cases are reported each year. The number of people that have oral herpes is vastly higher. 99% of adult humans have dormant herpes viruses in their cells.

The herpes virus is almost always transmitted through skin to skin contact (sexual or nonsexual) and results in periodic flare-ups of painful or itching blisters and sores around the mouth, face and genital regions. These are sometimes accompanied by fever and other symptoms of infection, particularly during the initial exposure. Most physicians and scientists say that herpes is incurable because they have not yet found a vaccine or other treatment that effectively controls or destroys the virus. The best that they can offer has been complicated, difficult-to-follow diets that help keep the virus in its latent (inactive) state, ointments that merely ease some of the symptoms, and a new generation of toxic, marginally effective acyclovir-like drugs that interfere with DNA transcription (both viral and human).

This book will present a safe, simple and inexpensive treatment that can reduce the severity of symptoms, reduce the frequency of flare-ups, speed healing, reduce infection and re-infection, and in some people, stop herpes flare-ups completely. BHT is not a cure for herpes. Once infected, the herpes virus inserts itself into our DNA and becomes, essentially, a part of our genes. BHT does not change that. No known technology can yet change that. However, BHT does have antiviral activity against the “active” viruses that cause symptoms and infect new cells. BHT may even be able to block herpes infection in the first place—and reinfection in people already infected—if used prophylactically.

Although I will describe prophylactic uses of BHT in this book, these are unproven. Nobody knows exactly how effective BHT might be in preventing skin-to-skin transmission of herpes virus. Consequently, it is not wise to rely upon BHT for this purpose. However, if intimate contact is going to happen regardless of BHT use, it may be wise to use BHT to further reduce what are considered to be acceptable risks.

This book describes the means by which tens of thousands of herpes victims have rid themselves of troublesome herpes symptoms by taking one or more small capsules per day of BHT. It will explain a variety of ways it can be used (oral, topical, suppository, vapor), how to increase its effectiveness (empty stomach vs predissolving it in fat), how safe it is, what medical tests can be used to monitor its dangers, how to prepare it for use, and how and where to obtain it inexpensively and without prescription.

This book will also discuss the most recent findings about BHT’s effectiveness against shingles, hepatitis, cytomegalovirus, influenza and other viral diseases (see page 33). Mention will also be made of other effects of BHT on 1) improving skin condition (see page 43), 2) preventing cardiovascular disease (see page 43), and 3) decreasing cancer risks (see page 43).

Although many scientists and physicians will find this book fascinating and informative, it is primarily intended for lay persons. Those wishing to pursue the technical details will find that the latter chapters are extensively referenced.
What is BHT?

BHT (butylated hydroxytoluene) is a synthetic food preservative that is widely used in the US to prevent rancidity in fat-containing foods, such as breakfast cereals, baked goods, potato chips, pork sausage, peanut butter, instant potatoes, and other commercially prepared foods. Even foods labeled “no preservatives” or “no preservatives added” may and often do contain BHT which was present in the ingredients used in making the food. Such pre-existing additives and preservatives do not need to be disclosed on labels.

Since 1947, the US Food and Drug Administration (FDA) has approved BHT’s use in amounts up to 0.02% by weight of the food product (in some instances even higher). BHT is generally not approved in other countries. The typical daily intake in the USA is estimated to be about 2 mg. Although it is a completely synthetic substance, its unusually low toxicity makes it a much safer compound than many natural substances in food. Furthermore, it has been found to have many outstanding vitamin-like effects on humans and animals, which will be discussed later.

The only apparent long-term effect from the small amount of BHT (2 mg or so) that most Americans get is a statistical reduction in the incidence of gastrointestinal cancer since this preservative first came into commercial use in 1947. In experiments with animals, larger doses have reduced the incidence of many kinds of cancer by much greater amounts. On the basis of animal experiments and other evidence, a few scientists have speculated that a daily intake of 50-250 mg of BHT could reduce the rate of human cancer to less than half of what it is today. BHT’s powerful antioxidant and free-radical-scavenging properties could similarly lower the occurrence of heart attack and stroke. Animals that are given large daily doses of BHT live up to 50% longer than normal and maintain youthful characteristics throughout most of their lives. This will be discussed at greater length later.

Although BHT is a synthetic compound, it bears a chemical similarity to tocopherols (the vitamin E family) and to some naturally occurring nutrients (phenolic antioxidants and flavones). BHT seems to have vitamin-like activities in the body, possibly because it “preserves” the fat-soluble vitamins E and A from oxidative destruction. For the past 30 years, thousands of people have been taking 200 to 2000 mg of BHT daily for its viral-protective and health-enhancing properties.

Side effects are generally quite mild, especially at the lower dosages. A few people experience brief lightheadedness within a half an hour after taking BHT on an empty stomach. This can be minimized by taking it with meals, or by taking it lying down (i.e., just before going to sleep). Rarely, people have allergic reactions to BHT that manifest as skin problems, particularly rashes and dry, flaky skin. Such people should not take BHT. It is possible that some of these toxic reactions to BHT are caused by impurities in commercial-grade BHT that could be minimized by further purification (see page 19). If you try this, please relate your experiences.

More commonly, people experience enhancement of the health of their skin. About half of the people who call me to share their experiences with BHT volunteer some comment about improvements in their skin. I suspect that BHT helps the skin partly by direct enhancement of antioxidant defenses and partly by indirect preservation of vitamins A and E, both of which play a role in skin health and vitality.

Some people still insist that BHT can cause cancer. The basis of this rumor is an old study in which rodents fed large amounts of BHT developed lung tumors. It was later revealed that the rodents’ feed had been contaminated with aflatoxin, a powerful natural carcinogen (cancer causing substance) produced by a mold called Aspergillus flavus, which commonly grows on grains and nuts. The carcinogenicity of peanut butter is primarily due to the traces of aflatoxin it contains.

A subsequent bioassay performed by the National Cancer Institute showed BHT to be noncarcinogenic in rats and mice. Nevertheless, the FDA placed BHT on interim status and requested that further studies be done on its toxicity. These studies found BHT to be noncarcinogenic, nonmutagenic (doesn’t cause mutations), and nonteratogenic (doesn’t cause birth defects). For a more detailed discussion of this issue, turn to page 37 in the Toxicology of BHT chapter.

Part of the popular prejudice against BHT comes from the fact that it is a synthetic preservative which has been foisted upon an unsuspecting (or unwilling) public by the FDA and unscrupulous food vendors who do not appreciate the value of natural foods. While this may be true to a significant extent, it is limited in its usefulness. Natural is not necessarily good and synthetic is not always bad. Aflatoxin and fatty acid peroxides (rancid fat) are
quite natural and very toxic, while BHT and piracetam (the European “smart drug”) are 100% synthetic and far safer.

Approximately 5% of the dry weight of most plants (i.e., vegetables and herbs) consists of chemicals that are specifically toxic to the predatory organisms which prey on them, like nematodes (worms), insects and mammals. You can think of these chemicals as “natural insecticides,” for that is exactly their function. Plants cannot run away, so they defend themselves with “chemical warfare.”

Edible mushrooms contain hydrazine alkaloids, which are mutagens and carcinogens. Nightshade vegetables (tomato, potato, eggplant, green and red peppers, paprika and tobacco) contain solanine, which can cause skin sensitivity and severe arthritis symptoms in susceptible people. (Solanine alkaloids are the basis for the “eggplant skin-cancer cure.”) Corn, peanuts and peanut butter frequently contains aflatoxin, which is a hundred thousand times more carcinogenic than alcohol. Celery contains psoralen (a photosensitizing chemical). (The hypericin and pseudohypericin found in St. John’s wort are also photosensitizing chemicals in addition to being antiviral agents.) Basil contains estragole (a mutagen). Alfalfa sprouts contain canavanine (an amino-acid “mimic” which causes a lupus-like autoimmune disease in monkeys—and probably humans). Wheat contains estrogenic substances which interfere with the sexual function (and reproduction) of male mammals. And coffee, tea and chocolate contain caffeine and theobromine, both of which are natural insecticides (there’s enough caffeine in used coffee grounds to discourage bugs from taking up residence in your vegetable garden or compost pit).

Contrast the toxicity of such natural chemicals with the “smart drug” piracetam. Despite being entirely synthetic, piracetam is considered the treatment of choice for newborn infants with myoclonic seizure disorders at dosages of 12-24 grams per day! That’s 1-2 heaping tablespoons of piracetam. Maybe vitamin C is less toxic.

There are no figures available about acute toxicity of BHT in humans from extremely large doses. One study with rats showed the LD50 (the amount that kills 50% of the animals) to be 1,600-3,200 milligrams per kilogram of body weight. This would be equivalent to 1/4 pound to 1/2 pound of BHT for an average 154 pound (70 kg) person. There are likewise no figures available about the minimum toxic dose in humans. Many people take up to 2,000 mg daily without side effects. A few people have taken as much as 3,000-7,000 mg, although side effects become quite common at those dosages. One study of 36 dogs reported daily 10,000 mg dosages throughout life with no obvious toxic effects and some outstanding benefits (see page 34). The above figures might indicate that BHT probably has a therapeutic index (the ratio of the toxic to therapeutic doses) of 10 to 1, which is comparable to Tylenol and alcohol. This makes BHT acceptably safe by pharmaceutical standards.

BHT seems to have no specific long-term toxicity, even when taken in medicinal doses. The short-term toxic effects involve 1) a transitory reduction in blood clotting, which lasts only a day or two, 2) a transitory lightheadedness, which is related to postural hypotension, and 3) induction of liver enzymes which metabolize BHT, which are apparently harmless and fully reversible on discontinuation of BHT. This latter effect results in a slight enlargement of liver cells due to increased metabolic activity of this organ. This same enlargement is seen with the consumption of cruciferous (crew-siff-er-us) vegetables (broccoli, Brussels sprouts, cabbage, cauliflower bok choy and kale), which contain natural chemicals that the liver must metabolize similarly to BHT. This phenomenon of liver enlargement is discussed in greater depth later in the Toxicology chapter (pages 36-41).

Although BHT seems to be healthful rather than harmful to a normal liver, anyone with a history of liver pathology (hepatitis, jaundice, cirrhosis, etc.) should use BHT only under medical supervision with regular liver-function tests (see page 38). When John A. Mann and I wrote Wipe Out Herpes with BHT back in 1983, we specifically cautioned against BHT use in cases of hepatitis, specifically because of the compromised liver function associated with active hepatitis infections. However, over the intervening years, I have heard of a dozen cases where BHT has spectacularly resolved symptoms of chronic hepatitis (A, B and C, even though hepatitis A is supposed to be a non-lipid-enveloped virus according to some sources, and hepatitis B is non-lipid according to other sources) and none where BHT has aggravated them. (Additional details were provided on page 6.)

Although animal studies suggest that BHT does not cause birth defects, the potential risks of BHT to human pregnancy have not been directly assessed. In my opinion, a minimal standard of safety has been met by pregnancy studies in rodents and monkeys. Stated negatively, the available data do not rule out the possibility of the clinical use of BHT in pregnancy or infancy. The prevalence of herpes virus and its special risks to pregnancy may tempt many physicians to use BHT in treating pregnant women or newborn infants with life-threatening
herpes infections. Data are badly needed. I ask that anybody using BHT during pregnancy, lactation or early
infancy to please share their experiences with me.

Chronic prenatal exposure to BHT may perhaps prove to be benign, however, infant exposure through breast milk
must be considered as a realistic concern. BHT is significantly excreted in breast milk, although there are no data
that specify exactly how much is secreted.

The strongest warning about BHT is not to take it while drinking, as it temporarily interferes with alcohol
metabolism and may get you much more intoxicated than usual. If you take BHT while drinking alcohol, or you
take BHT shortly after drinking even small amounts of alcohol, don’t drive! Also, refrain from trying to operate
machinery, dice vegetables or juggle chainsaws. This warning against alcohol and BHT applies to near-
concurrent use. BHT with breakfast and alcohol with dinner, or alcohol in the afternoon and BHT at bedtime,
will not interact in this way.

BHT can also change the rate at which other drugs are metabolized, and some adjustment of dosage may be
necessary. If you are taking medications like phenytoin (Dilantin) or phenobarbital, you would be wise to consult
your doctor or pharmacist before taking BHT.

There have been a few reports of allergy to BHT involving very mild skin rash. The problem is extremely rare
and is less likely to occur when the person is getting a good, nutritionally rich diet with adequate amounts of zinc,
vitamins A, B<sub>6</sub>, C and polyunsaturated fatty acids.

**The Viral Infection Process**

When any kind of herpes-like virus is transmitted from one person to another, the virus particles penetrate the
skin, bind to cells near the surface, and inject their DNA or RNA into the cell. This DNA or RNA “hijacks” the
DNA-copying and protein-making machinery of the cells.

DNA (deoxyribonucleic acid) is the molecule of human inheritance that encodes all the “instructions” and
“machinery” necessary to create the structure and coordinate the function of the human body. DNA is like a
computer code that translates into words in an encyclopedia. The DNA “words” are called genes, each of which
produces a specific protein or enzyme when it is translated. The DNA “volumes” of the encyclopedia are called
chromosomes. The human “encyclopedia,” called the genome, consists of 23 volumes (chromosomes). Other
animals have different numbers of chromosomes.

The DNA in chromosomes is extremely long. A typical human chromosome contains 50 to 300 million nucleic
acids strung together in a chain. It takes three nucleotides to code for each “letter,” and a dozen-to-thousands of
letters to code for each “word.” Still, that’s a lot of words.

This extremely long strand of DNA strand is wound around a protein core called a histone very much like the way
thread is wound around a spool.

Viral DNA is much smaller. Viral genomes are only 5-50 thousand nucleotides long. They are extremely small
because much of the biochemical machinery that they need in order to replicate is provided by the host cell. They
only need to carry the “extra” stuff not present in their host.

When virus DNA inserts itself into the cell, it is copied (transcribed, translated) repeatedly into RNA, like a Zerox
machine making multiple photocopies. These RNA “copies” are then repeatedly translated (transcribed) into
proteins. RNA viruses carry an extra protein called reverse transcriptase, which repeatedly copies the RNA into
DNA (the reverse of the normal cellular process). This DNA is then repeatedly copied back into RNA the same
way that DNA viruses are copied.

These DNA-to-RNA and RNA-to-protein processes are the exact same steps by which human DNA is translated
into human proteins. Only with viral DNA, you get viral proteins. A virus “assembly line” is created that
manufactures new viruses. Some viruses “bud” out through the cell membrane as they are produced, taking a
coating of the membrane with them as a lipid envelope. Other viruses simply accumulate in the infected cell to
the point where the cell eventually ruptures and is destroyed, spewing forth thousands to millions of new viruses
into the blood stream where they travel to infect new cells.
If this viral life cycle continues unchecked, the virus will multiply until it either causes serious organ pathology or it kills enough cells to kill its host. Fortunately, the immune system counteracts this process by detecting the virus proteins and destroying infected cells and free viruses.

**Lipid-Enveloped Viruses**

In the case of herpes, the immune system has a difficult time getting at the virus because of a lipid (fatty) coating that camouflages most of its proteins. Scientists call herpes a lipid-enveloped virus because of the fat (lipid) found in the outer shell or coat. To the immune system, lipid-enveloped viruses look more like tiny fat droplets than an infectious organism.

Not all viruses are lipid enveloped. For example, poliomyelitis (polio) virus, hepatitis A and the common cold virus (rhinovirus) have no lipid covering their outer protein shell. There is not yet any clear evidence yet that suggests that BHT has an effect on non-lipid viruses. However, there has been medical reporting over many decades that antibiotic use seems to result in beneficial effects in viral disease, even though there is no known mechanism (!) why this would be the case (except for the metabolic hypothesis, to be outlined in greater depth later).

Standard vaccination approaches for lipid-viral diseases become difficult-to-impossible because they are based on the immune system’s response to proteins. Lipid viruses have much less exposed proteins. Lipid-enveloped viral diseases are among the most difficult diseases to treat.

Currently identified lipid viruses include all herpes strains, Epstein-Barr virus, human immunodeficiency virus (HIV, all strains), cytomegalovirus (CMV), hepatitis virus (B and C), rubella virus (German measles), varicella virus (chicken pox), Newcastle disease virus, swine fever virus, SARS virus, West Nile virus, Ebola virus, and influenza virus (all strains, including swine flu and bird flu viruses).

**Herpes Associates with Nerve Ganglia**

Herpes viruses have a special affinity for the human nervous system.

Virus that successfully evades the immune system retreats through nerve fibers to nerve clusters (ganglia) near the brain or spinal cord, where they go into a latent state. Sometimes, the virus will remain in this state for life, causing no apparent harm. In many cases however, it is awakened periodically by changes in body chemistry due to stress, diet, illness, weakened immune system, menstruation, overexposure to sunlight, or other causes. Even sexual activity can trigger the dormant virus to become active. The virus then travels from the ganglia, through the nerve fibers, back to the same area that it first affected and the victim has another episode of sores and blisters. These eventually subside as the virus retreats once more to its hiding place in the ganglia, where it remains until it is triggered again into its active state. We will discuss more about metabolic “activators” of herpes later (see page 20).

**Controversy about Proposed Mechanisms of BHT’s Action**

In test-tube experiments, scientists have identified two specific ways in which BHT inactivates lipid-containing viruses. First, it disrupts the virus’s lipid envelope, leaving it naked and vulnerable to attack by the immune system. Second, it removes binding proteins that viruses need to bind to and penetrate cell membranes. Without these binding proteins, viruses are non-infective.

Whether or not these mechanisms are applicable to living animals has not been determined. In fact, it may be near to impossible to make that determination. In test-tube experiments, scientists can utilize viral preparations that are 100% whole-virus (i.e., they have been purified to remove all viral fragments). They can then study whether whole viruses disintegrate in response to an antiviral agent. This is not the case with lab animals suffering from a viral infection. The viral replication process (the assembly line) is not particularly efficient—at all. There are many more viral parts produced that there are fully assembled viruses. Massive numbers of viral fragments are released when an infected cell ruptures. Scientists cannot easily distinguish between viral fragments that are a natural product of inefficient viral replication and viral fragments that are produced by BHT disruption of intact viruses. So in real-life, scientists haven’t yet figured out how BHT works.

I believe that there is enough evidence about the mechanism by which BHT disrupts viruses in a test tube to conclude that this is not the mechanism of action in living animals. BHT precipitate is correlated with its
virucidal activity, but BHT precipitates are highly unlikely to form in living animals. I think that it is much more likely that BHT works by a general metabolic mechanism discovered by Emanuel Revici in the 1930s (see the Metabolic Hypothesis on page 20).

Despite these unanswered questions, researchers have found that BHT does interfere in the course of lipid-enveloped viral diseases. Animals given BHT resolve their lipid-enveloped viral diseases much faster than otherwise (see BHT Antiviral Findings on page 33). And the vast majority of people using BHT do experience relief from their herpes infections. Empirically, it works.

Should someone discontinue use of BHT, the symptoms may or may not return, depending upon the many factors that influence herpes. Some people report going for very long periods of time symptom free, even when their previous episodes were chronic, severe and protracted. Other people report flare-ups within a month of stopping BHT. If dosage is maintained, however, the antiviral effect tends to maintain reasonably stable. However, some people have reported that the antiviral potency of BHT diminishes slowly over time. This is consistent with metabolic adaptation to BHT use. But it may be the result of homeostatic mechanisms that tend to counteract any therapeutic influence that is “judged” as destabilizing in nature.

How to Use BHT

BHT comes in capsules, bulk powder or coarse granules. The most popular capsule size is 250 mg, although any size will do. The dosage can be as little as one 250 mg capsule each day, or it might be more. When BHT is taken is not crucial, but it may matter whether you take it with fatty food or on an empty stomach.

When Durk Pearson and Sandy Shaw wrote about BHT and herpes in their bestselling book *Life Extension: A Practical Scientific Approach* (Warner Books, 1982), they suggested that BHT was best taken on an empty stomach before bed. This method may minimize liver metabolism of BHT (if there is no food being processed at the time) and it avoids dizziness symptoms (lightheadedness) in people who experience short-term drops in blood pressure when they take BHT on an empty stomach. Blood pressure regulation is not so important to your brain when you’re lying down.

When John Mann and I were collecting anecdotes in 1983, we were getting complaints from people who were not getting good results taking BHT on an empty stomach, but did when they took BHT with fat (either predissolving it in fat or oil, or taking capsules with fat-containing food). So in the first edition of *Wipe Out Herpes with BHT*, we recommended that BHT be taken with fat, instead of on an empty stomach.

Since that time, we have had opposite complaints: that taking it with fat did not work as well as taking it on an empty stomach. So, it appears that each method works better in a subset of people. If you get poor results one way, try the other.

BHT can be taken orally (by capsule, powder or oil solution), rectally (by suppository or lipid insufflation) or topically (by dissolving BHT in fat or oil, and applying it to the skin). Most people prefer capsules for the convenience they offer. However, oral use maximizes liver metabolism of ingested BHT and minimizes the amount that reaches the deep tissues of the body. Presumably, only the BHT that survives liver metabolism has any antiviral effect.

If you have herpes sores when you begin taking BHT, they should disappear within a few days. If the sores haven’t begun to go away after two days, the dosage can be doubled to 500 mg. If the infection still persists after two more days, the dosage can be doubled again to 1,000 mg. Most people respond to less than 1000 mg doses, but some people may require more.

Medical monitoring of liver function is warranted, especially with doses beyond 1000 mg/day. I have yet to hear of a single case of liver enzyme abnormalities with dosages of 1000 mg or less, but it does happen in the 1000-2000 mg dose range. Doses beyond 2000 mg should not be undertaken without regular medical monitoring of liver enzyme function.

It has been recommended that the dosage be continued for two weeks after the herpes lesions have healed to ensure that the viral infection is completely cleared, and that the treatment be commenced again immediately whenever symptoms recur. For some people, this approach makes the most sense. Other people may prefer to take a maintenance dose on a continuous basis so that viral replication is inhibited continuously. Some experimentation may be necessary to discover the approach that produces the best results in each person.
If you wait until symptoms are noticed before taking the BHT, it will take 4 to 7 days for the sores to heal completely. Physicians advise that there be no sex contact for at least three days after the sores are gone, because the patient may still be “shedding” infectious virus. Because shedding can happen after visible lesions have healed, a sexual quarantine of up to ten days is needed for any reasonable assurance of safety. A person may also be infectious for several days before the sores are noticeable. If the sores occur deep within the mouth, vagina, or anus, they may easily go completely unnoticed, yet still be a source of contagion. Continuous use of BHT may not only minimize infectious risk, it may offer other beneficial effects, like destroying other viruses, or helping reduce the risks of cancer, heart disease and stroke.

BHT can also be taken daily by people who don’t have herpes, not only for these beneficial effects, but also to reduce the chances of contracting herpes. Such uses appear to be effective based on anecdotal reports, but anecdotal reports are no substitute for a controlled scientific study. I suggest that such prophylactic use of BHT is unproven and therefore appropriate only for protection against inadvertent exposure, not for deliberate contact with herpes-active persons.

**Optimizing Results**

The exact reasons why some people require larger dosages than others is not well understood. It may be because some individuals don’t absorb fats as well as others. BHT is a fat soluble substance. That is one reason why some people do better taking BHT with a high-fat meal. In the stomach and intestine BHT gradually dissolves into the dietary fats or oils and is absorbed with them.

Other people may metabolize BHT too quickly. The blood supply from the intestine goes through the liver before it goes to the rest of the body, so BHT which is metabolized by the liver on the “first pass” never makes it to the body where the herpes infection is taking place. This is why some people suggest taking BHT at bedtime on an empty stomach. Without food, the liver is quiescent (semi-dormant) and BHT metabolism may be at low ebb. Less BHT metabolism in the liver means more BHT to fight viruses.

In some sensitive people, BHT on an empty stomach may cause a transitory drop in blood pressure leading to lightheadedness. This is another reason to take BHT immediately before bed. A drop in blood pressure is less noticeable (and less dangerous) when lying down in a horizontal position. People with postural hypotension (dizziness from sitting up or standing up too suddenly) may be more susceptible to this problem.

Administration of BHT through the bowel or skin bypasses the liver first-pass effect and maximizes BHT delivery to the body. Topical application of BHT maximizes skin concentrations of BHT which can be especially important with skin-active viral diseases like herpes and shingles. Recipes for topical BHT mixtures can be found on page 41.

Viral diseases which can attack the intestinal walls, like cytomegalovirus (CMV), can be treated with coarse BHT granules, which dissolve too slowly to be fully absorbed in the stomach and upper intestine and are therefore carried deeper into the GI tract and possibly all the way through the bowel. Efficiency of absorption can be measured by examining a stool sample for undissolved BHT granules. BHT has a very low specific gravity and BHT granules will readily float in water, or when fecal samples are mixed with an excess of water. If the BHT granules do not survive to the bowel, fat restriction and/or fiber supplementation may be necessary. Extremely coarse BHT can be made by dripping molten BHT into cold water, or onto cracked ice.

Another reason people may require more BHT than others has to do with metabolic factors that can increase or decrease viral susceptibility. This concept may be difficult for many people to understand, so I will devote considerable time and space discussing it (see page 21).

**Dissolving your BHT in Fat**

Although any vegetable oil will dissolve BHT, I recommend coconut oil because of its high saturated fat content which is more stable against rancidity (oxidation, peroxidation) than vegetable oils grown in the temperate climate of the United States. This means that the BHT-coconut oil mixture has a longer shelf life.

To dissolve BHT in oil, warm the oil to about 100°F (40°C) in a double boiler, or in a glass jar sitting in hot water. If you do not have a thermometer, the temperature should be warm to touch but not too hot to touch for extended periods of time. Add 10%, 15% or 20% BHT by weight and stir until it completely dissolves.
At 20% concentration, some of the BHT may recrystallize when the oil cools, but this does not seem to impair its absorption when taken orally. When used topically, the crystallized BHT can be initially gritty when first applied, which abates as the oil warms up on contact with the warm skin. 10% or 15% is probably a better concentration for topical application of BHT for treating shingles.

**Purifying your BHT**

Since BHT only needs to be pure enough to meet food-preservative standards, where human exposure is only 2 or 5 milligrams, it may not be pure enough for drug use, where doses can be 250-1000 mg, or higher. Impurities that may be well tolerated at 5 mg may not be so at 50 mg or 500 mg. This was true of some commercial B6 manufactured and distributed in the 60s which caused peripheral neuropathy when taken at doses 25 to 250 times the RDA levels. Although this neuropathy was (and still is) attributed to vitamin B6 itself by misinformed authorities with anti-supplement agendas, vitamin manufacturers solved the problem by using higher-purity B6 that did not produce any neuropathy, even at doses up to 1000 times the RDA.

As far as I know, there is nobody doing this for BHT. So if you react badly to BHT, or you merely want the best product that your money can buy, you might want to go the extra mile by:

1. Inquire of your BHT provider the source manufacturer of the BHT they are selling you.
2. Purify your BHT above and beyond the commercial standards that apply in the USA.

For at-home purification, activated charcoal works well to absorb the low-molecular weight impurities in BHT. You can melt your BHT by putting it in a double boiler, or by heating a glass container with BHT in it, or with BHT dissolved in vegetable oil, coconut oil, or MCT oil in it. The charcoal can then be added to the liquid BHT or BHT in oil. The longer time you leave them together, the more impurities are absorbed. A significant amount of BHT will also be absorbed (the charcoal does not just absorb the impurities, it absorbs everything in roughly equal amounts). So you will loose a significant amount of BHT in the purification process. But, given its low cost, this is not an economic hardship. After the BHT-and-charcoal mixture has been allowed to mix and sit, it can be filtered to remove the charcoal. Or it can be consumed with the charcoal.

Filtering charcoal from pure liquid BHT is a serious technical challenge due to the higher temperature required to keep the BHT molten enough to go through a filter. If you want to try this, call me if you have difficulties and I can make suggestions. I suggest that you try cloth and coarse charcoal if you want to purify BHT without oil. But it is much easier to filter BHT dissolved in fat or oil, and MCT oil is the easiest due to its extremely high fluidity.

For the chem-lab challenged, you might want to hire a chemist to purify your BHT for you. If you choose this option, make sure that the process is either fractionation (a kind of distillation that separates compounds by their boiling points), or solvent purification with a solvent that is safe in residual amounts (like spectrograde ethanol, and not hexane, methanol or methylene chloride).

Since activated charcoal is a remedy for poisonings that can be taken orally, there is no necessary need to filter out the charcoal once it is added to the BHT or BHT-oil mixture. As long as the burnt taste of charcoal is OK with you (!), and the dose of charcoal is not excessive, you may be able to reduce your BHT side effects caused by impurities. I do not know how this might affect the absorbed dose. This is also true of transdermal BHT; nobody knows how much gets through the skin into general circulation and how much gets trapped in the skin layers or on top of the skin.

**Preserving Your Spices, Coffee and Foods**

Many foods contain oils and fats that can go rancid on exposure to the oxygen in air. Nuts, seeds, grains and beans are typical examples. The extracted oils and fats have the same problem, only they are generally less stable and age more quickly after being removed from the protective matrix of the food. This higher reactivity and shorter shelf life also applies to associated dietary supplements, like fish oils, seed oils, lecithin and phosphatides (phosphatidylcholine, phosphatidylinositol, phosphatidylethanolamine and phosphatidylserine).

Coffee and spices have aromatic oils that age similarly to vegetable oils and animal fats. Cinnamon, mint, oregano, rosemary, black pepper, and pretty much anything with a volatile smell and pleasant odor can oxidize.
with extended contact with air. This is why chefs insist on fresh herbs for their cooking and why coffee aficionados will often go out of their way to freshly grind their coffee beans before making their chosen brew.

The aromatic oils in spices and the roasted volatile aroma in coffee can be protected by BHT. This can be accomplished by very tiny amounts of BHT added to the food or spice by vapor-phase deposition. There are two easy ways to do this.

**Method One:** Glue a piece of felt to the underside of a jar lid. After the glue is dry, pour a teaspoon of melted BHT onto the felt. Then, use the jar as you normally would to store flax seeds, coffee beans, ground coffee, stalks of rosemary, whole bay leaves, or ground oregano. Since the BHT is on the lid, it does not come in direct contact with the food or spice. However, the enclosed air space allows the BHT vapor to surround the food effectively.

**Method Two:** Wrap up some BHT crystals in filter paper (a coffee filter works great), staple it to trap the BHT inside, and then wrap it again with another layer of filter paper. Toss the assembled paper package into the food, coffee or spice. The paper layers keep the BHT from direct contact with the food, and the porous paper allows the BHT to breathe through the paper. This does not work with oils and nut butters in which the food will penetrate into the paper and dissolve the BHT.

This will not work well at refrigeration and freezer temperatures. BHT’s vapor pressure is strongly temperature dependent.

This is one way to keep dry dog and cat food fresh in a container with lots of air (boxes, bags, and bins). There is fat and oil in animal feed, and it goes rancid with extended storage just like human foods. Many commercial animal feeds add BHT and other preservatives as part of their formula. But some may not.

This approach may also be useful for preserving medical marijuana. Not much is known about all of the specific compounds in marijuana that are associated with a variety of medical benefits, but it is possible that some of these are oxygen and radical sensitive. Tetrahydrocanabinol is definitely sensitive to free radicals, undergoing isomerization with age. But there may be other, as-yet-identified substances contributing to the medical benefits of marijuana. From the aroma and smell perspective, BHT definitely prevents marijuana from getting stale.

### Strategy for Dealing with Physicians

People who write about new disease treatments that have not yet been approved by the FDA usually suggest that the treatment be conducted under supervision of a physician. Unfortunately, most physicians are unaware of BHT therapy or Revici’s metabolic approach to health. Even if they may have “heard about it,” they are likely to be prejudiced against it. *Physicians tend to be very down on things that they are not up on.* You will probably have to do a lot of shopping around before you find one who is willing to consider using BHT against herpes, or willing to provide medical supervision for your use of BHT. If you do find one, be sure that he or she gets to read this book before commencing the treatment.

You may get lucky and find a physician who already knows about treating herpes with BHT and has used it on some of his or her patients. I know of several doctors who have used it successfully on hundreds of patients, and even pioneered nutritional adjunctive therapies. But I cannot disclose their names. They are risking 1) liability by using a therapy that has not been approved for this purpose or in such dosages, and 2) loss of their medical license by practicing medicine that is not agreed to be “the standard of care” by other doctors (and state medical boards). There is no “loophole” in the medical regulations if a non-standard therapy works. There is no exemption if it is safer for you than accepted therapies. There is no burden of proof that is applied to regulators to establish any level of danger from a non-standard therapy. None at all. Because charges of medical misconduct relating to licensing are a matter of administrative law, the doctor is guilty until proven innocent, and the evidence of their service to their clients (patient welfare) is inadmissible. The land of the free, indeed!

The way you can work this with non-standard therapies is to give your doctor a get-out-of-jail card.

1. Assist in the process of creating a clear medical rationale for the therapy.
2. Do not ask for a prescription for the drug(s) or nutrient(s) in question unless it is a controlled substance. Testosterone (a Schedule-III steroid) and Xyrem (Schedule-III GHB) are the only two things in this category. This sets the stage for the following item.
3) Document in your medical record your decision to use the non-standard therapy against the doctor’s specific recommendation to the contrary. This way, the doctor’s decision to provide medical supervision for you (including prescribed tests and any prescriptions) is a clear matter of “protecting you from yourself.” If you need to go the extra mile, see a psychiatrist and get a “second opinion” that your belief in the therapy can only be dislodged by trying it and failing.

4) Provide additional documentation of your superior responsibility (asking for advice regarding everything you should pay attention to, like the symptoms of hyperthyroidism if you take thyroid hormones) and meticulous data collection abilities (disciplined measurements of body temperature, pulse rate, or blood pressure, for examples, or conscientious tracking of other, subjective, mental or emotional symptoms), and insist that the collected data be added to your medical record.

5) Then, after therapy commences, document your benefits! And insist that they be placed in your medical record.

6) If you can do it and are willing to suffer the consequences, consider doing an A-B-A-B protocol, where you stop the therapy to provide data that your symptoms return, before going on the therapy again. This is the scientific standard for experiments involving a single subject. You were not taking BHT, then you were, then you stopped to see what would happen, then you resumed therapy. If you symptoms go away, come back, and then go away again, you have generated scientific evidence that the therapy works. Again, put it in your medical record.

In other words, the goal is to create a paper trail that the doctor can use to document that he or she is behaving responsibly (as measured by the bureaucratic yardstick of “the standard of care.”

In talking with people over the last 25 years, I can say that most people who use BHT to stop herpes do so without medical supervision. They simply buy BHT capsules or bulk BHT from a mail-order or on-line dietary supplement company. There are at least three companies that I know of:

1) Vitamin Research Products, in Carson City, Nevada (www.VRP.com)
2) Lifelink, in Grover Beach, California (www.LifeLinkNet.com), and

If you think that you have herpes and intend to treat yourself with BHT, it may be a good idea to at least see a physician for diagnosis. Some herpes-like symptoms that didn’t respond to BHT and were eventually found to be conditions other than herpes. Delaying proper treatment because of incorrect diagnosis can allow a serious problem to progress unchecked. On the other hand, you may have a viral condition that does not manifest in the usual manner. I had a shingles outbreak at age 40 that manifested with the typical trigeminal-nerve pattern on the forehead, except that I had absolutely no pain. None. So my initial thought was that the redness was contact dermatitis from exposure to urethane adhesive, which I had just handled, and to which I am highly allergic. But it did turn out to be shingles, and it responded to BHT-plus-B₁₂ therapy. Within 12 hours, the redness had reduced markedly. And within 48 hours, the redness had abated and the healing had begun.

There are simple blood tests for viruses. They fall into two categories, 1) antibody tests which are relatively inexpensive, but do not measure the active virus, and 2) PCR tests which are relatively expensive and actually measure the viral load on the day of the test. PCR (polymerase chain reaction) measures the DNA and RNA of the viruses, so it tests the actual level of virus in your system when the blood is drawn. Sometimes it is a good idea to have both done, first the antibody testing and then the PCR testing.

The Metabolic Hypothesis

Why is it that only 5-10% of people experience herpes flare-ups when more than 99% of adults are infected with herpes viruses? The answer to this question goes to the heart of how to most effectively treat viral disease.

Most Western scientists and physicians think that infectious diseases result from aggressive invading organisms. This view is, to a very large part, the direct result of the ascendant influence of Louis Pasteur, whose demonstration of the role of bacteria in infectious disease was so compelling to scientists of 19th century France (and England) that they abandoned any consideration of the role of host resistance and susceptibility. In the shadow of Pasteur’s flamboyance, Antoine Béchamp had carefully identified “pleomorphic” changes in microbes that were associated with infection and pathology, and Claude Bernard had identified the influence of biological
“terrain” in causing pleomorphic transformations. Although Pasteur ultimately acknowledged the primary importance of these observations on his death bed, this had no effect on the momentum of scientific opinion of his peers, and Béchamp and Bernard were ignored with the arrogance of the righteous. This political prejudice survives to this day.

What does this mean to you? It means two things:

1) people come in virus-susceptible and virus-resistant forms, and
2) viruses have variable virulence (viruses will become more virulent in people and animals that are virus susceptible and less virulent in people and animals that are virus resistant).

As an example of these observations, consider that most of the most virulent viruses in recent history come out of Asia. Remember the Honk Kong flu, the Asian flu, SARS, the bird flu? They all developed in a highly populated rural region of China, where there is a widespread deficiency of selenium in the soil. This causes a heart disease, called Keshans disease after the county in China, but it also breeds abnormally virulent viruses. These viruses were virulent enough to kill people. When they entered the United States, they also killed people. But within weeks to months, the death rates began to drop, and eventually, after many months, the virulence was decreased to the point that people rarely died from these viruses. Selenium, as I will explain more on the next few pages, is a key nutrient for viral resistance. And viruses are known to become more virulent in selenium-deficient people [Beck et al. 2003; Ren et al. 2004]. So selenium deficiency is one of a few dozen pro-viral risk factors that can be corrected by simple dietary changes (eating liver, kidney and Brazil nuts) or by taking selenium supplements.

Although immune function was not understood back in Pasteur’s time, modern scientists have accepted that the strength and potency of the immune system is a very real and important aspect of host resistance or susceptibility. This is only one side of Béchamp’s and Bernard’s views. The other side, which is still ignored today, is that the metabolic state of host directly and critically influences the invading organism. The invading organism reacts to the state of the host, becoming more virulent or less virulent as the situation warrants (from the microbe’s survival perspective, of course). The degree to which this host-influence contributes to herpes flare-ups is neither widely nor fully appreciated. I believe that it is far, far from trivial.

The good news is that many common vitamins, minerals, nutrients and foods have specific effects on metabolic systems which can result in increased and decreased susceptibility to viral disease (or increased or decreased viral virulence). Through selective use of dietary supplements and foods, viral disease can be significantly decreased.

**Metabolic Balance**

One of the pioneers in the study of the relationship between metabolism and disease was the late Dr. Emanuel Revici (pronounced reh-vee-see; he was Romanian, not Italian). He measured tissue pH (acidity and alkalinity) and found that pH disturbances were correlated with metabolic shifts in a well organized manner. He described a linear metabolic continuum as “anabolic” in one direction and “catabolic” in the other.

Revici’s definitions of “anabolic” (healing, repair and growth-oriented metabolism) and “catabolic” (digestion and energy-production metabolism) are quite different from the modern English meanings of these terms. Since anabolic metabolic systems are also anaerobic (not oxygen based) and produce alkalinity and the catabolic systems are aerobic (oxygen based) and produced acidity, I prefer to describe Revici’s metabolic continuum as anabolic-anaerobic-alkaline versus catabolic-aerobic-acidic.

According to Revici’s views, health is defined by a dynamic balance between anabolic-anaerobic-alkaline systems and catabolic-aerobic-acidic systems, the dominance of which swing back and forth on a 24-hour basis. Before I go any further with Revici’s insights into the virulence of infections, I must first point out that metabolic acidity and alkalinity is distinctly different from the acidity or alkalinity of the food itself.

Acidic foods like lemons and oranges are quite tart to the tongue, but they produce a strongly alkaline influence when metabolized. This is why citrus fruits are said to have “alkaline ash.” Likewise, meats do not taste tart, but they have acidic ash (they produce acidity when metabolized). It is the final metabolic consequences of foods and nutrients that determine their acidic or alkaline classification.
Secondly, I must clarify that pH is not simply a one-dimensional issue of acidity and alkalinity. There are numerous metabolic compartments in the human body, and pH effects in one do not necessarily correlate with pH effects in another. In fact, it is often the case that they may be directly opposite. In other words, a particular dietary substance might alkalinize the cellular environment and acidify the blood at the same time. So in a very real sense, speaking of foods as being inherently “acidifying” or “alkalinizing” is potentially misleading and
possibly inaccurate unless one identifies the particular metabolic compartment which is being considered. To make matters even more complicated, your personal metabolism and immune system also influence the effects of foods on your system. If you are allergic to a food, it will acidify higher levels of your body’s fluids even if the food would be alkalinizing in another person who is not allergic to that food.

So I must caution readers not to confuse Revici’s “acidifying” and “alkalinizing” influences with those of Macrobiotics, Metabolic Typing, or other pH systems. Revici measured wound pH, which is an interstitial fluid which oozes from the spaces between cells. His discussions of the pH characteristics of metabolic systems refer to cellular (and subcellular) pHs, which he was never able to directly measure. And these are quite different from blood pH effects, which are commonly discussed by other pH models. Enough about pH.

Revici discovered that there was a daily (circadian) metabolic rhythm in healthy people that was determined by the ebb and flow of these two, opposite metabolic systems. In humans, the anabolic (anaerobic, alkaline) metabolic systems dominate at night and the catabolic (aerobic, acidic) systems dominate during the day. This metabolic “excess” of acid and alkali can sometimes be measured in urine with special pH papers. I’ll discuss this in more detail later.

In people with chronic degenerative diseases, especially cancer, Revici discovered specific disturbances in the circadian metabolic rhythm. Almost all patients exhibited strong suppression of the strength (amplitude) of the metabolic rhythm (i.e., the pH swings were damped out). Healthy people would tend to swing 2 full pH units per day, while cancer patients tended to shift only 1 pH unit, and sometimes less than a half pH unit. Furthermore, the average pH (the baseline) shifted dramatically away from normal (approximately 6.0 to 6.2) towards either acidic or alkaline values. Often the magnitude of the shift was a half-pH unit. The direction of the shift correlated with 1) the type of cancer, and 2) its response to treatment. Anabolic/catabolic balance also affects the course of infectious diseases. Revici discovered that anabolic influences increased the virulence of bacteria! When animals were fed extra cholesterol (an anabolic metabolic influence), they became more susceptible to anthrax (a bacterium). When animals were fed extra fatty acids (a catabolic metabolic influence), they became less susceptible to anthrax. It works the same way with viruses (and oppositely with most fungi).

The implications of these observations to humans are profound. I have noted that adults who catch colds and flu from children seem to have far more debilitating symptoms than other adults who catch colds or flu from other adults. That could be because children are much more anabolic than adults. School-teachers and parents frequently attest to the special virulence of kid-vectored bugs.

I have observed that individuals with anabolic dominance (or catabolic deficit) are especially prone to viral problems, including herpes. They have more severe symptoms and they have more frequent outbreaks. Likewise, individuals with catabolic dominance (or anabolic deficit) seem to rarely have problems with viruses. So catabolic agents should be helpful and anabolic agents counterproductive. That is exactly what I have seen.

How does BHT influence metabolism? It’s catabolic.

Is this a coincidence? Maybe, but I don’t think so. This pattern is too consistent. Vitamin E is anabolic and supplementation in high amounts (200-800 IUs) seems to be associated with an increase in the frequency of herpes outbreaks. Vitamin A is catabolic, and it appears to significantly help BHT work better.

Vitamin D is also catabolic and antiviral. Although it has received little popular or scientific recognition until recently, the emerging vitamin D literature is suggesting a powerful role for vitamin D in not only decreasing influenza mortality but in explaining the “seasonal factor” that makes influenzas more deadly in the depth of winter and so strongly latitude dependent. In my opinion, pretreatment with high-dose vitamin D$_3$ (50,000 IU for a week in the fall, or 5,000 IU for a month in the fall) will be found to be more effective in preventing flu (even bird flu and swine flu) than any and all flu vaccinations and antiviral drugs. Vitamin D deficiencies have also deepened in recent decades due to pronouncements by dermatologists that sun exposure causes skin cancer. Actually, this is not true. In fact, regular sun exposure decreases risks for the vast majority of skin cancers, and
especially those that are the most difficult to treat. It is true that sun over-exposure is a serious skin-cancer risk. But this does not justify avoidance of the sun entirely, rather only moderation of sun exposure. By creating abject fear of the sun, dermatologists have put us all at risk, fortified their business (increased the number of their clients), and increased overall viral susceptibility in the general population. Vitamin D levels are half to a third of what they should be. This makes vitamin D deficiency roughly as common as magnesium deficiency.

Hypericin (a substance found in St. John’s wort) is very strongly catabolic. It is an oxygen catalyst which directly potentiates aerobic metabolic processes (through conversion of triplet oxygen to singlet oxygen). And it has strong antiviral influence in many viral diseases.

Similar things can be said of negative ions, which is another term for superoxide. Negatively charged superoxide ions are produced by electrons combining with oxygen molecules. So \( \text{O}_2 \) becomes \( \text{O}_2^- \). Negative ions are found at the beach, where waves mix seawater with air, near waterfalls, where air and water are mixed, and during storms, when rain falls through the air. Negative ions make people happy. They also make people antiviral. Like oxygen, superoxide is an essential component of aerobic metabolism. About 15% of our oxygen metabolism is superoxide dependent, including the pathway for the synthesis of serotonin, the “happiness neurotransmitter.” Positive ions from dry desert winds blowing across shifting sands deplete negative ions and cause irritability, depression, increases in traffic accidents, hostility, fights and homicides. The Santa Ana winds of Los Angeles, the Sirocco winds of northern Africa, and the Foehn winds of Germany are well known examples of positive ion-rich winds.

In addition to oxygen and superoxide, hydrogen peroxide, hyperbaric oxygen and ozone are catabolic, too. Each has significant literature documenting antiviral effects.

Vitamins \( B_6 \) and \( B_{12} \) are the only catabolic B vitamins, and I (and others) have observed that \( B_{12} \) is very effective at augmenting BHT efficacy in people for whom BHT works poorly by itself.

\( B_1, B_2, B_3 \) and \( B_5 \) are the anabolic B vitamins, and they do not seem to be of any particular help, at least beyond the low doses that would correct a simple deficiency of any of them. Although \( B_1, B_2 \) and \( B_3 \) are mitochondrial nutrients and essential for energy production, which is catabolic and antiviral, they are, overall, anabolic in character and not known for their antiviral effects.

Two common causes of anabolic dominance in people are vegetarianism and subclinical hypothyroidism (hypometabolism).

**Vegetarianism**

Vegetarians tend to become anabolic dominant and overly alkaline (at the cellular level) because most non-meat foods are anabolic/anaerobic/alkalinizing. The reasons for this are too complicated to explain fully in a book of this size, but I will mention two factors that have a lot to do with it: 1) the low-sodium, high-potassium content of vegetable foods, and 2) the low levels of polyunsaturated fatty acids that tend to occur in vegetables.

Grains are the primary exception, and this is largely due to their high polyunsaturated fatty acid content. However, not all grains are acidifying. So vegetarians who do not emphasize sufficient quantities of catabolic grains or catabolic exercise can easily drift into anabolic territory, with resulting cellular alkalinity. Such a state might be better described as catabolic deficient, or aerobically impaired, but the important take home message is that complementary metabolic systems are out of balance with respect to each other.

Before going on, I’d like to clarify my use of the terms alkalinization and acidification with those of traditional Eastern medicine, for which alkalinity is always promoted as essential to health and acidity a cause of degenerative disease. This “traditional” Chinese-medicine precept only applies to tissue pH. Acid tissue is associated with disease and degeneration. But acid tissue is associated with alkaline cells. Alkaline cells are hypometabolic cells, and they produce disproportionate amounts of lactic acid, which when exported from the cell produces the tissue acidity which is bad. Cells with normal metabolism are acidic cells and they make predominantly carbon dioxide (i.e., carbonic acid). So there is little lactic acid to be exported into the surrounding tissue to cause the traditional-Chinese-medicine “acidity” phenomenon, and the carbon dioxide that is exported is easily and efficiently removed to the lungs for outgassing. In other words, lactic-acid acidity accumulates locally, and carbon dioxide acidity dissipates globally. This is the difference between acid-as-disease and acid-as-health, respectively. So the traditional-Chinese-medicine maxim that “body alkalinity is good” is because it facilitates
healthy cellular acidity! The pH issues of health are not one dimensional. So do not be misled or concerned by this apparent discrepancy.

With vegetarianism, I have to mention B\textsubscript{12} again. Vegetarian foods do not contain any B\textsubscript{12}. To be fully accurate, B\textsubscript{12} may be found in small quantities in vegetarian foods due to the presence of insect parts, which may “contaminate” the food, especially in poorer countries. However, this animal-source B\textsubscript{12} is not an intrinsic part of the vegetarian food itself, and it tends to be absent in vegetarian foods grown and harvested in affluent countries, like the United States, where the cleaning and storage of agricultural foods tends to be more thorough. Either way, strict vegetarians run a significant risk of B\textsubscript{12} deficiency. And B\textsubscript{12} is an important catabolic nutrient, one with antiviral properties.

Fortunately, modern fermentation methods produce large amounts of microorganism-derived B\textsubscript{12} at quite reasonable costs. So affordable B\textsubscript{12}-containing dietary supplements are available to offset this particular vegetarian lifestyle risk.

**Intrinsic Factor and B\textsubscript{12}**

The B\textsubscript{12} viral-susceptibility issue is not just a matter of the availability of dietary B\textsubscript{12}. In normal, young, healthy people, B\textsubscript{12} absorption is facilitated by the secretion of intrinsic factor, a protein which is secreted by the stomach to selectively bind to B\textsubscript{12} and facilitate its absorption into the body. The secretion of intrinsic factor seems to be easily impaired by illness, stress and advancing age, so many middle-aged and elderly people do not efficiently absorb B\textsubscript{12}, even when they take it supplementally. Without any intrinsic factor, only a small percentage of ingested B\textsubscript{12} is absorbed.

People who do secrete intrinsic factor may need ten to a hundred times more dietary B\textsubscript{12} than those who do. Alternatively, they may opt to receive regular B\textsubscript{12} injections from their physicians.

Before we advance to a major discussion of hypothyroidism, I’d like to cover other risk factors first.

**Subclinical and Clinical Hemachromatosis (iron-overload syndrome)**

Iron is anabolic, particularly in its reduced (ferrous) form. It is therefore a potential aggravating factor for viral disease [Drakesmith and Prentice 2008]. Iron toxicity is also relevant to other conditions [Weinberg 2009].

Iron is a known risk factor for many bacterial diseases because of iron’s central role in cellular and subcellular energy processes. This is evidenced by two defining phenomena: 1) the body sequesters (stores) iron during activation of the immune system (a mechanism triggered by cytokines), and 2) iron administration during a bacterial infection can be fatal (it overrides the sequestration mechanism). At the very least, iron administration aggravates the infection and interferes with treatment. [See Sikorska et al. 2010 for viral-equivalent effect.]

Iron is equally important to human cellular and subcellular metabolism. Because iron availability is almost always a rate-limiting problem for human growth, iron absorption is an efficient, one-way process. In other words, we do not have a good way to get rid of excess iron—except by bleeding. Menstruating women often have difficulties maintaining sufficient iron levels for good health, but for men, the opposite condition tends to apply—to much iron absorption. I believe that this is a contributing factor to male cardiovascular disease deaths; after 30-40 years of one-way iron absorption, iron starts to “leak” out of overloaded storage systems and causes free radical stress, destruction of vitamin C, breakdown of collagen particularly in the vascular system, decreased immunity, increased vascular infection, plaque formation, and, ultimately, clotting or hemorrhaging.

Why modern Western medical doctors do not assess iron status in all middle-aged males with ferritin, transferrin and TIBC testing I don’t understand. Men should be assessed every ten years starting at age 45, and every 5 years if above-average iron levels are found, and every year if they are very high. It’s a cheap test. Why stint?

If your iron is elevated, do what I do: donate blood regularly. If they won’t take your blood because you have hepatitis C or traveled to the wrong part of the world, have your doctor draw the blood and discard it.

If your iron is very elevated, get chelation therapy to bring it down quickly. Then start donating blood.

The interaction between iron and vitamin C is problematic, so I suggest that people with very high iron levels consider bringing their iron levels down before administering more than 200-500 mg of vitamin C per day. Also,
vitamin C triples iron absorption from vegetable foods. So men taking vitamin C might be more susceptible to iron overload.

**Type-1 and Type-2 Copper Deficiencies**

Copper deficiency may have pro-viral consequences (Yörük *et al.* 2007). It comes in two forms:

Type 1 is the dietary kind, which can be corrected by eating copper-rich foods like shellfish (especially oysters), nuts (especially sesame seeds, cashews and sunflower seeds), grains (buckwheat and wheat), beans (especially garbanzo and navy) and calf’s liver, or by taking copper supplements.

Type 2 is not caused by diet, but by chronic inflammation. The activation of the immune system causes excessive copper storage in ceruloplasmin and resulting deficiencies in the body tissues. This cannot be treated by foods and supplements, as the administered copper is filtered out of the blood supply from the stomach and intestine as it passes through the liver before going on to the rest of the body. Getting rid of the inflammation by resolving the underlying cause is the therapeutic strategy to consider.

**Hypothyroidism**

Hypothyroidism (low thyroid-hormone activity) is a lot more common than most people think. The term “subclinical hypothyroidism” is often used to describe hypothyroidism that occurs in people with thyroid hormone levels that fall within the “normal” range. However, this “normal” range is set so broadly that there is good reason to question its validity. Furthermore, the activity of thyroid hormone occurs at the cellular and subcellular levels. Standard blood tests ignore what happens at those “deeper” levels of the body.

I prefer the term “hypometabolism” to describe this problem because it bypasses the issue of how much hormone is being secreted by the thyroid gland and addresses the net effect of thyroid hormone at the cellular and subcellular levels. If the metabolism-enhancing effect of thyroid hormone is deficient, then you have all the symptoms of hypothyroidism, whatever it may be called.

The official medical dogma in the US is that “subclinical” hypothyroidism does not exist, yet one in four people in the US have clear hypothyroid symptoms. The most objective symptoms are caloric: a depressed body temperature, a tendency to get chilled easily, a difficulty warming up after getting chilled, and cold hands and feet much of the time. But the subjective symptoms of fatigue, weakness, depression, sleep difficulties and cognitive problems are just as real a manifestation of insufficient cellular energy production as a lack of warmth.

In talking with the many hundreds of people who experience chronic herpes problems, I now suspect that hypothyroidism/hypometabolism symptoms are even more common among herpes sufferers than the general population.

The underlying biological dysfunction of hypothyroidism and hypometabolism is a depressed basal metabolic rate. In other words, this means that people with this condition have a less-than-ideal cellular energy production. Basal metabolic rate is regulated by thyroid hormones (most notably T4 and T3). So a simple deficiency of either T4 or T3, or both, can produce hypometabolic symptoms. Medical tests of these hormones are useful for precisely this reason. However, the normal range is set far too wide and people with low levels are routinely told by their physicians that their thyroid is “normal” and that “nothing is wrong,” despite the fact that their levels are low and the likelihood that thyroid medication would relieve their oppressive symptoms.

If your physician has told you this, look at the test results for yourself. Ask for a photocopy of the thyroid test results, or ask for a copy of all your medical records and keep a copy at home.

Find the T3 and T4 readings and see if they are in the middle of the normal range. If they are near the bottom of the range, you might want to reconsider the prospect of thyroid hormone replacement therapy and nutritional supplementation of thyroid-related nutrients.

Although orthodox physicians are trained to look only at thyroid hormones in the bloodstream, this is only a superficial view of the full process by which thyroid hormones regulate basal metabolic rate. There are other steps involved, any one of which can malfunction to produce insufficient metabolic rate.

First, each of the tissues of the body has the ability to convert the low potency thyroid hormone (T4) into the high potency thyroid hormone (T3). T3 is four times more potent than T4. Since the thyroid hormone excreted by the
thyroid gland is 85% T4 and only 15% is T3, this tissue-level control of T4-to-T3 conversion is potentially a huge
determinant of basal metabolic rate.

Second, the enzyme that converts T4 into T3 is selenium dependent. So selenium nutriture is involved.

Third, T4 can get converted into reverse-T3 (rT3), which has no thyroid hormone activity at all, and which
undercuts basal metabolic rate.

Fourth, there are receptors on the surface of cells that bind to thyroid hormones and transfer it within the cell.
These receptors are essential for thyroid to be able to affect metabolic rate. Changes in the numbers of those
receptors can undermine metabolic responsiveness to thyroid hormone.

Fifth, there are also thyroid hormone receptors on the surfaces of the nucleus and mitochondria, which are also
essential to thyroid’s hormone function. Standard thyroid blood tests done by your doctor ignore these receptors.

Sixth, there are thyroid immune antibodies to consider. These thyroid antibodies can interfere with thyroid
activity. US physicians are trained to look only at blood TSH, T4 and T3 levels in people without severe
symptoms. It is no wonder that there are lots of hypometabolic people walking about who believe that their
thyroids are “normal.”

There is an acknowledged medical condition called generalized resistance to thyroid hormone (GRTH), in which
serious hypothyroid symptoms coexist with normal blood thyroid hormone levels. If GRTH is possible, why is it
impossible that a subclinical version of this condition might exist? There isn’t. It is not only possible, it happens
regularly.

Many orthodox doctors are trained to ignore blatant hypothyroid symptoms when blood thyroid tests fall into the
“normal” range—which is set by statistical criteria, not medical ones. The scientifically valid test for basal
metabolism is not blood thyroid levels, but whole-body calorimetry. But whole-body calorimeters are rare,
expensive, troublesome to operate (they need constant calibration), and they make patients feel claustrophobic in
a coffin-like enclosure. Fortunately, simple body temperature measurements provide a fairly accurate indication
of basal metabolic rate. Thermometers are inexpensive and easy to operate.

The best time to measure body temperature is in the early morning (4-6 AM), just after waking and before getting
out of bed. This minimizes the contribution of muscle activity to body temperature, So basal temperature is more
obvious. So take your temperature before stretching, going to the bathroom, or engaging in any other kind of
physical activity.

Because body temperature is affected by a variety of things, it is a good idea to take repeated measurements on
successive days to determine how much your morning body temperature fluctuates.

Some people advocate the use of axial (armpit) body temperature. This may be a good idea. However, most
people do not have major variations between axial and mouth temperatures. The most common exceptions are
“mouth breathers,” who breathe through their mouths instead of their noses while they sleep. If you don’t know,
why not test both and compare. The cost of a second thermometer is not going to break you.

With the exception of ear thermometers, pretty much any kind of thermometer can be used. Battery-powered
electronic thermometers are the fastest, but they may produce varying (unstable) results depending on the
electronics package, how long you leave them in, and how fresh the battery is. Some electronic thermometers
have accuracy errors of one degree, even though they say “medical standards” on the label. Mercury
thermometers are quite stable, but you have to shake them down after each use and it takes many minutes for
them to reach their stable readings. “Fertility” thermometers are often excellent due to their easier-to-read more
finely graduated temperature markings. Any thermometer may have calibration errors (i.e., produce readings that
are off by a set amount). If you have more than one thermometer, you can play them off against each other for
speed of use, temperature agreement, and consistency. Once you have a favorite, stick with it for your daily
temperature readings.

Normal body temperature in the early morning is usually a half-degree to a full degree lower than the “normal”
daytime temperature of 98.6°F. But if it is more than a degree low, then it may be appropriate to investigate
thyroid and metabolic issues, especially in those people who have specific health complaints that may be related
to hypometabolism.
Adrenal Hormone Issues

Hypothyroid symptoms can be caused by adrenal exhaustion, too. Thyroid hormone works intimately with adrenal hormone (cortisol), and a cortisol deficiency produces a nearly identical set of symptoms as hypothyroidism and hypometabolism. Some hormone-replacement specialists will not work on thyroid hormone replacement without simultaneous adrenal hormone replacement.

Cortisol has a strong circadian (daily) pattern. Levels are very high in the early AM, drop rapidly during the morning hours, and then less rapidly during the afternoon, to bottom out in the evening hours. Therefore, it is necessary to measure cortisol at a particular time to have any hope of assessing its sufficiency, and I strongly recommend that you consider four-times-in-a-day salivary assessment to get the shape of the cortisol curve. I’ve seen too many jet-lag-like disturbed cortisol patterns to trust one-time salivary testing or one-time blood testing.

The opposite side of adrenal exhaustion is elevated cortisol. This is the classic stress maladaptation syndrome associated with the “type-A” personality in a high-stress job, post-traumatic stress disorder (PTSD), or a type-B personality trapped in a really bad situation. Since cortisol is catabolic-aerobic-acidic to an extreme, this can cause down-regulation of other catabolic-aerobic-acidic systems in an attempt to restore homeostasis. The four-time salivary adrenal stress test identifies this problem as well as adrenal exhaustion.

The following Steroid Tree illustration shows how steroids are metabolized. On the right side, the lowest branch is the mineralocorticoids and the branch right above it is the cortisol (corticosteroid) branch.

Estrogen Dominance and Sex-Hormone Replacement Therapies

Estrogen dominance is a risk factor for hypometabolism, autoimmune diseases, cancer and viral diseases. This is one of the reasons why:
1) younger women are at much higher risk for autoimmune diseases than young men,
2) older men develop autoimmune diseases (their testosterone converts to estrogen with aging),
3) in women, herpes flare-ups synchronize with the estrogen-dominant phase of menstruation, and
4) cancer is strongly age related.

Estrogens promote these processes by suppressing protein synthesis and energy metabolism. In other words, estrogens are anabolic/anaerobic/alkaline. There are three primary estrogens, estrone (E1), estradiol (E2) and estriol (E3). Of the three, estriol is the least potent estrogen and is actually protective for autoimmune diseases.

Estrogens are the metabolic-rate off-switch. The on-switches are progesterone, androstenedione and testosterone, and to a minor extent DHEA. In men and women, the ratios of these on-switches vary. In men, testosterone dominates with progesterone playing a strong minor role. In women, progesterone dominates, with androstenedione, testosterone and DHEA playing minor roles. In both sexes, estrogens are the off-switches.

Because of the on-off antagonism or balance between estrogens and other steroids, estrogen must be measured in its hormonal context. In men with high testosterone, high estrogen is not as big a risk factor as it is in low-testosterone men. Likewise, estrogen dominance in women is defined by the estrogen/progesterone ratio.

During perimenopause, progesterone levels fall before estrogen levels do. This creates a stronger estrogen dominance than generally exists in post-menopausal women who have low estrogen but even lower progesterone. This estrogen dominance is one reason why menopause is so metabolically stressful. According to changes in melatonin levels, women age twice as fast during the menopausal transition as they do before and after (see blue line in the illustration at right).

The estrogen context is also important because it is modified by inflammation. Inflammation is triggered by infection, allergy and oxidative stresses, which cause immune system cells to send out cell-signaling factors called cytokines, which turn on inflammation and activate the estrogen-forming enzyme. This enzyme, aromatase, converts testosterone to estradiol, androstenedione to estrone and hydroxyandrostenedione to hydroxyestrone. So it is possible that estrogen dominance can be triggered by inflammation and perpetuated by chronic inflammation.

In men, testosterone declines gradually over time while estrogen slowly rises. However, sudden changes in estrogen levels can be caused by infection, allergy or iron toxicity. This is best measured by simultaneous measurement of testosterone and estradiol, where the ratio provides information about the activity of aromatase. Men whose testosterone is low due to inflammation often have severe side effects from testosterone replacement therapy due to the aromatase-induced skyrocketing of estradiol levels. This can be easily detected by estradiol tests with testosterone tests. Since this is not standard practice, men need to insist that their estradiol be tested.

**Infection**

It might seem weird to talk about infection and chronic infection in a book about viral disease. After all, isn’t herpes an infectious disease? And isn’t viral disease, in general, infectious? Yes, certainly. However, other infections can co-exist with viral disease and cause metabolic shifts that are favorable to viral replication. Sometimes, inflammation cannot be turned off merely by shutting down viral replication. If there is another infectious disease present, it may persist long after viral load goes to zero.
Allergy

Allergy is an independent inflammatory influence. Allergies can be generally split into two kinds: immediate hypersensitivities and delayed hypersensitivities. The immediate hypersensitivities are the kinds of reactions that you notice: rashes, itching, boils, sores, swelling, redness, coughing, sneezing, watery eyes. These are obvious symptoms, and they tend to occur rapidly after exposure (minutes to hours). They are mediated by IgE antibodies, and dermatologists specialize in such allergies.

The delayed hypersensitivities are a different kettle of fish, involving IgA, IgG and IgM antibodies. Many allergists vociferously denied that they even existed less than 20 years ago. Reactions can be spread out over time, and delayed by up to 6-8 days. These kinds of sensitivities are often referred to as food allergies and they can be related to gut permeability (“leaky gut syndrome”). Wheat, milk, yeast, corn and eggs are probably the most common foods causing delayed hypersensitivities, but this may be because such foods are so common. With leaky-gut syndrome, any food eaten regularly can become an allergenic influence.

Both immediate and delayed hypersensitivities trigger immune response and cytokine activation of aromatase (the estrogen-driving enzyme) and indoleamine deoxygenase (IDO, a tryptophan-destroying enzyme). Aromatase converts energy-enhancing hormones (progesterone, testosterone) into energy-conserving hormones (estradiol and estrone). This exacerbates hypometabolism and increases viral susceptibility. IDO catabolizes (degrades) tryptophan, 5-hydroxytryptophan and a host of other indoleamines that might be found in certain herbs. The most predictable consequence of this is serotonin deficiency, which would otherwise be synthesized from the destroyed tryptophan. This can lead to depression, sleep problems, moodiness, emotional volatility, aggravation of obsessive and compulsive tendencies, and irritability. It can also result in carbohydrate cravings, impulse-regulation problems, violence-control problems and alcoholism.

Heavy metals

Low metabolism can also be triggered by heavy metals, which sabotage enzyme systems in the body and impair mitochondrial metabolism. I have seen heavy metal toxicity show up in unexpected situations, so some kind of screening is probably the only way to know. In my opinion, a chelation challenge is the best option. With this test, a chelating agent is administered by mouth or by injection, and the heavy metals are measured in a 6-hour, 8-hour or 24-hour urine-collection sample. EDTA is the most common chelating agent, and it works well for most toxic metals/minerals. DMSA or DMPS are generally favored for measuring mercury levels. Nano-colloidal zeolite seems to facilitate the safe transport of mercury to the urine. Regular zeolite does not work in this manner.

Urine pH Biofeedback

Another method that can be used to track metabolic state is sequential urine pH testing. This biofeedback technique involves 1) testing urine pH every time you urinate, 2) plotting the resulting curve on paper, and 3) finding correlations between urine pH changes and symptoms. If a correlation is found, then the metabolism (and urine pH) can be manipulated to influence symptoms and, hopefully, undermine a disease process (i.e., viral susceptibility).

There are specific pH features that may be closely associated with viral susceptibility. The first one is alkaline dominance. In this situation, the urine pH is either frequently alkaline, most particularly during the day when it is supposed to be acid, or the pH baseline (the pH average) is significantly higher (more alkaline) than 6.0-6.2 (the approximate average pH in healthy people). These features may be caused by a multiplicity of factors. Some are metabolic, like hypothyroidism or hypometabolism. Some are dietary (like a vegetarian diet, a specific nutrient deficiency, or an unsuitable diet). Some are ecological, like from pesticide poisoning, heavy metal toxicity (dental amalgams), gut dysbiosis or allergies. Whatever the cause, the urine pH is a reflection of a biological dysfunction just as viral susceptibility is.

If you are fortunate to see an alkaline dominant pattern, then you can sequentially investigate what factors do or do not change that dominance. This is biofeedback training, based on urine pH as the biofeedback signal. When you find something that moves your alkaline dominance towards normal, that something is likely to reduce your viral susceptibility in the bargain. It may also reduce other symptoms that you might not think are associated with viral susceptibility, like migraine headaches, asthma, fatigue, depression, sensitivity to cold weather, mental fuzziness, and sleepiness in the mid or late afternoon.
Unfortunately, alkaline dominance may be masked by inflammation. When alkaline dominance reaches a point where it becomes biologically dangerous, the body produces tissue hormones (prostaglandins) which mitigate the alkaline stress. If you remember Revici’s model, alkaline stress is a manifestation of anabolic dominance, and prostaglandins are the body’s catabolic defense mechanism to an anabolic crisis. These prostaglandins (particularly prostaglandin E\textsubscript{2}) cause the urine to swing strongly acid, which “masks” (hides) the underlying alkaline stress. This is the second pH pattern to look for: constant acidity. If the urine stays acid all the time, especially during the night when it is supposed to swing alkaline, then your alkaline stress has progressed to a state of chronic inflammation. While urine pH is masked by chronic acidity, urine pH testing cannot be used for biofeedback purposes—until the inflammation is resolved (ended).

Therapeutically, chronic inflammation is troublesome to treat. Most orthodox doctors don’t even attempt to treat it. Even doctors familiar with nutritional and ecological medicine have difficulty dealing with chronic inflammation. This is because there are so many potential causes.

Chronic infection can trigger chronic inflammation. Chronic infections may result from parasites, protozoans, viruses, fungi or bacteria. Sometimes such infections are easy to overlook, or take for granted, like toenail fungus.

Chronic allergies can trigger chronic inflammation. These may take the form of classic respiratory allergies (pollen, grasses, animal dander) and skin allergies (rashes from fibers or chemical exposures) that orthodox allergists recognize and treat with corticosteroids (cortisone) and other drugs. Classic allergies are triggered by immunoglobulins of the E series. These are quick. The exposure and reaction are separated by seconds or minutes.

Alternatively, inflammation may be triggered by hypersensitivity reactions to foods (food allergies), chemicals (chemical sensitivities), and traditional allergens (molds, dust mites, animal dander, etc.). Delayed hypersensitivities are triggered by immunoglobulins of the A, M and G series (IgA, IgM, IgG), which most orthodox allergists ignore. Delayed hypersensitivity reactions are difficult to recognize because some symptoms can follow the exposure by up to 6-8 days!

The food allergy issue can be specific to a narrow group of foods that tend to be frequently consumed. Wheat and yeast allergies are common examples because wheat protein (gluten) and the cell walls of yeast are very difficult to digest. So in a marginal digestive system, undigested wheat proteins or yeast cell-wall polysaccharides may become a trigger for hypersensitivity and chronic inflammation.

In some people, allergies to foods can be extensive, involving dozens to hundreds of foods. Usually, this is a direct result of 1) dysbiosis (a disturbance in the intestinal flora that would otherwise assist human digestion), and/or 2) intestinal hyperpermeability (a breakdown in the integrity of the intestinal lumen, the internal “skin” of the digestive tract). There are now high-tech medical tests for dysbiosis and gut permeability. Although most doctors still deny that intestinal permeability is a disease, it is now becoming easier to find physicians that will test for this syndrome.

The intestinal lumen relies on the amino acid glutamine for much of its energy requirements. Oral glutamine is often prescribed to speed up intestinal healing, along with probiotics (e.g., acidophilus).

The third pH pattern to look for is the “jet lag” pattern. In this situation, the normal pattern of acid (catabolic) dominance during the day and alkaline (anabolic) dominance during the night is reversed.

Jet-lag syndromes not only result from high speed east/west long-distance travel, but from dietary, metabolic and neuroendocrine disturbances. Sequential urine pH testing is one way to identify any kind of circadian (daily) metabolic rhythm dissynchrony (timing disturbance).

**Catabolic Adjuncts**

If the metabolic hypothesis is correct, then other compounds with similar effects on catabolic metabolism should exhibit synergy with BHT against viruses. Although this hypothesis has never been systematically studied, several physicians and more than a dozen people have noted that vitamin B\textsubscript{12} (either oral or injected) seems to markedly aid in the control of herpes. B\textsubscript{12} and B\textsubscript{6} are the catabolic B vitamins. Vitamin A is a catabolic lipid-soluble vitamin, and it seems to help not only with herpes control, but with general immune reactions to infections of all kinds.
Vitamin E, which is an anabolic fat-soluble vitamin, has been reported to aggravate herpes flare-ups when taken in amounts many times greater than the 30 IU recommended daily allowance, but not when only 30 IU are taken. Although this latter finding is highly questionable due to its methodologies (it was a questionnaire-based study), I felt that it should be mentioned because it fits the pattern in a mild way.

And, finally, it has been noted that antibiotics (which are catabolic) have a therapeutic effect against infections that later prove to be viral, even though there is no known mechanism for this action—other than the general catabolic property of antibiotics, of course.

A generalized list of the metabolic effects of numerous substances appears on the previous page. Substances were classified based on their general effect on metabolism, not any quantified antiviral effect.

**Lipid-Enveloped Viral Diseases**

Although this book is written primarily about herpes, there are a host of other lipid-enveloped viruses that cause morbidity and mortality. These include:

1. cytomegalovirus (CMV),
2. Ebola virus (hemorrhagic fever virus),
3. Epstein-Barr virus (infectious mononucleosis),
4. hepatitis virus (types B and C),
5. human immunodeficiency viruses (HIV),
6. influenza (all strains, including bird flu),
7. rubella virus (German measles virus),
8. varicella zoster virus (a herpes family virus that causes chicken pox and shingles), and
9. variola virus (smallpox virus), and
10. SARS virus (one coronavirus that infects humans).

Animal viral diseases include:

1. swine fever (pigs),
2. Newcastle disease (birds and horses),
3. bird flu (also infecting humans),
4. swine flu (also infecting humans),
5. Semliki Forest virus (also infecting humans),
6. coronaviruses (infecting dogs and cats), and
7. canine and feline distemper.

Mention will also be made of other effects of BHT:

1. improving skin condition,
2. preventing cardiovascular disease, and
3. decreasing cancer risks.

**The Antiviral Literature on BHT**

The scientific literature on BHT prior to 1975 had developed several themes:

1. BHT’s toxicity was of a low order, especially its chronic toxicity. It is enzymatically metabolized only in the liver, with only trace quantities of changed BHT being found in the brain, lungs, heart and kidneys.
2. BHT is a powerful antioxidant. Its ability to protect fats and oils from peroxidation may be several times better than other natural fat-soluble antioxidants like vitamin E.
3. BHT extends lifespan in animal studies. These results have been well documented in many studies over many animal species, and in some animals, typical mean lifespan increases of 50% are seen. The qualitative benefits observed in these studies are consistently striking, the BHT treated animals look younger, have glossier and thicker fur coats, are leaner and more active, and have better immune responses and healing times. The mechanism of action may have something to do with the control of free radicals and reduction of oxidative stress, but it seems more likely to be the direct but unintended result of food restriction induced by the noticeable taste of BHT in the BHT-fortified animal feed.
4) BHT lowers the incidence of cancer in cancer-prone animals and in animals exposed to some carcinogens. The mechanism of BHT’s action appears to be due to two effects. First, BHT is a free-radical scavenger and intervenes in free-radical pathways of carcinogenesis. And second, BHT causes induction of certain hepatic (liver) enzymes that metabolize carcinogens before they initiate cancer.

**BHT Antiviral Findings**

In 1975, Wallace Snipes, Stanley Person, Alec Keith and James Cupp published the first in a series of papers concerning the antiviral properties of BHT. Their paper was entitled, “Butylated hydroxytoluene inactivates lipid-containing viruses” and was published in Science.

In their experiment, BHT was found to be a potent inhibitor of mammalian and bacterial lipid-containing viruses. Virus preparations were exposed to BHT for 30 minutes and added to host cells for assay of viral activity. The results indicate total inhibition of Phi-6 virus, substantial inhibition of HSV, and almost no inhibition of polio virus, which contains no lipids. A HSV mutant and PM2 virus, both lipid-containing viruses, were also substantially inhibited. Phi-3-1a virus, which infects the same host as Phi-6 but contains no lipids, was not affected. In the following table, the effective concentrations for 50% inactivation of the virus are compared to approximate body concentrations in the US population.

<table>
<thead>
<tr>
<th>BHT Concentration</th>
<th>Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.6 x 10^{-5} Molar</td>
<td>Approximate U.S. Body Concentration</td>
</tr>
<tr>
<td>1.0 x 10^{-5} Molar</td>
<td>50% Inactivation of Phi-6 virus</td>
</tr>
<tr>
<td>0.7 x 10^{-4} Molar</td>
<td>50% Inactivation of Herpes virus</td>
</tr>
</tbody>
</table>

The amount of BHT found in the body fat of the US population was slightly less but of the same order of magnitude as that necessary to inactivate Phi-6 virus. The amount needed to inactivate HSV was one order of magnitude higher. Since the average daily intake of BHT in the US is estimated to be about 2 mg, we can make a crude, order-of-magnitude estimate of the therapeutic dose for herpes treatment at 20-200 mg of BHT. This is not far from what has been found by people using BHT to treat herpes.

Later that year, a second paper from the same laboratory was published in *Antimicrobial Agents and Chemotherapy* entitled “Inactivation of lipid-containing bacteriophage PM2 by butylated hydroxytoluene” [Cupp et al. 1975].

In the first paper, PM2 virus was reported to be inactivated to the same degree as HSV. In this paper, evidence is presented to indicate complete destruction of PM2 by BHT treatment. Most of the killing effect occurred in the first five minutes.

The active form of BHT was postulated to be a non-soluble suspension of microcrystals. This conclusion was supported by several observations. First, surfactants that would tend to solublize BHT lessened its killing ability. Second, solvents that gave the greatest precipitate gave the greatest antiviral activity. The correlation between absorbance (turbidity of the precipitate) and virucidal activity was approximately linear. Third, the BHT precipitate of microcrystals that formed when the BHT/solvent mixture was added to the medium decreased with time, as did the killing activity. Sixty percent of the virucidal activity was lost in 40 minutes. And fourth, a freshly mixed solution of BHT and medium was filtered through a 0.22 micrometer filter removing 80% of the BHT and leaving only the finest crystals. The resulting solution retained most of its virucidal activity.

Once the microcrystal precipitate was recognized as an important aspect of BHT antiviral activity, its toxicity to the host cell was assayed. At a concentration of BHT that killed more than 99% of PM2, absolutely no effect on the growth of the host cells could be seen.

In 1976, a letter written by Robert Alan Franklyn, “Butylated Hydroxytoluene in Sarcoma-Prone Dogs,” appeared in *The Lancet*. The main subject of this paper is the anticancer and life extending effects of BHT. It is included here for two reasons; 1) It concerns the use of BHT on large animals, and 2) reference is made to distemper, a viral disease.

The author of the letter was a breeder of Scottish deerhounds which have a genetic weakness and usually die at age 4-6 years of large-bone sarcoma (cancer). Thirty-six animals, ages 1-1/2, 2 and 3 years, were split into a control group and a BHT group which received one tablespoon (30 grams) of BHT daily.
Control animals all died at age 4-6, mainly of sarcoma. Cause of death for BHT treated animals was distemper for the 3 year olds at age 8, and heart and kidney failure for the 1-1/2 and 2 year olds at ages 9 (6 dogs) and 10 (3 dogs).

There were qualitative differences reported between the BHT dogs and controls. The BHT dogs were sleeker, racier, thinner, trimmer, and more “typy” of the breed. There was no difference in appetite, calorie intake or diet (except the BHT). The ineffectiveness of this high dose of BHT at preventing death from distemper is puzzling. Canine distemper is reported to be a lipid-enveloped viral disease. It is also puzzling that none of the younger dogs died of distemper.

Although this paper was quite intriguing, I should caution dog owners against uncritical acceptance of the above report. Although the amount of BHT was reported to be one tablespoon or 30 grams, one tablespoon of BHT actually weighs only ten grams. So something may have gotten lost in the translation of a letter into a letter-to-the-editor. Even ten grams is a huge dose of BHT to give a dog. If the “tablespoon of BHT” was actually a tablespoon of vegetable oil, coconut oil or lard into which BHT had been dissolved, then the actual dose of BHT given to the dogs might have been an order of magnitude lower than reported.

One month later, the third paper from the Snipes-Person-Keith-Cupp research group was published in *Antimicrobial Agents and Chemotherapy* entitled “Inactivation of the enveloped bacteriophage Phi-6 by butylated hydroxytoluene and butylated hydroxyanisole” [Wanda et al. 1976].

BHT was found to inactivate Phi-6 virus at concentrations as low as 3 x 10^{-5} Molar. BHA also inactivated Phi-6, but higher concentrations were required. The viral envelope was not stripped off by BHT treatment, in contrast to treatment with the detergent Triton X-100. The BHT treated, inactivated virus was found to be morphologically indistinguishable from the active virus. It was suggested that a missing binding protein might account for the treated virus’ inability to attach to its host cell.

Later in the following year, the first scientific study on live animals was reported in *Science* entitled “Butylated Hydroxytoluene Protects Chickens Exposed to Newcastle Disease Virus” [Brugh 1977].

Newcastle disease virus (NDV) affects a wide range of avian species including ornamental pet birds. It also infects thoroughbred race horses. Its extreme virulence was largely prevented by small amounts of BHT, 0.01% to 0.1% of diet by weight. The immunization response of chickens to a non-virulent strain of NDV was also blocked by BHT, suggesting that previously reported vaccination failures were primarily due to the use of BHT as an antioxidant in feed.

The ability of NDV LaSota to agglutinate (stick together) blood cells, a normal membrane function, was not blocked by BHT at 44 mcg/ml indicating non-disruption of the NDV virion (virus particle). The dose for NDV inactivation was one to two orders of magnitude less than that used in studies of the life extension or anti-carcinogenicity effects of BHT.

In 1978, a paper was published on BHT’s effects on cytomegalovirus (CMV), a human pathogen responsible for cytomegalic inclusion disease, intrauterine death, prematurity, congenital defects, mental retardation, post-perfusion syndromes, and interstitial pneumonia, plus viral enteritis in organ transplant patients, “Inactivation of cytomegalovirus and Semliki Forest virus by butylated hydroxytoluene,” by K. S. Kim, H. M. Moon, V. Sapienza, R. I. Carp, and R. Pullarkat (*Journal of Infectious Diseases* volume 138, number 1, pages 91-4, July 1978).

Cytomegalovirus (CMV), a member of the herpesvirus group, was inactivated by more than 99% by 40 mcg/ml of BHT. Murine (rodent) CMV, and Semliki Forest virus, were also inactivated more than 90% by the same concentration of BHT. The lipid-containing vaccina virus was inactivated only at higher concentrations of BHT. poliovirus, which contains no lipids, was not inactivated.

One and a half years later, “Studies with a hydrophobic, spin-labeled virucidal agent” was published by Neal DeLuca, Alec Keith, and Wallace Snipes in *Antimicrobial Agents and Chemotherapy* (volume 17, Number 1, pages 63-70, January 1980).

A spin-labeled (stable free-radical) virucidal agent, BPN, was synthesized and found to inactivate both Phi-6 and herpes simplex virus to the same degree as BHT. The hypothesis that BHT inactivates Phi-6 by removing a binding protein is proven to be correct. Of the five membrane proteins of Phi-6, only one is removed by both BHT and BPN. While BHT and BPN have quite different structures, they do have similar globular shapes and
charge distributions, and additionally, they are quite hydrophobic. The authors present the hypothesis that it is the particular associations between the proteins and lipids in viruses that allow BHT and BPN to selectively damage the virus, and not the host cell membrane. The absence of “free lipid pools” in the viruses is the source of their weakness to BHT. This could be studied by changes in the energy level of the lone (free radical) electron in BPN, which were caused by differences in solvent (between viruses and host cell membrane). The authors suggest that each virus may require a differently shaped hydrophobic molecule to optimize the antiviral effect, depending upon the exact association of lipid to protein in the viral structure.

In March, Vern D. Winston, Joseph B. Bolen and Richard A. Consigli published a paper “Effect of butylated hydroxytoluene on Newcastle disease virus” in the *American Journal of Veterinary Research* (Volume 41, Number 3, pages 391-4, 1980) which confirmed Brugh’s work with BHT and Newcastle disease virus. NDV was found to be inactivated 92% by 50 mcg/ml of BHT. Virion adsorption to host cells was inhibited 32% and electron microscopy revealed visible disorientation and disruption of the viral envelope.


Although the mouse is not a good animal to model herpes infections, the experimenters used three different techniques in attempting to induce human-like herpes lesions. In the first experiment, mice without immunity to HSV-1 were used. These animals developed deep lesions that were not typical of human HSV lesions. In the second experiment, previously infected and recovered mice were γ-irradiated to suppress immune activity and re-infected with HSV-1. Lesions on these animals remained more localized and more typical of human HSV lesions. In the third experiment, animals were inoculated with γ-globulin 24 hours prior to infection with HSV. In this case, lesions also remained more localized. In all cases, topical BHT had significant effect on reducing clearance time of the infections. The significance of this experiment to human herpes infections is not clear.

**The Toxicology of BHT**

Despite BHT’s meager clinical experience and lack of approved-drug status, its effectiveness as an antioxidant and antiviral agent will provide an incentive for its clinical use. However, there are many questions about the use of BHT in human medicine that currently remain unanswered. Each one is a potential research project in itself. I hope this presentation and discussion of the available literature on BHT will prove useful in both assessing its value to a comprehensive health care system and in stimulating interest in further research. This second element is especially problematic due to the present generic status of BHT. All chemical patents have long since expired worldwide. In addition, the use patents relating to antiviral applications of BHT have also expired. Without proprietary interests, financial incentives for further research are minimal.

Animal studies are our largest source of information from which to extrapolate clinical risks in man. The inherent uncertainties involved in translating dosages between species makes it imperative to look for toxic effects in man at dosages less than those that produce toxicity in animal experiments. Additionally, some of BHT’s toxic effects on laboratory animals have been related to vitamin deficiencies.

Since lab-animal nutrition is often better than the human average, caution is warranted in this area. Most of the studies presented here on the effect of BHT on various organ systems use dosages between 50 mg/kg and 500 mg/kg. While the higher dose is conclusively tied to adverse effects in some animals, the lower dose seems to be relatively benign.

For a 70 kg person (150 lbs), 50 mg/kg is a 3500 mg dose, which is 100 times the unconditionally acceptable daily intake of 0.50 mg/kg body weight set by the WHO [Joint FAO/WHO Expert Committee on Food Additives 1967].

For the treatment of herpes, doses of 250-2000 mg are suggested, which is 7-58 times the WHO unconditionally acceptable dose for a 70 kg person. For a 50 kg person, 250 mg is 10 times the WHO dose. Please refer to the adjacent table for a comparative presentation of BHT dosages used in animal research studies with those used in a clinical environment.
Teratogenicity

Early reports on the teratogenicity of BHT found anophthalmia (missing eyes) in rodents [Brown 1959]. Later studies found no such effect [Frawley 1965, Johnson 1965] and one paper attributed the anophthalmia to a possible deficiency of Vitamin A or Vitamin E in the diet of the earlier test animals [Clegg 1965]. Subsequent testing has failed to find any birth defects in BHT gestated offspring in mice or rats at 500 mg/kg dose level [Vorhese 1981, Meyer 1980, Stokes 1974, Clegg 1965, Frawley 1965, Johnson 1965] including monkeys at the 50 mg/kg dose level. There is even a lack of evidence to support birth defects in monkeys at 500 mg/kg [Allen 1976].

Carcinogenicity

BHT has been shown to have both carcinogenic and anticarcinogenic activity in animal studies. Several experimental approaches have been investigated, varying from massive single injections of BHT to chronic, daily exposure.

In experiments with BHT alone, the incidence of cancer seems either to be unaffected or much reduced [Clegg 1965, Hirose 1981, Shirai 1982], especially in cancer-prone animals. An early study demonstrating carcinogenic activity of BHT could not be replicated by subsequent studies, the erroneous result being attributed to the presence of aflatoxin contamination of the animal feed. Aflatoxin is an extremely powerful carcinogen produced by fungal (mold) contamination of nuts and grains. It is a significant epidemiological cancer risk to humans, especially in third-world nations and in tropical climates.
In animal experiments with BHT and known carcinogens, BHT acts as both a promoter and an antipromoter of carcinogenesis, depending upon the experimental conditions. Carcinogenesis is usually decreased when the BHT is administered prior to or concurrent with the carcinogen [Ulland 1973, Goodman 1976, Clapp 1979, McCay 1980, King 1981, Williams 1983]. When BHT is administered after carcinogenic exposure, the incidence of cancer is frequently increased [Peraino 1977, Witschi 1981, Imaida 1982, Williams, 1983]. The increases are greatest with hepatically metabolized carcinogens where large single doses of BHT are administered post-exposure. Compared to phenobarbital, another hepatic enzyme inducer, BHT is a “weak enhancer” and then “only at near-toxic doses” [Maeura 1984].

Because BHT is both a promoter and an antipromoter, the type of carcinogens that people are exposed to will determine whether its net effect is to increase or decrease incidence of cancer. Because cruciferous vegetables (cabbage, cauliflower, Brussels sprouts, broccoli) are known to induce liver enzymes similarly to BHT—and also lower general cancer incidence epidemiologically—we can infer that BHT is likely to lower net cancer risks.

In the Soviet Union during the 50s and 60s, BHT (called ionol by the Soviets) was extensively studied as an anti-tumor compound [Emanuel 1963, 1973] culminating in its approval as a treatment for bladder cancer.

**Psychological and Behavioral Changes**

Many studies have found evidence of psychological and behavioral changes in development at 500 mg/kg doses of BHT [Vorhese 1981, Meyer 1980, Stokes 1974]. In one experiment, the decrease in weight seen in BHT raised rat pups at 500 mg/kg was found to attenuate with time, becoming insignificant by age 3 months. This effect was not seen after weaning or at 125 or 250 mg/kg dose levels.

A delayed development in a multiplicity of behavioral traits, seen only in the 500 mg/kg dosed animals, was also not evident after weaning, suggesting no “special toxicity of BHT for the central nervous system” [Vorhese 1981]. Another study demonstrating behavioral changes found that the changes were most clearly seen in the lactation phase of development. BHT is strongly excreted in breast milk. While a slight (statistically nonsignificant) reduction in growth rate was seen in BHT-gestated pups nursing non-BHT-dosed mothers at the 500 mg/kg dose level, the effect was significant and substantial for both BHT-gestated and non-BHT-gestated rat pups nursing BHT-dosed mothers [Meyer 1980]. There was no observable effect on birth weight or gestation time.

In a test of 5 female monkeys taking 100 mg/kg of a BHA/BHT mixture (50 mg/kg BHA and 50 mg/kg BHT), no clinical abnormalities were observed during a 1 year initial exposure, nor during a second year of exposure during which they were bred and gave birth to normal infants [Allen 1976]. The subsequent two years following antioxidant exposure were also free of any clinical abnormalities. The females continued to give birth to normal, healthy, infant monkeys.

Chronic prenatal exposure to BHT may perhaps prove to be benign, however, infant exposure through breast milk must be considered as a significant concern. In my opinion, the available data do not yet rule out the possibility of the clinical use of BHT in pregnancy or infancy. More data are needed to assess this aspect of BHT’s safety to my satisfaction. However, the herpes group viruses (HSV-1, HSV-2, cytomegalovirus, etc.) pose serious health risks during pregnancy, childbirth and infancy.

**Hepatic Effects of BHT**

There are still uncertainties about the full effect of BHT on the liver of man. In rats and monkeys, the degree of liver enlargement closely parallels the proliferation of smooth endoplasmic reticulum (SER) and the increase in drug metabolizing enzymes. A concomitant depression of glucose-6-phosphatase activity appears related to the induction of drug metabolizing enzymes and is “consistent with increased metabolism of glucose via the pentose phosphate pathway in response to an increased requirement of NADPH” [Crampton 1977]. This is not felt to be indicative of any cell damage [Crampton 1977, Goldberg 1966]. Rats treated with 0.4% BHT in the diet for 80 weeks showed increased aniline-4-hydroxylase activity, decreased glucose-6-phosphatase activity, and increased liver weight, all of which had returned to normal four weeks after discontinuation of BHT.

A simultaneous increase in urinary ascorbic acid is seen during the BHT-induced process of liver enlargement in the rat. Urinary ascorbic acid is proposed as a test to distinguish hyperfunctional liver enlargement from pathological liver enlargement. The livers of primates are not capable of producing ascorbate, but this
phenomenon might prove useful by following the excretion of L-xylulose and/or D-glucaric acid [Gaunt 1965]. These observations would suggest the ascorbate be included with BHT, especially in the dose titration phase of BHT therapy, when hepatic enlargement would be occurring. In additions, ascorbate’s strong antioxidant and free radical-scavenging effects might prove helpful in lowering the toxicity or concentration of BHT-hydroperoxide, which has been reported to be the most toxic of the BHT metabolites [Yamamoto 1980]. Sulfur antioxidants, such as cysteine, N-acetylcysteine and glutathione, should also be mentioned in this regard. Vitamins and coenzymes which support the generation of reducing agents (NADH, NADPH and FADH$_2$) may have significant effects on the redox recycling of ascorbate and glutathione. Nutritional factors with critical roles in the production of reducing power include vitamins B$_1$, B$_2$, B$_3$, tryptophan, lipoate and coenzyme Q.

In rat experiments, the liver adjustment phase was established at less than one week, which was in accord with the induction phase of BHT-oxidase [Gilbert 1967], the enzyme responsible for oxidizing BHT to BHT-alcohol. No permanent liver changes are seen at a dietary level of 0.1% BHT (approximately 100 mg/kg).

In monkeys, 50 mg/kg and 500 mg/kg produce no clinical abnormalities, yet many ultrastructural abnormalities are visible under an electron microscope at the higher dose [Allen 1972]. “The degree of liver enlargement and induction of drug-metabolizing enzyme activity increases linearly with dose until, at very high doses, no further increases occur” [Crampton 1977].

Several differences in liver metabolism between primates (monkeys) and rodents (rats) have been reported. The greater liver enlargement with BHT over BHA in rats is reversed in monkeys. There is an enterohepatic circulation of BHT in the rat that is not present in man.

An early report of t-butyl-oxidized metabolites in man [Daniel 1968] was not confirmed by another researcher [Ryan 1971]. Further research using high-performance liquid chromatography has confirmed that t-butyl oxidation is a major metabolic pathway in man [Wiebe 1978] and a minor one in rats and mice [Matsuo 1984].

**Increased Thyroid Weight**

In rats, BHT has been reported to increase thyroid weight and iodine uptake at both 500 and 5000 ppm (0.05-0.5%) BHT. Electron microscopy “revealed microfoliculation and increased height of the follicular epithelial cells” [Sondergaard 1982]. The significance of this finding to the health of the rat, or man, is not clear.

**Lung Damage**

In single doses of 400 mg/kg, BHT causes lung damage and cell proliferation in all strains of mice [Williamson 1978, Witschi 1978, Omaye 1975, Saheb 1975, Marino 1972]. This effect is not observable at doses below 200 mg/kg and is also completely blocked by cedar terpene administration (from cedar shavings or cedrol injections), even up to doses of 2500 mg/kg BHT or with a two hour delay in terpene administration [Malikson 1979]. Lung damage is specific to BHT, or an early metabolite, as other antioxidants (BHA, α-tocopherol, pyrogallol, propyl gallate), other substituted phenols (2,4-di-tert-buty phenol, 4-phenylphenol, 4,5-butylenphenol; and 2,4,6-trimethylphenol), and BHT metabolites (BHT-alcohol, BHT-acid, and BHT-quinone) did not have that effect [Malikson 1979]. The lack of sensitivity to BHT of young mice (who do not have fully active livers) suggests that a metabolite of BHT is the toxic agent in lung damage. The structural features responsible for lung toxicity are a methyl group in the para-(4)-position and hindering alkyl groups in the ortho-(2,6)-positions on a phenolic ring [Mizutani 1982]. This suggests the quinone-methide, or a close metabolite, as the toxic moiety. BHT-hydroperoxide is another possible candidate. However, an increase in the non-enzymatic conversion of BHT to BHT-hydroperoxide that would be expected from exposure to 100% oxygen is not seen [Williamson 1978]. It is possible that unchanged BHT itself is responsible for lung damage in mice. If a radical intermediate is responsible for the toxic effect, it should diminish with the addition of appropriate free-radical scavengers. Although BHT-induced lung damage is observed in all mouse species, it has yet to be seen in any other species.
Dosage/Effect Ranking

The adjacent table summarizes the published animal research on BHT and the suggested doses for herpes treatment, ranked in order of mg/kg values.

<table>
<thead>
<tr>
<th>BHT Dosage</th>
<th>Observation or Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.02-0.03 mg/kg</td>
<td>Average daily intake by US populace.</td>
</tr>
<tr>
<td>0.5 mg/kg</td>
<td>FAO/WHO maximum unconditionally acceptable daily intake.</td>
</tr>
<tr>
<td>0.5 mg/kg</td>
<td>From 1-3/4 kilos of food at 0.02% BHT (FDA maximum) for 70 kg person.</td>
</tr>
<tr>
<td>3.4 mg/kg</td>
<td>250 mg dose for 70 kg (154 lb) person.</td>
</tr>
<tr>
<td>20 mg/kg</td>
<td>1000 mg dose for 50 kg (110 lb) person.</td>
</tr>
<tr>
<td>15-20 mg/kg</td>
<td>(0.017% of diet) Threshold dose for temporary lowered prothrombin index in rats.</td>
</tr>
<tr>
<td>40 mg/kg</td>
<td>2000 mg dose for a 50 kg person.</td>
</tr>
<tr>
<td>100 mg/kg</td>
<td>(50% BHA, 50% BHT) All monkeys give birth to normal infants.</td>
</tr>
<tr>
<td>100 mg/kg</td>
<td>Produces no permanent liver changes in rats.</td>
</tr>
<tr>
<td>200 mg/kg</td>
<td>Threshold dose for lung damage in mice.</td>
</tr>
<tr>
<td>250 mg/kg</td>
<td>Threshold dose for sustained lowered prothrombin index in rats.</td>
</tr>
<tr>
<td>400 mg/kg</td>
<td>Lung damage and cell proliferation in mice.</td>
</tr>
<tr>
<td>400 mg/kg</td>
<td>Lowered and raised radiation sensitivity in mice.</td>
</tr>
<tr>
<td>200-500 mg/kg</td>
<td>(0.25-0.50% of diet) Mean lifespan increases in male mice (greater at higher dose).</td>
</tr>
<tr>
<td>500 mg/kg</td>
<td>Lowered prothrombin index in rats.</td>
</tr>
<tr>
<td>500 mg/kg</td>
<td>Changes in electrolytes and organic transport in rat kidney slices.</td>
</tr>
<tr>
<td>500 mg/kg</td>
<td>Lowered growth rate and delayed development of behavioral traits in rat pups nursed by BHT-dosed rat mothers.</td>
</tr>
<tr>
<td>500 mg/kg</td>
<td>Ultrastructural liver abnormalities in monkeys with absence of clinical abnormalities.</td>
</tr>
<tr>
<td>500 mg/kg</td>
<td>Increased thyroid weight &amp; iodine uptake in rats.</td>
</tr>
<tr>
<td>500 mg/kg</td>
<td>Non-teratogenic in rats and mice.</td>
</tr>
<tr>
<td>2500 mg/kg</td>
<td>Absence of lung damage in mice exposed to cedar shavings or cedar terpenes.</td>
</tr>
<tr>
<td>1600-3200 mg/kg</td>
<td><em>Merck Manual</em> LD$_{50}$ in rodents.</td>
</tr>
</tbody>
</table>

BHT's Effect on the Kidney

High doses of BHT also have effects on the kidneys. In rats, 500 mg/kg oral doses of BHT cause decreases in food intake and water consumption, and an increase in urinary volume, followed eventually by an increase in water consumption. Sodium and potassium excretion dropped but not in proportion to the drop in food intake. Urine osmolality was consistently lower [Ford 1979a]. Other renal functions were also affected. The ability of renal cortical slices to accumulate an organic acid (p-aminohippurate) was reduced on days 1, 2, and 4 but was comparable to control levels by day 6. “The attenuation of this effect despite continual administration of the antioxidant may be related to the induction of hepatic metabolism” [Ford 1979b]. Transport of an organic base (n-methylnicotinamide) was unaffected.

BHT and Radiation

Many antioxidant and reducing (anti-oxidizing) chemicals have radio-protective effects including ascorbate, reduced sulfhydryl compounds, selenium and tocopherol. When 400 mg/kg BHT was given by single injection to induce cell proliferation in mice, changes in radiation sensitivity were observed for both x-rays and fission neutrons. At day two after BHT, the LD$_{50}$ dose had dropped 72% (from 959 rad to 269 rad) for x-rays and 80% (from 476 rad to 98 rad) for fission neutrons. At day six, however, the LD$_{50}$ had risen above control levels, to 150% (1445 rads) for x-rays and 120% (575 rads) for neutrons [Ulrich 1982]. BHT must therefore be considered to be a radiation-modifying compound and appropriate care taken in adjusting the dose and timing of cancer radiation treatments to avoid potential complications and maintain radiation effectiveness.
Similar tests with mice on a 0.75% BHT diet for 28 days found radiation potentiation in C31F1 mice and radiation protection in BALB/c mice [Clapp 1975, Cumming 1973]. Both effects were statistically significant. If BHT is demonstrated to be radio-protective over long-term exposure, it may have application in high-radiation jobs, like extended space missions and nuclear power plant decommissionings.

**BHT and Blood Clotting**

BHT also causes a lowering of prothrombin index in rats at doses as low as 0.017% of diet after one week [Takahashi 1978]. This effect also attenuates with time. After four weeks, prothrombin index was lowered only at dietary intakes of 0.25% and 0.50% BHT. At levels of 1.0-1.5%, dietary BHT causes hemorrhagic death in male rats [Takahashi 1981, 1978b, 1976b]. This effect may be due to inhibition of phylloquinone epoxide reductase [Takahashi 1981c] which allows accumulation of a prothrombin precursor in the microsomes of treated rats. The hemorrhagic effect is completely blocked by phylloquinone (vitamin K) or phylloquinone oxide [Suzuki 1979, Takahashi 1979].

There have been no published data concerning this effect in man or monkey, but we have received numerous anecdotal reports of delayed clotting in humans. It is possible that supplemental vitamin K may prove of benefit. Special caution is indicated with concurrent use of other substances with anti-coagulant activity, especially during the titration phase of BHT therapy. These include warfarin, aspirin, ginkgo biloba and cold-water fish oils—which contain EPA (eicosapentaenoic acid) and DHA (docosahexaenoic acid).

**Addendum: Extra Materials**

The following sections are extracted from the *Wipe Out Herpes with BHT* book.

**What else can be done to help fight herpes?**

**Question 8 from *Wipe Out Herpes with BHT***: A strong and healthy immune system is our main defense against any kind of disease. Many people come in contact with herpes but never contract it. The reason for this is apparently the efficiency of their immune systems. The difference between their immune systems and those of other less fortunate people is largely genetic. Nevertheless, much can be done to keep your immune system in peak condition.

The most important thing is to follow the basic rules of good health, which include proper nutrition, adequate rest, regular exercise, and avoidance of too much stress. Stress, both mental and physical, depresses the functioning of the immune system. Excessive use of stimulant drugs or alcohol can play havoc with the system. Even too much exercise is a form of stress. It is interesting to note that short bursts of maximum-output exercise stimulate the immune system, especially in persons under the age of thirty, whereas long-duration exercise such as jogging doesn’t have this effect. There is probably a lot more to be gained from a quarter mile dash at top speed than from eight miles of jogging.

Good nutrition begins with a sound diet, but some supplements can make a big difference in terms of both immune system function and general health. Top on this list for building and maintaining a healthy immune system are vitamin C (at least 1,000 mg daily, in divided doses), vitamin A (5,000-10,000 IU per meal), and zinc and vitamin B6 (about 5-25 mg of each per meal). A complete range of B vitamins, including ample amounts of pantothenic acid (100 mg or more), helps counter the effects of stress, which not only depresses the immune system but also can trigger herpes episodes. Vitamin B12 also helps protect cell membranes from penetration from viruses.

Because vitamin C is well-known to be helpful against infection, millions of people take it in emergency situations; when colds, flu or other infections strike. Its greatest benefits are experienced, however, when it is has been taken for a year or more, in which time it helps gradually to build a more effective immune system. In the preceding paragraph, we recommend at least 1,000 mg of vitamin C daily in divided dose. Results will be much better if 4,000 mg or more is taken, but large amounts of ascorbic acid often cause heartburn or diarrhea, especially when taken as tablets. Sodium ascorbate and ascorbates of other macro-minerals (calcium, magnesium, or potassium) are non-acidic and are less likely to cause gastric disturbances. Some tablets, though, contain hard binding agents and don’t dissolve completely in the stomach and intestines. We suggest dissolving 1-2 tsp of
powdered vitamin C (about 4,000-8,000 mg) in a quart or liter of water or fruit juice and sipping this throughout the day. Be sure to mix your vitamin C fresh daily, and keep it cool and out of strong light whenever possible. Adjust the dilution to suit your taste. Your mouth is a good judge of how much acidity your stomach can tolerate. This approach eliminates the problem of gastrointestinal disturbances and maintains the most consistently high blood levels of vitamin C.

The graph above indicates the importance of taking vitamin C frequently. After the body has assimilated a dose of vitamin C, a steeply declining phase begins in which approximately half of the vitamin C is excreted every 4 hours. Many researchers believe that the minimum level of vitamin C determines the therapeutic effect. So take your C regularly!

Recently, many dentists have expressed concern that ascorbic acid can erode tooth enamel. They recommend sodium ascorbate, or a half-and-half mixture of the ascorbate and the acid. Rutin, hesperidin complex, citrus bioflavonoids, quercetin—the are dozens of bioflavonoid to choose from—all increase the effectiveness of vitamin C. We suggest that 250-1,000 mg of the complex be taken daily, in divided doses if you can swing it. Other nutrients can have a more or less direct stimulatory effect on the immune system. These include:

**Selenium** (200-400 mcg daily), with no more than 100-200 mcg or organic selenium (selenomethionine and/or selenocysteine, which accumulate in the body over time) and no more than 200 mcg of inorganic selenium (selenite and selenate, which are immediately excreted) within any given three-hour period.

**Vitamin E** (100-400 IU per day),

**Lysine** (usually several grams) opposes the herpes-stimulating effect of arginine, which is found in high levels in nuts, and
Vitamin A, no more than 5,000 to 8,000 IU in women who are pregnant or capable of getting pregnant. Doses can be in the 10-25,000 IU range if there is no chance of pregnancy (post menopausal females, or males). Beta-carotene (pro-vitamin A) does not have this effect.

Adding fat to Enhance BHT Absorption

Some stubborn cases are due, not to poor immune functions, but to poor fat absorption or insufficient dietary fat. For BHT to be absorbed it must first dissolve into fats or oils. This usually takes place in the intestinal tract. If you are on a very low-fat diet, there may not be enough fats or oils in your intestine to dissolve the BHT. If this is the case, you might try predissolving it is vegetable oil. To do this, add 5-1/2 tsp of BHT (16.5 grams) to a quart (32 fluid ounces) of vegetable oil. Warm the oil lightly in a double boiler to help dissolve the BHT. Be sure that no crystals remain undissolved. Each tablespoon of oil now contains slightly more than 250 mg of BHT. There are about 64 tablespoons to a quart.

Although pure BHT has little noticeable taste, dissolved in oil in this concentration its taste becomes much more pronounced. We find its somewhat bitter taste tolerable, but others may not.

Is BHT 100% effective against herpes?

Question 13 from Wipe Out Herpes with BHT: Probably not. No treatment for any disease has ever been 100% effective. There will always be cases that, for one reason or another, do not respond. We have witnessed only a fraction of the herpes cases that have been treated with BHT. All were successful. We have heard of five cases that didn’t have satisfactory results. The first four were homosexual males who had no remission of lesions, even after taking 1,000 mg of BHT. At the time, few people were yet aware of AIDS (acquired immune deficiency syndrome). In retrospect, it seems very possible that AIDS, or an early stage of that disease, was involved in these failures. The fifth case was a woman whose apparent herpes condition improved only slightly after taking 2,000 mg of BHT. In none of these cases were immune-enhancement procedures (described in question 8) employed, although the woman was reported to be on a general vitamin program. Comparing the few reported failures against the many successes, BHT has been better than 90% effective in reducing herpes flare-ups.

Combined with the nutritional therapy outlined above, the effectiveness is about 99%.

Is BHT equally effective against oral and genital herpes?

Question 14 from Wipe Out Herpes with BHT: Yes; and because it is, we have rarely made a distinction in this book between the two types of Herpes simplex virus. Most herpes lesions about the face and mouth are caused by HSV-1, and most about the genital regions are caused by HSV-2. Because of the increasing popularity of oral/genital sex, physicians are finding cases of type 1 about the genitals and type 2 about the mouth. HSV-2 is usually more severe, slower to heal, and more recurrent than type 1. They both disappear in about the same amount of time when BHT is taken.

How does BHT protect against cancer & other killer diseases?

Question 16 from Wipe Out Herpes with BHT: When fats or oils (or foods that contain) them are exposed to air for a time, they take up oxygen (oxidize) and go rancid. Fat molecules in the body are similarly subject to oxidation. In the process, highly reactive molecular fragments known as free radicals are formed (see question 19). Uncontrolled oxidation and free-radical production damage tissues, cells and DNA, and are now known to be leading causes of heart disease, stroke and cancer. They also hasten the rate at which we age. When free radicals react in the body, they usually produce more free radicals, which do further damage and breed more free radicals, and so on, in an almost endless series of chain reactions.

When antioxidant food preservatives, such as BHT or BHA, are added to oils, oxygen and free radicals react more readily with the antioxidant than with the oil and relatively safe by-products are formed. In other words, food preservatives serve as decoys and sacrificial materials to protect oils and fats from the ravages of oxygen. When ingested, BHT and similar preservatives inhibit dangerous oxidation and free-radical propagation in the body.

The small amounts of BHT or other antioxidants that are allowed as preservatives are enough to extend the shelf life of food and have resulted in a slight reduction of the rate of certain kinds of cancer. But they are not enough to give really significant protection. Larger doses of BHT, as used in treating herpes, can give a remarkable degree of protection. Widespread use of such doses could result in a sharp decrease in the incidence of cancer,
heart disease, stroke and possibly other diseases, especially is coupled with a healthy diet that contains adequate vitamin and mineral supplements.

Coronary heart disease is not caused by eating a high-cholesterol diet, as many physicians still believe. Free radicals damage the cells of artery walls and cause the cells to reproduce wildly, forming a tumor-like cluster that breaks through the artery wall and attracts calcium and cholesterol from the bloodstream. The mere avoidance of dietary cholesterol has little or no effect on its accumulation, since the body manufactures all that is needed. Calcium and cholesterol accumulate to form the plaque that clogs the arteries and cuts off the flow of blood. If the blood to the heart is cut off, a heart attack results. If the blood to the brain is affected, stroke occurs. It is only through inhibiting the free radical process that heart disease can be stopped. The powerful antioxidant effects of BHT make it an excellent choice for free radical inhibition.

A new treatment for coronary heart disease has been developed over the last quarter of a century called chelation (key-lay-shun) therapy. It has met with much resistance by established medical institutions which have tried to defend the coronary bypass operation with which it competes. Chelation therapy involves administration of a chelating agent (EDTA -ethylenediaminetetracetic acid) which removes calcium from the blood, in turn causing the body to scavenge calcium from arterial plaques. The American Medical Association criticizes chelation on the grounds that it doesn’t remove plaque permanently and is therefore useless. What they do not consider is 1) the coronary bypass is usually only of short term benefit itself, and 2) chelation therapists had already begun using antioxidants as therapeutic adjuncts to the chelation process. These antioxidants, vitamin E, vitamin C, selenium, etc., drastically lower the free radical cause of plaque formation, which eliminates the plaque formation problem. Chelation therapy with antioxidants is now becoming recognized as the treatment of choice for arterial plaque. The potential of BHT in this therapy has not been explored, but its effectiveness as an antioxidant and its synergism with other antioxidants make it a logical choice.

In addition to BHT’s free-radical-scavenging properties, BHT causes the induction of various liver enzymes which metabolize carcinogens. Many potent carcinogens exhibit lowered activity, sometimes markedly, when co-administered with BHT. Also, several kinds of cancer have been linked to herpes virus; skin cancer with HSV-1 and cervical cancer with HSV-2. If herpes virus can lead to cancer, as most researchers now believe to be so, BHT can give triple protection against cancer by 1) destroying lipid-containing viruses, 2) scavenging free radicals, and 3) inducing anti-carcinogenic enzymes, all at the same time.

**Acknowledgements and Final Comments**

This section must begin with an acknowledgement of John A. Mann, who wrote his first booklet on BHT back in 1981 and with whom I co-authored the first edition of *Wipe out Herpes with BHT* in 1983. In many respects, John was my mentor and taught me how to write effectively, a skill that I managed to neglect during four years of high school and five years attending one of the best liberal arts colleges in the world, Reed College. But then again, there is a huge difference between writing because of duty, a class assignment for example and writing because you have something to say. As you might guess from reading this book, I definitely had something to say.

The second acknowledgement goes to Durk Pearson and Sandy Shaw, who were the first people to fully appreciate BHT’s therapeutic potential as an antiviral agent and the first people to popularize this idea in writing (in their 1990 best seller *Life Extension: A Practical Scientific Approach*). Durk and Sandy were information pioneers way back then, and are still doing cutting-edge analysis today.

The third acknowledgement goes to Ward Dean, who had the vision to see BHT’s value as a therapeutic agent from within the medical profession and the courage to put his vision into practice. The earliest insights into adjunctive therapies were his.

The last acknowledgement goes to the faculty and students at Reed College, who had a huge effect on my thinking. Although Reed College is truly a liberal arts college bestowing only Bachelor of Arts degrees, it has outstanding scientific departments that rival the best technical colleges and universities. My coursework in chemistry and biology at Reed (and the impromptu discussions with fellow students) taught me how to think, how to analyze, how the scientific process is supposed to work, and how to properly question and evaluate scientific research. These are the skills upon which my professional career has been built.
I also came to understand how ideology, belief and financial reward can slant the process of discovery, leading to what might be called “self-fulfilling prophesy.” Scientists who set out to prove a belief often accomplish that end, but not without sacrificing the scientific process which would have validated their work. When we work from within ideology and belief, we tend to find what we expect to find.

Another way to say this is we more easily ignore facts, observations and data which conflict with our expectation. Expectation has a dark side—disappointment. That may sound strange, but think about it for a moment. We cannot be disappointed unless we have an expectation. And disappointments are something most of us would rather not have in our lives. This is not rocket science; this is plain, ordinary wisdom. Regarding financial conflicts, there is little need of explanation. Pretty much everybody understands the power of money to corrupt any supposedly impartial process. Whether we are talking about bribes for police or regulators, a salary for employment, or a grant for a scientific investigation, the political or ideological agenda of the employer can become part of the transaction. With science, the degree to which political influence corrupts the grant process is the degree to which the scientific process is undermined before the research actually takes place.

Following my graduation from college in 1975, I have found many instances—probably far more than most people suspect exist—of scientific research that has been conducted with faulty premises, with flawed methodology, with incomplete analysis and/or with overt bias. Despite the minimal scientific value of such flawed research, some of it is touted by experts and media alike as 1) scientifically valid and 2) a sound basis for public health policy. I am not afraid to disagree with such findings, people and institutions, and have regularly done so in my writings. The full extent of such criticisms will be largely outside the scope of this book, which must necessarily remain focused on viral diseases. But interested readers are invited to read for themselves various newsletter articles on other subjects on the web (http://www.ceri.com).

Regarding BHT and herpes, the issue is not about scientific fraud. The issue is why isn’t there ongoing research? How can BHT be so effective and not be on the TV nightly news? A significant number of readers might ask themselves, “How can I have suffered for ten years with herpes and become lesion-free in ten days, at a total cost of $5?” Many people with herpes problems have been to doctors and been told, “Live with it” or “Take acyclovir.” Some people with herpes, shingles, hepatitis or cytomegalovirus may have been to a dozen doctors, with the same lack of results.

I hope that my criticisms of medical and regulatory institutions are not taken personally by medical doctors and regulators. There is a huge difference between institutions and individuals. Pride in being a scientist does not require endorsement of the NIH. Pride in being a doctor does not require appreciation of the AMA. And just as one’s spiritual development does not require a Church, one’s continuing medical education does not require CME credits.

There are many paths. Find and make your own.

References

The following references have been published over the last 50 years and present a broad spectrum of scientific inquiry into the properties of BHT. Many papers have been included that do not deal directly with BHT, however they do discuss aspects of aging, free radical activity, liver enzyme induction, and vitamin therapeutics.

Due to the sequential writing of the above material and the merging of new files with old files dating, some dating back 30 years, most of the following references are not cited directly in the above text. Although citations are being slowly added as editing advances, any assistance by readers is welcome. If you track down a reference and want other readers to have the benefits of your effort, please send me the citation and location in the text (at fowkes2@ceri.com). Thank you.


Young-Nam Cha and Henry S Heine. Comparative effects of dietary administration of 2(3)-tert-butyl-4-hydroxyanisole and 3,5-di-tert-butyl-4-hydroxytoluene on several hepatic enzyme activities in mice and rats. *Cancer Res* 42(7): 2609-15, 1982.


Hal Drakesmith and Andrew Prentice. Viral infection and iron metabolism. *Nature Reviews Microbiology* 6: 541-52, July 2008. This is a review article discussing viral manipulation of iron mechanisms and viral virulence relating to iron levels. “Some viruses selectively infect iron-acquiring cells…” and “Other viruses alter the expression of proteins involved in iron homeostasis…” and “In HIV-1 and hepatitis C virus infections, iron overload is associated with poor prognosis and could be partly caused by the viruses themselves.” And concluding with, “Understanding how iron metabolism and viral infection interact might suggest new methods to control disease.”


AR Johnson, A re-examination of the possible teratogenic effects of butylated hydroxytoluene (BHT) and its effect on the reproductive capacity of the mouse. *Food Cosmet Toxicol* 3: 371-5, 1965.


H Marquardt, MD Saposnik and MS Zedeck. Inhibition by cysteamine-HCl of oncogenesis induced by 7,12-dimethylbenz(a)anthracene without affecting toxicity. *Cancer Res* 31: 1506-12, 1971.


H Marquardt, MD Saposnik and MS Zedeck. Inhibition by cysteamine-HCl of oncogenesis induced by 7,12-dimethylbenz(a)anthracene without affecting toxicity. *Cancer Res* 31: 1506-12, 1971.


Paul B McCay, M Margaret King and Jan V Pitha. Evidence that the effectiveness of antioxidants as inhibitors of 7,12-dimethylbenz(a)anthracene-induced mammary tumors is a function of dietary fat composition. *Cancer Res* 41(9): 3745-8, 1981.


G Papaccio, MP Morelli and F A Pisanti. Effects of butylated hydroxytoluene (BHT) enriched diet on serum antioxidant activity in pre-and overtly diabetic NOD mice. *Life Sciences* 63(16): 1457-60, 11 September 1998. “…we show that the alterations of the antioxidant status in [non-obese diabetic] mice is efficaciously counteracted by BHT.”


K Sikorska et al. The role of iron overload and HFE gene mutations in the era of pegylated interferon and ribavirin treatment of chronic hepatitis C. *Med Sci Monit* 16(3): CR137-43, Feb 2010. “Iron overload was frequently detected in patients with [chronic hepatitis C], and was associated only with C282Y alleles. Biochemical markers of iron overload and HFE gene mutations were negative prognostic factors of antiviral treatment.” The HFE gene is associated with hereditary hemachromatosis.


Dorrit Sondergaard and Preben Olsen. The effect of butylated hydroxytoluene (BHT) on the rat thyroid. *Toxicology Letters* 10(2-3): 239-44, February 1982. “Iodine uptake was significantly increased in those animals given BHT in the diet, but the half-life of thyroxine was unchanged or slightly prolonged. Thyroid weight was enhanced at both 500 and 5000 ppm BHT, while liver weight was increased only in the latter.”


O Takahashi and K Hiraga. Inhibition of phyloquinone epoxide-dependent carboxylation of microsomal proteins from rat liver by 2,6-di-tert-butyl-4-methylene-2,5-cyclohexadieneone. Food Cosmet Toxicol 19: 701-6, 1981c.


ED Weinberg. Iron toxicity: New conditions continue to emerge. *Oxid Med Cell Longev* 2(2): 107-9, Apr 2009. “...four additional disorders have been recognized to be enhanced by iron: aging muscle atrophy, viral replication, rosacea and pulmonary alveolar proteinosis.”


Ibrahim Yörük, Yeter Deger, Handan Mert and Veyssel Ataseven. Serum Concentration of Copper, Zinc, Iron, and Cobalt and the Copper/Zinc Ratio in Horses with Equine Herpesvirus-1. *Biological Trace Element Research* 118(1): 38-42, July 2007. “In conclusion, copper and zinc concentrations of the infected group were lower than the control group (p<0.001), whereas iron concentration and the copper/zinc ratio of the infected group were higher than the control group (p<0.05 and p<0.001).” Therefore, proportional loss of copper was the elemental signature of EHV-1. Whether this was caused by the infection or an underlying risk factor for the infection is not known.

