

HEALTH AND STRESS

The Newsletter of The American Institute of Stress

Number 2

1997

CHITOSAN: THE FAT BINDING, STRESS BUSTER

KEY WORDS: weight loss diets, weight loss drugs, homeopathy, aromatherapy, stress and appetite, cravings, hunger, and dietary outcomes, chitin, chitosan, cholesterol, nitric oxide

The odds are better than even that anyone reading this is on some kind of weight loss program, or plans to go on one. That's especially true around the beginning of the year. Losing weight and reducing stress are the two top New Year's resolutions, followed by exercise, which is often pursued to achieve both of these goals. The problem is, how can you get those extra pounds off fast, and more importantly, keep them off?

There's certainly no shortage of advice. Two books currently on the Best Seller List, tout the benefits of a low carbohydrate, high-protein, diet, but this is hardly new. *Dr. Atkins' New Diet Revolution* is a resurrection of the regimen he introduced two decades ago, but goes back to the Civil War era, when it was proposed by William Banting, a London undertaker. It has also periodically resurfaced as the Pennington, Canadian Air Force, Calories Don't Count, Drinking Man's, Stillman, and Scarsdale Diets, which allow you to stuff yourself with all the ice cream, eggs and meat you want. *Enter The Zone*, also advises you to "Eat like cavemen, not like cows."

Proponents claim that when carbohydrates are curtailed, the body consumes its fat stores to provide energy. What actually happens is that we burn protein first, and then fat, causing a buildup of ketone byproducts, which can be damaging to diabetics and people with kidney disease, and cause headache, dizziness, and bad breath. These diets also tend to restrict foods rich in antioxidant phytochemicals thought to prevent cancer and heart disease. They leach calcium from bone, which can worsen the osteoporosis that affects many post menopausal females, and a high saturated fat diet is considered to be a risk factor for heart attacks, strokes, and certain cancers.

The secret in weight loss is not in losing weight, but in keeping it off. Proper diet and exercise are important, but they can only be maintained by stress management strategies that produce behavioral modification. Over the past 34 years, Weight Watchers has taught more than 25 million members how to lose weight, and there are currently some 15,000 weekly programs in the U.S. alone. In their experience, stress is the major reason that clients fail to lose weight. This is especially true for women, so their new Freedom Plan was designed to include group support sessions to address this. As noted in the recent National Study of Weight Loss Methods report, these dieters lost 2 1/2 times more weight in the first four weeks, than a control group of participants, not enrolled in their new stress reduction program. In addition to losing more weight, the Freedom Plan group reported substantially increased levels of vigor and vitality compared to controls, and even non-dieters.

(Continued on page 2)

ALSO INCLUDED IN THIS ISSUE

Why Diets Don't Work - And Can Make You Dopey.....	3
What About Weight Loss Drugs?.....	4
The Crucial Role Of Stress.....	4
The Phenomenal Fat Magnet.....	5
Cholesterol, Caveats, Confusion.....	6
21st Century Weight Loss.....	7
EAT FAT.....	Book Review - last page

Health and Stress; The Newsletter of The American Institute of Stress is published monthly. Annual subscription rate \$35.00 (U.S.), \$45.00 (Foreign). Copyright © 1997 by The American Institute of Stress, 124 Park Ave., Yonkers, NY 10703. All rights reserved.

HEALTH AND STRESS

*The Newsletter of
The American Institute of Stress*

Paul J. Rosch, M.D., F.A.C.P.

Editor-in-Chief

Contributing Editors from The Board of Trustees of
The American Institute of Stress

Robert Ader, Ph.D., Rochester, NY
Herbert Benson, M.D., Boston, MA
Michael E. DeBakey, M.D., Houston, TX
Joel Elkes, M.D., Louisville, KY
Bob Hope, Palm Springs, CA
John Laragh, M.D., New York, NY
James J. Lynch, Ph.D., Baltimore, MD
Kenneth R. Pelletier, Ph.D., M.D., Berkeley, CA
Ray H. Rosenman, M.D., San Francisco, CA
Charles F. Stroebel, Ph.D., M.D., Hartford, CT
Alvin Toffler, New York, NY

(Continued from page 1)

Previous fads have included high fiber, grapefruits, guzzling gallons of cabbage soup, and other approaches that quickly become boring. All diets result in weight loss the first week or two, usually from water. But as the body's natural protective mechanisms kick in, this slows down, or stops after 5-10 lbs., and most people eventually gain back more than they lost. However, the type of diet may be important in determining long term benefits. A very recent study compared the results of following a high protein, rapid weight loss diet for eight weeks, or a low fat diet rich in carbohydrates for 17 weeks. After both groups lost an average of 30 lbs., they were randomly assigned to follow either a diet that focused on counting calories, or an unstructured diet that simply concentrated on reducing fats. One year later, the calorie counters had regained more than nine pounds, in contrast to less than one pound for the low fat group. Reducing fat is more effective than lowering calories.

But low fat diets take away much of the joy of eating, which will make chitosan very popular. Fat is what gives many foods their appealing taste and flavor, so we tend to crave it. When denied, there is a greater tendency to binge eating, smoking, drinking, and other addictions. Fat is a vital nutrient for cell construction, nerve function, and digestion. It is the building block for hormones that regulate everything from metabolism to circulation, and the body's most concentrated source of energy. Without its cushioning effect, we would have little protection for bones and vital organs subjected to

physical trauma, or insulation from the cold. Stringent low fat diets can cause dry skin, brittle hair and nails, chronic constipation, menstrual abnormalities, fatigue, anemia, impaired wound healing, joint pain, headache, and memory loss.

On the other hand, there is little doubt that excess fat can cause health problems. We are constantly reminded of this by dire warnings from governmental and medical groups, and advertisements from food manufacturers. There is now a fat free or low fat version of almost everything edible, from soups, stews, and meats, to dairy and bakery products, and even chocolate. Fake fat is not the solution. Olestra, which has now been available in test markets for over a year, can cause severe gastrointestinal symptoms requiring hospitalization, and has other drawbacks. Z-Trim, another no calorie fat substitute derived from oat hulls, may appear in some baked goods later this year, but appears to offer few advantages. While chitosan does not provide a licence to pig out, it does allow you to eat more of the foods you prefer, without piling on the pounds.

Americans are not likely to change their eating habits. We enjoy fresh butter, crisp bacon, juicy steaks, pastrami sandwiches, and rich desserts. The backlash to all the low fat propaganda is mounting, as illustrated in *Eat Fat*, a current Best Seller, which is reviewed in this issue. Pizza is gaining in popularity, as are other fast foods high in fat. McDonalds recently ditched its unpopular McLean burger, and is now pushing Arch Deluxe, which contains a whopping 610 calories and 31 grams of fat. Add another 510 calories and 26 grams of fat for the accompanying oversized French fries, for a total of 1120 calories and 56 grams of fat! For some reason, having large stores of fat in our body doesn't seem to reduce our appetite for it. One nutritionist believes that some of us are born with a "fat tooth", that creates cravings stronger than any sweet tooth, especially in adults. This is supported by studies showing that such urges are decreased by naloxone, a drug that blocks endorphins, and the pleasurable sensation they provide. This suggests that, in addition to "chocolaholics", some people may actually be addicted to fats.

Will it ever be possible to eat tempting fatty foods and not gain weight? Some surgical procedures might permit this, but are reserved for patients with extreme obesity that threatens health. Chitosan, a natural fiber derivative readily available without a prescription, is a safer and much less expensive alternative. Besides dieters, and their family members whose meals are often affected, it should be welcomed by health authorities.

(Continued on page 3)

(Continued from page 2)

Why Diets Don't Work - And Can Make You Dopey

According to the laws of thermodynamics, you will lose weight if you expend more calories than you take in. Therefore, eating less and exercising more should be a double whammy. Sounds pretty simple, but it just doesn't work for everybody. Most of us will lose weight on 1000 calories a day, but others don't, and a few may actually gain. The weight reduction response to exercise is even less predictable. We all inherit different set points, about which our weight tends to hover. Some individuals seem to be able to eat as much as they want without gaining an ounce, while others put on pounds despite paltry portions. Not much is known about these genetic factors, but our bodies do resist any sudden attempt to change the status quo. Researchers from Rockefeller University suggest that one way this is accomplished, is by varying the efficiency with which muscles burn calories. They showed that if you gain ten pounds, your muscles will then use up 10-15% more calories than normally expected during exercise. The reverse happens if you lose ten pounds. Obese individuals may have a defect in this compensatory mechanism.

Other adaptational factors may be involved, as I discovered forty years ago, when directing the Endocrine section of the Department of Metabolism at Walter Reed. At the time, the Army was engaged in a crack-down on obese personnel. Although strict weight requirements had to be met to enter the service, little attention was subsequently paid to this. It was obvious that a soldier who was 50 lbs. or more overweight, might be endangering himself and others in combat situations. Many of our senior officers also failed to fall into the category of a "trim" military figure, and some had severe hypertension, and other weight related problems. The Army's assumption was that any overweight individual could get back down to normal if they tried hard enough, and that many of these phenomenally fat officers who claimed they had tried everything they could to lose weight, were essentially lazy liars. As a result, a few hand picked corpulent colonels, and at least one grotesque general, were incarcerated in our metabolic ward for a month.

We had strict 24 hour surveillance over everything they ate, drank, and did, and weighed and analyzed everything they excreted. We also recorded levels of physical activity, and performed elaborate endocrine studies, to see if abnormal hormonal activities or other metabolic derangements might be the problem. Some

did lose a significant amount of weight on their Spartan fare of 800-1000 calories a day, and no booze for four weeks. We gave them a congratulatory diploma on discharge, although when our alumni returned for their annual checkups, most had regained everything or more. There were also several on the identical diet and same activity level who just refused to budge. In some, it appeared that if we substituted breakfast for supper and vice versa, they would lose weight, despite the same total caloric intake for 24 hours. This was reminiscent of the old adage, "Eat breakfast like a king, lunch like a prince, and dinner like a pauper." Many farmers are not obese, despite consuming enormous daily breakfasts of bacon, ham, eggs, pancakes, syrup and sweet buns, that total thousands of calories. Although some do strenuous physical work, the reason may be that they tend to have an early and sparse dinner.

Caloric restriction stimulates enzyme systems that both manufacture and store fat. These are life saving responses that have developed over millions of years of evolution, to help the body store energy during periods of starvation. Similarly, prolonged exercise sets in motion other mechanisms to conserve calories. Primitive man ate when he could, or required more fuel for impending increased physical activity. No law states that you should eat three meals a day, with the largest one in the evening, and this schedule may be sending the wrong signals to our bodies.

According to British researchers, diets also make people dopey, forgetful, and vague. They tested memory, reaction speeds, and other measures of mental performance in normal volunteers, and found that those with deficits comparable to having two drinks, were invariably in subjects who said they were on weight loss diets. They found that the culprit was not a lower caloric intake, but the stress of dieting. When they had the dieters eat normally, and put the others on a low calorie diet and retested them, the dieters again did worse, especially those who didn't lose any weight. As the lead author explained, this was probably due to the anxiety associated with constantly worrying about what to eat. He concluded that dieting was not a sensible way to lose weight anyway. In addition to the fact that it just doesn't work, "It really screws up people's metabolism." Numerous studies confirm that 95 percent of dieters eventually gain back any weight they have lost, and often more. Some who go through periodic cycles of diets, can experience marked fluctuations in their weight. Such "yo-yo" dieting is believed to be much more hazardous than carrying around an extra five or ten pounds.

(Continued on page 4)

(Continued from page 3)

What About Weight Loss Drugs?

They don't work either. Amphetamines like Benzedrine and Dexedrine were banned because of excess stimulation and addiction. Phendimetrazine is still around (Trimstat etc.), but also has side effects, and tolerance develops rapidly. Sales of fenfluramine (Pondimin), a serotonin booster, exploded a few years ago when, in combination with phentermine (Ionamin and others), it was reported to be safe and effective when taken for over two years. "Fen-phen" clinics sprang up all over, dispensing the drugs "like cheap Halloween candy". Doctors were under so much pressure that Pondimin couldn't be made fast enough. However, it was associated with a significantly increased incidence of deaths due to pulmonary hypertension, and never approved for long term use. Dexfenfluramine (Redux), a closely related drug with similar drawbacks, was approved over much objection last June. During the next four weeks, 160,000 physicians were detailed, including psychiatrists, OB-GYN and other specialists not familiar with the pharmacology of anorexigenic agents. One enthusiastic sales rep claimed it could be safely taken forever. More than 2 million prescriptions were written for Redux in the last half of 1996! As true for all these drugs, the vast majority were for cosmetic purposes in modestly overweight patients, for whom they are not indicated and could cause problems.

Sibutramine (Meridia), which increases both serotonin and noradrenaline, was approved in January, despite previous rejection because it raised blood pressures. Leptin, neuropeptide Y, beta-3 adrenergic receptors, urocortin, melanocyte concentrating hormone, are in the works. Even human choriogonadotropin has been revived in a pill. Xenical (orlistat), a lipase inhibitor that blocks fat absorption, causes gastrointestinal symptoms, but will probably be approved this year. Almost every major pharmaceutical company is shelling out millions for the rights to anything with a remote chance of some success. However, long term studies demonstrating safety in humans, and information on possible adverse reactions with other medications will not be available for any. As each new product becomes available, promotional efforts claiming increased efficacy and safety will escalate, creating more confusion and stress for those trying to shed a few pounds safely.

There have been numerous nonprescription weight loss drugs, but in 1991, the FDA banned such claims for 111 ingredients found in most. Dexatrim, Acutrim and an oral spray called Spray-U-Thin, contain phenylpropanolamine, which causes increased heart rate, blood

pressure, nausea and dizziness. Thin Patch delivers homeopathic weight loss agents transdermally, "scentsational therapy", which involves sniffing certain smells, allegedly allowed some people to lose 100 lbs., and an \$80.00 motivational book teaches you how to use sounds (flushing toilets) and rhymes ("Arteries go splat when you fill them with fat") to make you eat less.

The Crucial Role Of Stress

Stress plays a quintessential and quotidian role in dieting, but it is impossible to even scratch the surface of this, and still have space to discuss chitosan. We have devoted previous Newsletters to "The Stress-Food-Mood Connection", the role of stress in appetite and cravings, effects on serotonin, dopamine, noradrenaline, endorphins, melatonin, neuropeptide Y, vasopressin, cholecystikinin, melatonin, galanin, and other chemical messengers that influence why, what, when, and how much we eat. The perception of obesity can be very stressful, and stress hormone levels are elevated in anorexia and bulimia. Conversely, all weight loss programs now acknowledge the pivotal role of stress in obesity, and stress management has become one of their key components. There are numerous other connections, and one of the most fascinating is urocortin.

It's obvious that if primitive man were fleeing from a saber-toothed tiger, the last thing on his mind would be stopping for a snack. The response to stress is orchestrated by corticotropin releasing factor (CRF), and while injecting this suppresses hunger, it also causes anxiety, aggression, and hazardous cardiovascular and respiratory responses. Researchers recently discovered that urocortin, a component of CRF, does not have these effects, but still reduces food intake in starved and free feeding rats by 75 percent! Since urocortin is blocked by the blood brain barrier, it must be injected directly into the brain, so it is not likely to gain wide popularity. However, the gene for expressing this natural hormone has been localized to human chromosome 2, its receptor sites have been identified and cloned, and the search is on for oral agents that could conceivably have the same effect. Similar approaches are being tried for GLP-1, another appetite suppressing brain peptide, and leptin, a protein secreted by fat stores that sends satiety signals to the hypothalamus. Leptin injections suppress appetite, but since many obese patients already have high levels, the problem may lie at the receptor level.

Appetite is affected by stress, exercise, temperature, the amount and location of body fat, what we have recently eaten, the type of food available, and numerous

(Continued on page 5)

(Continued from page 4)

other influences. Complex backup systems have been developed during the lengthy course of evolution, that makes it unlikely that a single drug, or combination of drugs, will outsmart the wisdom of the body. That is what makes chitosan such a sensational stress reducing weight loss product. As is true for all natural substances as well as drugs, we all respond differently, and chitosan may not work the same for everyone. However, it is safe, can be taken indefinitely, and a forthcoming book will explain in simple terms how it can provide optimum benefits for you.

The Phenomenal Fat Magnet

Chitōn, is the Greek term for tunic, or protective covering, and chitin is a component of the shells of shrimp, lobster, and most other living things that have a hard, external shield, rather than an internal skeleton. Chitin is also found in plankton, the myriad masses of minuscule floating plant and animal life that tiny fish feed on, as well as the cell walls of mushrooms and certain plants. After cellulose, it is the second most abundant natural fiber, and has long been used to promote tissue healing. A paste containing powder from the ground up shells of shrimp, crabs, and other crustaceans, has been used to treat wounds for centuries. Several decades ago, researchers developed chitosan, a deacetylated derivative of chitin, which appeared to be responsible for this healing property. It was unique in that it had a positive charge, whereas all other fibers are negative or neutral. This makes it bind to negative surfaces, like skin, as well as bacteria that could cause infection.

Subsequent investigations confirmed that chitosan not only had healing properties, but numerous other medical and industrial applications. Since it is both biocompatible and biodegradable, chitosan causes no harm to body tissues, and leaves no toxic residue. It is used in contact lenses, to allow drug implants to deliver a constant dosage, as they slowly and safely dissolve. Special dressings containing chitosan facilitate the healing of injured eye and other tissues. Arterial grafts connecting major blood vessels have more effective connections and less leakage when chitosan is included, and it also promotes the regeneration of severed nerves. Chitosan has been found to be a safe and effective antacid in Japan, and chitosan chewing gum binds and inactivates plaque causing bacteria. A thin coating of chitosan can significantly preserve the quality and texture of fruits, vegetables, and other foods, by protecting them from oxidation.

Since chitosan binds to skin and hair, it is used in hair conditioners and skin creams, and to treat acne. Its positive charge also chelates heavy metals and other toxic waste products in solutions, causing them to clump together into a removable precipitate, and it is used extensively as a flocculant in water purification plants. Chitosan can be utilized instead of cellulose, to make a stronger and completely biodegradable paper, or insoles with anti-fungal properties to treat athlete's foot. At triennial chitosan conferences, researchers from all over the world regularly report on new developments and applications for this amazingly versatile compound. Over a thousand studies have been published on chitin and its derivatives, and almost 200 patents have been obtained in the U.S. alone.

Chitosan is not digestible, contributes no calories, and large quantities can be safely consumed. Like other fibers, it can enmesh and trap dietary contents, causing them to pass through the gastrointestinal tract without being absorbed. However, because of its unique positive charge, it especially lures negative fat molecules, much like a magnet attracts iron filings. Chitosan can attract two to four times its weight in fat, resulting in a conglomerate that is too big to be metabolized. Instead, the resultant grease ball is eliminated in normal fashion, and its increased bulk speeds up this process, further diminishing caloric intake from other foods. Chitosan's ability to trap fat can be readily demonstrated by emptying a teaspoon of oil into a glass of water, and watching it form a thin layer as it floats to the top. If you empty the contents of a chitosan capsule on this, you will see it immediately start to absorb the fat. If you lightly swirl or agitate the glass for a few seconds to simulate what happens in the stomach, the resultant chitosan-fat glob will slowly sink to the bottom, and you can retrieve it with a fork to examine it more closely. Similarly, if you pour some milk into a glass of water, it will become cloudy, but if you add some chitosan, it will quickly start to attract the fat in the milk, much like a magnet draws iron filings. The fat will then rise to the surface, and the water will become clear again. Chitosan does not interfere with the absorption of carbohydrates and proteins. Although it could theoretically reduce the intake of fat soluble vitamins, this has not been found to pose any problem, unlike fat binding resins.

The same thing happens in your body, resulting in a marked reduction in fat absorption. In one report, obese patients were put on a strictly supervised 1000 calorie diet consisting of 40% fat, 40% carbohydrate, and 20% protein, and given either chitosan or a placebo.

(Continued on page 6)

(Continued from page 5)

Neither the patients nor the physicians knew whether chitosan or a placebo was being administered. After four weeks, the chitosan group had lost an average of 14 lbs., compared to only 5.5 lbs. for the placebo group. Equally impressive was the lowering of blood pressure to normal in obese hypertensives taking chitosan, which allowed them to discontinue their medications. The majority of weight loss in the placebo group occurred during the first two weeks, mostly from water contained in carbohydrates. This is also true for high-protein/low carbohydrate, grapefruit, cabbage soup, and every other weight reduction diet. In contrast, the chitosan group showed a steady loss of pounds throughout the study. There are well over 300 publications dealing with chitosan, and it is estimated that more than one million people currently take it to promote weight loss.

Cholesterol, Caveats, Confusion

In trials designed to determine its cholesterol lowering effects, chitosan was found to provide benefits similar to those seen with cholestyramine (Questran), a powdered resin containing coloring, flavoring, and other additives. Questran combines with cholesterol rich bile acids, so that they cannot be returned to the liver. However, it can interfere with the action of other medications, cause liver damage, bleeding due to vitamin K deficiency, night blindness from lack of vitamin A, severe constipation, and other gastrointestinal complaints. Chitosan is devoid of these and other side effects, except for weight loss. One comparison study showed that Questran lowered cholesterol slightly more than chitosan, but it also caused damage to the intestinal wall that might predispose to malignancy. In another comparison evaluation in animals, cholestyramine caused yellow, atrophic alterations in the liver, but no changes were seen in the chitosan group.

Chitosan reduces blood levels of cholesterol not only by blocking fats in food, but also cholesterol manufactured in the liver. Only 25 percent of blood cholesterol comes from food, and many individuals on a low fat diet still have high cholesterols. Chitosan is effective in these patients, because it also binds cholesterol rich bile acids, preventing them from being metabolized. In one animal study, administering chitosan daily for five weeks resulted in a reduction of cholesterol by as much as 32 percent, and triglycerides by 18 percent. Along with this, there was a 7.5 percent increase in "good" cholesterol, or HDL. In another, a daily dose of chitosan reduced the concentration of cholesterol in the liver by 60% in four weeks.

As indicated, a high saturated fat diet has been implicated in colon, breast, uterine cervical, and endometrial cancers. A National Academy of Science report states that "Diet is responsible for 60% or more of all cancer in women." Cancer prone mice given chitosan show a reduction in tumor growth. Certain toxic agents that can contribute to cancer and neurologic disorders are fat soluble, and enter the body through ingested fat, and chitosan could help prevent this. In addition to its ability to act as a fat magnet, chitosan has a variety of other biologic properties. According to one review, these range from speeding up bone formation and regeneration of connective tissue, to stimulation of the immune system, and antibiotic effects.

As a result of all these attributes, chitosan can provide a number of health benefits. Because of its ability to lower cholesterol and increase HDL, it helps to prevent heart attacks. Lowered fat intake could protect against certain cancers, reduced caloric intake would theoretically prolong life, and less weight might ease the pain of arthritis. Like other fibers, chitosan speeds up transit time in the gut, and does improve symptoms of irritable bowel syndrome in many patients. An Italian study has shown that it is far superior to any other fiber in binding to toxic bacteria, and removing them from the gut, before they can spread to other parts of the body. Another from Czechoslovakia demonstrated that it reduces the tendency for blood to coagulate prematurely, and form clots that block arteries. Japanese investigators found that when solutions contaminated with heavy metals were ingested, chitosan could almost completely bind and precipitate them, so it might prove useful for the treatment of heavy metal poisoning.

Although much of these speculations have yet to be confirmed by clinical studies, some aggressive multi-level marketing distributors have hyped it even more than other products in their line. Some idea of how lucrative this can be is afforded by a statement from one company, that the average income of their top 214 marketers was over \$700,000 in 1995. One 41 year old created a \$40 million annual business from his home in Milwaukee, without any employees, accounts receivable, inventory, or real estate overhead! In 1994, drug sales constituted only 3% of the total weight loss market. According to Medical Data International, this is expected to increase to more than 30% of market share within three years, and sales will jump from \$117 million, to \$1,687 million. Claims for chitosan as a panacea were so exaggerated, that it was banned for direct sale to the public in Canada, Australia, and New Zealand.

(Continued on page 7)

(Continued from page 6)

21st Century Weight Loss

The struggle to gain a bigger portion of the weight loss pie has led to a variety of formulations of chitosan, and combinations with other substances, that will undoubtedly cause considerable confusion for consumers. Much of the associated promotional literature is misleading, and based on conceptual considerations, rather than scientific studies, much less proof. Chitosan is available in health food stores, pharmacies, and from numerous multi-level marketing vendors. There are all sorts of combinations of additives that allegedly result in a superior product, including citric, erythorbic and ascorbic acid, concentrates of cruciferous vegetables, and various antioxidants. Others have chromium picolinate, because of its purported ability to "burn fat", despite the fact that the FDA has recently ruled that such claims cannot be made. Prices also vary, and can range from \$23.00 to \$89.00 for a month's supply of the identical preparation.

On the other hand, some formulations are definitely superior to others. Chitosan's magnetic charge and fat magnet capabilities can vary considerably, depending on the source of the chitin, degree and method of deacetylation, and other factors. Pharmaceutical grade chitosan, which is deacetylated between 90-95%, can absorb 10-12 times its weight. Good grade chitosan is deacetylated between 75-80%, binds with four to six times its weight, but these are more expensive than many of the preparations currently on the market, and consumers don't know the difference. Researchers from New Zealand, Japan, Israel, and all over the world are working feverishly to obtain protective patents for proprietary products that might be more effective or concentrated. The standard dosage recommendation for chitosan is 2 grams 20 minutes before lunch, and before supper. This means taking eight rather large capsules a day, which is a drawback for some individuals. One product not yet available in the U.S., delivers the same amount in 2 capsules taken twice daily. Because of other enhancements, each gram of chitosan can absorb up to 9 times its weight in fat, making each capsule four times more potent, at a very modest cost for a month's supply. An unpublished study suggests that this formulation may provide additional benefits that are now being further explored.

There may also be ways to increase the positive ionic charge, by selecting specific sources of chitin, improving the deacetylation procedure, or trying different physical and chemical procedures, to make a more potent derivative.

Since it takes much longer for fat to be absorbed than carbohydrates, adaptational responses have evolved over millions of years to provide for this. When fat, and especially triglycerides enter the gut, they trigger the release of nitric oxide, a powerful vasodilator that opens up blood vessels, so that fat absorption can be significantly enhanced. A very recent report has shown that specific amounts of vitamin C and vitamin E block this release of nitric oxide. Including these in a chitosan formulation could increase its ability to cause weight loss through mechanisms other than effects on its magnetic charge.

Some of the seminal research on nitric oxide has been performed by Ross Adey and his group, and was presented at our Congress several years ago. His prediction that it would emerge as an extremely important and powerful intra and intercellular chemical messenger has now been confirmed in almost every area of medical research all over the world.

Inhaling nitric oxide (not to be confused with nitrous oxide or "laughing gas") is effective in asthma, preventing heart transplant rejection, and blue baby cardiac surgery, etc. Nitric oxide is responsible for the clot busting abilities of t-PA in acute strokes and heart attacks, the ability of testosterone to cause erections as well as increased libido, and has great potential for the treatment of everything from diabetes and hypertension, to Alzheimer's and Parkinson's Disease. I have asked Dr. Adey to provide an update on nitric oxide research for this year's Congress, and discuss its crucial role in modulating the effects of electromagnetic fields, free radicals, and antioxidants, and should add chitosan.

Our response to ingesting anything varies because of differences in absorption, metabolism, time of day, sex, and a host of heritable and other factors. The optimal dosage, and time of administration of chitosan will also deviate for each of us. Most people would prefer to take this when they eat, but this will not produce the best results. A forthcoming book will explain how you can learn to get the best results, and how and when to vary the dosage, depending on what you intend to eat. It will also explain in simple terms how to calculate your body mass index (BMI), why fat deposits in certain parts of the body may be more harmful than others, what promising new drugs may soon be available, and their assets and drawbacks. You will also learn how to find out what type of stress reduction strategies may be best for you, not only for losing weight, but also improving the quality of your life. Stay tuned.

Paul J. Rosch, M.D., F.A.C.P.
Editor

Book Review: *EAT FAT*, Richard Klein, Pantheon Books, New York, 1996 247 pgs., \$24.00

While the definitions or denotations of words don't change, a variety of influences can markedly alter their meaning or connotation. Referring to someone as a politician was formerly a compliment. It meant having great skill, sagacity and statesmanship in dealing with sensitive issues, to avoid offending any of the parties involved. Today, it is more apt to be a pejorative description of someone who pursues personal goals by making false promises, or any deceit that serves this purpose. A similar fate seems to have befallen fat. A politician who is a "fat cat", is perceived as using an elected position to gain personal wealth and power, rather than serving the interests of constituents. In contemporary culture, describing someone as fat, often insinuates that they are unattractive, lazy, or even slothful. It wasn't always that way.

Rubens and Renoir's beauties had full, voluptuous, sensual bodies. Twiggy might be a model agency's dream, but would not likely be an appealing nude. "Zofig" women are sexy because they are pleasingly plump, and fat people have much larger libidos, as well as appetites for fat, sweets, and other pleasures, according to the author. Duncan's *How to be Plump*, and similar offerings were popular books in the last century, and there are abundant anecdotes about the virtues of being fat. Fat people are more apt to be happy, and trustful. "Let me have men about me who are fat" said Julius Caesar, who distrusted Cassius because of his "lean and hungry look". The pleasant personalities of Friar Tuck, and "Jolly St. Nick", are reinforced by their portrayal as being chubby.

The abhorrence of fat is largely a feminist issue, fueled by food companies, the fashion and beauty industries, fitness equipment and sneaker manufacturers, weight loss programs, nutritionists, and others, for financial, rather than health rewards. Over 95% of dieters are even fatter after five years of dieting, and weight loss programs are so successful because clients keep coming back. Such "yo-yo" dieting is dangerous, and the author argues that we might be far better off if we just let people eat what they want. His views are echoed in *True Beauty*, another new backlash book by a model. Although very attractive, it was obvious she was much too heavy to hope for a successful career. She was urged to go on a starvation diet and take appetite suppressant pills, but began to ask herself whether it was really worth all this in the long run.

She urges learning how to accept and be satisfied with the way you are, rather than trying to conform to the arbitrary standards of others. This soul searching inward journey is a voyage that many fat people should undertake, since it will end in a feeling of external beauty. As she eventually found out, this may also become apparent to others. The main reason people want to lose weight, is to appear more attractive.

While beauty is in the eye of the beholder, societal and peer pressures are powerful forces in shaping this, as are faulty perceptions. Skeleton thin anorexics continue to starve because they persistently perceive that they are fat. Anorexia has the highest mortality rate of any psychiatric disorder. The perception of beauty varies in different cultures. Steatopygia, the massive accumulation of fat around the buttocks that seems so grotesque to us, is admired by Hottentot and other African tribes, where it is a prized racial characteristic. Tiny feet was such a sign of beauty in Chinese women, that the practice of binding their feet tightly during childhood to prevent growth was a common practice. In Elizabethan days, a beauty was "fair skinned", since this implied a higher social status that did not require the need to work in occupations that exposed you to the sun, wind, and rain. Paradoxically, that gave way in the present century, to a perpetual tan as being beautiful or handsome, as exemplified by Cary Grant and George Hamilton. The implication now is that this is a sign of wealth, higher social status, and even better health. While someone who is pale, or has a "pasty" complexion is still often viewed as being sick, a "healthy tan" has become an oxymoron, because of sun related skin cancers.

The possible perils of being portly, and the dire dangers of morbid obesity are clearly acknowledged in this book. But, most dieters who forsake fat or take pills are not in this category. The same holds true for those women who spent \$90 million last year to remove cellulite, and probably more for liposuction. Diets and drugs don't really work, can cause health problems, and are stressful in other ways. St. Benedict's advice seems most appropriate, "*Omnia tamen mensurate fiant*" — moderation in all things. And those of us who like to pig out once in a while, might add "and moderation even in this". After all, there's always chitosan.

ISSN # 1089-148X

HEALTH AND STRESS

*The Newsletter of
The American Institute of Stress*

124 Park Ave., Yonkers, New York 10703

Non-Profit Organization
U.S. Postage
PAID
Yonkers, NY
Permit No. 400