The McDougall Newsletter

Volume 2 Issue 10

In This Issue

A Brief History of Protein: Passion, Social Bigotry, Rats, and Enlightenment

Nutrition is an emotional subject and nothing arouses people's passions more than the subject of protein in their diet. Widely divergent opinions on whether more protein or less is best, and on the merits of animal vs. vegetable sources, have been debated for more than 150 years. And for all that time *solid scientific research* has clearly supported the wisdom of a diet low in protein – favoring vegetable sources. So far, however, the scientific facts have fought a losing battle against *popular opinion* – which values high-protein diets based on animal foods. Mark Twain once said, "Truth is mighty and will prevail. There is nothing wrong with this, except that it ain't so." Even though the facts may never become popular knowledge, I will always believe it is your fundamental right to know the truth about your nutritional requirements – this vital information should be taught from childhood as basic education, along with reading, writing, and mathematics – and along with health facts such as cigarettes cause lung damage, drunk driving kills, and automobile safety belts save lives. See page 2

USDA Misleading American Public about Beef Safety

by Michael Greger, M.D.

Welcome to the world of bovine spongiform encephalopathy (BSE), or Mad Cow disease. The pathogen thought responsible for this disease is not a virus, not a fungus, not a bacterium, but thought to be a prion, an infectious protein. Because of their unique structure, prions are practically indestructible. They can remain infectious for years in the soil. They are not adequately destroyed by cooking, canning, freezing, usable doses of radiation, digestive enzymes, or stomach acid. Even heat sterilization, domestic bleach, and formaldehyde sterilization have little or no effect. One study raised the disturbing question of whether even incineration could guarantee the inactivation of prions. That study was performed by Paul Brown, medical director for the U.S. Public Health Service, who found prions could remain infectious even after exposure to temperatures over a thousand degrees Fahrenheit. That's hot enough to melt lead. Prions have been called the smallest, most lethal biological entities in the world. It is perhaps not surprising that U.S. cattle have Mad Cow

see page 14

Continued from page 1

Human Protein Needs

The primary importance of protein in our foods is to serve as a source of building blocks called amino acids. There are 20 different amino acids which build all the proteins in nature – from mosquitos to elm trees – by arranging themselves in different sequences, like the 26 letters of our alphabet form all the words in a dictionary. We, like other animals, can make some of these amino acids from carbon, nitrogen, sulfur, and water – these do not have to be in our foods and are therefore referred to as *nonessential* amino acids. Others we cannot synthesize in our bodies and must be obtained from our foods – these are referred to as *essential* amino acids. Plants make all 20 of these amino acids. Bacteria living in the large intestine are also an important source of amino acids, including the essential ones, which they readily synthesize. The body has highly efficient systems for reutilizing and conserving amino acids, and as a result the need for protein (and amino acids) in our diet is very small. As children we use a significant portion of our dietary-derived protein for growth, but adults use most purely for maintenance – replacing protein lost from the body primarily through the sloughing of skin and intestinal cells – and to a minor amount, through secretions leaving the body, such as nasal fluid, spit, menstrual flow, semen, and hair cuttings and nail clippings. The amount lost is minute – less than 10 grams (one-third of an ounce) a day. Human growth is very slow, thus the demands are small.[3,4] Unlike fat, protein cannot be stored. When it is consumed in excess of our needs, protein is broken down mostly by the liver, and partly by the kidneys and muscles. Consumption in excess of our needs overworks the liver and kidneys, and can cause accumulation of toxic protein byproducts.

High Protein Standard Set by Social Bigotry

One of the earliest proponents of high protein diets was the distinguished German physiologist Dr. Carl Voit (1831-1908).[1,2] After studying laborers who consumed approximately 3100 Calories daily, he concluded that protein intake for people should be 118 grams (g) per day – this value became known as the "Voit standard." How did he reach this conclusion? He believed that people with sufficient income to afford almost any choice of foods – from meat to vegetables – would instinctively select a diet containing the right amount of protein to maintain health and productivity. Other European and American authorities made similar observations about the eating habits of working men with sufficient incomes to afford meat and came to similar conclusions – ultimately recommending diets high in protein (100 and 189 grams of protein a day). No experiments were performed on the human body to reach these conclusions. Information on the diets of vigorous individuals living during these times and following low-protein vegetarian diets was largely ignored.[2,3] The healthy active lives of hundreds of millions of less affluent people laboring in Asia, Africa, and Central and South America on diets with less than half the amount of protein recommended by Dr. Voit (and almost no meat), were overlooked when experts established protein requirements that still affect us today.[3,4]

What arrogance! To conclude that the superior intellect of moderately affluent people of European descent would cause them to naturally come to correct conclusions about their personal nutritional needs. What foolishness! You can see the effects of self-selection when unrestricted food choices are available. What do more than one billion people living in the 21st century choose? McDonald's, Burger King, Pizza Hut – need more be said about people's innate wisdom to make food selections in their best interests? Unfortunately, these flawed recommendations based upon such social bigotry have not yet been silenced by over 100 years of scientific research.

See page 3

Continued from page 2

Recommendations for Protein Needs
Based on observations made in the late 1800s

Investigator	Observed Countrymen	Protein (Grams)	Fat (Grams)
Erisman	Russian Laborers	132	80
Hultgren	Swedish Laborers	180	110
Voit	German Laborers	118	
Voit	German Soldiers	145	100
Rubner	German Soldiers	165	
Leichtenfelt	Italian Laborers	146	
Gautier	French Laborers	110	68
Atwater	American Workers	150	
Playfair	Scottish Workers	119	

Russell Henry Chittenden Tells the Truth a Century Ago

Such narrow-minded thinking should have been stopped by 1905 when Russell Henry Chittenden, Yale University Professor of Physiological Chemistry, published his scientific findings on human protein needs in his classic book, *Physiological Economy in Nutrition.*[2] Professor Chittenden believed Dr. Voit had cause and effect reversed: people did not become prosperous because they ate high protein diets, but rather they ate meat and other expensive high protein foods because they could afford them. One hundred years ago he wrote, "We are all creatures of habit, and our palates are pleasantly excited by the rich animal foods with their high content of proteid (protein), and we may well question whether our dietetic habits are not based more upon the dictates of our palates than upon scientific reasoning or true physiological needs." He reasoned that we should know the minimal protein requirement for the healthy man (and woman), and believed that any protein intake beyond our requirements could cause injury to our body, especially to the liver and kidneys. As he explained it, "Fats and carbohydrates when oxidized in the body are ultimately burned to simple gaseous products…easily and quickly eliminated..." "With proteid (protein) foods…when oxidized, (they) yield a row of crystalline nitrogenous products which ultimately pass out of the body through the kidneys. (These nitrogen-based protein byproducts) – frequently spoken of as toxins – float about through the body and may exercise more or less of a deleterious influence upon the system, or, being temporarily deposited, may exert some specific or local influence that calls for their speedy removal." With these few words Professor Chittenden explained the deleterious effects of diets high in protein and meat – consequences too few practicing doctors know about today.

Russell Henry Chittenden

The First Scientific Experiments on Our Protein Needs

Professor Chittenden's first experiment was on himself. For nine months, he recorded his own body weight, which decreased from 143 pounds (65 Kg) to 128 pounds (58 kg) on his new diet of one-third the protein that Dr. Voit recommended. Chittenden's health remained excellent and he described his condition as being with "greater freedom from fatigue and muscular soreness than in previous years of a fuller dietary." He had suffered from arthritis of his knee and discovered that by reducing his intake of meat his condition disappeared and his "sick headaches" and bilious attacks (abdominal pains) no longer appeared periodically as before; plus he fully maintained

see page 4

continued from page 3

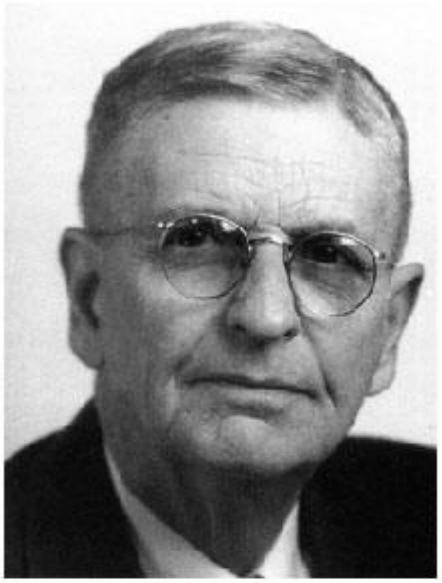
his mental and physical activity, with a protein intake of about 40 grams a day.

Chittenden performed valid scientific studies by collecting data on the daily dietary and urine histories of his subjects (including himself) to determine protein utilization. Because he was contradicting the known “truths” of his time, he proceeded with extreme caution with his further investigations. He organized three controlled trials with increasing demands for testing the adequacy of diets lower in protein than commonly recommended.

The first trial involved a group of five men connected with Yale University, leading active lives but not engaged in very muscular work. On a low-protein diet (62 grams daily) for 6 months, they all remained healthy and in positive nitrogen balance (more protein went into, than out of, their bodies). The second trial used 13 male volunteers from the Hospital Corps of the U.S. army. They were described as doing moderate work with one day of vigorous activity at the gymnasium. They remained in good health on 61 grams of protein daily. His final trial was with 8 Yale student athletes, some of them with exceptional records of athletic events. They ate an average of 64 grams of protein daily while maintaining their athletic endeavors, and improving their performance by a striking 35 percent. Following these studies, Chittenden in 1904 concluded that 35–50 g of protein a day was adequate for adults, and individuals could maintain their health and fitness on this amount. Studies over the past century have consistently confirmed Professor Chittenden’s findings, yet you would hardly know it with the present day popularity of high protein diets.

Rats Confuse Nutritionists

Many people have the idea that animal foods contain protein which is superior in quality to the protein found in plants. This misconception dates back to l9l4, when Lafayette B. Mendel and Thomas B. Osborne studied the protein requirements of laboratory rats and demonstrated nutritional requirements for the individual amino acids.[5] They found that rats grew better on animal sources of protein than on vegetable sources. So, investigators at that time suspected that the vegetable foods had insufficient amounts of some of the amino acids essential for the normal growth of rats. Because of these and other animal-based experiments, flesh, eggs, and dairy foods were classified as *superior*, or "Class A" protein sources. Vegetable proteins were designated *inferior,* or "Class B" proteins.



William Rose

Studies completed in the early 1940's by Dr. William Rose of the University of Illinois found that l0 amino acids were essential for a rat’s diet.[6] The removal of any one of these essential amino acids from the food of growing rats led to profound nutritive failure, accompanied by a rapid decline in weight, loss of appetite, and eventually death. Animal products, such as meat, poultry, milk, and eggs prevented this decline in the rats’ health, and were found to contain the l0 essential amino acids in just the right proportions for needs of growing rats. Based on these early rat experiments the amino acid pattern found in animal products was declared to be the “gold standard” see page 5

continued from page 4

by which to compare the amino acid pattern of vegetable foods. According to this concept, wheat and rice were declared deficient in lysine and corn was deficient in tryptophan.

Subsequent research has shown the obvious: the initial premise, that animal products supply the most ideal protein pattern for humans, as they do for rats, is incorrect.[7] The dietary needs of rats are considerably different from those of humans, mainly because rats grow very rapidly into adult size as compared to people. Rats are fully adult after 6 months; whereas a person takes 17 years to fully mature. This difference in need is especially clear when the breast milk of both species is examined and compared. The protein content of rat breast milk is 10 times greater than the milk intended for human babies.[8,9] Baby rats double in size in 4.5 days; an infant doubles in size in 6 months. The obvious reason for the different needs is because rats grow very rapidly into adult size as compared to humans; therefore requirements for protein to support that growth are very much higher.

Dr. William Rose Discovers Human Needs

In 1942, Dr. William Rose turned his attention from rats to people and began studying the amino acid requirements for humans using basically the same methodology he had used with rats. Healthy, male graduate students, grateful in those days for the free food, the dollar a day they were paid and the prospect of getting their initials in print in Rose's widely read publications, served as his experimental animals. They were fed a diet consisting of corn starch, sucrose, butter fat without protein, corn oil, inorganic salts, the known vitamins, and mixtures of highly purified amino acids. Their diet also included a large brown "candy," which contained a concentrated liver extract to supply unknown vitamins, sugar, and peppermint oil to provide a "never-to-be-forgotten taste."

The study used a chemical measurement called *nitrogen balance* to determine whether the subjects were getting enough usable protein from the mixture. From his experiments, Dr. Rose found that only eight of the ten amino acids essential to rats were also essential to men – we were better at making two amino acids than rats. When an essential amino acid was given in insufficient amounts for approximately two days, all subjects complained bitterly of similar symptoms: a clear increase in nervous irritability, extreme fatigue, and a profound failure of appetite. The subjects were unable to continue the amino acid deficient diets for more than a few days at a time.

Through his studies, Dr. Rose also determined a minimum level of intake for each of the eight essential amino acids.[10] He found small amounts of variation in individual needs among his subjects. Because of these unexplained differences among people, he included a large margin of safety in his final conclusion on minimum amino acid requirements. For each amino acid, he took the highest recorded level of need in any subject, and then doubled that amount for a "recommended requirement" – described as a *definitely safe intake*. It is important to realize that his higher requirement is easily met by a diet centered around any single starchy vegetable. Even in children, as long as energy needs are satisfied by starch, protein needs are automatically satisfied in almost every situation because of the basic and complete design of the food. These investigations were completed by the spring of 1952, resulting in sixteen papers in *The Journal of Biological Chemistry* that are considered classic contributions in the history of nutrition for the benefit of human beings.

See page 6

Continued from page 5

The results of Dr. Rose`s studies are summarized in the following chart, under "minimum requirements". From the chart, it is clear that vegetable foods contain more than enough of all the amino acids essential for humans.[11]

(grams per day) Amino Acids	Rose's Minimum Requirem.	Rose's Recom. Requirem.	Corn	Brown Rice	Oatmeal Flakes	Wheat Flour	White Beans	Potatoes	Sweet Potatoes	Taro	Asparagus	Broccoli	Tomatoes	Pumpkin	Beef Club Steak	Egg	Milk
Tryptophan	.25	.50	.66	.71	1.4	1.4	1.8	.8	.8	1.0	3.9	3.8	1.4	1.5	3.1	3.8	2.3
Phenylalanine*	.28	.56	6.13	3.1	5.8	5.9	10.9	3.6	2.5	3.0	10.2	12.2	4.3	3.0	11.2	13.9	7.7
Leucine	1.10	2.20	12.0	5.5	8.1	8.0	17.0	4.1	2.6	5.2	14.6	16.5	6.1	6.0	22.4	21.0	15.9
Isoleucine	.7	1.4	4.1	3.0	5.6	5.2	11.3	3.6	2.2	3.0	11.9	12.8	4.4	4.3	14.3	15.7	10.3
Lysine	.8	1.6	4.1	2.5	4.0	3.2	14.7	4.4	2.1	3.4	15.5	14.8	6.3	5.5	23.9	15.3	12.5
Valine	.8	1.6	6.8	4.5	6.4	5.5	12.1	4.4	3.4	3.5	16.0	17.3	4.2	4.3	15.1	17.7	11.7
Methionine	.11	.22	2.1	1.1	1.6	1.8	2.0	1.0	.8	.6	5.0	5.1	1.1	1.0	6.8	7.4	3.9
Thionine	.5	1.0	4.5	2.5	3.6	3.5	8.5	3.4	2.1	2.7	9.9	12.5	4.9	2.7	12.1	12.0	7.4
Total Protein	20	37 (WHO)	109	64	108	120	198	82	45	58	330	338	150	115	276	238	160

Many investigators have measured the capacity of plant foods to meet our protein needs. Their findings show that children and adults thrive on diets based on a single starch; and they grow healthy and strong.[11,12] Furthermore, no improvement is obtained by mixing plant foods or supplementing with amino acid mixtures to make the combined amino acid pattern look more like that of flesh, dairy, or eggs.[12] (For a thorough discussion of human protein needs see The McDougall Plan, New Win Publishers.)

Diet for a Small Planet Helps and Harms

A popular book among vegetarians, *Diet for a Small Planet*, by Frances Moore Lappe' published in 1971, started a revolution that has had a positive impact for the past three decades on the lives of millions of people. Unfortunately, Ms. Lappe' failed to understand the basic scientific literature on human protein needs and the sufficiency of plants foods before she wrote her influential book. She believed plants contained "incomplete proteins" with insufficient amounts of certain essential amino acids to meet the needs of people.[13] As a result of this misunderstanding, she placed great emphasis on combining vegetable foods to create an amino acid pattern which resembles that found in animal foods. This emphasis is unnecessary and implies that it is difficult to obtain "complete" protein from vegetables without detailed nutritional knowledge. Because of her complicated and incorrect ideas people are frightened away from vegetable-based diets.

The impact of her incorrect teachings of more than 30 years ago affects nutritional policy even today. In 2001 the Nutrition Committee of the American Heart Association published a long overdue review warning people of the dangers of high protein diets, like the Atkins, the Zone, and Sugar Busters diets.[14] Unfortunately, this one statement in an otherwise valuable report is scientifically incorrect: "Although plant proteins form a large part of the human diet, most are deficient in 1 or more essential amino acids and are therefore regarded as incomplete proteins." For a supporting scientific reference the Committee cites Frances Moore Lappe's 1971 book, *Diet for a Small Planet.*

You may think this is a trivial matter; however, incorrect information on

see page 7

continued from page 6

our protein needs can have grave consequences on your health and your family's health. With the American Heart Association teaching that plants fail to supply complete protein you are almost certain to receive incorrect, potentially damaging, medical advice. For example, say you go to your doctor after a heart attack and mention that you are now going to become a pure vegetarian to avoid future heart trouble. Your doctor may respond, "You can't do that, you will become protein deficient on an all plant food diet – the Heart Association says so." Or your child is sick with recurrent asthma and ear infections and you want a dietary cure – you may be warned away from a highly effective therapy because members of the Nutrition Committee of the American Heart Association fail to understand basic scientific research about human protein needs and plant foods. So this is no small matter.

I have confronted the Heart Association about spreading misinformation that can result in suffering as serious as death from heart disease – so far they have shown no interest in making overdue corrections to their incorrect teaching. (See my July, August and November 2002 Newsletters for more information on this.) I recently shared my conflict with the Heart Association with the world's leading authority on human protein requirements, Dr. D. Joe Millward from the Center for Nutrition and Food Safety, School of Biological Sciences University of Surrey, UK. His response to me on July 10, 2003 was, "Contrary to general opinion, the distinction between dietary protein sources in terms of the nutritional superiority of animal over plant proteins is much more difficult to demonstrate and less relevant in human nutrition. This is quite distinct from the AHA position which in my view is wrong." [15]

So How Do You Know the Truth about Your Protein Needs?

Read the scientific literature (www.nlm.nih.gov) and look at the world picture. Notice that 60 percent of people alive today and most of the people who have lived in the past have obtained their protein from plant foods. They have lived successfully; avoiding all the diseases common in our society. Even today plant sources provide 65% of the world supply of the protein we eat.

What about the starving children in Africa? The picture one often sees of "protein deficient" children in famine areas of Asia or Africa is actually one of starvation and is more accurately described as "calorie deficiency."[11] When these children come under medical supervision, they are nourished back to health with their local diets of corn, wheat, rice, and/or beans. Children recovering from starvation grow up to l8 times faster than usual and require a higher protein content to provide for their catch-up in development – and plant foods easily provide this extra amount of protein. Even very-low protein starchy root crops, such as casava root, are sufficient enough in nutrients, including protein, to keep people healthy.[3]

WHO Recommendations:
(With wide safety margin)

Men	5%
Women	5%
Pregnant	6%

The World Health Organization knows the truth. Since 1974 it has recommended that adults consume a diet with 5% of the calories from protein – this would mean 38 grams of protein for a man burning 3000 calories a day and 29 grams for a woman using 2300 calories a day. These minimum requirements provide for a large margin of safety that easily covers people who theoretically could have greater protein needs see page 8

– such as accident victims or people with infections. This quantity of protein is almost impossible to avoid if enough whole plant food is consumed to meet daily calorie needs. For example, rice alone would provide 71 grams of highly useable protein and white potatoes would provide 64 grams of protein for a working man.[16]

Percent of Calories of Protein[16] (Selected Foods)

FOOD	% PROTEIN
Grains and Flowers:	
Cornmeal	9
Brown Rice	9
Oatmeal	15
White Rice	7
Whole Wheat Flour	15
White Flour	11
Starchy Vegetables:	
Black Beans	27
Cassava	10
Corn	11
Kidney Beans	27
Peas	28
Potato	8
Sweet Potato	7
Green Vegetables:	
Asparagus	42
Broccoli	42
Carrots	10
Lettuce	40
Mushrooms	32
Onions	12
Spinach	51
Animal Foods:	
Beef	53
Chicken	46
Pork	29
Salmon	43
Whole Milk	21
Skim Milk	39
Human Milk	5
Cheddar Cheese	25
Cottage Cheese	68
Egg	32

see page 9

Continued from page 8

For a pregnant woman the WHO recommends 6% of the calories come from protein – again an amount of protein easily provided by a diet based on starches, vegetables, and fruits. **Human Breast Milk – Your Final Assurance** Your greatest need for protein is when you grow the most. The greatest time of growth in a human being's life is as an infant. We double in size during the first 6 months. The ideal food for a baby is mother's milk. Therefore, breast milk is the "gold standard" for nutrition – during your time of greatest need for all nutrients, including protein. Five to 6.3 percent of the calories in human breast milk are from protein.[9,17] This is the maximum concentration of protein we will ever need in our food supply. Knowing this value tells us that at no other time in our life will we ever require more protein. Consider the protein content of the foods we consume after weaning – these are even higher in protein – rice is 9%, potatoes are 8%, corn is 11% and oatmeal is 15% protein.[16]

Wrong Thinking Ruins Health

Even though all the scientific knowledge accumulated over the past 100 years clearly shows our bodies were designed to live best on a diet lower in protein than dictated by common belief, we continue on the same disastrous dietary path. As Russell Henry Chittenden explained 100 years ago, "The poorer man emulates his richer neighbors as soon as his circumstances permit, and resources that could be much more advantageously expended for the good of the family and the home are practically wasted – to say nothing of possible injury to health – under the mistaken idea that this more generous method of living (a high-protein, high-meat diet) is the surest road to health and strength."[2] Dr. Chittenden also believed that knowledge and the truth would prevail. He wrote, "Habit and sentiment play such a part in our lives that it is too much to expect any sudden change in custom. By a proper education commenced early in life it may, however, be possible to establish new standards, which in time may prevail and eventually lead to more enlightened methods of living..." The past century of declining health for people living in developed countries has proved Chittenden wrong – so far. However, with widespread communication via the Internet his predictions may soon become reality.

References:

1) Carpenter K. A short history of nutritional science: part 2 (1885-1912*). J Nutr.* 2003 Apr;133(4):975-84.

2) Chittenden, R. H. (1904). Physiological economy in nutrition, with special reference to the minimal protein requirement of the healthy man. An experimental study. New York: Frederick A. Stokes Company.

3) Millward DJ. The nutritional value of plant-based diets in relation to human amino acid and protein requirements. *Proc Nutr Soc.* 1999 May;58(2):249-60.

4) Millward DJ. Metabolic demands for amino acids and the human dietary requirement: Millward and Rivers (1988) revisited. *J Nutr.* 1998 Dec;128(12 Suppl):2563S-2576S.

5) Osborne T. Amino-acids in nutrition and growth. *J Bio Chem.* 1914; 17:325-49.

6) Rose W. Comparative growth of diet containing ten and nineteen amino acids, with further observation upon the role of glutamic and aspartic acid. *J Bio Chem.* 1948; 176: 753-62.

7) Bicker M. The protein requirement of adult rats in terms of the protein contained in egg, milk, and soy flour. *J Nutr* 1947;34: 491.

8) Bell G. Textbook of Physiology and Biochemestry, 4th ed., Williams and Wilkins, Baltimore, 1959, p. 12.

Continued from page 9

9) Reeds PJ. Protein nutrition of the neonate. *Proc Nutr Soc.* 2000 Feb;59(1):87-97.

10) Rose W. The amino acid requirement of adult man. *Nutr Abst Rev.* 1957;27:63l-47.

11) McDougall J. (1983). The McDougall Plan. Clinton, NJ. New Win Publishing.

12) M. Irwin, Hegsted D. A conspectus of research on protein requirements of man. *J Nutr.* 1971;101:385-428.

13) Moyer G. Frances Moore Lappe's new edition says it all. Nutrition Action, Oct. 1982. p. 10-11.

14) St. Jeor S, Howard B, Prewitt E. Dietary protein and weight reduction. A statement for health professionals from the Nutrition Committee of the Council on Nutrition, Physical Activity, and Metabolism of the American Heart Association. *Circulation* 2001;104:1869-74.

15) Personal Communication with John McDougall, MD on July 10, 2003.

16) J Pennington. Bowes & Church's Food Values of Portions Commonly Used. 17th Ed. Lippincott. Philadelphia- New York. 1998.

17) Reeds PJ. Protein and amino acid requirements and the composition of complementary foods. *J Nutr.* 2003 Sep;133(9):2953S-61S.

My Favorite Five Articles from Last Month's Medical Journals

Fish Promotes Breast Cancer

Fish intake is positively associated with breast cancer incidence rate published in the November 2003 issue of the *Journal of Nutrition* by Connie Stripp found the risk of a woman developing breast cancer increases when she eats more fish. The investigation studied 23,693 postmenopausal women, average age of 57 years. For each 25 grams (less than an ounce) of lean fish consumed there was a 13% increase in risk of breast cancer. For fatty fish the increase was 11% for each 25 grams. These findings are exactly the opposite of most of those that are found in experiments done in laboratories on animals. This may be because the laboratory experiments testing the link between fish fats (omega-3 fats) and cancer feed only omega-3 fats to the animals studied – A diet that includes only omega-3 fats would never be found in natural living conditions. In the real world where a mixture of fats is consumed, fish fat can be very cancer-promoting. Here are a few possible reasons:

1) Fish and fish fat are known to suppress our cancer-fighting immune system.

2) Fish is contaminated with cancer-causing environmental chemicals (like heavy metals and pesticides).

3) Cooking fish produces powerful carcinogens called heterocyclic amines.

For supporting research and more reasons to avoid fish in your health-supporting diet see my February 2003 Newsletter.

Stripp C, Overvad K, Christensen J, Thomsen BL, Olsen A, Moller S, Tjonneland A. Fish intake is positively associated with breast cancer incidence rate. *J Nutr*. 2003 Nov;133(11):3664-9.

Plant-based Diets Reduce C-reactive Protein and Heart Disease

Relation of dietary fat and fiber to elevation of C-reactive protein published in the December 2003 issue of the *American Journal of Cardiology* by Dana King found that people with diets high in fiber and low in saturated fats had lower levels of a risk factor for predicting heart disease. A diet high in fiber and low in saturated fat is a diet based upon plant foods.

C-reactive protein is a very sensitive indicator of inflammation anywhere in the body. It is non-specific – in other words, it does not tell you the source of the inflammation – it could be an infection in your toe, arthritis in your knuckles, or a bad cold. C-reactive protein provides non-specific information similar to the elevation of the body temperature, called a "fever." This protein is measured by a blood test. When the walls of your arteries are inflamed during the acute stages of atherosclerosis, C-reactive protein will rise – in this way this protein may predict your future risk of artery failure, commonly known as a heart attack or a stroke.

The inflammatory disease of the arteries can best be pictured as sores or pustules lining the inside walls. The life-threatening event occurs when one of these pustules ruptures; causing a blood clot to form – occluding the flow of blood to vital tissues, like the heart or brain. When you understand the inflammatory story behind artery disease, you then know the reason why a healthier diet, based on plant foods, results in lower C-reactive protein levels. The most important message from this study is to focus your attention on the eating behavior that improves C-reactive protein; a diet based on starches, vegetables and fruits. This is the same diet that improves all other risk factors, including cholesterol, homocysteine, triglycerides, blood sugar and uric acid levels, and saves your life.

King DE, Egan BM, Geesey ME. Relation of dietary fat and fiber to elevation of C-reactive protein. *Am J Cardiol*. 2003 Dec 1;92(11):1335-9.

see page 12

Continued from page 11

Cheap, Immediate-acting Niacin Is Best

Varying cost and free nicotinic acid content in over-the-counter niacin preparations for dyslipidemia by C. Daniel Meyers in the December 16, 2003 issue of the *Annals of Internal Medicine* found the least expensive, most effective and safest forms of niacin are plain immediate-acting varieties bought over the counter in most pharmacies and natural foods stores. Most important, the "no-flush" varieties of niacin (inositol hexaniacinate) are useless and should be avoided – they contain no free nicotinic acid and are also the most expensive ($21.70). Sustained-released niacin preparations are effective, less expensive ($9.76/month), but serious side effects, like liver damage, may occur with some brands. Some sustained-release preparations, like Slo-niacin, Enduracin and Niaspan (by prescription), have a record of safety. Slo-niacin contains heart-disease-promoting hydrogenated vegetable oils (trans-fatty acids) – this makes no sense – read the ingredient labels of all medications carefully. Immediate-acting niacin is least expensive ($7.10/month) and is most effective.

In 1955 Niacin (vitamin B3) was found to lower cholesterol and triglycerides by 20% to 50%. LDL-cholesterol is lowered by 10% to 25% and HDL-cholesterol is increased by 10% to 30%. Most importantly, niacin has been shown to reduce the risk of heart attacks and the risk of overall death by 11% after 9 years. The most common side effect is flushing, but people adjust to this in time. Serious side effects like liver toxicity, and elevated glucose and uric acid, can also occur. Dosages of immediate-acting niacin should be started at 250 mg daily, then gradually increased to 500 mg three times a day after meals. Dosages as high as 2000 mg to 6000 mg are effective and can be safely taken. Periodic liver tests and doctor's supervision are important for anyone taking this kind of serious drug therapy in order to reduce the risk of cardiovascular disease.

A form of this vitamin called nicotinamide has few side effects, but does not work. More on niacin therapy can be found in my February 2003 newsletter.

Meyers CD, Carr MC, Park S, Brunzell JD. Varying cost and free nicotinic acid content in over-the-counter niacin preparations for dyslipidemia. *Ann Intern Med*. 2003 Dec 16;139(12):996-1002.

Lipitor Is Not Proven Better Than Pravachol

Intensive statin regimen can stop atherosclerosis – some experts urge caution about posthoc analysis of LDL cholesterol reduction by Michael Zoler in the December 1, 2003 issue of *Internal Medicine News,* questions a highly-publicized study concerning the superiority of Lipitor (atorvastatin).[1] Pfizer, the manufacturer of Lipitor, sponsored this study which compared 80 mg daily of their powerful agent against 40 mg daily of Pravachol (pravastatin). After 18 months of treatment, 256 patients taking Lipitor found their LDL-cholesterol levels were reduced to 79 mg/dl, and there was observed a 0.4% reduction in artery disease. Pravachol, a much weaker statin, given at half the dose of Lipitor, reduced the LDL-cholesterol to 110 mg/dl in 249 patients and this group showed a 2.7% increase in artery disease in 18 months. Pfizer's conclusion was Lipitor is better. Many doctors changed their prescribing practices and many more patients who read the newspaper stories demanded this "better" drug from their doctors.

Obviously, no such conclusion of the superiority of Lipitor should have been reached from this research – they compared two statins of dissimilar potencies and dosages. However, what this study

see page 13

continued from page 12

clearly showed is the necessity to lower LDL-cholesterol below 80 mg/dl to reverse atherosclerosis. (The goal I teach is to lower total cholesterol to below 150 mg/dl, which would be similar to an LDL-cholesterol goal of 80 mg/dl.) Insufficient Pravachol was given to patients in this study to achieve this ideal cholesterol level.

I usually prescribe Pravachol because this medication has the best record for reducing the risk of heart attacks and death – my goals for my patients.[2] The approach I use is clearly described in my June 2003 Newsletter article "Cleaning out Your Arteries." Essentially, I prescribe a no-cholesterol, low-fat diet (plant-based diet) and add enough cholesterol-lowering medication to reduce the blood cholesterol level below 150 mg/dl (or the LDL-cholesterol below 80 mg/dl).

1) Zoler M. Intensive statin regimen can stop atherosclerosis – some experts urge caution about posthoc analysis of LDL cholesterol reduction. *Int Med News* 2003; 36 (23):1-2.

2) Ichihara K, Satoh K. Disparity between angiographic regression and clinical event rates with hydrophobic statins. *Lancet.* 2002 Jun 22;359(9324):2195-8.

Silver-colored Cars Are Safest

Car colour and risk of car crash injury: population based case control study by S. Furness in the December 20, 2003 issue of the *British Medical Journal* found silver-colored cars are 50% less likely to be involved in a crash resulting in serious injury than white cars. Green, black, and brown cars had twice the risk of being involved in a serious injury crash than white cars. Thus silver cars are four times safer than green, black, and brown cars. The data, gathered between April 1998 and June 1999, come from Auckland, New Zealand. No reason was given for these findings, but from my observation, it appears lighter and brighter colored cars (silver, yellow and white) are safer than darker cars (green, black and brown).

S. Furness, J Connor, E Robinson, R Norton, S Ameratunga, and R Jackson . Car colour and risk of car crash injury: population based case control study. *BMJ* 2003;327:1455-1456.

continued from page 1

disease given that certain cannibalistic practices of feeding slaughterhouse waste to livestock have been allowed to continue. What is surprising, given the inadequacy of our surveillance program, is that we found a case at all. Europe and Japan follow World Health Organization guidelines and test every downer cow for Mad Cow disease. In contrast, the U.S. has tested less than 2% of downers over the last decade. (Downers are cattle too sick or injured to make it to the slaughterhouse on their own legs.) In 2003 we increased that testing, but only to about 10%. Regardless of whether downer cows are tested or not, most of these animals end up on our dinner plates.

The discovery of a case of Mad Cow disease in the U.S. highlights how ineffective current safeguards are in North America. The U.S. banned the feeding of the muscles and bones of most animals to cows and sheep back in 1997, but, unlike Europe, left gaping loopholes in the law. For example, blood is currently exempted from the U.S. feed regulations. You can still collect cow's blood at the slaughterhouse and feed it to calves. In modern agribusiness, calves may be removed from their mothers immediately after birth, so the calves are fed milk replacer, which is often supplemented with cow blood protein. Weaned calves and young pigs may also have cattle blood sprayed directly on their feed to save money on feed costs. The outdated notion that blood cannot transmit the infection is no longer tenable given our current understanding of prions.

The U.S. feed regulations also still allow the feeding of rendered cattle remains to pigs, for example, and then the pig remains can be fed back to cattle. Or rendered cattle remains can be fed to chickens and then the chicken litter, or manure, can be legally fed back to the cows. So the fact that the most infectious tissues of the recently reported U.S. Mad Cow case – the brain, spinal cord, and intestines – were removed from this animal and not sent to rendering is not necessarily reassuring given that contaminated tissues are routinely still fed to pigs, chickens, and other animals who may cycle the disease back to cows, or perhaps even carry the deadly prions directly to human consumers. Even with the loopholes closed, though, the feed ban will only be as effective as its enforcement. Hundreds of feed mills and rendering plants have violated the feed ban regulation. Last year the United States General Accounting Office (GAO) released a report on the inadequacy of our defenses against Mad Cow disease and concluded that the FDA 's failure to enforce the feed ban may already have "placed U.S. herds and, in turn, the human food supply at risk."

In Canada, authorities were at least able to reassure the public that the infected downer cow they discovered was excluded from the human food chain and only rendered into animal feed. U.S. officials don't seem to be able to offer the same reassurance, as the Mad Cow we discovered may very well have been ground into hamburger. How then, can the USDA and the beef industry insist that the American beef supply is still safe? They argue that the infectious prions that cause the disease are only found in the brain and nervous tissue, not in the muscles, i.e. not in the meat. This can be viewed as misleading on two counts.

First, Americans do eat bovine central nervous system tissue. The GAO report noted, for example, that beef stock, beef extract, and beef flavoring are frequently made by boiling the skeletal remains of the animals, including the spinal column. According to the consumer advocacy organization Center for Science see page 15

continued from page 14

in the Public Interest, spinal cord contamination may also be found in U.S. hot dogs, hamburgers, pizza toppings, and taco fillings. In fact, a 2002 USDA survey showed that approximately 35 percent of high risk meat products tested positive for central nervous system tissues. Even if Americans just stick to steak, though, they may not be shielded from risk. There are a number of ways the muscle tissue can get contaminated by potentially highly infectious brain or spinal cord tissue. For example, the head trauma caused by the stun guns used to kill the animals prior to slaughter commonly blasts tiny fragments of brain throughout the bodies of these animals – causing emboli of brain tissue to lodge in the lungs, muscles and other tissues.

Even without nervous tissue contamination, though, there is now evidence that the muscle tissue itself might be infectious. Dr. Stanley Prusiner, the scientist who won the Nobel Prize in Medicine for his discovery of prions, proved last year that prions can build up in muscle tissue, a finding confirmed by follow-up studies in Germany published in May. And just last month, published in the *New England Journal of Medicine*, Swiss scientists found prions in the muscles of human CJD (Mad Cow) victims on autopsy. Eight out of the 32 muscle samples turned up positive for the deadly prions. Despite these shortcomings, Secretary of the US Department of Agriculture (USDA), Ann Veneman, and the state of Washington's governor, Gary Locke, both assured the public that that beef remains safe for consumption in our state and across the country, and they were still having beef for Christmas – reminiscent of the 1990 fiasco in which the British agriculture minister appeared on TV urging his 4-year-old daughter to eat a hamburger. Four years later, young people in Britain were dying from an invariably fatal neurodegenerative disease called variant Creutzfeldt-Jakob Disease (CJD) – the human equivalent of Mad Cow disease – which they contracted through the consumption of infected beef. With an incubation period up to decades long, no one knows how high the final human death toll will be.

One of the problems, as many English pundits saw it, is that the British Ministry of Agriculture represented the interests of both consumers and the beef industry. A similar conflict of interest exists here in the United States. The mandate of the USDA is to promote agricultural products, but also to protect consumer health. Secretary Veneman herself appointed Dale Moore, former chief lobbyist for the National Cattlemen's Beef Association, as her chief of staff. In the end I'm afraid this crisis may show to what length governments will go to prevent financial harm to powerful lobbies in general, and in doing so risk immeasurable harm to those they claim to represent.

For more information from Dr. Greger, please see my June 2003 Newsletter article, “Cure Your ‘Beef Habit’ Today with a Little Mad Cow.

Michael Greger, MD, is a graduate of the Cornell University School of Agriculture and the Tufts University School of Medicine. Dr. Greger has been speaking publicly about Mad Cow disease since 1993. He debated National Cattlemen's Beef Association Director Gary Weber before the FDA and was invited as an expert witness at the infamous Oprah Winfrey "meat defamation" trial. He has contributed to many books and articles on the subject, continues to lecture extensively, and currently coordinates the Mad Cow disease website for the Organic Consumers Association. Dr. Greger can be reached for media inquiries at (617) 524-8064 or mhg1@cornell.edu.
mhg1@cornell.edu
http://www.veganMD.org

Macular Degeneration: Blind from the Western Diet

Like other degenerative diseases – heart disease, stroke, arthritis – *age-related macular degeneration (AMD)* is due primarily to our diet and secondarily to our lifestyle – therefore easily preventable, and to some extent reversible. This form of eye disease is the leading cause of blindness in people age 64 or older living in Western countries. The severe form with impairment of vision affects 1.7 million people in the United States, with 200,000 new cases annually. Characteristically, this is a disease of progressive, painless, loss of the central vision in the macula of both eyes simultaneously. The macula is the part of the retina which provides our most acute and detailed vision, and is used for visual activities, like reading, driving, recognizing faces, watching television, and other fine work.

Multiple studies clearly show that the same risk factors that predict the development and progression of coronary artery disease (heart disease) also predict the chance of you losing your eyesight from AMD:

* Overweight people have more than twice the risk of progression of this disease from the mild form, which affects nearly 8 million people in the United States, to the severe blinding form over the next 5 years.[1] Other common risk factors shared by both diseases are cigarette smoking, lack of exercise, high cholesterol, and hypertension.[1]
* A Diet high in all kinds fats, including animal, trans-fats (margarines, shortenings), monounsaturated fats (olive oil), and other vegetable fats, increases the risk of developing AMD by two to three times compared to a diet low in fat.[2,3]
* A diet low in fruits and vegetables is associated with an increased risk of AMD.[4]
* Vigorous physical activity decreases the risk of AMD.[1]
* As people in underdeveloped countries, for example Japan, Taiwan and China, switch from their native diets based on starches (like rice) to Western diets their risk of AMD increases parallel to their risk of heart disease.[5]

AMD is a Form of Atherosclerosis from the Western Diet

Disease of the arteries, known as *atherosclerosis,* is so common in Western societies that it is considered a normal part of aging. However, this disease is rare or unknown in parts of the world where people consume a diet based on starches, vegetables and fruits. The underlying mechanism involves the depositing of cholesterol and fat from the diet into the walls of the arteries.[6] In smaller vessels, such as in the eye, this process results in stiffening of the walls, inflammation of the vessels, a decrease in blood flow, and finally leakage of fluids through the vessel walls into surrounding tissues. The average blood flow reduction in people with AMD is 37% compared to people without this disease.[7] The end result is deprivation of oxygen and nutrients to the visual tissues of the eye found in the retina and concentrated in the macula – and the receptors of light and color (rods and cones) soon become nonfunctional and die.

Preserving Your Sight

The commercial solution to AMD is to take vitamin and mineral supplements. One recent study found supplements containing vitamins C and E, beta carotene, and zinc resulted in a 25% reduction in the risk of the intermediate stages of AMD progressing to the advanced stages within 5 years.[8] Despite this one study, a more honest conclusion is: in the face of intensive marketing, high profits, doctors' recommendations, and widespread use, no supplement has been found to be effective at preventing AMD or delaying its complications.[6] (A related story of supplements failing heart disease patients is found in my August 2003 Newsletter article, "Plants, not Pills, for Vitamins and Minerals.")

The simple, cost-free, side-effect-free, non-profitable solution for preserving your sight see page 17

continued from page 16

for a lifetime is the same one you should be presently using to preserve the circulation to your heart, brain, kidneys, etc. – a healthy low-fat, no-cholesterol diet, moderate exercise, and clean habits. As a secondary therapeutic approach for some people with elevated blood cholesterol levels (above 150 mg/dl), I recommend cholesterol-lowering medications. (More information on this subject can be found in my September 2002 newsletter article, "Cholesterol - When and How to Treat" and my June 2003 Newsletter article "Cleaning out Your Arteries.")

Even if you have already started to lose your vision it is not too late. Treatment of blood cholesterol and triglyceride levels has been shown to improve vision in a person with very high levels of blood fat (triglycerides).[9] Circulation to the eye and the rest of the body is improved immediately after switching from a high-fat to a low-fat diet.[10,11] The underlying disease, atherosclerosis, is also reversible in time.[12] Inflammation subsides and cholesterol and fat deposits are removed from the artery walls. The damage left from meat- and dairy-laden forks and spoons is the scarred tissue (sclerosis) that has forever lost its ability to distinguish light. The sooner you make long overdue changes in your diet the better sight you will have in your later years.

References:

1) Seddon JM. Progression of age-related macular degeneration: association with body mass index, waist circumference, and waist-hip ratio. *Arch Ophthalmol.* 2003 Jun;121(6):785-92.

2) Seddon JM. Progression of age-related macular degeneration: association with dietary fat, transunsaturated fat, nuts, and fish intake. *Arch Ophthalmol.* 2003 Dec;121(12):1728-37.

3) Cho E. Prospective study of dietary fat and the risk of age-related macular degeneration. *Am J Clin Nutr.* 2001 Feb;73(2):209-18.

4) Mozaffarieh M. The role of the carotenoids, lutein and zeaxanthin, in protecting against age-related macular degeneration: A review based on controversial evidence.
Nutr J. 2003 Dec 112:20-30.

5) Bird AC. What is the future of research in age-related macular disease? *Arch Ophthalmol.* 1997 Oct;115(10):1311-3.

6) Friedman E. The role of the atherosclerotic process in the pathogenesis of age-related macular degeneration. *Am J Ophthalmol.* 2000 Nov;130(5):658-63.

7) Grunwald JE. Foveolar choroidal blood flow in age-related macular degeneration.
Invest Ophthalmol Vis Sci. 1998 Feb;39(2):385-90.

8) Seddon JM. Dietary carotenoids, vitamins A, C, and E, and advanced age-related macular degeneration. Eye Disease Case-Control Study Group. *JAMA.* 1994 Nov 9;272(18):1413-20.

9) Nagra PK. Lipemia retinalis associated with branch retinal vein occlusion. *Am J Ophthalmol.* 2003 Apr;135(4):539-42.

10) Friedman M. Serum Lipids and conjunctival circulation after fat ingestion in men exhibiting type-A behavior pattern. *Circulation* 29:874 874-86, 1964.

11) Kuo P. The effect of lipemia upon coronary and peripheral arterial circulation in patients with essential hyperlipemia. *Am J Med.* 26:68, 1959.

12) Ornish D . Intensive lifestyle changes for reversal of coronary heart disease.
JAMA. 1998 Dec 16;280(23):2001-7.

Recipes

SPINACH DIP
Heather and I have been making this dip for many years. We like it on crackers or as a dip for fresh vegetables. Heather especially loves it with artichokes.

Preparation Time: 5 minutes
Chilling Time: 1-2 hours
Servings: makes about 2 cups

1 12.3 ounce box Lite Silken tofu
1 package (1.1 ounce) Fantastic Foods Vegetable Soup & Dip mix
½ package (10 ounce) frozen chopped spinach, thawed & squeezed dry
¾ cup tofu sour cream (recipe August 2002 newsletter)

Place the tofu in a food processor and process until very smooth. Scrape into a medium sized bowl. Add the soup mix and stir well. Add the spinach and stir again until well mixed. Stir the tofu sour cream into this mixture, cover and refrigerate for at least one hour to allow flavors to blend.

MUSHROOM SPREAD
This is another delicious spread for crackers or toasted bread. It may be served warm or at room temperature.

Preparation Time: 30 minutes
Cooking Time: 30 minutes
Servings: makes about 3 cups

¼ cup vegetable broth
½ cup finely chopped shallots
1 clove garlic, minced
4 cups finely chopped portobello mushrooms (see hint below)
3 cups finely chopped shiitake mushrooms
1 cup Madeira wine
1/2 cup finely chopped fresh parsley
1 teaspoon thyme
freshly ground pepper to taste
dash salt
1/3 cup tofu sour cream (recipe August 2002 newsletter)
1 teaspoon balsamic vinegar

Place the vegetable broth in a large non-stick skillet. Add the shallots and garlic. Cook, stirring frequently for about 3 minutes. Add the mushrooms, continue to cook and stir about 10 more minutes. Add the wine, parsley, thyme, pepper and salt. Bring to a boil, reduce heat, simmer over low heat for about 15 minutes, stirring occasionally. Remove from heat. Stir in tofu sour cream and vinegar. Serve warm.
Hints: Clean the portobello mushrooms well and scrape off the dark brown gills on the underside of the caps (use a spoon). Remove the tough stems from the fresh shiitaki mushrooms. Chop both kinds of mushrooms finely. (Use a food processor for an even finer chop.) This may be prepared a day ahead and heated in the microwave just before serving. Or serve at room temperature.

CHUNKY CHILI
I make many variations of chili during the winter months. Some of them take a long time to cook and seem to warm up the kitchen while they are cooking. This chili only takes 40 minutes to cook but it will warm you up when you eat it. It is just the thing for those days that never seem to have enough hours for cooking. It also tastes great reheated so you can take it with you for lunch (it will stay warm in a thermos).

Preparation Time: 15 minutes
Cooking Time: 40 minutes
Servings: 6-8

1 large onion, chopped
½ green or red bell pepper, chopped see page 19

continued from page 18

½ yellow or orange bell pepper, chopped
1 teaspoon minced garlic
1/3 cup vegetable broth
2 15 ounce cans stewed tomatoes
2 15 ounce cans black beans, drained and rinsed
1 15 ounce can kidney beans, drained and rinsed
1 15 ounce can pinto beans, drained and rinsed
1 ½ tablespoons chili powder
1 tablespoon brown sugar
1 teaspoon ground cumin
1 teaspoon dried oregano
dash salt
several twists of freshly ground black pepper

Place the onion, bell peppers, garlic and vegetable broth in a large pot. Cook over medium heat, stirring frequently, for 10 minutes. Add remaining ingredients, mix well and bring to a boil. Reduce heat and simmer for 30 minutes, stirring occasionally. Serve in a bowl with some bread on the side, or serve over brown rice.

HOPPIN' JOHN
This is traditionally served on New Year's Day for good luck all year, but it is delicious all year round. Using canned beans makes this easy. This can be as spicy as you want to make it.

Preparation Time: 5 minutes
Cooking Time: 15 minutes
Servings: 4-6
Cooked rice needed

2 cups vegetable broth
1 ½ cups chopped onions
¾ cup chopped celery
1 teaspoon bottled minced fresh garlic
2 15 ounce cans black eyed peas, drained and rinsed
1 bay leaf
½ teaspoon dried oregano leaves
dash salt
several twists freshly ground pepper
dash liquid smoke
Tabasco sauce to taste
2 cups cooked brown rice

Place ½ cup of the broth in a medium saucepan. Add the onions, celery and garlic. Cook, stirring occasionally, for 3-4 minutes. Add black eyed peas, remaining broth, bay leaf, oregano, salt and pepper. Bring to a boil, reduce heat and cook uncovered over low heat for 5 minutes. Add liquid smoke and Tabasco sauce to taste. Cook, stirring occasionally, for 5 more minutes. Remove bay leaf. Stir in cooked rice, adding more Tabasco and liquid smoke, if desired.
Hint: Instead of adding the cooked rice at the end, this may be served as a sauce over the rice or other whole grains.