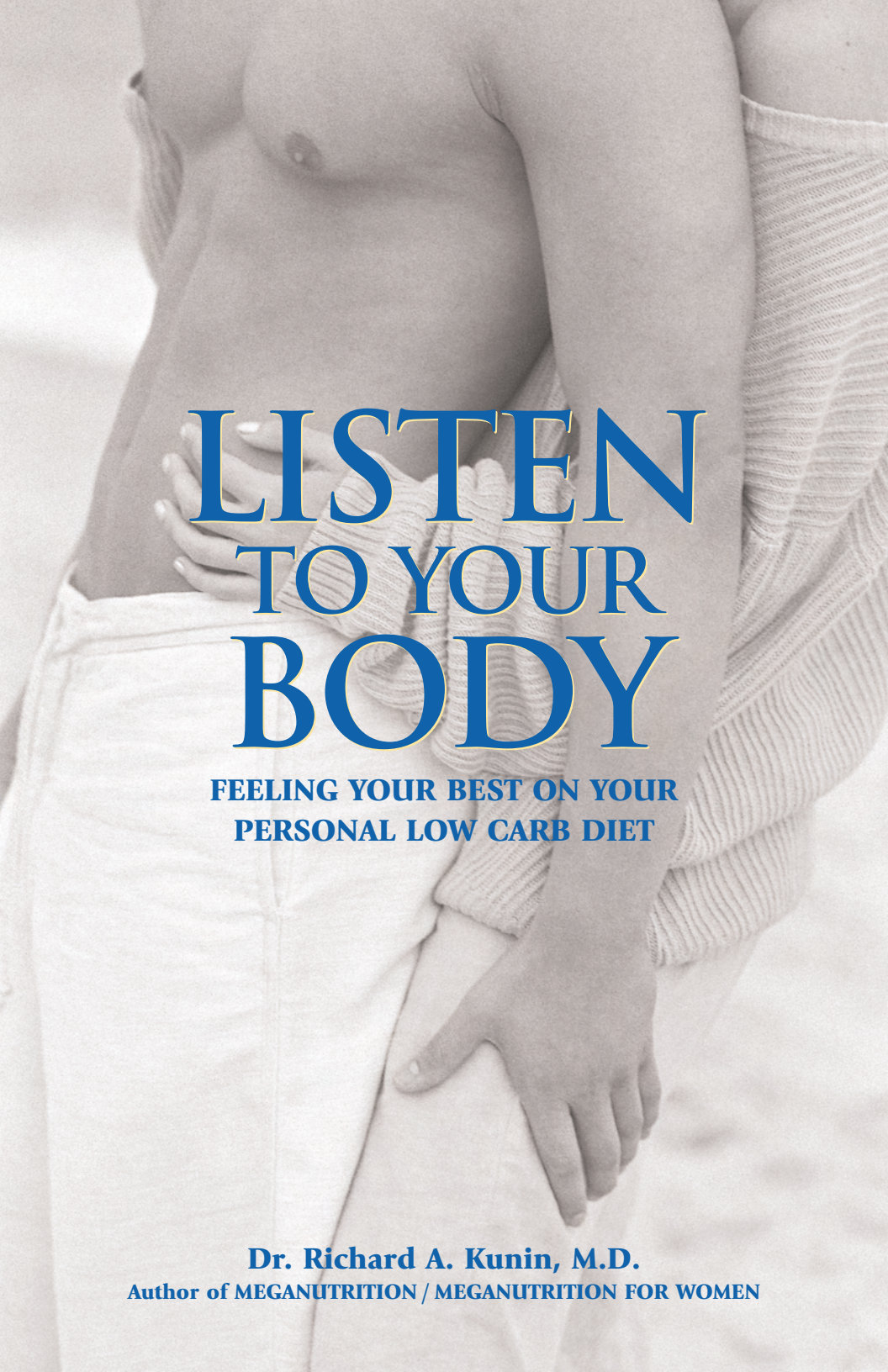


LISTEN TO YOUR BODY

FEELING YOUR BEST ON YOUR PERSONAL LOW CARB DIET

Dr. Richard A. Kunin, M.D.
Author of MEGANUTRITION / MEGANUTRITION FOR WOMEN

For more information:
Ola Loa Products, LLC
1-800-800-9550 or www.DrinkYourVitamins.com

LISTEN TO YOUR BODY DIET™

Feeling Your Best on Your Personal Low Carb Diet

The ***Listen To Your Body Diet***™ was introduced in my book "*MegaNutrition*" over twenty years ago. This approach identifies your personal needs for carbohydrate, fat, and protein. It begins with a low carbohydrate diet for one to three days, then gradually increasing dietary starches and sugars for a few days more. By keeping a daily record of foods eaten and how you feel, it is usually easy to identify what works for you. Once you have identified your carbohydrate balance point, where you feel your best, then it is possible to find your personal balance relative to fat and protein. That is what this essay is all about.

There is general agreement on the basic rules of a healthy diet. This can be summarized in five words: Variety, Moderation, Purity, Completeness, and Balance. Of these five guidelines, Balance is the least understood and therefore the most difficult to achieve. The *Listen To Your Body Diet* shows you how to understand the natural language of your own body so as to achieve dietary balance in response to the types of food eaten, i.e. carbohydrates, proteins and fats. These are classified as macronutrients, referring to large size and large amounts that make up the bulk of the food we eat. Micronurients are the vitamins and minerals in food that are invisible to the naked eye. Therefore they can only be accounted for by laboratory testing or by bad effects of deficiency or good-effects of proper supplementation. Micronutrients are especially important in weight loss diets because low calories and low intake translates into low micronutrients. That is why it is important to take a strategic nutrient supplement, such as Ola Loa, when you undertake a weight loss diet.

Mood, energy, and satiety (satisfaction) are the most obvious messages of your body relative to dietary needs. The goal is to satisfy your needs in a healthy way so that your feelings convey well-being, vitality, and satisfaction, especially after meals. The *Listen To Your Body Diet* is based on clinical research. Patients in the original study were taught to lower their carbohydrate intake and then gradually increase carbohydrates over a period of five to ten days while keeping a diary of their feelings. The following table shows how the first 73 subjects responded to low as compared to medium and high carbohydrate intake. As you can see, people differ from one another in their response to food. No diet is right for everyone.

	Good feeling	Bad feeling	No change	Carb=gram/day
High carb	12%	**81%**	7%	> 120
Medium carb	**68%**	14%	14%	**60 - 90**
Low carb	28%	**53%**	19%	<60

Note: 60 grams = 2 ounces = 1/8 pound.

The tabulation tells us that:

a. High carb: over 80% feel bad over 120 grams a day (i.e. 4 ounces of starch or sugar) and only 12% feel good. No wonder the low carb diet is catching on so fast.

b. Over 50 percent also feel bad on low carb diets, i.e. under 60 grams. In fact, only about 25% (one in four) actually feels good on a low carb diet!

c. Medium carbohydrate intake, 60 – 90 grams (2 to 3 ounces) total per day, was preferred by over two-thirds of the subjects. That means it was preferred two to one over the low carb diet and by over five to one over the high carb diet.

That highlights the problem of finding the right type of diet for each individual; and it calls for the *Listen To Your Body Diet*. In about a week you can learn what you need to know about carbohydrates, proteins and fats simply by following my directions and tracking your responses in a written diary. Your mood, energy, and satiety will help you to identify the effects of variable intake of these macronutrients. Definite preference will be apparent in nine out of ten of you.

For most people the *Listen To Your Body Diet* speaks loud and clear, especially at low carbohydrate, below 60 grams intake per day. In the first place, at that low level, acetone and other ketones appear in urine and can be detected by a dip stick test. Ketones are by-products from fat metabolism. The appearance of ketones in blood and urine is a clear indication that fat is being burned. This is normal during aerobic exercise after about half an hour. It is also normal during fasting over 12 to 24 hours and is a survival mechanism at times of famine and starvation. During such times the ketones are burned for fuel, especially in the heart muscle and nerve cells.

Ketones also appear in the urine of patients with diabetes. In this case, ketones are not a healthy sign, for they signify starvation in the midst of plenty. The defect is lack of insulin, not excess of ketones. One rational treatment for diabetes is to lower intake of carbohydrates, especially sugars, to lighten the burden on the insulin cells of the pancreas. Although the *Listen To Your Body Diet* is quite safe, diabetics are well-advised to consult their physician for supervision regarding any dietary change they may want to try.

This is the first new diet in more than a century! I can make this claim after seeing patient after patient go through one highly publicized diet after another with little lasting success. If any one of these diets had any basic merit, it would have lasted longer than a fad. The *Listen to Your Body Diet* is easy to follow without any special formulas, without long charts of favored foods and without special recipes. It is based on experience, and once experienced it becomes second nature, part of your personality.

All other diets make the mistake of trying to dish up the same program

to everyone. But the *Listen to Your Body Diet* is personal and individualized because it is based on your own personal experience in finding a balance of carbohydrate, fat and protein that best suits your personal needs.

It's this easy: First you're going to learn about carbohydrates. You're going to eliminate carbohydrates briefly from your diet, then bring them back in a gradual way until you exceed the optimal level. Second, you're going to learn how to adjust your fats and proteins for optimal energy--and hunger control. Third, you're going to learn to listen for the signals that tell when you have reached your personal best level of all three food types, carbohydrates, fats and protein.

To begin, just follow the text and diagrams.

PHASE ONE
The Personal Carbohydrate Adjustment

1. For two days eat only foods from the Non-carbohydrate List *(see below)*

It may surprise you to know that your body contains only about 100 grams of stored carbohydrate, roughly 500 calories of quick energy. After you have used up that many carbohydrate calories your metabolism shifts so as to burn fat. Ketones, such as acetone, are by-products of fat and when glucose and glycogen are depleted, they appear in the blood stream for use as a reserve fuel, especially in muscle, heart and brain cells. Ketones are the natural protection against starvation. They make fasting possible. Because the energy source, body fat, is continuous in ketosis, the energy flow is steady, without the ups and downs that occur after sugar and sweets, and uninterrupted by the energy drain from eating and digesting foods. That is why a state of fasting or starvation permits one to feel calm and relatively stable. The ketones have a calming effect.

Depending on the amount of your bodily carbohydrate (glycogen stores) and your rate of metabolism (use of calories), you will shift into ketosis in four to twelve hours. For example, aerobic exercise can consume up to 600 calories per hour so it is actually possible to induce ketosis in little more than an hour. On the other hand, energy output is less than 100 calories per hour during sleep so that most of us sleep overnight without waking in ketosis. Ketosis can be recognized by a characteristic sweet odor on the breath and it can be detected by means of the Ames Ketostix™, available at any pharmacy. You may find it interesting to monitor ketones this way but it is not necessary to do so: your body feelings during the Phase One-Carbohydrate Balance Point are better indicators than ketones of your personal best dietary balance.

NON-CARBOHYDRATE LIST:

- You may eat all types of meat, fish, fowl, cheese, eggs, and fats, including butter and oils.

- You should also eat as much as two cups a day of low carbohydrate vegetables, raw in salads, or steamed or sautéd. Lettuce, cabbage, brussels sprouts, parsley, watercress, celery, asparagus, broccoli, zucchini, cucumber, radish, eggplant, olives, and avocado are most popular.

  You must drink liquids—six or more glasses a day of: water, mineral water or tea. Coffee intake should not be interrupted by this diet because the withdrawal symptoms obscure the carbohydrate effect.

Notice what this excludes:

No sugar containing condiments greater than a gram (1/5 tsp) of honey, catsup, lemon juice, fructose, corn syrup and no table sugar. Sweeteners, ie. saccharin and aspartame, are best avoided because they stimulate insulin, almost like sugar. No alcohol because it masks the Balance Point effect.

Important:

- No limit on quantities of foods; eat according to your appetite.
- No vegetables other than the ones listed.
- No grains of any kind as they are moderately high in carbohydrate and have mood effects that can mask carbohydrate effects.
- No need to worry about ketones despite the fact that they appear in diabetes. Ketones don't cause the diabetes; they actually are a survival mechanism, a reserve fuel, just as in starvation or fasting. Diabetes is caused by deficiency of the hormone, insulin, whose function is to utilize the active products of carbohydrate, which is to say, sugars, particularly glucose. When insulin is deficient the body cannot burn glucose, so it must burn fats and proteins instead--or die. The worse the diabetes, the greater the amount of fat burned and the greater the amount of ketones that circulate and pass into the urine. This gave ketones a bad name by association; but, as you can see, there is no danger simply from the presence of ketones in your blood or urine.

The only precaution you need to take during these two days at low carbohydrate intake is to make sure you have ample potassium. The reason for this is that carbohydrates are generally high potassium foods. Low carbohydrate intake therefore reduces potassium intake. But this is easily compensated by using a potassium chloride salt substitute on your food. A half teaspoonful per day, taken in divided doses, should be sufficient.

2. On the third day begin increasing carbohydrate foods.

This is done in a systematic way, adding 6 grams per meal, or 18 grams per day. No need to weigh these amounts on a scale, simply refer to the Graded Carbohydrate List *(see next page)*. In general, carbohydrates are

found in fruits and vegetables. Fruits are sweet, a fact that tells you they are high in sugars, usually 18 to 36 grams per fruit, depending on size. Vegetables are starchy and only medium in carbohydrate, usually 12 to 24 grams per single portion of string beans or yam or potato. Cooking breaks down some of the complex carbohydrates and increases the amount of absorption (glycemic index) so you have to take this into account and allow for more carbohydrate grams if you like your foods thoroughly cooked.

Leafy greens are low in carbohydrate, only about 6 grams per cup, which is why they are allowed in the first two days of the diet.
Note that animal foods are not found on the carbohydrate list—except for milk and honey.

GRADED CARBOHYDRATE LIST

Add 18 grams more each day

3-gram foods:

- 4 lettuce leaves, 1/4 avocado, 1 thick slice tomato
- 1/2 cup mushrooms or sprouts, 1 Tbsp peanut butter

6-gram foods:

- 1 cup cole slaw, green beans, soy curd, 1/2 cup berries, 1/2 cup carrots 6 oz tomato juice, 1 oz (9-18) nuts, 1/4 cantaloupe, 1 cup cottage cheese, 1 Tbsp wheat germ or brewer's yeast, 2 Tbsp bran, 1 tsp sugar or honey

12-gram foods:

- 1 cup milk, 1 slice bread, 1 cup plain yogurt, 1 small apple or orange 1/2 grapefruit, 12 grapes

24-gram foods:

- 1 large potato or banana, 4 prunes or 1/2 cup raisins, 1 cup orange juice 1 med-lg pear, 1/2 cup peas, beans, grains, rice, or 1/2 cup fruit yogurt 1 slice cake, 1 scoop ice cream, an 8-oz cola drink

3. On each day write down the foods eaten and how you feel.

After seven days (five of them increasing carbohydrates by 18 grams per day) you will be at a level of 90-100 grams of carbohydrate a day. Keep increasing carbohydrates from the above list until you feel you have passed the point at which you "feel best." Use the nine Listen Factors listed in Phase Three to help decide which day is your best. Now remain at this level of carbohydrate intake as you enter the second phase.

PHASE TWO
The Personal Fat and Protein Adjustment

1. Make sure of adequate protein.

A few facts: You need approximately 1 gram of protein for every 2 pounds of your ideal weight. This assures more than adequate essential amino acids for health maintenance and some extra insurance for unexpected trauma, infection, stress or famine. It also stimulates production of the sugar-raising hormone, glucagon, which helps stabilize blood sugar and assure optimum mood and energy. If you have any concern about your kidneys ability to handle protein, of course ask your doctor's advice; however research supports the fact that protein does not harm the kidneys except in case of acute kidney failure. On the other hand, inadequate protein intake leaves our antioxidant enzymes in short supply and our detoxification defenses down. So if you are healthiest at 140 pounds, your body needs about 70 grams of protein per day. To make sure you are getting adequate protein, use the simplified Protein Equivalency List below for quick reference.

PROTEIN EQUIVALENCY LIST

- 7 grams: 1 egg, 1 cup milk, 1 oz cheese, 2 slices of whole wheat bread, 1 cup cooked wheat oats or rice cereal, 1/2 cup legume beans cooked
- 14 grams: 3 oz high-fat meat, 1/2 cup cottage cheese
- 21 grams: 3 oz fish or low-fat meat

2. Adjust for fats, up or down, for mood and appetite control

Do this by choosing your carbohydrate foods (mainly vegetables) and your non-carbohydrate foods (mainly animal) from the Animal-Vegetable Fat List below. This makes it easy to learn foods in logical relationship: Animal-Protein vs. Vegetable-Carbohydrate and High vs. Low Fat types of each.

ANIMAL-VEGETABLE HIGH FAT-LOW FAT LIST
**Note: Numbers in parentheses refer to grams of fat.*

HIGH FAT

ANIMAL:

- Beef, lamb, pork: 3 oz (24gm)*
- Fowl, with skin: 3 oz (16gm)
- 2 eggs, 2 cups milk, 2 oz cheese: (16gm)
- Calves brains: 3 oz (16gm)
- Butter, Lard: 1 Tbsp (16gm)

VEGETABLE:

- Nuts, seeds: 1 Tbsp (16gm)
- 1 avocado, 8 olives: (16gm)
- Vegetable oils :1 Tbsp (16gm)

LOW FAT

ANIMAL:

- Fish, fowl (no skin), veal, 3 oz (8gm)
- Liver, sweetbreads: 3 oz (4gm)
- Low-fat milk or yogurt, low-fat cottage cheese: 8 oz (< 1gm fat)

VEGETABLE:

- Leaves (brussel sprouts, cabbage, kale, spinach, lettuce)
- Green beans, Stems (celery),
- Roots (carrot, parsnip), Tubers (potato)
- Broccoli, Cauliflower
- Cucumber, Melon,
- Berries, Tomatoes
- Squash, Peas
- Vegetable juice, Fruit juice: 1 cup (Virtually 0gm fat)

MEDIUM FAT

- Whole Grains: 1 cup (cooked) (4gm)
- Legume Beans: 1/2 cup (1-2gm)
- Whole grain Bread: 1 Slice (1gm)

To estimate caloric intake, assume that a pound of fat, ie. 450 grams, has about twice as many calories as a pound of either protein or carbohydrate. Thus, a pound of fat provides about 4000 calories of energy--equivalent to a pound of weight gain–while a pound of carbohydrate or protein yields just under 2000 calories.

PHASE THREE
Learning to Listen to Your Body

Adjust your fats and carbohydrates in response to the messages from your body. Use the Body Message List to guide you.

BODY MESSAGE LIST

- **Hunger:** Increase fats from high-fat vegetable list, or decrease carbohydrate intake.
- **Craving sweets:** Increase carbohydrate a little, up to 30 grams extra per day.
- **Weakness**: Increase potassium: use Salt substitute or natural sources,

such as berries, melon, squash or vegetable juice. Do not use fruit juice.

- **Headache:** Increase potassium as above, or lower carbohydrates.
- **Lightheadedness:** Increase potassium as above, or add protein.
- I**rritability:** Increase carbohydrate 30 grams; if irritability persists, try a low level again (10-40 grams a day).
- **Fatigue:** Increase protein from low-fat animal list.
- **Constipation:** Increase potassium as above, or add flax or psyllium fiber.
- **No weight loss:** Eat proteins first. Increase exercise. Reduce calories by choosing from low-fat lists. Increase high-fiber vegetables from Phase One – low fat vegetables.

Note that I have simplified the portions and values of common carbohydrate, protein, and fat foods so that the gram-amounts are respectively in multiples of 6, 7, and 8. This will aid in remembering basic values. It is not necessary to consult a book or weigh out your foods on a kitchen scale.

FOR THOSE OF YOU WHO NEED GREATER DETAIL, HERE'S A GENERAL DAY BY DAY MODEL OF THE LISTEN TO YOUR BODY DIET

The food examples are just examples, i.e. common choices. You can substitute, just keep the total carbohydrate near the target each day, and about the same at each meal.

PHASE ONE
Carbohydrate Adjustment

1st Day

USE UP YOUR BODY's STORED CARBOHYDRATES.

- Eat anything from high and low fat animal lists, ie. meat, fish, fowl, dairy, butter, oil and vegetable salads, only 2 cups a day (avocado, olives, nuts, seeds, leaves, celery, cucumber, zucchini, broccoli, radish).
- Drink 6 glasses water, mineral water, tea or up to 2 cups of coffee.
- The salad vegetables provide about 12 grams total carbohydrate today and everyday of the diet.

2nd Day

Same as 1st Day. Remember: no alcohol, sugar, catsup, bread, fruits or juices. You should be in ketosis—meaning fats are being burned rapidly but if you have low thyroid activity or are physically inactive, ketosis may be so slight as to register negative on Ketostix. Go on per instructions anyway.

3rd Day
ADD CARBOHYDRATES BACK IN SIX GRAM INCREMENTS AND TAKE NOTES ON HOW YOU FEEL.

Add 6 grams of carbohydrates at each meal.

- Examples (6 grams each): 1/4 melon at breakfast, 1 cup cottage cheese or 1/2 cup broccoli at lunch, 1/4 avocado and l/2 large tomato at dinner.

You are at 18 grams plus 12 grams (salad veggies), total 30 grams carbohydrate.

4th Day

Add 12 grams of carbohydrates at each meal.

- Example (12 gram portions): 1 cup milk (12), 1 slice bread (12), 1/2 cup raisins (12), 6 oz tomato juice (6) with l/2 cup green beans (6)

You are at 12 grams each meal plus 12 grams, total 48 grams carbohydrate.

5th Day

Add 18 grams carbohydrate at each meal.

- Example (6 gram portions) These add to 12 gram portions making 18 grams: 1/2 cup berries (6), 1 Tbsp wheat germ (6) and 1 tsp. honey (6), 1 cup coleslaw (6), 2 Tbsp bran (6) with 1 cup yogurt (12) or 1 small apple (12)

You are at 18 grams each meal plus 12 grams, total 66 grams carbohydrate.

YOU ARE APPROACHING CARBOHYDRATE BALANCE POINT.

Caution: Some of you will have insulin rebound with hunger, food craving, edema, etc.

6th Day

Add 24 grams carbohydrates each meal

- Example: 1 medium potato (24), 1 large banana (24), 1/2 cup peas or beans (24)

You are at 24 grams per meal plus 12 grams, total 84 grams carbohydrate.

7th Day

Add 30 grams carbohydrate each meal.

- Examples: 2 Tbsp peanut butter (6), 2 tsp jelly (12), 1 slice bread (12), or 1/2 cup rice (24), 6 grapes (6), 1 small apple (12)

You are at 30 grams per meal plus 12 grams, total 102 grams carbohydrate.

8th Day

Add 36 grams carbohydrate at each meals

- Examples: 1/4 cup raisins (24), 1 cup orange juice (24) with 1 Tbsp brewer's yeast (6), 1/2 cup fruit yogurt (24), 1/2 cup ice cream (24)

You are at 36 grams per meal plus the 12 grams of salad, total 120 grams carbohydrate.

.

9th day

NOW TREAT YOURSELF TO A SUGAR BINGE

- Example: 8 oz apple juice or orange juice (24) 8 oz pineapple juice (36), 1 Tbsp sugar or honey (15) 1 cup ice cream (48), 1/8 cut of pie (40), 12 oz soft drinks with sugar (36).

Three servings will almost double carbohydrate intake, total over 200 grams carbohydrate.

PHASE TWO
Fat and Protein Adjustment

10th day

- Go back to the carbohydrate level at which you felt best.
- Eat foods only from the high fat animal and vegetable lists and the medium fat list.

11th day

- Continue to keep carbohydrates the same.
- Now choose foods only from the low fat protein and carbohydrates. e.g.: dairy items, fish, skinned fowl, organ meats. very low cottage cheese, skim milk, grains, most vegetables and fruit.

12th day

- Keep carbohydrates steady.
- Select foods from the animal lists to increase protein for at least two meals a day.
- Target protein intake at 1/2 your weight (lbs.), to calculate protein need (gms).

This probably will require an increased protein intake over your previous habits. You may need two days to adjust intake and find your protein balance point.

Write down your personal best carbohydrate level (about 6th day).
Your personal best fat level (about 10th day).
Protein level will become intuitive, i.e. high or low.

PHASE THREE
Listen to Your Body

Messages	Strategies
Hunger	Vegetable fats up
Headache	Carbohydrates down
Craving sweets	Carbohydrates up
Weakness, headache, Lightheadedness,* constipation	Potassium up Lite salt, berries, squash Melon, vegetable juice
Fatigue, failure to lose weight	Low-fat animal protein Exercise increase
Irritability	Carbohydrates up—or If it persists, Carbohydrates down!
Constipation, failure to Lose weight	High fiber, increase low Fat vegetables

** Try extra protein also*

PHASE THREE IS AN ONGOING PROCESS AND YOU WILL PROBABLY FIND OTHER CLUES AS WELL

Nutrition Support for Success and Well-Being

All the diet books I've seen have one feature in common: nutrition is a sort of necessary evil in the discussion. You are supposed to be awed by the scientific references, then forget them as you plunge ahead with the recipes. *The Listen to Your Body Diet* is quite different in this respect: it's a way of teaching you about foods and good eating habits. Once you have gone through the three stages of this diet you will know more about nutrition than most nutritionists, and you will never have to refer to a table again—except your dinner table. It is not surprising that Jean Mayer, a pioneer nutrition researcher, formerly of Harvard, then president of Tufts and a well-known health columnist, had this to say of the state of nutrition education: "Our studies at Harvard suggest that the average physician knows a little more about nutrition than the average secretary—unless the secretary has a weight problem. Then she probably knows more than the average physician."

The nutritional value of foods can be listed in charts or tables, broken down by food type, in some comparable portions. You may discover, and remember, that parsley is an excellent source of Vitamin C; but to eat a cup of parsley? Even a full cup of an ordinary vegetable, such as green beans,

is quite a portion. Yet the Food and Drug Administration allows canners of green beans to give RDA values for green beans in terms of l-cup portions. Or one can look up the major vitamins and minerals in a reference book and see what foods are their major sources. You might find, for example, that a cup of raisins provides 0.35 milligrams of vitamin B6 (not a bad source—better than brown rice, broccoli, or wheat germ); but then you notice that the RDA for an adult is 2 milligrams—six times as much. If you selected one of the better sources of B6, kale, you would have to eat a pound and a half of it (raw) to get your RDA. A third way of learning something about nutrition is to consult the occasional "super foods" lists. I feel that such a rating system, like a one-to-four star system in restaurant reviews, can be helpful. But is there much to be learned when such a list fails to take you into account? For example, a list I recently saw in a consumer's co-op ranked vegetables by the number of RDAs each one supplied in significant amounts. A vegetable that gives you 25 percent of the RDA for Vitamin A, 30 percent for C, and 40 percent for thiamine is a " 3." On this basis, collard greens and corn-on-the-cob were ranked as "super veggies." Black-eyed peas, kale, turnip greens, parsley, and spinach were runners-up. Mustard greens, okra, red peppers, lima beans, broccoli, peas, and asparagus came next. Even if you remembered these distinctions, what would this tell you about any one nutrient you might particularly need? And if you or your children simply don't like the stuff, how much would get off the plate and into the appropriate mouth?

So I'm really making two pleas here: first, a diet plan must be practical, must take your eating habits and likes and dislikes into account; second, such a plan must be specific, must take your particular physical and emotional needs into account. Add to this the third variable—what I have called the "biological complexity of food"—and you have indeed an imposing problem. What's the answer? Traditionally, doctors have preached variety in eating habits as the only practical solution. In effect they've said, "We just can't know our particular needs accurately enough, and we just can't remember, even if we knew, the biochemical contribution of foods. So if we range over the whole spectrum of fruits, vegetables, and animal sources of food, we're likely to pick up all the micronutrients we need, regardless of our vast individual differences." This method is, in fact, what our appetites tell us to do; we naturally tend to like variety. Even if we all had a lobster budget, few of us would choose lobster more than a few times a week. So it would seem that we can let nature take its course. Is this what the *Listen To Your Body Diet* comes down to? Not at all. Again, there is a practical problem—we do not live in an ideal world, or anything close to it. Several factors in our current evolution as human beings, as well as several man made contributions to our environment, interfere with the signals our bodies send to us. In some obvious cases, our cravings are overpowering, and we can assume such hungers are so biologically urgent that even the static of environmental pollution and overprocessing of food

can't disguise the message. Pregnant women, for example, have a variety of unusual cravings in the course of their pregnancies. Why pickles? I once suggested in an offhand way that perhaps the pregnant woman really wants the trace minerals in the brine solution, and not the pickles at all. It turns out that pickles are treated with copper to enhance the green color. Of course the dill and the salt both have effects of their own in addition.

How Poor Foods Drive Out Good Foods

Food processing also masks the signals we should be getting from food and from our bodies with typically heavy use of salt and sugar. Even our baby foods were once thoroughly salted and sugared, and as we grew we became used to foods like catsup that contained (and still contain) large amounts of sweeteners, as well as to soups, mayonnaise, peanut butter, and even canned and frozen vegetables liberally "filled" with sucrose. We didn't worry about canned fruits floating in heavy syrup, and only recently have consumers risen up against breakfast "foods" that contain more sugar than candy bars. Over the years we have grown so used to salt on nuts, snacks, and all sorts of canned goods that when we sample an unsalted version we think something is wrong. Now there are good reasons why the food industry has relied on salt and sugar in processing: both are excellent preservatives (sugar is so devoid of nutrients that not even microbes can live in it). Sugar is also one of the cheapest "fillers," volume for volume, that a manufacturer can use to extend his product. Once started down this path, processors discovered that the basic sweet and salt flavors had an almost addictive effect on consumers—hence the ludicrous extremes of ready-to-eat children's cereals. Needing nutrients to be digested, an "empty calorie" food like sugar can be dangerous; and, although salt in itself in moderation is not dangerous to most people, we do know that when potassium levels in the body are low, sodium can in fact cause widespread problems. In addition to all this, my concern with salt and sugar here is that they both hinder our ability to listen to your body. Quite simply, they pervert our taste buds.

It goes without saying that smoking dulls our sensitivity to tastes. But so do a lot of pollutants beyond our control: smog, pesticides, and industrial wastes. To prepare ourselves to hear what our cravings are telling us, we may have to get rid of some bad habits and make sure that we are getting enough of the micronutrients that protect against pollutants. Many of us, in addition, have allergies that can mask our food cravings.

Finally, most of us confuse our appetite controls by not getting sufficient exercise. As sports nutrition pioneer, Dr. Tom Bassler says, "Sedentary people have very dumb stomachs." When we leave unburned calories in our bodies from the previous day, looking for storage places, our stomachs fail to give us definite signals on what to eat. So we eat blindly. It is Bassler's observation that marathon runners crave whole

grains and vegetables, nuts, onions, garlic, and fresh fruits—more so than non-runners—because their appetites are not dulled by the hormonal mechanisms of storing food. Satiety dulls us; hunger sharpens our senses. Thus, long-distance runners are known to start burning fat as well as carbohydrates after an hour or so of exercise; hence a noticeable craving for fatty, even greasy foods after extended runs.

The Dietary Secret Is to Adjust, Not to Avoid or Reduce Fats and Carbohydrates

I have no quarrel with people who like to create diets. Every magazine has one of its own, at least once a year. Movie stars have them. Cities have them. Police departments and air forces and even doctors have them. Most of them are based on menus and recipes rather than on theory, but you can also be sure that no bariatric discovery of the slightest importance will go unpublished by some diet creator. Thus, we have seen the fructose diet, based on the interesting fact that this sweetener has less propensity to trigger the cycle of blood sugar ups and downs associated with sucrose. And other diets claim to be based on means of increasing the body's ability to burn fat. I have no quarrel even with some bizarre diets because strangely enough they sometimes do work—simply because they either cause people to stop and think about their food, or they get people off an even worse program.

I do have a quarrel with any diet that categorically forbids a major type of food. Even the medical establishment is guilty of this, with their obsession with low fat diets and the avoidance of cholesterol. Let’s consider what happened in the case of the three most popular diets of the 1980s. The Beverly Hills Diet was roundly criticized by the experts for being utterly unscientific. The reaction of Dr. Philip L. White, of the AMA's Department of Foods and Nutrition, was typical: "Her nutrition theory is out of the l9th century, and the diet is dangerous because it's so low in important nutrients and protein." The nutrition department of the University of California Medical School protested the serialization of the book in the San Francisco Chronicle for the same reason, declaring that all calories are the same and that weight reduction is possible only by lowering caloric intake below caloric expenditure. But the critics missed the point that this diet focused on enzyme containing foods, such as pineapple and papaya, which inactivate digestive enzymes and irritate the intestinal tract, thus interfering with digestion and absorption. Calories ingested does not always equal calories absorbed!

Then the long-smoldering debate between low fat maven, Nathan Pritikin and low carbohydrate guru, Dr. Robert Atkins came head-on in a debate on national television. Pritikin claimed that Atkin's low-carbohydrate plan inevitably means high animal fat and the consequent risk of heart disease. Atkins claimed success in treating a wide variety of illness-

es with his high-nutrient program, and called the severely low fat Pritikin diet impractical for most people. Dr. White threw up his hands at them both, saying, "I've never 'won' a TV debate with a diet author. They're entertainers. Next to them, we scientific types seem boring—or opposed to new ideas."

Pritikin's Longevity Institute has a remarkable record of success, but primarily with known heart patients. The complete or near-complete restriction of fat in his program is a drastic measure, and only those threatened with a serious ailment can ordinarily motivate themselves to stick to it. Moreover, who is to say what is the basic reason for the success of those who do stick to the plan—is it the absence of fat, or the abundance of nutrients that necessarily come with a high complex carbohydrate diet? I suggested the latter possibility to Mr. Pritikin during a debate with Dr. Atkins that I arranged at a convention of the Orthomolecular Medical Society several years ago. Since then, I have also come to suspect that low fat diets can induce long-term deprivation of essential fatty acids and could have serious effects. Dr. Bassler, who has worked with several patients at the Pritikin center, recently reported to the New England Journal of Medicine that the deaths of certain runners might be attributable to "nutritional arrhythmias," or malfunctioning of the electrical timing of the heart muscle—due to chronic depletion of fats.

Low fat diets increase risk of other deficiencies and this can cause adverse effects in some people. Low meat intake means a low intake of the vitamin, carnitine. Carnitine is required for transport of fatty acids to fuel the energy centers, mitochondria, of all cells. Fatty acids are the preferred cellular fuel and they come from both dietary fats and carbohydrates. Yes, sugars are converted into fat in your body! That is a major reason sugar can make you fat, for sugars are either burned or stored as fat. Muscles are major energy consumers and the heart is the champion of the muscles, but it requires carnitine to do this. So the common health prescription, increased exercise and decreased fat is not always good advice, especially not for those many individuals that run low on carnitine.

Another complication of the low fat diet is that low fat leads to more carbohydrate intake and this is converted into storage fat, triglyceride, at a faster rate than can be stored in the fat depots. In that case it must circulate, rising to high levels in the blood sometimes making a thick, fat emulsion that increases blood viscosity, promotes conversion of fibrinogen to fibrin strands, and coats the small vessels with fibrin monomers that impede the exchange of oxygen between red blood cells and the tissues. The extent of this hazard has recently been measured: the drop in oxygen transfer is over 50-fold as a result of a layer of fibrin monomers only a micron thick (1 millionth of a meter). This is a form of suffocation; it is definitely not healthy.

In addition, high carbohydrate aggravates the production of the most hazardous type of lipoprotein, the small-dense LDL, which is now recog-

nized as major risk factor for chronic degenerative diseases, especially prediabetes (high insulin=pancreatic stress), diabetes (injured pancreatic beta-cells), atherosclerosis, and heart attack.

At this stage I am prepared to say that, except for a small percentage of the population suffering from a unique inability to properly utilize fats, a program of drastic fat reduction as recommended by Nathan Pritikin and others appears misguided. At the least, the low fat diet is not for everyone. But it really comes down to our second rule of healthy nutrition: Moderation. And we try to prove the point by means of rule number five: Balance. I advise that when you find your balance points and arrive at your own maintenance plan, that you also ask your physician to test your triglycerides and the amount of LDL 3a+b (the small dense LDL).

The Atkins diet has also been characterized in extreme terms. Obviously there are millions of people who have benefited from Dr. Atkins advice. There are also millions who have tried low carbohydrates, felt bad, and gave it up. And, if my experience is any indication, there are a large number of folks who have had adverse reactions by trying low carbohydrates on their own. Judging by the few reports in the literature these have not been diagnosed. In the past year I have found three patients with adverse reactions to excess protein. One young man, a body builder, was hospitalized for a paranoid schizophrenic type episode after subjecting himself to a high protein, almost zero carbohydrate diet for a few months. A 12 year old high-functioning autistic child regressed for almost a month after taking a gram of methionine, the amount of this amino acid that would be found in 5 eggs, half a pound of beefsteak, or two cups of cottage cheese. Another of my patients, a 65 year old artist, suffered a persistent heart arrhythmia, with pauses every two beats (bigeminy) and later on he got persistent fibrillation. It turned out that he had put himself on very low carbohydrate intake with three times a day intake of animal proteins without consulting me. He had had an earlier episode ten years earlier when he first developed a temporary arrhythmia—but he hadn't made the connection to the high protein intake.

Until recently it was sufficient to point out that Dr. Atkins was only calling for a lowering of carbohydrates and he did not recommend a binge on animal fats. But it has become increasingly clear that the increase in protein intake that follows upon Dr. Atkins advice (and example) is the greater hazard. The danger of protein is due to the conversion of the methionine content of protein into homocysteine. Homocysteine is a chemically reactive molecule and can bind to the blood vessel wall, thus causing spasm and reduced blood flow. It also binds directly to fibrinogen, the stuff out of which clots are made. And the binding of homocysteine to fibrinogen is known to increase by about 20 times in the presence of high levels of Lp(a).

Is this a rare combination? I reviewed a hundred of my own patients who were tested for both Lp(a) and homocysteine and found 17 that were

high in both. By high, I mean Lp(a) over 30 mg/dl and homocysteine above 9 uM/L. I did not include fibrinogen in that survey but, this patient also had repeated tests that found high fibrinogen, as high as 430 mg/dl before treatment with fibrinolytic enzymes stabilized his level below 300 mg/dl. Luckily, this last patient had a homocysteine of only 6.8 uM/L when tested after an overnight fast; but it went up to 11.4 when measured 4 hours after ingesting two grams of methionine, an amount easily matched by a high protein meal.

Incidentally his total cholesterol was only 165 mg/dl and triglyceride 62 mg/dl, both very normal; but as luck would have it, he had high levels of these pro-clotting factors, a combination that increases the risk heart attack by about 10 to 20 times. He also carries a double mutation (homozygous) for the folic acid reductase gene, MTHFR 677. This means he is genetically handicapped by about two thirds in his ability to utilize the vitamin, folic acid, from food. At age 67 now, he is enjoying the most active and productive years of his career and the best sense of well-being of his adult life.

What makes this more remarkable is that he has two cancers: both metastatic melanoma and biopsy verified prostate cancer—and recurrent cardiac arrhythmia. Will the arrhythmia resolve? It has done so twice in the past; and now that we have made the appropriate dietary correction it is very likely that he will regain normal heart rhythm again. The point is that even under the best of circumstances, adverse conditions can occur if the individual patient strays into dangerous territory. Somehow, despite all of this insight in advance, in the heat of battle against his array of maladies, his experiment with the Atkins Diet and resultant excess protein was not mentioned until the persistence of arrhythmia forced a review of the total picture.

My main point is that no one diet is right for everyone, and therefore no doctor or biochemist or exercise trainer can categorically recommend a reduction in any major type of food for the public at large. In this case, excess fat is not the enemy, excess protein is. That doesn't mean that my patient can afford to be careless about fats and carbohydrates. Quite the contrary, it underscores the importance of the five basic rules of nutrition, starting with variety in diet and moderation in amounts and maintaining balance of carbohydrates, proteins and fats.

And to identify Balance, there is no substitute for the Listen to Your Body Diet: first, a carbohydrate adjustment; next, a fat adjustment, keeping protein up and carbohydrates stable, and paying careful attention all along to your energy and your mood. How you make these adjustments is easy, though perhaps not as easy as the all-this or all-that diets so common in popular magazines. But the effort is worth it, because when you are done you will have not only a tailor-made diet but also a very practical course in nutrition! You will know what you need to know about food.

Ironically, if you cut out fat entirely you may miss out on the EFAs, the

essential fatty acids, linoleic acid (also called omega-6), and linolenic acid (also called omega-3). Not only do these help burn fat more rapidly, they are also essential for a host of vital health functions that affect blood flow, inflammation, immunity, and organ function, including stomach acidity and renal blood pressure regulation, and most important, the ability of red blood cells to carry oxygen into the microcirculation, the smallest vessels in the deepest levels of our tissues. That is why it is so important to include supplements of flax oil (1 tablespoonful) and/or cod liver oil (1 teaspoonful) every day in your health regimen, especially if you are limiting your calories.

These are some of the things you may not see at first glance in the protein-fat-carbohydrate lists at the beginning of this chapter:

- The low-fat carbohydrates such as grains, beans, roots, and stems are filling and satisfying, and they also generally contain good quality fiber. (Leaves are also complex carbohydrates, but not as high in fiber.) In choosing carbohydrates rely on them rather than on the fruits (fruit sugars wet the appetite).
- Virtually every grain or vegetable has some protein; fruits have practically none.
- Animal foods provide protein more readily than non animal foods.
- To lower fats, choose your protein from lean meat, fish, and the legumes.
- Remember that the legumes are quite high in carbohydrates—you'll have to watch them carefully at the first stage of the program.
- For weight reduction it is better to eat snacks rather than meals. A snack is defined as any one or two items in the lists. A "meal" is three different items served together.

Anything beyond that is a "feast." Studies have shown that "meals" or "feasts" contribute to more storage of fat than "snacks" of the same caloric value. Five or six "mini-meals" are better than three regular meals with the same total calories.

The issue of protein usually comes up in a discussion of vegetarianism. I read recently in a book about elephants that these prodigious animals must eat 16 hours a day to get enough nourishment—because they are vegetarians. Now there are many admirable things about vegetarians, from a philosophical as well as nutritional point of view. Moreover, in this country those who make this dietary choice do so with their eyes wide open and with a true dedication to good nutritional practices. Yet there are dangers in going overboard on anything— including criticism of meat-eaters.

The weight-loss strategy involved in the **Listen To Your Body Diet** is quite a bit more than simple caloric reduction. Yes, some calories are better than others—that is, the calories represented by different foods are burned differently in the body. After all, the metabolism of food is not

quite the same as the burning of a woodpile. Biologist Raymond Peat writes, "The fact is that for many people 100 calories of sugar is profoundly different from 100 calories of protein, even when both are taken as excess food beyond an adequate diet. The sugar will affect not only the way it is used, but it will modify the body so that the other food is not used properly."

Proteins and certain fatty acids also vary considerably from one to the next in their ability to "burn" in the body. This characteristic is called their "specific dynamic action." Why then do all the debunkers of diets—they tend mainly to be establishment spokesmen—insist that "a calorie is a calorie," and that unless one lowers caloric intake or increases physical exercise no weight loss can occur? Well, in a certain sense they are right. One must burn calories to shed pounds (about 4,000 calories per pound). But there are at least four different reasons why some nutrients, in some bodies, burn better than others without overt physical activity. And these four ways add up to substantial differences in our ability to lose weight. They are not gimmicks dreamed up by promoters of special pills or special diets; they have all been reported in the leading medical literature for some time.

I have referred briefly to two of these four factors already: (1) the specific dynamic action of certain proteins, and (2) the superiority of unrefined foods which do not stress the pancreas and overstimulate insulin. A third factor in weight gain not explainable by caloric intake is simply a depressed metabolic rate. Studies published in *Nature* in 1979 and in the *New England Journal of Medicine* in 1980 indicate that the obese gain weight at a relatively low daily caloric intake because they have a greater efficiency for storing food energy. The implication is that all of us have a neuro-hormonal regulator that decides when we will burn and when we will store fat. Further studies have suggested that this regulatory mechanism is affected by diet as well as by heredity or illness. Several researchers have confirmed that this "set point" can be lowered or raised by the quality of food we eat and by exercise habits.

Finally, the fourth factor that influences caloric expenditure without overt corresponding physical activity is exercise. This must seem like a contradiction, but read on! You've seen the tables that tell how many calories are burned in walking, jogging, playing handball, etc. That's the overt physical activity. In addition to that expenditure, certain types of exercise cause an ongoing caloric expenditure. A study in the *American Journal of Clinical Nutrition* as far back as 1967 showed that exercise performed for more than an hour nearly doubles the basic metabolic rate (BMR). It runs the motor, so to speak, without the motor's being plugged in—so the motor must be running off its internal batteries. Furthermore, studies in Lancet in 1972 and in 1978 showed that aerobic exercise (such as long-distance walking, running, swimming, cycling) establishes certain metabolic pathways for the burning of fat. And these pathways remain open long after the exercise is completed. A marathoner can loll about in the comforting knowledge that she's burning more fat than her tennis-playing friends. Exercise does make a difference.

HOMOCYSTEINE:

A RISK FACTOR OF THE LOW-CARB DIET
THE KEY TO HEART ATTACK, STROKE AND CANCER

A series of brilliant research achievements in the past 30 years has confirmed the importance of homocysteine as a PREVENTABLE and TREATABLE factor in blood vessel disease. In fact, over 200 research studies already provide a consensus that identifies this molecule as THE strategic factor in heart attacks and strokes, far more powerful than cholesterol and fat. In the first place, cholesterol has vital structural functions in every cell membrane in your body and very low toxicity; whereas homocysteine is a transitory metabolic intermediate. If the chemical pathways to its useful end-products are impaired, homocysteine build-up causes more mischief than any other physiologic "ortho"molecule.

The possibility of homocysteine toxicity has been known since 1962, when a rare genetic disease of infancy was linked to high levels of this substance. It has taken over 30 years to verify that homocysteine can and frequently does build up to dangerous levels in many normal people also, especially if they are deficient in vitamins, such as B6, B12 and folic acid and betaine. Because these vitamins are frequently deficient in large-scale health and nutrition surveys, it is now believed that homocysteine is the cause of at least 10 percent of all deaths from heart attack. That amounts to over 50,000 deaths per year in the United States!

An important new research, published in the prestigious New England Journal of Medicine, shows that by fortifying a breakfast cereal with folic acid, homocysteine disappears from the blood of patients with coronary heart disease[1]. The researchers found that it requires at least 400 mcg of supplemental folic acid plus the usual dietary intake in order to remove the risk of homocysteine toxicity and damage. This is a direct challenge to the previous governmental RDA of 200 mcg, which was expected to be entirely available from food.

The editorial commentary that accompanied this research carries the headline "Eat Right and Take A Multivitamin." That is an historic first in American medicine. Up until now such research findings have ended with an admonition against vitamin supplementation, and calling for more research instead. This time the editorial calls for raising the RDA for folic acid. Such a bold about-face is based not only on this research but also another recent study of folic acid levels and birth defects[2] which showed that at least 400 mcg of folic acid plus the usual diet is required to achieve maximum prevention of neural tube birth defects, e.g. spina bifida.

The Nurse's Health Study found a roughly 50 percent reduction in coronary artery disease in women with diets rich in B6, folic acid, whether from supplements or diets high in fruits and grains. This was a large study of 80,000 participants and it was published in the Journal of the American

Medical Association in February of 1998. It is the largest study so far that links heart disease and these two nutrients, vitamin B6 and folic acid, which are especially available in orange juice, spinach, bananas, and whole grains--but also in calves liver, pate', red meat (rare), and fish. The researchers found that the greatest protection was at twice the RDA, i.e. a dose of 400 mcg of folic acid and 3 milligrams of vitamin B6.

The fact that homocysteine can damage blood vessels was very evident in the original reports of deficient cystathionine synthase enzyme activity in babies who developed brain damage and seizures due to blood vessel damage resembling atherosclerosis. After much research we know that not all such cases die in infancy but about half do suffer blood clots before age 30. That means about half of these genetic cases can go unrecognized into adulthood.

Dr. Kilmer McCully, then a research fellow at Harvard, was fascinated by the fact that the arterial damage in these infants closely resembles hardening of the arteries in adults. The infants had premature "aging" of their arteries! However this type of arteriosclerosis was NOT caused by cholesterol and had no evident connection to dietary fat. Instead, it was caused by deficiency of the enzyme, cystathionine beta synthase, and the damage could be prevented by providing megadoses of vitamin B6, to compensate for the genetic enzyme weakness.

Dr. McCully wrote a landmark research paper in 1969 in which he suggested that homocysteine might be implicated in coronary heart disease and that research should be conducted to determine if coronary arteriosclerosis could be responsive to vitamin therapy.[3] That was about the time Linus Pauling introduced the idea of orthomolecular medicine, which promoted the idea that nutrients are the "right molecules" for prevention and treatment of disease. Both men were ridiculed for advocating vitamin therapy but McCully has lived long enough to enjoy vindication. Homocysteine is a classic example of orthomolecular medicine because most cases can be effectively treated with vitamins.

Homocysteine is formed when the essential amino acid, methionine, loses a carbon atom, one of its physiological actions. The carbon atom also carries 3 hydrogen atoms, and it is quickly transferred to other molecules in a process called methylation. Methylation thus refers to the transfer of a carbon atom from methionine to other molecules. This is a vital process in biochemistry and requires co-factors, such as folic acid, cobalamin (B12), choline, betaine, and possibly dimethylglycine, all of which can transfer methyl groups. For example, methylation is required in order to form creatine for muscle energy, carnitine for cell energy throughout the body, taurine for cell membrane stability and cholesterol excretion, glucosamine for maintaining connective tissues and joint surfaces, phospholipids for cell regulation (PS) and cell structure (PC), and spermine for cell growth.

The methyl group is one of the smallest units of organic biochemistry, a single carbon atom with three hydrogens in attendance, but it has the abili-

ty to form electronic bonds with other atoms of carbon, hydrogen, nitrogen, and sulfur as well as oxygen. Methyl is one of the the most active players in the chemistry of life and homocysteine is one of the transport factors that carries the methyl carbons to their appropriate reaction sites. In the process homocysteine is transmuted into methionine, cystathionine, and adenosyl homocysteine, but only if the co-factor vitamins, amino acids, minerals and enzymes are in balance.

For example, in order to become cystathionine, homocysteine must join with the amino acid, serine, in a reaction that requires a synthase enzyme and adequate amounts of activated vitamin B6, i.e. pyridoxal phosphate. The enzyme, cystathionine synthase, was at first believed to be the whole story, and that excess homocysteine was due only to a genetic defect in this enzyme. Now we know that it is also a dietary problem, related to vitamin B6, which acts as a co-enzyme. That is, cystathione synthase enzyme requires vitamin B6 in order to reach full activity. Dr. McCully suggested that mild genetic damage, (heterozygous), might cause sub-clinical cases that could respond to treatment with vitamin B6 therapy. He theorized that this might explain the observation that vitamin B6 deficiency provokes arteriosclerosis.

Now we know that the synthase enzyme was only one of seven enzyme defects that can cause homocysteine to build up to toxic levels. In particular, blockade of methylene tetrahydrofolic reductase (MeTHF reductase) is now recognized as more common and therefore more important.

A remarkable research in support of the homocysteine-heart theory was published in 1976.[4] Patients with premature atherosclerosis, confirmed by angiogram, showed high homocysteine levels after taking a loading dose of the amino acid, methionine. Healthy controls did not. This eye-catching study did not open the door to the homocysteine paradigm but it did encourage research and by 1995 there were enough studies for a meta-analysis, bringing together results of 27 studies. Boushey[5] concluded that homocysteine is an independent risk factor for coronary artery disease, cerebrovascular disease and peripheral vascular disease, i.e. heart attack, stroke, and blockage of arteries and veins of the legs. He estimates that it causes 10 percent of the risk of heart attack and that the risk is graded, i.e. the higher the homocysteine level, the greater the individual risk.

Statistical analysis shows 15 mM/L to be high risk (95 percentile), while 11 mM is the upper limit of the mean (75 percentile). Previous to this analysis, homocysteine data was misleading and was rated as moderate (15-30), intermediate (30-100) and severe (>100)[6], which gave a false sense of security in interpreting results of testing. The reason for the discrepancy is simply that these numbers were intended for research into genetics, not clinical use. Full-blown enzyme deficiency (homozygous) causes blood homocysteine over 400 mM/L. 'Mild' cases (heterozygous) typically have blood levels of 20 to 40 mM, sufficient to be 'mildly fatal.'

This is especially important amongst French Canadians, who have

recently been found at high risk, almost 40 percent bearing a mutant MeTHF reductase enzyme, which exaggerates the homocysteine level if they are folic acid deficient. In general it is now believed that vitamin inadequacies, especially low folic acid, account for two thirds of all cases of high homocysteine. So far no conclusive study has been carried out to determine if correction of homocysteine will improve cardiovascular disease outcomes–but it is almost certain.

Other conditions that increase homocysteine levels are pernicious anemia, low thyroid, and kidney disease. Victims of end-stage renal disease typically develop accelerated atherosclerosis also. Since B12 is a co-factor with folic acid in the remethylation process that transforms homocysteine into methionine, it is logical to expect a similar increase in homocysteine in case of B12 deficiency. Thus it is no surprise to find that of 434 patients with B12 deficiency[7], almost all had homocysteine above 95 percentile (15 mM/L). Excess homocysteine is associated with several types of cancer, including breast, ovary and pancreas, and I have noticed a tendency for bone metastases in patients with high homocysteine. It may be a good idea to treat all cancer patients with folic acid, vitamin B12 and vitamin B6. For the same reason, I am wary of treating with methotrexate as it blocks folic acid and thus increases homocysteine levels. This inevitably must provoke platelet clots, growth factors and metastases, though I have seen no research paper on this subject to date (1998).

Other medications are also known to increase homocysteine levels. Anticonvulsants, particularly phenytoin (Dilantin™) are notorious folic acid inhibitors. Pancreatic enzyme supplements, also seem to interfere with folate absorption![8] Theophylline is believed to inhibit activation of vitamin B6 (pyridoxal phosphate) and caffeine is also chemically similar and associated with high homocysteine. Cigarette smoke has also been implicated and cigarette smokers have lower B6 levels than non-smokers and therefore higher homocysteine levels.

In order to underscore the importance of homocysteine and the extent of the supporting research, the next few paragraphs are a brief summary of the most important studies that have reached mainstream acceptance by the medical community.

In 1985 Boers[9] tested 75 patients with vascular disease and found nearly a third of those with cerebral and peripheral vascular disease also had high homocysteine. In 1991 Clarke[10] measured homocysteine after loading doses of methionine in his patients with premature vascular disease. He found 42 percent of those with cerebral disease, 28 percent of those with peripheral vessel disease and 30 percent of those with heart attack had high homocysteine. The relative risk of coronary artery disease in these patients was over 20 times higher than in a comparison group with normal homocysteine.

In 1988 Boers tested 32 patients with high homocysteine after treating them with vitamin B6 250 mg, and 5 mg of folic acid if they were deficient.

This normalized homocysteine in 81 percent. After adding 6000 mg of betaine, the results were 100 percent! This was an example of megavitamin therapy on all counts: B6 was given at 100 times RDA, folic acid at 50 times the then RDA, and betaine was given by the teaspoonful as there was no RDA. Before then one was likely to be called a quack for offering such treatment.

After Boers broke the ice, many other studies then succeeded in bracketing the required doses. Brattstrom found a 52% drop in homocysteine after 5 mg doses of folic acid in healthy subjects, also in 1988. Five years later a more definitive study was performed by Ubbink, who observed a similar 55 % drop in high homocysteine subjects (over 16.3 mM/L) when treated with only 1 mg folic but combined with 50 mcg of B12 and 10 mg of B6. A year later Ubbink fine-tuned his study by using a placebo group. The placebo had no effect on homocysteine, of course, but to a skeptical audience, it was a necessary demonstration.

Ubbink also tested folic acid at a lower dose, only 650 mcg, and found only 42 % lowering in high homocysteine subjects. This same dose of folic acid got better results when combined with B12 and B6. On the other hand a 10 mg dose of B6 by itself lowered homocysteine only 5%; and 400 mcg doses of B12 alone managed only 15% reductions. So it became clear that the key player in homocysteine therapy is folic acid and that doses as high as 650 mcg reach only 80 percent efficiency. Since the RDA is only 400 mg per day, it is likely that many people, otherwise well-informed, are still at unnecessarily increased risk for heart attack, stroke and cancer metastasis.

The Physicians' Health Study[11] followed 14, 916 men for over seven years during which there were 271 heart attacks, of which 19 were attributed to homocysteine (7 percent). When homocysteine scores were analyzed, those above 15 mM/L (95 percentile) were at three times greater risk than those below 14 mM (90 percentile). Thus, a 12 percent increase, the difference between 14 mM and 15 mM, was associated with a triple increase in risk of heart attack.

Other studies show that our norms for homocysteine are still too high and need to be lowered further. For example, Dr. Selhub[12] found the incidence of carotid artery narrowing is increased between 11.4 and 14.3mM/L. Dr. Graham's large study in Europe takes it even lower. His study compared fasting levels of homocysteine in atherosclerosis patients and healthy controls. The 750 atherosclerosis patients averaged 11.3 mM/L; but 800 normal controls averaged only 9.7. A methionine challenge test revealed an additional 27 percent of patients with high homocysteine that otherwise would have been missed. That is a lot of possible error in testing for a disease as lethal as this and for which there is a cure.

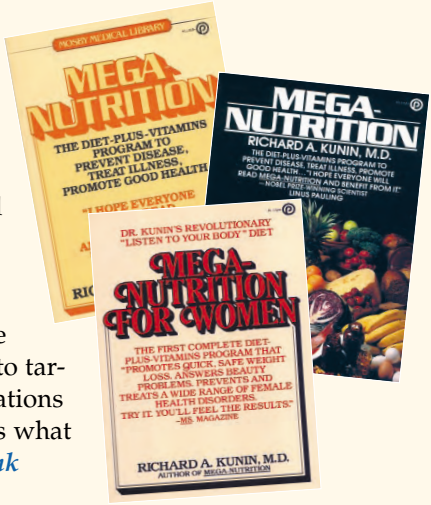
In 1988 the National Research Council increased the official Recommended Dietary Allowances (RDA) for folate and B6. Will we see changes in the public health as a result? Certainly! The impact on cardiovascular disease will lead to better health and longevity of such magnitude as to make this the biggest public health event of the second half of the 20th Century.

[1] Malinow MR, Duell PB, Hess DL et al: Reduction of plasma homocysteine levels by breakfast cereal fortified with folic acid in patients with coronary heart disease. N Engl J Med 1998;338:1009-15.
[2] Daly S, Mill JL, Molloy AM et al. Minimum effective dose of folic acid for food fortification to prevent neural-tube defects. Lancet 1997;350:1666-9
[3] McCully KS. Vascular pathology of homocysteinemia: implications for the pathogenesis of arteriosclerosis. Am J Pathol 1969;56:111-28.
[4] Wilcken DEL, Wilcken B. The pathogenesis of coronary artery disease: a possible role for methionine metabolism. J Clin Invest 1976;57:1079-82.
[5] Boushey CJ, Beresford SA, Omenn GS, Motulsky AG. A quantitative assessment of plasma homocysteine as a risk factor for vascular disease: probable benefits of increasing folic acid intakes. JAMA 1995;274:1049-57.
[6] Kang SS, Wong PW, Malinow MR. Hyperhomocyst(e)inemia as a risk factor for occlusive vascular disease. Ann Rev Nutr 1992;12:279-98.
[7] Savage DG, Lindenbaum J, Stabler SP et al. Sensitivity of serum methylmalonic acid and total homocysteine determinants for diagnosing cobalamin and folate deficiencies. Am J Med 1994;96:239-46.
[8] Russell RM, et al: Impairment of folic acid absorption by oral pancreatic extracts. Dig Dis Sci 25:369-73, 1980.
[9] Boers GHJ, Smals AGH, Trijbels FJM et al. Hyperhomocysteinemia: an independent risk factor for vascular disease. N Engl J Med 1991;324:1149-55.
[10] Clarke R, Daly L, Robinson K et al. Hyperhomocysteinemia: an independent risk factor for vascular disease. N Engl J Med 1991;324:1149-55.
[11] Stampfer MJ, Malinow MR, Willett WC et al. A prospective study of plasma homocyst(e)ine and riskof myocardial infarction in US physicians. JAMA 1992;268:877-81.
[12] Selhub J, Jacques PF, Bostom AG et al. Association between plasma homocysteine concentrations and extracranial carotid-artery stenosis. N Engl J Med 1995;332:286-91
[13] Graham IM, Daly LE, Refsum HM, et al. Plasma homocysteine as a risk factor for vascular disease: the European concerted action project. JAMA 1997;277:1775-81.

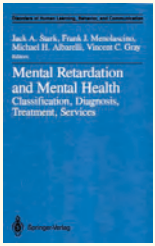
ABOUT THE AUTHOR

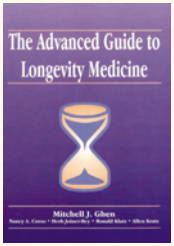
Dr. Richard A. Kunin is a nutrition physician, with over 30 years experience in the field. He pioneered the use of vitamins and minerals in medical diagnosis and therapy. He joined with Nobel laureate, Linus Pauling, in founding the **Orthomolecular Medical Society** in 1976 and wrote two best-selling books in the 1980s, ***Mega Nutrition*** and ***Mega Nutrition for Women***. He was invited to represent orthomolecular medicine at the President's Commission on Mental Retardation and Mental Health in 1987. After Dr. Pauling's death in 1994, Dr. Kunin founded **The Society of Orthomolecular Health-Medicine** to provide accredited educational forum for health professionals.

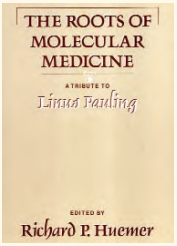
Dr. Kunin teaches medical strategy based on nutrition, detoxification and adaptive support that integrates all aspects of health care. The slogan *"putting nutrition first"* identifies this as physiological approach to health. His research in nutrition has produced new formulations and improved delivery systems that are creating a revolution in health products. As research director of **Ola Loa**, he is able to use his knowledge and experience to target the most effective nutrient formulations for better health and happiness. That's what makes **Ola Loa** the leader in the ***"Drink Your Vitamins"*** revolution.

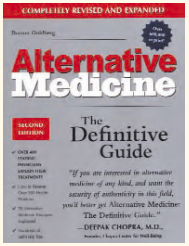


Dr. Kunin is also a contributor to various published medical books like *Mental Retardation and Mental Health, The Advanced Guide to Longevity Medicine, The Roots of Molecular Medicine,* and *Alternative Medicine*.









$5.95