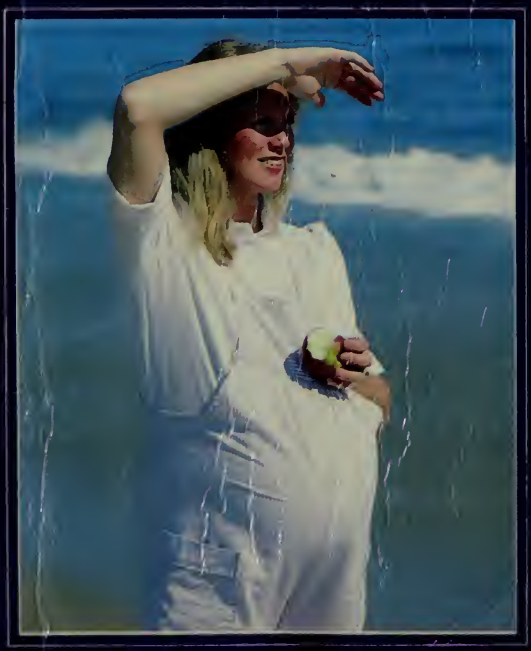
COMPLETELY UPDATED

THE TRUTH ABOUT DIET AND DRUGS IN PREGNANCY

WHAT EVERY PREGNANT WOMAN SHOULD KNOW

GAIL SFORZA BREWER
WITH TOM BREWER, M.D.,
MEDICAL CONSULTANT



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WHAT EVERY PREGNANT WOMAN SHOULD KNOW

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The Truth about Diet and Drugs in Pregnancy

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For All Our Children

Science should always explain obscurity and complexity by clearer and simpler ideas. —Claude Bernard, 1865

Nutrition is the most important of all environmental factors in childbearing whether the problem is considered from the point of view of the mother or that of the offspring. —Sir Edward Mellanby, 1933

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What Every Pregnant Woman Should Know

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A Routine Office Visit

"Let's step up on the scales first," the nurse directed.

Eve Gilbert had been preparing for this moment for two days—eating little and, last night, taking a laxative, anticipating the big brunch she planned to share with her husband, Dick, after her appointment. Though it was the middle of January, she wore a sleeveless summer dress and no underwear, hoping to save a few extra ounces from being permanently entered on her chart in the column marked "Weight."

"One forty-six," the nurse intoned. "You've gained six pounds this month. That makes twenty-four altogether. Doctor won't be too happy about this. You're the third one this morning. Must be the holidays! You'll regret all that turkey and eggnog next summer on the beach, I can tell you that! And all the weight won't do the baby any good, either. What kid wants a fat mother?" Shaking her head, she wrote "146" on the chart, set Eve up on the examining table, then swept out. The nurse knew how Dr. Finley felt about women gaining too much weight, so she took special care to give each one advice about dieting right after the "weigh-in." It was one of the most important parts of her job.

Eve wished Dick had come with her. Last month she had gained five pounds. Dr. Finley had said then that she had

only six pounds to go, and it was up to her how long she took to gain them. Now, with the birth of her baby still eight weeks away, she had reached the limit.

The nurse's remark about too much weight harming the baby worried her. Yet, Eve was hungry much of the time. She felt tired and irritable when she didn't eat. She wondered if this was normal in pregnancy. Two of her friends had gone to Dr. Finley and he had given them diet pills to control their appetites. Now, after their babies were born, they looked so trim. It was hard to tell they had ever had a baby, and they credited their good figures to Dr. Finley's careful watch on their weight.

Eve decided to ask the doctor to help her, too, since she was having so much trouble doing it on her own. She wrote "Pills?" at the bottom of her list of questions for the day, hoping he would have time to talk. She always felt guilty about taking too much time in the office, even when she had important questions.

"Good morning, Eve," Dr. Finley boomed. She liked his friendly manner, which added to her confidence in him. "How are you and junior doing today?" He strode directly to the desk where the nurse had arranged Eve's file, glanced at the column marked "Weight," and turned to her with a more sober expression. "Six pounds, I see. What am I going to do with you gals? Too many holiday parties?"

"Not really, Dr. Finley," Eve started to explain. "I guess I need help to stop eating so much. I've really tried the past few days, but I'm always hungry."

"Well, we can talk about that in a few minutes," he replied. "There are a few other things I want to check first, so we know where we stand."

"Is there something wrong?" she wanted to know.

"Now I didn't say that, did I?"

The nurse brought in the tray with the equipment needed for Eve's examination: fetoscope, tape measure, blood pressure apparatus, and thermometer. The last she placed

under Eve's tongue while Dr. Finley took Eve's pulse. Then he attached the blood pressure cuff above Eve's elbow, pumped it up, released the pressure, said "Hmm," then repeated the procedure. The nurse stood ready by the desk to fill in the numbers on Eve's chart. Eve stared at the ceiling with the thermometer under her tongue, pretending not to listen to them as they assigned numerical values to her body's functions.

"One thirty over eighty," Finley reported.

"One thirty over eighty," the nurse wrote.

"Pulse seventy-six."

"Seventy-six."

Placing the fetoscope on her abdomen, the doctor listened for the familiar thumping of a healthy baby's heart. After fifteen seconds he announced, "One forty."

Next he stretched the tape measure from Eve's pubic bone up over her protruding tummy to the topmost margin of her growing uterus. "Twenty-six c-m's," he relayed.

Finally, with both hands he pressed on Eve's middle in several places, chuckled when the baby kicked, then stood back and said, "The baby's in good position, head down, so you're both in fine shape. After you're back together I'll give you a little stick in the finger to check your blood count."

The sample of blood was analyzed by the office technician. It was the last number to be entered on Eve's chart for the day; her urine test was normal. The nurse poked her head through the doorway en route to her next "weigh-in."

"Hematocrit thirty-seven," she said. "Urine negative."

"Is that okay?" Eve asked, knowing she hadn't had a blood test since her first appointment months ago.

"Just fine," Dr. Finley answered. "Are you taking the vitamins and iron pills I prescribed for you?"

"Yes, of course," Eve replied.

"Then we won't have any problems with anemia, will we?" Finley smiled.

"Now," the doctor began as he closed the file and looked at her face for the first time this morning, "any questions?"

Yes, there were advantages and disadvantages to both formula and breast-feeding. The nurse could give her a pamphlet about infant feeding on the way out. Each mother must decide which type of feeding suited her best.

Yes, the hospital did allow fathers to participate in the birth and help in the care of their newborn babies, if the mother had a private room. The nurse could arrange a private room if Eve decided she wanted to have the baby with her, but many of his patients had complained about being tired after having "rooming-in."

Yes, it would be all right for her to continue her weekly swim at the Y, as long as she didn't overexert herself. Walking was also good exercise, he thought, and a good way to prevent leg cramps.

"Pills?" was the last entry on her list.

She summoned her courage.

"Dr. Finley, what can I do about my weight? I know I've already gained the twenty-four pounds you said were okay. What should I eat? Can you give me some diet pills so I don't feel so hungry?" Eve asked nervously.

"That's what I wanted to discuss, too, Eve," he said seriously. "I used to give diet pills, but some recent studies have shown that they don't work to reduce weight permanently and that they may have some bad effects on the baby. Just to be safe, we should try another approach for the next few weeks and see how it works."

He reached into a file cabinet next to the desk and pulled out a sheet of paper, which he handed to Eve.

"This is a low-calorie, low-salt diet plan for pregnancy. We use this now instead of diet pills. It tells you just which foods to eat and which to avoid. You see, we can't tell just by looking, but it may be that some of the weight you've put on already is just water your body is retaining. Salt does that,

you know. So, if you cut down on your salt and cut back on your calories, we should see some loss of weight in a week or two. Have you noticed any swelling in your feet and ankles?"

Eve nodded. "Just toward the end of the day a little bit. Is it dangerous?"

"No. Swelling of the ankles is pretty common. The weight of the baby pressing down on veins in the pelvis usually causes it. But," and he paused for emphasis, "if you notice any swelling of your face, or your rings get tight, that would be a sign of toxemia. You'd call me right away, agreed?"

She murmured assent, busily examining the lists of permitted and not-permitted foods, thinking she'd have to forget the brunch with Dick. She'd just sip some orange juice while he ate.

The doctor was on his way out the door.

Eve looked up gratefully. "Thank you, Dr. Finley. I'll do everything the diet sheet says. I'm sorry to have taken so much of your time today."

2

The Question Doctors Don't Ask

There are three million Eves and over twenty thousand Dr. Finleys reenacting the preceding scene each year in the United States.

On the surface it appears to be a well-conducted, even amiable interchange—the sort many women can remember as part of their pregnancy experience. A closer look reveals a grave omission that jeopardizes every pregnant woman and every unborn baby. This omission occurs routinely because the standards that determine the type of prenatal care given to pregnant women worldwide are deficient. They do not require that doctors ask each mother one simple, potentially lifesaving question:

"What have you been eating?"

Until sound nutrition is accorded first priority in routine obstetrical practice, all mothers must be considered "high-risk," endangered by the common pregnancy complications now known to be nutritional in origin.

The lack of attention given to pregnant women's nutrition in our country contributes heavily to some disturbing facts of contemporary life: the United States lags far behind many other advanced countries in terms of the health of our mothers and babies. Out of every thousand babies born, we lose eighteen in the first year of life, placing us sixteenth in the

world in infant mortality rate, according to international statistics compiled by the United Nations. The implications of American medical practice are of worldwide significance because so many physicians from other countries train here.

The incidence of low-birth-weight babies (under five and a half pounds at birth) born to mothers in all economic groups has risen sharply since 1960. Birth weight is the most important factor in predicting a child's future health and mental development. The correlation between low birth weight and a wide range of developmental disorders is highly significant and alarming.

There has been an upsurge in the number of brain-damaged, hyperkinetic, and learning-disabled children entering our nation's schools since the early 1960s, a time when birth rates have been declining. This was formerly considered a problem faced mainly by inner-city schools, but the number of these children has now reached epidemic proportions in even the most affluent areas. For example, officials in Monroe County, New York, a suburb of Rochester, report that 25 percent of their students are affected.

For the past forty years research has been conducted all over the world that concretely links maternal malnutrition with a host of obstetric and pediatric complications. Yet in 1975 the U.S. Department of Health and Human Services published research that concluded that the total number of pregnant women suffering from malnutrition—serious enough to endanger their babies—was more than 945,000. Roughly one of three pregnant women in America falls into the recognized malnourished group!

It is our opinion, based on analysis of this research and Tom's own work with pregnant women, that much of the pregnancy malnutrition found in the United States is attributable to unscientific methods of nutrition management that have become entrenched in Western obstetrics. Our physicians, almost without exception, have been trained to

demand compliance with weight-control regimens in pregnancy, irrespective of the mother's nutritional needs. Most of these programs feature low-calorie, low-salt diets. Some still use salt diuretics (water pills). They take into account neither the serious medical consequences of such dietary practices nor what is known about human nutrition.

As it stands now, most doctors have never taken a course in applied human nutrition. No medical school in the United States requires such a course of its students. As Dr. Frederick Zuspan, editor of *The American Journal of Obstetrics and Gynecology,* commented in August, 1976:

> Most medical students, interns, and practicing physicians do not know or appreciate good nutrition. This change must begin in the medical schools.

Doctors currently in training need to learn about the protective benefits of sound pregnancy nutrition. Just as important, doctors already practicing must also be educated and begin to apply the scientific research in nutrition to routine prenatal care.

In this they have much to learn from ranchers, farmers, and veterinarians, who are taught the importance of feeding pregnant animals scientifically. They know exactly what constitutes a healthful diet for a pregnant cow, sheep, or horse. And they enthusiastically put into practice what they know. They have to—some cows are worth $5,000 apiece!

Is a pregnant woman as valuable as a cow? If so, the answer to improving pregnancy outcomes worldwide lies in raising the awareness of doctors and women alike to the importance of good nutrition in pregnancy. The idea that pregnancy imposes a special nutritional stress on every woman is not commonly held. On the contrary, letters we have received from thousands of women here and abroad indicate that nutritional nonchalance characterizes much of the di-

etary advice given by American-trained doctors. A sampling of the most recent letters illustrates the point:

Little Rock, Arkansas

I am three months along and have had one miscarriage: the doctor told me I could only gain ten pounds. But is that right? I don't feel right about it.

Worthington, Ohio

Just last night in our childbirth class one "skinny" gal, four and a half months pregnant, stated her doctor reduced her diet to 1,000 calories because she gained seven pounds in seven weeks. This is the only weight she has gained thus far in her pregnancy.

Los Angeles County, California

Last week one of my students was told by a young doctor to lose fifteen pounds (she's due in three weeks) and that if she didn't she'd have to "go to County to deliver"—a threat they often use as it has a horrible reputation in obstetrics. Many gals are scared into dieting in order to save having to go there. This doctor also told the woman that it didn't really matter what she ate as the baby took it all from her anyway!

New York City

I'm a public health nurse involved in a prenatal clinic here; and in spite of the convincing evidence of harm, the clinic physicians still order low-salt and weight-reduction diets. They get hysterical over a four-pound weight gain in one month!

Miami, Florida

I have a student due in December who is underweight for her height. She is going to a private doctor who does not want her to gain more than eighteen pounds. One month she gained three pounds and he was very upset about it. He told her not to salt her food.

Boston, Massachusetts

I have been a member of the American Dietetic Association since 1956, have a master's degree in nutrition, and have worked in two teaching hospitals in New England. I have talked with many women who are afraid to face the physician because they have gained weight. I have attempted to discuss with these women the need for the basic four food groups emphasizing protein, but unless the physician has asked that they talk to me, they usually pay little attention because it has not come from the doctor.

Memphis, Tennessee

I had a first child who was a low-birth-weight, "toxic" baby due to the severe toxemia I developed in my last trimester of pregnancy. My OB doctor restricted me to *clear liquids only* for six weeks and diuretics daily. I have never received a straight answer to my questions about toxemia and its cause.

Ann Arbor, Michigan

When I was pregnant, my doctor told me I had preeclampsia, but did not elaborate to my satisfaction. Although I had regular prenatal checkups, no one even mentioned the possibility of toxemia to me until my blood pressure continued to rise on the delivery table. If I really had toxemia, shouldn't a doctor have known before? Is toxemia just a name that is applied to several symptoms, including weight gain, swelling, headaches, etc? I am especially interested in the relationship of nutrition to toxemia.

Havelock, North Carolina

When I went for my first prenatal, I was told to go on a salt-free diet and to eat sparingly so I would not gain "too much weight." All during my pregnancy my father told me I wasn't eating right, regardless of what the doctors were telling me to eat. I thought he was just being old-fashioned with his views of pregnancy and nutrition.

During the first six months I was always exhausted and developed severe anemia. I also developed severe kidney infections and toxemia. In the beginning of my eighth month, the toxemia was so severe I was hospitalized. I was placed on a diet of 24 ounces of skim milk and 24 ounces of dietetic orange juice daily.

On the third day in the hospital, I went into premature labor and my daughter was born six hours later. She had yellow jaundice, respiratory difficulty, and weighed four pounds, ten and a half ounces. For the first week of her life she refused to eat. Two months later she died of what the doctors called Sudden Infant Death Syndrome, or crib death.

Middletown, New Jersey

I argued with my obstetrician through two pregnancies to leave me and my thirty-five-pound gain alone. My babies were eight pounds, six ounces and eight pounds, two ounces—and healthy.

Green Bay, Wisconsin

I am a high school home economics teacher and have five children. None was a defective baby, fortunately, because I *ignored* my doctor's accusations that I was gaining weight at a rate twice too fast. I did not argue, but I knew in my bones that my baby was made out of what I ate. I was sufficiently intimidated not to protest, though.

Each of my children weighed between eight and nine pounds. I was the string-bean type—can you imagine what shape they would have been in if I gained only fifteen to twenty pounds!

Now in my classes when I tell my students that in somewhere between thirteen and twenty-two other countries a baby has a better chance to live to see its first birthday than in the United States, the students are shocked.

"How could this be? Why?" they ask.

Isn't it ironic that it has been medical advice that has caused devastating effects on these babies and mothers?

What would it take to redirect the efforts of these doctors away from weight control and onto sound nutrition? To make sure that every mother receives proper instruction about her diet? How much would it cost to insure that Dr. Finley asked Eve that all-important question: What have you been eating?

It requires neither the expenditure of vast sums of federal money nor the establishment of special offices and programs dispensing nutrition information. Quite simply, all that is needed is for every obstetrician to learn and pass on to his patients the basics of pregnancy nutrition and to emphasize this information at each prenatal visit. It would not take any more of the busy physician's time to disseminate correct information than is currently spent hounding women about their weight. And research shows that women fully cooperate in a program designed to make pregnancy a healthful time for themselves and their unborn babies.

The first step is convincing the doctor that the old methods he was taught in medical school have become obsolete in modern prenatal care.

3

Weight Control

A Hazard in Pregnancy

The idea that the weight of a pregnant woman should be controlled has been prevalent in obstetrics for a long time. Too long.

As medical knowledge has advanced, particularly about the way the baby develops *in utero,* it has become clear that the practice of strict weight control benefits neither mother nor child. The thinking of today's obstetricians, however, continues to be conditioned by four theories that have been popular for years:

1. Weight restriction is beneficial to the mother because it makes delivery easier.
2. Weight restriction is beneficial to the mother because it prevents toxemia.
3. Weight restriction does not harm the baby because the baby is a parasite, able to take what it needs from the mother.
4. Weight restriction does not harm the baby because the baby's birth weight is determined by heredity.

1. There is no denying that weight restriction results in smaller babies. Nineteenth-century medical school professors, from Brunninghausen in 1803 to Prochownick in 1899, wrote extensively on the subject. But the idea that a smaller

baby necessarily makes for an easier delivery overlooks a critical corollary to weight control—nutritional deprivation. In circumstances where mothers are on deficient diets, the weight control that results in a smaller baby is now known to also result in a uterus that is likely to malfunction during labor. Labor is often prolonged in these cases. Sometimes it stops altogether and the uterus must be artificially stimulated by drugs into further contractions. When this fails, Caesarean section is the only recourse. Dr. Cecil Mary Drillien reported in 1958 in the *Journal of OB/GYN of the British Empire* that more maternal complications are associated with low-birth-weight babies than those of normal weight. Among four hundred low-birth-weight infants studied, 52 percent of mothers experienced complications, whereas only 10 percent of the mothers of babies with normal birth weight experienced complications. These observations have been confirmed by many other researchers. Advocating weight control during pregnancy as a way of making labor easier simply does not correspond with the facts.

2. The notion that a mother who gains too much weight in pregnancy is more liable to develop toxemia arose because of confusion about what causes the disease. The predominant theory for many years was the "utero-placental ischemia theory." Its proponents believed that fatty accumulations around the blood vessels in the pelvis interfered with the flow of blood to the uterus. The placenta supposedly responds to the reduced blood flow by releasing an as yet unidentified "x" substance. The "x" factor, the theory holds, causes blood vessels throughout the body to constrict, raising the mother's blood pressure to dangerous levels. Direct damage to the mother's kidneys, liver, brain, and other vital organs are also blamed on this constriction of blood vessels.

Were this theory correct, the obstetrician would certainly be justified in controlling the weight gain of every patient. Toxemia is one of the most dangerous pregnancy complications. However, evidence from investigators around the

world, reported since the 1930s, points to an entirely different cause of toxemia—maternal malnutrition during pregnancy. This metabolic theory traces the onset of toxemia to a lack of nutrients essential in pregnancy, chiefly protein. Lack of these nutrients results in a malfunctioning liver. Various compensatory mechanisms throughout the body are called into action when liver function fails. These mechanisms account for the high blood pressure and abnormal swelling that characterize toxemia.

3. The "parasite theory" supports weight control because it contends that the developing baby takes priority for essential nutrients over the mother's own tissues. If any necessary nutrients are missing from the mother's diet, the baby is able to extract whatever it needs directly from the mother's body: protein from her muscles, calcium from her bones, etc. In this way, the theory holds, the baby is guaranteed normal physical and mental development in the womb, no matter how malnourished the mother may be. If the baby is small at birth, no one need worry. These theorists see the small baby as merely perfection in miniature.

4. Enter the "genetic theory," which maintains that the baby's weight and length at birth are inherited traits. If the parents are tall, the baby will be big; if short, small. This theory has been used as a way of explaining the much higher incidence of low-birth-weight and brain-damaged children among lower-income groups in our country. Epilepsy, for instance, is ten times more common among the poor. If these problems can be traced to genetic inferiority, then there is nothing anyone in authority can do except perhaps build more institutions to care for the retarded. If everything about a baby's development is predetermined by the parents' legacy of chromosomes, there is little that can be done to improve the outcome of pregnancy short of choosing the right ancestors, as one well-known obstetrician has only half-jokingly suggested.

If either the parasite theory or the genetic theory were

valid, neither restricting nor supplementing the diets of pregnant women should have any effect on their babies' birth weights. Yet it has been known since the nineteenth century that weight control during pregnancy results in a smaller baby, and Mrs. Agnes Higgins of the Montreal Diet Dispensary has shown over the past twenty years that improving a mother's diet results in a larger newborn.

The four theories discussed above have influenced the training of most obstetricians in practice today, so that weight control remains a fixture in American obstetrics. Doctors continue to seek a definitive answer to an irrelevant question: How much weight can a pregnant woman gain without placing herself or her baby in jeopardy?

The current "magic number" in often-encountered tables is 24 pounds, accounted for this way:

Fetal tissues (baby)	7½ pounds
Placenta	1
Amniotic fluid	2
Organ growth (uterus)	2
Growth of breasts	1½
Increase in blood	3½
Tissue fluid and stored body fat	6½
Total maternal weight gain:	24 pounds

This table appears to be based on a scientific analysis of the various physiologic changes that occur in normal pregnancy. However, recent research demonstrates that when weight control is not practiced and the mother is encouraged to maintain throughout pregnancy optimal nutrition, including adequate salt intake, she commonly gains ten pounds more than this table indicates. Additional circulating blood, tissue fluid, and stored fat comprise these ten pounds. This is not excessive, undesirable weight. Rather, as we shall see, this increase is a proven safeguard for mother and baby that is

subverted when weight control is practiced in lieu of scientific nutritional counseling.

The American College of Obstetricians and Gynecologists' *Guidelines for Perinatal Care* (1983) contains a chart that purports that the twenty-four pounds must be gained according to a set pattern in order to minimize obstetrical risks. Deviations from this pattern are to be interpreted as warning signs. A statement accompanying the chart also explains that twenty-four pounds are not to be gained by every pregnant woman. Those who are overweight at conception should have a smaller weight gain because by the end of pregnancy a mother should weigh no more than twenty-four pounds over her "ideal weight" for her height. The determination of appropriate weight gain in any individual case is left to the discretion of the physician.

This chart first appeared in a medical journal, *Clinical Obstetrics,* in 1953. Since its publication many comprehensive clinical studies have been reported in major journals here and abroad.[1] In fact, some of these studies originally were published in ACOG's own journal. Evidence from these more recent investigations leads to the conclusion that for numerous reasons it is hazardous to rely on weight control as a tool for management of human pregnancy. To the contrary, healthier mothers and babies result when the focus is on quality of the diet, not pounds.

Hytten and Thomson, British investigators writing on maternal physiologic adjustments in pregnancy in a 1970 publication of the National Academy of Science, were struck not by the supposed predictability of weight gain in normal pregnancy, but by its variability. They present convincing evidence that normal pregnancies can take place within a wide range of weight gain and loss, and that the pattern of weight adjustment is a function of individual metabolism

[1] See Bibliography: Brewer, Eastman, Hamlin, Iyengar, Lowe, Pasamanick, Pike, Platt, and Singer.

and activity. It is, therefore, not wise to attempt to regulate it.

They note that it was hard to find subjects for their research since many—perhaps most—obstetricians advise patients to eat less than their appetites dictate, thus altering the normal adjustments they wanted to study.

The 746 Scottish women chosen for investigation met all the criteria for normality in pregnancy: they were between the ages of twenty and twenty-nine, at least sixty-three inches tall, and in good physicial condition. They were allowed to eat to appetite. All gave birth to normal, healthy babies between the thirty-ninth and the forty-first week of gestation.

A chart showing the distribution of their weight gains over the last twenty weeks of pregnancy disproves every point advanced in the ACOG weight-control chart. Instead of each mother gaining the same amount of weight per week in the last twenty weeks, some mothers gained virtually nothing while others gained over forty pounds! Neither the total number of pounds, nor the pattern in which it was gained, had any effect on the outcome of pregnancy. *All mothers and all babies were normal.*

Clearly some factor other than the number of pounds gained was responsible for the normal outcomes of these pregnancies. A look at what the mothers were eating, a variable the study failed to detail, would be more productive in terms of providing practical advice for the physician to pass along to his patients.

Of course, if one looks at all the pregnancies in this study and averages the weight gains, an absolute number is reached. However, this statistical approach to the question of what is the correct management of an individual pregnant woman can only lead to difficulties. To establish the average of all weight gains in normal pregnancies as some sort of "ideal" to which every individual case must correspond

means that only those mothers for whom the "ideal" is physiologically compatible will be managed properly. All others will be coerced into following a pattern that does not foster their most healthful adjustment in pregnancy! In short, they are placed at higher risk of developing complications.

Babies are also more likely to suffer when the obstetrician's attention is devoted to controlling the mother's weight. Low birth weight commonly results when the mother follows advice to restrict calories and salt and to take diuretics during pregnancy. As was pointed out in 1968 by the National Institutes of Health "Collaborative Study of Cerebral Palsy, Mental Retardation and Other Neurological and Sensory Disorders of Infancy and Childhood," the baby who weighs under five and a half pounds at birth is more apt to be afflicted with such defects as mental retardation, cerebral palsy, epilepsy, hyperactivity, learning disabilities, respiratory distress syndrome (RDS), sudden infant death syndrome (SIDS), and to spend time in intensive care.

Most doctors know that in the last two months of pregnancy the baby who is developing normally experiences an unparalleled growth spurt. Many seem not to realize that this critical phase of the baby's development can be seriously disrupted by inadequate maternal nutrition during these last few weeks of gestation. When the physician rigidly enforces a weight-gain limit, mothers often reach it just as the baby's growth spurt begins. When a mother starts to cut down on her food and salt intake in order not to exceed her doctor's weight limit, she unknowingly begins to starve her unborn baby. It is tragic that as she earnestly strives to carry out her doctor's orders in the belief she is doing the best for herself and her baby, the mother is actually placing them both in jeopardy.

The work of Dr. John Dobbing—a research professor in the Department of Child Health, University of Manchester

Medical School, England—explains how interference with maternal nutrition at the end of pregnancy compromises the growth of the baby's brain in particular. In February 1976, in a talk at the Montreal Children's Hospital, he concluded:

> Even mild degrees of maternal undernutrition in the last few weeks of pregnancy can interfere with the normal growth and development of the human fetal brain.

For many years Dobbing has studied how the brain of the unborn baby develops. Identifying two periods of rapid growth of brain cells—the first at twenty weeks' gestation and the second at thirty-six weeks, one month before the baby is born—he believes that the developing brain is most vulnerable to the effects of maternal malnutrition at these times.

Since even "mild degrees of maternal undernutrition" can interfere with the baby's brain growth and development, the doctor must recognize what constitutes such "undernutrition," so it can be prevented in every pregnancy.

A sample day's menu from a typical low-salt, low-calorie diet sheet clearly exemplifies the undernutrition Dobbing warned against. Though apparently supplying an amount of high-quality protein adequate for pregnancy (approximately 90 grams), its severe restriction of calories and salt makes it a hazard to mother and baby.

The importance of adequate protein intake during pregnancy was proven by the pioneering work of Bertha S. Burke of Harvard. In the 1940s she found that women whose diets contained 45 grams or less of protein a day suffered the highest incidence of stillbirths, neonatal deaths, congenital defects, and premature and low-birth-weight babies.

The late Professor Benjamin S. Platt demonstrated at the London School of Tropical Medicine that these disorders could be produced experimentally in animals by limiting

protein. One way to do this is by restricting protein intake directly by not allowing the animals to eat protein-rich foods. Another way is to limit the amount of carbohydrates the animals consume. He found that when the calorie intake provided by fats, sugars, and starches is reduced below the body's requirements, dietary protein is burned for energy. During pregnancy this means that only the "leftover" protein will be available for growth of the baby and maintenance of maternal health.

A moderately active woman needs approximately 2,600 calories every day to meet her normal energy requirements in the last three months of pregnancy. If she is carrying twins, the figure is closer to 3,100 calories. On the kind of diet recommended for weight control by many obstetricians, she is going to get only 1,700 calories—a deficit of at least 900.

Platt calculated that a deficit of one-third in needed calories results in *one-half the dietary protein being burned for energy.* So, over half the 90 grams of protein the mother is allowed daily on this diet will not be available for building her baby's body and brain.

In other words, the effect of a "low-calorie, low-salt" diet is to put the mother on a "low-protein" diet—less than 45 grams a day—and right into the severely malnourished group Burke identified in the 1940s as being at higher risk.

The undernutrition caused by protein-calorie deficiency is aggravated by drastic sodium restriction to less than two grams a day. When the mother follows this diet, she and her baby are in trouble.

4

Low-Salt Diets

Why They Don't Work

Every day of her life the expectant mother, like every other man and woman, needs sodium. The trillions of cells that make up her body testify to this biological necessity. Like the cells of all species evolved from the sea, hers must be continually bathed in salt water to remain healthy.

Her unborn baby shares this legacy. Afloat in a sac filled with hospitable brine, the baby obtains the sodium it needs from the mother's circulating supply. The only way the essential sodium is in the mother's bloodstream is if she eats it. Sodium is contained in many foods, in addition to being readily available in its commonest form, ordinary table salt. The placenta transfers needed sodium from the mother's bloodstream to the baby's from the earliest weeks of pregnancy until the moment of birth.

Every person has many finely tuned mechanisms that work in the body to preserve the appropriate concentration of sodium in the tissues and in the bloodstream. These mechanisms are interrelated, so that a change in salt metabolism that affects one of them causes adjustments in others. Human sodium requirements vary widely, depending on an individual's level of physical activity, state of health or illness, and the external temperature and humidity. There is a great deal of concern today about overconsumption of salt in

our country. Studies have shown that excessive salt intake from infancy onward may result from the intake of prepared foods and snack foods that contain a great deal of salt but little else nutritionally, and have come to comprise a large part of the diets of many people. While the concern about oversalting may be legitimate in terms of overall public health, there is one group of people for whom oversalting is not a problem—pregnant women. In fact, pregnancy is one condition in which the body requires *more* sodium in order to remain healthy. Numerous changes in the mother's body during pregnancy explain this increased need for sodium.

Of first importance is the growth and development of the placenta. This organ, unique to pregnancy, makes possible the exchange of all nutrients and waste products between mother and baby. As the baby grows and requires more nourishment, the placenta increases in size to provide it. If the placenta does not grow well, neither can the baby.

As pregnancy progresses, the placenta needs a great deal more blood flowing through it in order to work efficiently. In normal pregnancy, the mother's blood volume must expand by more than 40 percent to meet this metabolic need. Salt is a chief element in maintaining this dramatically expanded blood volume. One of the properties of salt is that it causes the body to retain fluid, which, under normal conditions, is retained in the bloodstream for use in placental perfusion. Salt restriction during pregnancy limits the normal expansion of the blood volume. A blood volume below the level needed to service the growing placenta produces disastrous consequences.

Depending on the degree of salt restriction and subsequent blood volume limitation, the placenta may grow slowly or not at all; develop areas of dead tissue (infarcts) that cannot function; be unable to accomplish the transfer of all needed nutrients to the baby; or even begin to separate from the wall of the uterus, causing hemorrhage and cutting

off the baby's oxygen supply. Obviously, when the ability of the placenta to function is impaired, the baby's growth, development, and even life are imperiled.

Clinical evidence supporting the importance of sodium in pregnancy was provided in 1958 by Dr. Margaret Robinson, a London obstetrician. Working in a public clinic, she conducted a study of 2,019 pregnant women, chosen at random. Half were instructed to reduce their salt intake; half to increase it. Information about which foods contain high amounts of salt was given to the mothers in the low-salt group. Dr. Robinson did nothing else by way of dietary counseling to influence what the mothers ate. She only asked them to report the amounts of salt they were eating.

Unfortunately, not all the high-salt foods on the restricted list are nutritionally deficient. For instance, many, like milk, eggs, salty cheeses, salty fish, and salty meat products are important sources of essential high-quality proteins. Since this study was conducted with low-income mothers for the most part, the effect of banning these foods from the diet because of their salt content was also to ban the lower-priced excellent sources of protein. Consequently, when the mothers followed the diet and were unable to afford higher-priced protein foods, such as lean meat, they were not only on a low-salt diet but on a low-protein one as well. So, the outcome of this study is due not merely to salt restriction alone, but to a combination of salt and protein restriction. Since imposition of a low-salt regimen on a pregnant mother may well mean protein deprivation as well, the results of Robinson's work are very significant.

The low-salt group had nearly three times more damaged placentas, two and a half times more toxemia, and twice the number of infant deaths.

The high-salt group fared better in other ways. They had fewer delivery complications and even a reduced incidence of leg cramps during pregnancy than mothers in the low-salt group.

The inescapable conclusion is that dietary sodium benefits the pregnant woman and her unborn baby. It is required for optimum human reproductive efficiency. To restrict salt is to court disaster.

Dr. Robinson, while proving this important point, did so at agonizing cost to the families whose babies died due to maternal salt and protein restriction. Mothers in the low-salt group saw twenty-four more of their babies die—babies who might have been born healthy and strong if their mothers had happened to come into the clinic on another day.

Despite these findings many researchers today continue to demand that more studies like this be done on pregnant humans. Not satisfied with the wealth of supporting evidence from animal experiments conducted over the past fifty years, they propose studying the effects of drug therapy, protein restriction, calorie restriction, vitamin restriction, mineral restriction, etc.—all for the purpose of "seeing what will happen"! Their demands for "control" and "experimental" groups of pregnant mothers is clearly inhumane in light of the tragic consequences of just this one study, completed nearly twenty years ago. Persisting in subjecting more pregnant women and their unborn babies to hazardous deprivation experiments, or refusing to improve the diets of "control" mothers known to be suffering nutritional deficiencies in their daily diets, is criminal. Because of mounting criticism of such projects from a few lone voices in the scientific community and the public at large, many American researchers associated with prestigious universities and international health agencies have moved their nutrition projects abroad. A baby who dies or is damaged in Guatemala provokes less outcry than one whose life is taken in Boston.

Ruth Pike, a nutritionist at Pennsylvania State University, influenced by Robinson's work, decided to see if she could duplicate her findings in a highly controlled laboratory situation—using pregnant rats instead of human mothers as ex-

perimental subjects. Specifically, she wanted to describe changes in organs brought on by low-salt diets in pregnancy. Her experiments are significant because she did not restrict protein in the diets of the rats. Salt intake was the only variable in her two groups.

She described two specific effects. First, rat mothers who were salt-restricted gave birth to offspring of low birth weight. Second, rat mothers on low-salt diets evidenced profound changes in the cells of the kidneys and adrenals. Pike found that when she reintroduced salt to the diet three days before delivery, the rats did not exhibit these changes. The damage to the organs was reversed when salt was added back to the diet.

She also observed that rats whose diets contained little salt and who were presented with containers of salt water and distilled water at the same time chose the salt water first. Only after drinking enough of the salt water to provide the necessary amount of salt for their normal body functions did the rats move to the distilled water. Pike's observations should have been brought to the attention of American obstetricians long ago by ACOG. Such an action might have convinced physicians to stop handing out restricted diets in pregnancy years ago. Today, malpractice lawsuits may do it.

Ranchers, farmers and veterinarians have arrived at the same conclusions as Robinson and Pike through their own experience and experiments. This 1968 reminder in the *Dairy Goat Journal* emphasizes their practical approach to the question of dietary salt:

> Salt is in the forefront of all feed additives. Both sodium and chloride, salt's two components, are needed in the nutrition and physiology of all animals, including man. Without salt, life as we know it could not exist. With too little salt in the diet depending merely on the small amounts of sodium and chloride inherently present in

> feeds, animals become unthrifty and in time go to pieces. Cows deliver weak calves, or even lose their calves. Cows actually die from salt starvation.

Researchers and people who work with animals would never presume to add a certain prescribed amount of salt to an animal's feed each day as a way of meeting that animal's needs. They follow the proven principle of allowing the animal's instinct for salt to operate. They set out salt blocks or buckets of crushed salt which the animals are free to lick as they feel the need. In this way, each animal's *individual needs* for salt are best met.

Humans have an identical self-regulating mechanism, which, when allowed to function, guarantees an adequate supply of sodium to the body. Taste buds sensitive to salt are present on the tongue and inside the cheeks. When your body needs sodium, food tastes flat and unappetizing. This is a signal to add more salt to your food. In this simple way, nature alerts all of us to our metabolic needs for salt.

Should a woman happen to take in more sodium on any day than she needs, a second salt-regulating mechanism is activated. Her kidneys respond automatically to the elevated concentration in the blood by allowing excess sodium to leave the body in the urine. This built-in adjustment makes sure her body never becomes overloaded with sodium.

Dr. Mary Jane Gray of the OB/GYN department of the University of Vermont Medical School has tested this salt-regulating mechanism in pregnant women. She tried to induce salt overload in them and failed. Twenty-eight pregnant women were divided into two groups and followed for a month. Even with urging from the doctor to increase salt intake by means of salt tablets, capsules and syrups, the high-salt mothers retained no excess sodium in their bodies. Nor did any of them develop toxemia, although classic teaching has been that too much salt in the diet leads to toxemia.

There are a few medical conditions that have always been treated with salt restriction. High blood pressure (hypertension), heart failure and kidney failure are examples. When women with such conditions become pregnant, or when pregnant women develop such conditions, special care must be exercised by the physician to see that the mother obtains enough salt to allow her blood volume to expand normally without triggering undesirable side effects. In the case of hypertension, careful research challenges sodium restriction. Dr. Lionel Schewitz of Michael Reese Hospital in Chicago reported in 1971 that even mothers with severe hypertension did better with liberal salt intake during pregnancy than with rigid salt restriction and diuretics.

Otherwise healthy pregnant women may encounter some circumstances in which, though their kidneys are functioning normally, they lose more sodium from the body than is healthful. Many women report bouts of vomiting for a time during pregnancy, commonly during the first three months. Diarrhea from flu or other illnesses also results in excess loss of salt and water from the body. Or, if the mother lives in a hot climate, exercises strenuously, or works in a factory or laundry in high temperatures, she may sweat profusely. All these conditions boost the body's sodium need. If the mother does not take in more, her depletion will activate temporary sodium-conserving mechanisms in the kidneys and adrenal glands. If salt deprivation continues, these organs can become exhausted and show signs of degenerative disease. The best way for each pregnant woman to be assured of meeting her individualized sodium needs is to follow the wisdom of the body and salt her food to taste throughout pregnancy. The body's simplest salt-regulating mechanisms, the taste buds, are the most reliable guides to managing this aspect of human pregnancy nutrition.

Why, then, do doctors continue to place mothers on low-salt diets? Firmly fixed in their minds is the "magic number"

they have erroneously accepted as the upper limit of safety for pregnancy weight gain—twenty-four pounds. Exceed twenty-four and risk toxemia, difficult labor, and maybe a lifetime of obesity. When their thinking is dominated by these concerns, physicians are likely to accept any practice that seems to control weight—even that of restricting one of the most vital bodily substances, sodium. It seems unlikely that the laws of physiology and biochemistry that govern human sodium metabolism are suspended in the case of the pregnant woman. Yet doctors ignore these fundamental needs and persist in viewing salt restriction as an easy, safe way to rid the mother of worrisome pounds.

The pregnant woman's problem is that her doctor has set *artificial standards* for weight gain and salt intake. In order to enforce these standards, he relies on her cooperation in a deliberate strategy of nutritional deprivation for the duration of her pregnancy. If she follows the diet, the protein-calorie deficiency it engenders will be further complicated by sodium deficiency. After a time, her metabolism will be markedly altered due to physiologic stress caused by malnutrition. She will become ill. Her baby will suffer. The diet will have failed.

The low-salt, low-calorie diet doesn't work because it overlooks the body's physiologic self-conserving mechanisms and brings about the very conditions it was designed to prevent:

1. **High blood pressure:** when salt is restricted below body requirements, the kidney reacts by releasing a hormone, renin, into the bloodstream. Renin influences other hormones which, in turn, cause the arterioles to constrict. The effect is to raise the blood pressure since the same amount of blood is being pumped with the same force through a smaller opening. The obstetrician worries about high blood pressure (hypertension), since it often accompanies one of the most dangerous

pregnancy diseases, toxemia. By putting the mother on a low-salt diet he can *cause* hypertension where there was none before.

2. **Low-protein intake:** not only does the conventional low-salt, low-calorie diet directly limit the amount of protein available for the baby's growth and the mother's health by cutting back on her needed calories by one-third, but the low-salt provision sharply limits her range of food choices and makes the permitted foods less palatable. Her appetite wanes, so she will probably eat less than she could under the diet's rules. She will then be even more severely malnourished than a first look at the diet indicates. As her intake of protein falls, her liver becomes less able to manufacture circulating serum proteins, such as albumin, and albumin levels start to fall. As a result, water is lost from her bloodstream into the area surrounding the cells (interstitial space), and it appears that other substances in the blood, such as iron, are present in adequate levels. Fluid lost from the bloodstream shows up as generalized swelling of tissues called edema. Edema caused by this fall in albumin levels is abnormal, a sign of disease. It is a clear sign with metabolic toxemia. The mother's true anemia is also masked.
3. **"Excess" weight gain:** the edema will increase as long as the woman's body is malnourished. Her kidneys excrete less water in the urine as they scramble to keep salt and water concentrations in the body within normal limits; the reabsorbed water cannot be held in the bloodstream since albumin levels are too low, so it leaks out into the tissues. Result: added swelling and added pounds.

A logical, effective alternative to this type of stopgap dietary meddling would be a program for pregnancy nutrition that respects physiology.

In order for an obstetrician to implement such a program in his practice, he would have to abandon the traditional

thinking and unscientific practices taught him by his professors in medical school. Instead, he would focus his efforts on preventive care—on getting each prospective mother to eat good foods to appetite and to salt her food to taste.

Doing so, though, would soon lead him to a confrontation with another aspect of his routine practice, the diagnosis and treatment of edema, or swelling. He would find, to his acute distress, that the vast majority of pregnant women who eat to appetite and salt to taste, whose diets provide the optimum amounts of protein, calories and salt, do swell during pregnancy—normally!

He would then have to learn how to distinguish normal, healthful swelling from the swelling that accompanies disease—especially metabolic toxemia.

5

Understanding Swelling

Water Retention Is Normal in the Well-Nourished

Eighty to 90 percent of women swell up at some time in the course of their pregnancies. Most American obstetricians look on this normal swelling with alarm. The specter of toxemia is never far from their minds, and toxemic women swell up.

Physicians have been trained to view swelling as a potential danger sign. When they see swelling of the face or hands, they recoil in horror. This is definitely a "condition" to be "treated." They attack the swelling with therapeutic frenzy. They desalt. They drug. They dehydrate. Then they are confounded when their patients develop toxemia anyway.

Dr. Leon Chesley, for years the distinguished author of the toxemia chapter in *Williams Obstetrics,* the most widely used obstetrics textbook, now challenges this traditional approach to pregnancy swelling. After forty years of research in the field, he has concluded that normal swelling, or physiologic edema, is a sign of health in pregnant women, and not a pathological condition to be treated.

At a July 17, 1975, hearing of the Food and Drug Administration on the use of "water pills," or diuretics, in preg-

nancy, Dr. Chesley testified that 60 to 70 percent of normal pregnant women will have benign swelling of their faces and hands—in addition to that of their feet and ankles.[1]

This single statement is of enormous significance because up to two million pregnant women a year since 1958 have been placed on potent diuretics to "treat" the very edema Professor Chesley termed normal.

Citing study after study, going back as far as Dexter and Weiss's classic book on toxemia (1941), Dr. Chesley criticized the routine American obstetrical practice of "treating" pregnancy edema at all. Instead, he argued for an appreciation of its underlying physiologic causes.

Normal water retention comes about in pregnancy chiefly from an impressive rise in the level of female hormones, principally estrogens, manufactured by the placenta. These hormones are the same ones that cause many women to have water buildup and swelling in the few days preceding their menstrual periods, or when they are taking birth control pills. During pregnancy these hormones influence connective tissue throughout the body to retain extra fluid. Hence, the pregnant woman commonly experiences swelling of her face and hands (generalized edema) in addition to that of her feet and lower legs (dependent edema).

The retained fluid is of benefit to mother and baby. Like a reservoir, it provides a water-storage system in the mother's body. The stored fluid serves as a safeguard, a backup for the expanded blood volume we have learned is needed to nourish the placenta. At the time of birth, when some blood loss is unavoidable, the extra fluid protects the mother from going into shock. Remaining tissue fluid is mobilized in the early breast-feeding period to insure the mother an adequate milk flow.

In women pregnant with twins, the process of physiologic

[1] A complete transcript is available from: FDA, Bureau of Drugs, 5600 Fishers Lane, Rockville, MD 20852

swelling is exaggerated. Their larger placentas manufacture more hormones, which in turn cause more water to be retained in their bodies—normally! This additional water, plus the weight of the second baby, dramatically increases the weight gain of the mother carrying twins. Weight gains of fifty to sixty pounds are typical when mothers are encouraged to eat well. Unfortunately, in the United States, where rigid weight control, salt restriction, and diuretic therapy have characterized standard prenatal care, diagnosis of a twin pregnancy automatically assigns a mother to the so-called "high-risk" category. It is easy to understand why twins have had so much trouble when their intrauterine growth has been consistently subverted by these practices. It has even come to be accepted by doctors and mothers alike that "twins come early"—that they are born three or four weeks ahead of time, and that each must weigh less at birth than a single infant would. Doctors often say that the mother's uterus had stretched as much as it could—"there was no more room"—so the babies had to be born.

When mothers of twins are counseled to eat correctly for three throughout gestation they meet their increased nutritional demands. When they refuse diuretics and low-salt diets for their extra physiologic edema they usually give birth, at term, to infants of normal birth weight. Twins are not of necessity "high-risk." They only become so when management incompatible with their extra needs is imposed by the physician.

Dr. Chesley, in his FDA testimony, consistently associated the presence of physiologic edema with better infant outcome. On two critical measures, birth weight and infant mortality, mothers with normal swelling did far better than those without it.

Drawing attention to a major conclusion of the 1968 *NIH Collaborative Study of Cerebral Palsy,* Dr. Chesley noted that babies born to mothers with normal swelling were of

higher birth weight than those born to mothers with no swelling.

The Collaborative Study also found that a baby's birth weight is the most reliable indicator of future neurologic development. Low-birth-weight babies have a much higher likelihood of starting life with significant brain damage or growing up to face learning difficulties in school.

Dr. Chesley also reported a review of the medical records of 17,000 healthy mothers pregnant for the first time. In this study edema was associated not only with higher birth weight, but also with lower infant mortality. In 10,126 mothers who at no time had edema of the hands or face, the infant death rate was 26 per thousand. In the 6,963 mothers who did have edema of hands and/or face, the infant death rate was 18 per thousand. There was 44 percent higher infant mortality in the no-edema group!

After presenting this evidence and a very erudite discussion of the other harmful effects of "water pills" (which called into question the validity of the research which had originally persuaded the FDA to allow them to be used in pregnant women), Dr. Chesley went on record in opposition to the use of diuretics in human pregnancy. He stipulated only one exception to the blanket contraindication. Diuretics may appropriately be used when the mother suffers heart failure, kidney malfunction, or other medical disease which results in abnormal water retention in both the tissues *and the circulation.*

This exception does not apply to toxemia, Dr. Chesley asserted. He adamantly stated that diuretics do not prevent or ameliorate toxemia. This bold conclusion discredited the slick, four-color spreads promoting diuretics which have appeared in major American OB/GYN journals since 1958. To the contrary, Dr. Chesley blamed diuretics for aggravating a significant abnormality present in mothers with toxemia, low blood volume (hypovolemia). The diuretics drive sodium

and water from the circulation, thus shrinking the blood volume even more. When used in conjunction with a low-salt diet from early pregnancy on, as the drug companies urged in their promotions, the diuretics assist in bringing on the toxemia the doctor seeks to prevent.

What has been the outcome of this hearing? Up to now, most practicing obstetricians do not even know it was held. No testimony from the several physicians who appeared at the hearing has been publicized. The FDA has not called a public press conference to warn the public directly about the hazards of these drugs, even though millions of women and unborn babies continue to be exposed to them. Nor have the customary warnings been sent to physicians.

Rather, the FDA merely issued directives requiring a change of labeling on the drugs, removing the indication that they are effective in toxemia. Without warnings, this labeling change in the fine print of the doctors' portion of the package insert has gone unnoticed by most busy physicians. Alarmingly, the American College of Obstetricians and Gynecologists, whose representative at the hearing argued that the drugs should continue to be prescribed if the mother is "too uncomfortable" at the end of pregnancy due to edema, still clings to this position. As a result, many thousands of women each year continue to take these drugs because their doctors continue to write the prescriptions.

Recent developments in malpractice litigation—including numerous suits pending in U.S. courts—may finally rectify the situation and result in protective standards of care—forced on the obstetrical profession by successful plaintiffs who have suffered damages from physician-prescribed undernutrition and diuretics. Whether legal remedies will be available to women in other countries where these practices prevail is yet to be determined.

This situation is not confined to the United States. As

Professor A. Cretti, an OB/GYN professor from Poland commented in the *P.E.T.S. Newsletter* (No. 8: November/December 1983):

> Some ten years ago there were serious arguments against the use of diuretics in gestosis (P.E.T., pre-eclampsia/eclampsia, MTLP). In the U.S.A. the Food and Drug Administration gave a warning against their use. During our international congresses after 1974 there were almost no publications advocating the use of diuretics in gestosis; one paper at the symposium in Muenster (1976) and one paper at the symposium in Vienna (1982)—both papers strongly criticised by the participants.
>
> So somebody could conclude that the problem of diuretics in gestosis was sufficiently investigated and discussed and that this questioin was solved, namely, that diuretics should not be given routinely in gestosis with the exception of cardiac failure or pulmonary oedema.
>
> But what is going on in practical life? Not only in the case stories in your *Newsletter* do we read of diuretics being administered, but you can also read reports based on answers from hundreds of obstetricians surveyed and presented in the medical journals.
>
> In 1978 Chamberlain and co-workers (*British Medical Journal,* 1: 626) described the results of the questionnaire action in the United Kingdom and Eire. In fulminating (severe) pre-eclampsia, 872 out of 1093 respondent obstetricians *still used diuretics!* A similar study from Sweden was published as late as 1981 by Lindberg and Sandstrom (*Acta. Obstet. Gynaecol. Scan.,* 60: 327) showing that 123 out of 179 respondents still use diuretics.*
>
> The problem of diuretics is only one example of many

* Note: the Organisation Gestosis has recently distributed new questionnaires to hospitals all over the world to get information on how toxemia is really being diagnosed and treated. The questionnaire is available from: Dr. E. T. Rippmann, Gerbergasse 14, Basel, Switzerland, or Dawn James, Secretary, P.E.T.S., 33 Keswick Avenue, Hullbridge, Essex, England SS 5J L6.

> differences between the standard of management presented at congresses and this standard in practical life. At the congresses there are mainly reports on very good results from single highly-specialised departments with sophisticated equipment and abundant excellent staff. But in these hospitals only a very small proportion of the world population of pregnant women are delivered. What is going on with the remaining vast majority of gestosis cases, how they are diagnosed and treated, remains unknown.
>
> It is very good the P.E.T.S. publishes the case stories of its members, showing how much the practical management of gestosis differs from the beautiful picture of this management in top departments. If the OB/GYN doctors will study these newsletters they shall realize these differences and take steps to improve their management.

Without the correct information from their physicians about normal swelling, many women are dismayed by the way they look when they begin to swell a bit. Many physicians play on the mother's glum assessment of her looks as a way of forcing compliance with their low-salt diets and diuretics. If the mother refuses to cooperate, other forms of pressure may ensue. She is often told that her swelling is related to unnecessary accumulation of fat during pregnancy that will lead to permanent obesity. Or that her husband might lose interest in her if she becomes obese. The mother, not realizing that her swelling is probably normal and will vanish after the baby is born, accepts her doctor's appraisal.

One suburban mother angrily recalls how her obstetrician was so disgusted with her twenty-eight-pound weight gain and open disregard for his diet during her second pregnancy that he refused, point-blank, to attend her delivery. He "taught her a lesson" by leaving her in the hands of a doctor-in-training she had never met before!

Her healthy baby boy weighed seven pounds—a marked difference from her first child, who weighed three and a

quarter pounds and was born prematurely after an induced labor due to toxemia. This mother had followed the doctor's diet the first time, and the child has had an endless series of health problems since birth, a victim of intrauterine malnutrition. These families are those now lodging lawsuits.

When swelling becomes uncomfortable, as it might toward the end of the pregnancy, the mother should take the following steps:

1. Switch to open, flat shoes, like summer sandals. Feet are then free to swell as the day goes on, not pinched tight in closed shoes.
2. Try to minimize chair-sitting, especially on hard surfaces. Return of blood from the lower legs is impeded as the chair edge presses into upper leg. Sitting tailor-style (cross-legged) or using an ottoman for a footrest brings lower legs even with hips, assisting the flow of blood.
3. Lie with feet elevated on pillows, permitting return of blood pooled in feet and lower legs. Repeat three or four times a day, five to ten minutes each time.
4. Remove too-tight rings from swollen fingers.
5. Keep salting food to taste. Swelling can result from too little salt in the diet.

If the doctor suggests diuretics at any time in pregnancy, the mother must ask questions.

First, of herself: Am I eating a diet adequate for this pregnancy? Am I getting enough protein, calories, and salt? Swelling can result from deficiencies of any of these nutrients.

Next, of the doctor: Do I have any medical disease that causes an abnormal increase in blood volume, such as heart failure or nephritis? Diseases in which excess fluid is retained *in the circulation* may be aided by judicious diuretic therapy. An internist should be consulted and careful evaluation of the mother's condition made if any of these medical diseases

are suspected. Diuretic therapy should be conducted *only* in the hospital where the mother's situation can be followed closely.

Women must know that these diseases are exceedingly rare during the childbearing years. So rare, in fact, that if a doctor prescribes a diuretic for her, she must ask why she needs it. **If he assures her she has no abnormal increase in her blood volume due to underlying medical disease, she should refuse to take the pills. Diuretics can do nothing but harm except in these rare situations.**

Dr. Douglas R. Shanklin, professor in both the departments of OB/GYN and pathology at the University of Chicago Medical School and past editor of the *Journal of Reproductive Medicine,* declared in 1973:

> Modern renal physiology makes it clear that the use of diuretics in pregnancy has little or no basis. There is a strong body of belief that they are causative of complications. The use of diuretics in pregnancy should be banned; they should be abandoned in modern prenatal care.

6

Metabolic Toxemia of Late Pregnancy

A Disease of Malnutrition

"Doctor, it's Mrs. Gilbert on line two. She insisted on speaking to you."

Dr. Finley excused himself from his patient and took Eve's call in his private office.

"Hello, Doctor, I don't know exactly what's wrong. Everything's been going so well with the diet up until now, but this morning I can't get my feet in my shoes and my rings have gotten so tight I can't get them off. Also, the past two days I've been very tired. Last night Dick had to fix dinner when he came home. I didn't even feel like eating—and this morning I felt nauseated, too. I just got out of bed to call you. I know my regular appointment isn't until next week, but I was wondering if you could see me sometime today . . . if you could squeeze me in?"

Finley pulled Eve's chart from the file next to his desk.

"I see you were in last week, Eve. How long have you been following the diet?"

"Three weeks."

"And you've really been keeping with it? No deviations or substitutions?"

"Oh, no, Doctor. I've been cooking my food separately

and letting Dick do the shopping so I won't snack on potato chips while I'm at the market. I admit I will want to use salt on things, but I know how important it is to control my weight right now . . . and that's the other thing that bothers me."

"Yes?"

"I think I've gained seven pounds this week. I don't know how, though. What do you think is wrong? I'm scared, Dr. Finley."

"Now don't worry, Eve. We can take care of this just fine. I want you to come in at one o'clock this afternoon. I'll check your blood pressure and take a look at this swelling and weigh you on our scales. It may just be a difference between your scales and ours that's upsetting you. . . ." His voice trailed off.

"But I feel so weak—and look so puffy. Dick says I look like I got back all my baby fat. Should I have him come with me this afternoon?"

"Well, I don't think that will be necessary, Eve. If the swelling looks as bad to me as you say, we can give you some water pills to get rid of it in no time. I have some samples right here and you can get the prescription filled on your way home, okay?"

"But what if it's something else? What if it's toxemia?"

Toxemia of pregnancy, "the ancient enigma of obstetrics," has presented a grave danger to pregnant women throughout history. Hippocrates, the ancient Egyptians, and the Chinese were perplexed by it. Lever, the first to write about the disease in the modern era, detailed case studies from London, 1832–1843, the first to mention the diets of the patients.

Later medical writers observed that pregnant women with toxemia swell dramatically in the last half of pregnancy, gain large amounts of weight suddenly, develop high blood pressure, and experience blinding headaches. Protein ap-

pears in their urine. In the most severe cases, women fall over in convulsions, lapse into coma, and die, often with their babies undelivered.

Nobody knew why, though many theories were advanced to explain the origin of this killer disease. Atmospheric conditions, emotional instability, a too-tight uterus in first pregnancies or twins, poisons from the breasts and fatty accumulations pressing on pelvic arteries have all been blamed at one time or another. Yet none of these theories has been able to account for all known cases.

Various treatments have been devised to combat the classic signs and symptoms known as the "toxemia syndrome." Low-salt diets and diuretics aimed at reducing swelling, low-protein diets aimed at stopping protein spills in the urine, low-calorie diets and amphetamines aimed at limiting weight gain, drugs aimed at lowering high blood pressure, drugs aimed at preventing convulsions, and, as a last resort, delivery as soon as possible by inducing labor with synthetic hormones or by Caesarean section have all been tried. None of these therapies has successfully eliminated the disease, because none has been directed at its underlying cause.

In the United States, where the rate of Caesarean deliveries is climbing past 30 percent of all births in 1985, and where new *lower* values for treating blood pressure variations have been instituted and are being aggressively promoted by pharmaceutical houses, more women than ever before are being diagnosed with supposed toxemia. Shockingly, their treatment, based on recent medical records we have reviewed, is not much different from that reported by Lever 150 years ago!

Today, as a result of evidence gathered by researchers over the past forty years, there is conclusive evidence why pregnant women get toxemia. Even better, we know there is an inexpensive way to prevent it in every pregnancy.

A demonstration toxemia prevention project was insti-

Excerpt from: *Guy's Hospital Reports,* vol. 1, series 2, 495-517, 1843

CASES OF PUERPERAL CONVULSIONS WITH REMARKS

by John C. W. Lever, M.D.

CASE 1.

Fifth Confinement—Anaemic Convulsion from Loss of Blood—Mother recovered—Child born alive.

ELIZA H——, aged 36, in labour with her fifth child. When seven months pregnant, she had a discharge of blood; and about a week previous to her labour, whilst rising from her chair, about half-a-pint again passed from her, unattended by pain or effort; this discharge continued in greater or lesser quantities, up to the time of her labour. She was much depressed in spirits, and complained of feeling weak: her pulse was feeble, 80. She had been living in a state of most abject penury for two or three months, *subsisting for days on a single meal of bread and tea.* Her face and body were covered with cachectic sores. Mr. Tweedie, who was called to Mr. Champion's assistance, made an examination. The os uteri scarcely admitted the point of his finger, and the disturbance brought back a return of the bleeding.

On the 28th, and morning of the 29th, she was better: the discharge not so great, but of a more offensive character. At 10 P.M. Mr. Tweedie was summoned: he was informed that since 2 o'clock she had had several fits resembling those of epilepsy, followed by stertorous breathing, and insensibility: her pulse was 72, feeble: pupils variable: on being roused she said she had a most severe headache. During Mr. Tweedie's visit she was seized with a rigor, followed by paroxysms of convulsion, alternating with stertorous breathing. Towards the con-

clusion of these fits, there seemed to be a certain degree of uterine contraction; and on examination, the os uteri was found fully dilated, the child's head presenting at the brim of the pelvis. Her hair was removed from her head; but the pulse would not admit of the slightest depletion [Ed. note: Her pulse was too weak to permit the doctors to think about bleeding her with leeches or by opening blood vessels surgically.] From this time the convulsions increased in force and frequency until 1 A.M. when the child was suddenly expelled during a fit;—a female, living, but very small, and apparently but seven months advanced. The placenta was readily removed. There was no unusual haemorrhage, and the perinaeum had not been injured. After the birth of the child, she lay insensible, and could not be made to swallow either medicine or sustenance: the pulse remained exceedingly feeble, and 72: the convulsions continued to recur, though less powerfully than before; and as depletion was contra-indicated, abundant dashing of cold water over the face was the only remedy which circumstances permitted to make use of. A full dose of aether, liq. opii sed., and ammonia, was with difficulty administered. The convulsions continued all night, with scarcely any abatement, interrupted only by intervals of coma: pulse 72, weak: pupils contracted: conjunctiva clear: she passed urine in her bed.

In consequences of the abject destitution of her home, she was removed into Guy's Hospital, and placed there under Dr. Ashwell's care, in the Obstetric Ward. During the removal she had a convulsion, and reached the ward nearly lifeless.

She remained in this critical state for some days; but then gradually and slowly recovered, and left the ward in a state of convalescence.

tuted in the prenatal clinics of Contra Costa County, California, in 1963. During the twelve and one-half years of the project, Tom supervised the prenatal management of over seven thousand mothers from the lowest-income group in the San Francisco Bay area. Over half the mothers belonged to ethnic minorities—Black, Mexican, American Indian, and Oriental. Two-thirds of those having their first babies were teenagers. All of these factors—poverty, race, age and number of pregnancies—contribute to what medical statisticians call a "high-risk" obstetrical population. These mothers, by all odds, should have had a great deal of trouble giving birth to healthy babies. They are considered to be especially likely candidates for developing toxemia and having low-birth-weight babies. Statistics range from 20 to 35 percent.

Unlike these other reports, the incidence of toxemia among mothers in the Contra Costa County project was 0.5 percent, with no cases reaching the convulsive stage.

What made the difference?

We credit four major changes made in daily clinical practices over several years' time:

1. **Redefining toxemia in a way that explained all cases;**
2. **Properly interpreting the classic signs of toxemia and refraining from merely treating them symptomatically;**
3. **Requiring that every mother attend nutrition counseling sessions with Tom;**
4. **Developing skills of communicating with mothers so they would understand and be motivated to follow the clinic nutrition program.**

These departures from traditional methods were not easy to make. They evolved over Tom's thirteen-year training and work in our Southern states, the "eclampsia belt," so-called becuse of its persistently high rate of convulsive toxemia. Over these years it became necessary to rethink and reject much of what had become standard medical school teaching about the origin of the disease and its treatment.

Conclusions resulting from his laboratory and clinical research were published in 1966 in a handbook for the practicing physician, *Metabolic Toxemia of Late Pregnancy: A Disease of Malnutrition.*[1] In it a separate disease entity of known origin, metabolic toxemia of late pregnancy (MTLP), was differentiated for the first time from the "toxemia syndrome"—the well-known signs and symptoms that accompany the disease. The clue to this discovery was the realization that the signs and symptoms which accompany MTLP can also be caused by other conditions. Sorting out which conditions are responsible for which aspects of the "toxemia syndrome" in any individual case is a process called differential diagnosis. Undertaking differential diagnosis whenever a mother displayed the "toxemia syndrome" was not taught in medical school or OB/GYN residency programs in the past—nor is it now. Instead, any symptoms were *presumed* to be toxemia and treated as such.

The prevailing teaching during Tom's training was that toxemia ("preeclampsia/eclampsia") is a disease of hypertension and kidney malfunction precipitated by an unknown underlying mechanism. This theory provided the physician no tools for use in the face of impending "toxemia," and, since the cause was officially unknown, every pregnant woman was to be managed as though she were likely to develop the illness. If the signs and symptoms arose, all the physician could do was institute one of the myriad therapies and hope for the best. Lacking knowledge of the underlying cause of the disease, there could be no efforts at true prevention.

Tom's work advanced a simpler thesis which gave the obstetrician a clear course of action to take in preventing the disease. His major conclusion was that fundamental disturbances in metabolism, chiefly in liver cells, afflicted mothers

[1] Tom Brewer, M.D., Charles C. Thomas Publishers, Springfield, IL. (updated paperback edition: New Canaan, CT, Keats Publishing, 1982).

with MTLP. These disturbances were caused by malnutrition and resulted in a malfunctioning liver. Thus, the "toxemia syndrome" of swelling, hypertension, protein in the urine, and sudden weight gain must be viewed as the end result of metabolic derangement.

Characteristic liver lesions have been observed by pathologists for many years in mothers who have died of convulsive MTLP (eclampsia). In 1973 Sheehan and Lynch, two of England's leading pathologists, published a monumental review (1,719 references) of the world's literature on certain fatal diseases related to human pregnancy, including their own thorough autopsy reports on 677 obstetric patients. In 377 of these cases the mother had been diagnosed with "toxaemia of pregnancy." Sheehan and Lynch described specific changes in the livers of these mothers *which occur in no other recognized human disease.* Sometimes these lesions are so severe that they cause rupture of the liver and intra-abdominal hemorrhage. Tom pointed out in his book that similar liver lesions have been produced experimentally in animals deprived of proteins and other essential nutrients during gestation. In areas of the world where malnutrition is widespread, liver ruptures resulting from MTLP are often reported.

While malnutrition has been an undeniable fact of life for women living in poverty throughout history, the swing in 1958 in American obstetrical practice to rigid weight control, salt restriction and diuretic therapy as methods of routine pregnancy management made malnutrition an ever-present threat to women *in every economic group* who followed such dietary prescriptions.

It became clear that preventing malnutrition is the key to preventing MTLP. The successful Contra Costa County project was based on this single idea.

As Tom explains, "My interest in MTLP began in 1950 when I was a medical student at Tulane University Medical School, rotating through the OB/GYN department. One of

the instructors, Dr. James Henry Ferguson, had spent the years 1946 to 1948 studying maternal deaths and the nutrition of pregnant women in rural Mississippi. He included material from his field work in his lectures. Our obstetrics textbook mentioned a new 'nutritional' theory of the origin of toxemia based on work done by Maurice Strauss and Bertha Burke at Harvard and Ferguson's research seemed to confirm it."

Toxemia was the number one cause of maternal death at that time throughout the South. In Mississippi seventy-six deaths from toxemia were reported in the first year of Ferguson's study. Rather than pore over medical records and state health department statistics, Ferguson chose a more direct way of finding out the conditions under which these unfortunate women had lived and died. He visited physicians and midwives who had had contact with a maternal death. He consulted public health nurses for information on the victim's background, home, and diet. He visited some of their homes and personally interviewed over four hundred pregnant women coming to prenatal clinics in public hospitals. The picture that emerged was not a pretty one, nor one most well-fed and prosperous American physicians could accept as reality, especially those living outside the South.

As Ferguson reported in the *Journal of the American Medical Association* in 1951:

> The case reports in this study are heavily weighted with women who are poverty stricken. Seventy-nine percent of these women can be classified as being in the lowest socio-economic group.

He also published reports on the nutrition of the clinic patients he interviewed. Examples of some of the daily diets he encountered among women doing heavy field work were:

I

Breakfast: 3 tablespoons grits
1 tablespoon butter
2 pieces of toast
1 cup coffee
Lunch: 1 candy bar
1 apple
1 soft drink
No dinner

II

No breakfast
Lunch: 1 root beer
2 plates field peas
4 biscuits (large)
Dinner: ½ plate water gravy
1½ plates fried okra
2 biscuits (large)

He found 94 percent of these mothers to be obviously malnourished: their diets were deficient in high-quality proteins, iron, vitamin C, the B vitamins, calcium, and many other nutrients recognized as essential. Eighty-nine percent did not receive a quart of milk a day, and 57 percent had no eggs. More expensive sources of protein, such as lean meats, were way beyond their means.

The same miserable circumstances existed on the "toxemia ward" at Charity Hospital, Tulane's teaching institution serving the "medically indigent" from New Orleans and referrals from across Louisiana and Mississippi. The importance of taking in-depth histories detailing the life and di-

etary habits of the patient before entering the hospital was stressed in the internal medicine department.

Tom found, however, that on the OB/GYN service such histories were rarely taken. With over one thousand deliveries a month, 19 percent of which were complicated by the "toxemia syndrome," much of the patient care was on a strictly emergency basis. Only in the occasional case involving an internal medicine consultation was a detailed medical history attached to the patient's chart. The failure to take dietary histories on mothers admitted for "toxemia" denied the obstetricians an important clue to the underlying cause of the disease. It is impossible to get the right answers without asking the right questions. This missed opportunity left the doctors functioning in a vacuum which persists to this day. The only reality was the possibility that at any moment any one of the critically ill mothers on the ward might convulse.

One of the students' jobs was to go from bed to bed checking and recording the toxemic patients' blood pressures. As Ferguson had done in Mississippi, Tom began asking the mothers what they had been eating before entering the hospital. They often volunteered that they had been vomiting for weeks off and on, then severely for a few days just prior to being hospitalized. Most were in the last trimester of pregnancy. The conversation:

"Did you have milk?"
"No, sir."
"Did you have eggs?"
"No, sir."
"Did you have meat?"
"Yes, sir."
"What kind of meat?"
"Fatback."
"Sow belly."
"Salt pork."

"Any lean meat?"

"No, sir."

Cornbread, grits, water, gravy, and field peas often constituted the rest of the diet.

In the crisis treatment center, which was the "toxemia ward" in particular and the obstetrics service in general, the idea that malnutrition might be the cause of the problem was the farthest thing from the chief resident's mind.

It was his responsibility to supervise the anxious watch for convulsions, a sign that the disease had reached life-threatening proportions. The most important thing, when faced with rows of beds filled with patients who might convulse at any moment, was to ward off those convulsions! Repeated injections of mercury diuretics, magnesium sulfate, and morphine had to be given in hopes of reducing gross swelling and achieving adequate sedation.

Trying to introduce the subject of meat, milk, and eggs in this highly charged atmosphere must have seemed preposterous. At this late stage in the course of full-blown MTLP, any consideration of underlying cause appeared to be a speculative, irrevelant matter. Even if anyone knew the cause, by the time the seriously toxemic mother reached the ward there was nothing to be done about the disease but treat it. Prevention was simply beside the point.

Tom recalls: "That goal became very important in my own professional life, but to prevent the disease, I had to learn more about it. In particular I wanted to find out what biochemical events, for instance, preceded the liver damage so many investigators before me had reported associated with convulsive toxemia."

Thousands of hours spent poring over scientific reports in *Chemical Abstracts* yielded little. Virtually every biochemical test known had been done on normal pregnant women and those with the "toxemia syndrome," but confusion was rampant. Conflicting results on the same tests done on the same populations in different medical centers were the rule.

Clearly the researchers were not all calling the same set of phenomena by the same name, or there were variables in their samples of which they were unaware.

During his internship at the city-county hospital in Houston, Tom noticed that the private attending physicians seemed not to worry about "toxemia." They often commented, "We have to come over here to Jeff Davis to see preeclampsia, eclampsia and abruptions of the placenta. We don't see these in private practice."

Tom notes: "Their remarks strengthened my growing belief that MTLP historically afflicted the poor because the poor were more likely to be malnourished. From 1955 to 1958 in my private general practice in Fulton, Missouri, I saw no cases of MTLP in one hundred pregnancies. The absolute difference between the malnourished women of the 'toxemia wards' and this better-fed group of mothers confirmed what the Houston obstetricians had told me. MTLP was, at that time, a rare complication in middle-class women."

The subject came up occasionally during informal talks with other doctors in Fulton. They usually credited the absence of toxemia among their patients to the higher economic status and generally better health of the women in Fulton as compared to the women they had cared for in their training days. "Poverty" was the reason for all the troubles they had seen back in the inner city teaching hospitals. But the idea that poverty usually meant malnutrition and that malnutrition predisposed to disease never entered the conversation. The casual expectation of the doctors was that mothers who made up the bulk of private practice would go through pregnancy just fine and have a normal baby. The sharp contrast between this attitude and that which prevailed in the university centers helps explain a development in routine pregnancy management which in retrospect seems almost inconceivable.

A look at the medical journals of the 1950s and 1960s

leaves little doubt as to which attitude gradually came to dominate the American OB/GYN consciousness and inadvertently lay the groundwork for middle-class pregnancy malnutrition on an unprecedented scale. The emphasis on pregnancy complications, crisis-management, and drug therapies is so overwhelming that if one had no other source of information about pregnancy in mid-century America, one would be driven to conclude that it was a high-risk condition of the same order as impending heart attack. The journals reflect this point of view because they are written primarily by and for researchers in teaching institutions whose "material" for study is almost exclusively comprised of malnourished, poverty-stricken women who do indeed have many pregnancy problems.

Abetting the preoccupation with pregnancy pathology were drug company advertisements, each of which tried to outdo the others in convincing the physician of the efficacy of their products. Since claims made in these advertisements are based on research done in the university medical schools with grant money provided by the drug companies, it should not be surprising that journal articles and drug company promotions address the same concerns and reinforce each other's conclusions. Drug companies in this country, of course, are in business to make a profit. Advertising in medical journals is an important part of overall marketing strategy. Today, technology companies are well represented, too.

For thirty years competition in the pregnancy "market" was focused on developing new ways of dealing with that old problem, weight control. Excess weight gain had been implicated for decades in the onset of toxemia, so, to the traditionally trained obstetrician, any assistance he can get in preventing undue weight gain he viewed as an aid to preventing toxemia. The drug company market analysts knew of the university physicians' continual concern about tox-

emia, and their promotional campaigns ever since the late 1940s have featured advertisements in which the specter of toxemia looms as an unspoken menace. By never allowing the obstetrician to forget the "toxemia ward" of his training, a "market" was created for weight control drugs which can only be obtained by prescription. Prescriptions mean profits.

The first category of drugs to be approved for use in pregnancy weight control were appetite depressants (amphetamines or "speed"). At first promoted primarily for mothers who were overweight at the beginning of pregnancy, they were quickly taken up for use in enforcing rigid patterns of weight gain in normal mothers as well. Competition for dominance in the lucrative pregnancy weight control "market" was keen. The July 15, 1962, issue of the *American Journal of Obstetrics and Gynecology* probably represents the pinnacle of corporate contention: four major drug companies advertised appetite depressants, each with full-page layouts.

In them we learn that Ambar Extentabs, a combination of amphetamine (an "upper") and phenobarbitol (a "downer")—later in the ad described as a "balanced formula"—are "small . . . easy to take . . . suppress appetite for up to 12 hours . . . improve mood *without* 'jitters' . . . and help establish conservative eating habits." With Tenuate, the doctor can "control weight gain from test to term" by "suppressing appetite with no effect on heart rate, blood pressure, pulse, respiration and no alteration of basal metabolism rate (BMR)." The doctor might also consider Dexamyl Spansule, a brand of sustained release capsules containing Dexedrine and amobarbital ("Warning, may be habit forming") especially effective "during pregnancy . . . to keep her weight right and her outlook bright." For those who had a few pounds to lose during pregnancy, the doctor could count on Desoxyn Gradumet, "the all-day appetite control from a single oral dose" which caused side effects such as insomnia,

nervousness, and heart palpitation in only 15 to 20 percent of patients!

These advertisements never pointed out that a mother could be obese because her diet was high in carbohydrates, sugars, and fats, and low in protein, vitamins, and minerals. Nor was there ever an intimation that a more appropriate form of physician intervention would be to switch the mother to a higher quality diet and more exercise instead of doing anything she could to hold her weight down. Because doctors had been trained to think of the baby as a parasite and "toxemia" as a consequence of excess weight gain, the concept that dieting during pregnancy might be harmful to baby and mother completely escaped them. During no phase of their training had anyone made the link between malnutrition and poor pregnancy outcome, so it was easy for them to be seduced into prescribing amphetamines, unaware that reducing any mother's food intake below pregnancy requirements could harm the baby. This major clinical error could only have come about as the result of medical training which failed to take into account the malnutrition of the poorest mothers in the country. If doctors had fully recognized the role of malnutrition in human reproductive casualty, they could never have been induced to cooperate in the next phase of maternal starvation for profit—the campaign for sodium diuretics.

Capitalizing on their by-then well-established "market" for pregnancy weight control, the major drug companies added a new promotional twist in January 1958. With full approval of the Food and Drug Administration, the American Medical Association (AMA), and the American College of Obstetricians and Gynecologists (ACOG), a new category of drugs was introduced for use in pregnancy—thiazide diuretics. The journal ads for the thiazides displayed concern over one specific component of the "excess" weight gain targeted by the amphetamine ads, pregnancy swelling (edema).

Since gross swelling is associated with severe toxemia, and responsible for the sudden increase in weight in toxemic mothers, the ads encouraged the physician to take charge in early pregnancy as he had been trained to do on the "toxemia" ward. By prescribing a diuretic, the ads proclaimed, the doctor could "prevent preeclampsia or toxemia" and provide relief from the "discomfort of late pregnancy edema" without having to hospitalize the mother. Until this time, the most effective diuretic, mercury, had to be given by injection. Its use was of necessity limited to the critically ill who populated the "toxemia" wards.

With the advent of the thiazides, all that changed. Far more potent than any of their percursors, the thiazides acted directly on the kidney, effecting wholesale excretion of salt, water, and potassium from the body. They were effective when taken by mouth, so even the mother on the most rigorous diuretic therapy could now maintain her customary activities.

Just as the amphetamine ads never acknowledged the different status of mothers who gained weight on sound diets from those who gained on poor diets, the ads for thiazides never distinguished between the multitude of conditions that could cause fluid retention in the pregnant woman. On the contrary, the ads give the impression that all edema is worth "treating"—and the sooner in pregnancy the better, so no serious problem could develop. Because doctors themselves had not been trained to differentiate between physiologic edema (which accompanies nearly every pregnancy to some degree) and pathological edema resulting from an underlying disease, all edema came to be viewed as suspect. Because edema is so common, the "market" for the new diuretics was much broader than that for amphetamines alone had been. Because edema can be associated with MTLP, doctors were interested in a drug which promised to help them eliminate this threat to their patients. Because few physicians reflected

on the deleterious effects of interfering with the body's normal mechanisms governing salt metabolism, there was not a murmur of protest as drug companies took the position that all water retention is potentially harmful.

Sales of the thiazides zoomed as ten giants of the pharmaceutical industry engaged in a long-running battle for their share of the profit-laden "market." Huge advertising budgets were allotted to the diuretic campaign. Conferences, seminars and medical meetings, traditionally sponsored by drug manufacturers, were highlighted by attractive booths featuring the new diuretics and, as usual, the industry reached the physician in his office with its direct mail promotion and visits from 35,000 company representatives, the "detail men."

In 1973, after certain studies showed that thiazides damaged mothers and babies, one major company voluntarily withdrew its promotions for its diuretic compound. The medical director of this firm disclosed that by the time the average drug hits the market, the company has spent five million dollars to develop it and that only after five years of intensive promotion will the product begin to make money. This often puts the company in the position of having to push the product even in the face of evidence that the drug might be harmful to the user. These economic imperatives account for the reluctance of the drug companies to remove the thiazides from the pregnancy "market." Not until the FDA acted in June of 1976 to require a labeling change on these drugs did the other nine firms in the diuretic business abandon their pregnancy promotions, despite the fact that reported side effects from the thiazides, as listed on the package for the doctor's information, ran the gamut of insults to mother and baby. Loss of appetite, stomach irritation, diarrhea, constipation, cramping, jaundice, pancreatitis, hyperglycemia, hypertension, dizziness, headache, thrombocytopenia, sugar in the urine, depression of bone marrow function, and allergic reactions were noted.

In addition to these side effects of the drugs themselves, several of which—like loss of appetite—have direct bearing on the mother's nutritional status, the detail man carried with him an adjunct to diuretic therapy which made it even more hazardous: the low-salt, low-calorie diet sheet. The low-salt provision supposedly reduced the likelihood that a mother would retain excess sodium in her tissues, thereby heading off edema from the very start of pregnancy. The low-calorie provision kept alive the notion that weight control was necessary in the fight against "toxemia."

The diet sheets, several of which were authored by professors in prestigious departments of OB/GYN, were a great blow to the concept of sound nutrition in pregnancy. Because they, like the new diuretics, were intended to be used by every pregnant woman as a preventive measure against the onset of "toxemia," even the healthiest mother in the country would be exposed to the hazards of malnutrition if she followed the regimen. In the original research on the thiazides, mothers had been permitted to use as much salt as they wished while they were on experimental diuretic therapies. So, even though the thiazides depleted the body's supply of sodium, mothers could keep up with their requirements by taking in more. When the diuretics were used rigorously in conjunction with the low-salt diets, however, metabolic consequences were predictably catastrophic. Not only would the mother have a much higher risk of developing MTLP, but her baby's rate of intrauterine growth would be slowed due to a reduced supply of blood to the placenta.

Estimates of how widespread the use of diuretics and low-salt diets became are mind-boggling. A survey conducted in 1963 in Tulsa, for instance, showed 93 percent of doctors responsible for prenatal care reporting that they used thiazide diuretics exactly as they had been promoted: in the treatment of edema, for weight control, and to treat and prevent "toxemia." Diuretic therapy became an accepted part of

routine prenatal care in the United States and has been going strong ever since 1958. There is evidence that up to two million pregnant women a year have taken diuretics and even more mothers have been managed with salt restriction and weight control as essential, unquestioned practices.

Tom became deeply disturbed by the promotions for the thiazides when they first appeared in 1958. "I was convinced from my own experience and study," he relates, "that adoption of this approach to pregnancy management would *produce* MTLP, not prevent it. The malnutrition and dehydration resulting from the diet and drugs would make all women subject to the same diseases and complications of pregnancy suffered by women in poverty for generations. In the case of the middle-class mother, though, this nutritional deprivation would be engendered by the advice of her physician. I decided to undertake further research to try to find a way to prevent MTLP. I was especially interested in the relationship between malnutrition and liver dysfunction since many researchers had called attention to certain liver lesions unique to patients with MTLP."

In his last year at Miami's Jackson Memorial Hospital, Tom became chief OB/GYN resident with the authority to test one of the results of his research: a new protocol for managing the mother acutely ill with MTLP.

There are two central problems presented by these patients. Solving each provided a strategy for true prevention of the conditions which precipitate MTLP. These mothers have markedly contracted blood volumes (hypovolemia) and they have impaired liver function due to malnutrition. Neither of these problems was taken into consideration by the standard protocol for treating "toxemia." With the advent of the more potent thiazide diuretics, the patient with hypovolemia was at even greater risk than before.

One of the earliest signs of developing MTLP is a fall in

the serum albumin levels in the mother's blood. Albumin is a protein which keeps water in the circulation. It is manufactured by the liver. More albumin is required during pregnancy to maintain the normally expanded maternal blood volume. When the mother's diet is inadequate, the liver cannot synthesize enough albumin to keep up with the extra demands of pregnancy and albumin levels in the blood fall, allowing water which should be in the circulation to leak out into the mother's tissues. More significantly, her blood volume falls and the ability of the placenta to function starts to decrease.

Result: she appears swollen and puffy from the abnormal accumulation of water. The extra water retention also causes a sudden increase in weight.

During pregnancy the liver is working overtime to meet the stress of increased metabolic functions of all kinds. If the mother is malnourished in the last half of pregnancy, impairment of albumin synthesis can occur in a matter of weeks!

If the mother's diet is not improved, the blood volume continues to fall. Her body compensates in at least three ways:

1. **the kidneys start to reabsorb water in an effort to restore fluid to the circulation. But without sufficient albumin, the reabsorbed water also leaks into the tissues, thus aggravating the edema;**
2. **blood pressure rises in an attempt to maintain adequate blood flow to all organs;**
3. **if blood volume becomes critically low, the kidneys shut down completely causing urinary output to dwindle to zero.**

At this point in the traditional management of the severely toxemic patient, the practice has been to administer ever more potent diuretics such as furosemide (Lasix®) to the

mother in hopes of boosting urinary output and reducing swelling.

In these circumstances, the diuretics are lethal. They act in the body only to remove more water from the already perilously shrunken blood volume. They are unable to reduce the abnormal swelling because they do not contain any substance capable of attracting tissue fluid back into the circulation. **Instead, they rob the patient of the very fluid she needs in her bloodstream to keep heart, lungs, and brain functioning.**

With repeated doses of the diuretics, the mother eventually lapses into hypovolemic shock: exactly the same condition as if she had been in an auto accident and were bleeding uncontrollably. In both cases the mother lacks enough blood to sustain normal body functions. Tom witnessed several maternal deaths in the university hospital following such courses of diuretic therapy.

Reports in the medical literature indicated that these deaths became widespread. Advocates of the new diuretics overlooked the problem of hypovolemia. They maintained it was the "toxemia" that killed the mother, not the drugs.

In one case in 1969, a Vallejo, California, mother with three previous normal pregnancies died of MTLP along with her unborn twins in Kaiser-Permanente Hospital. The family sued the physician for malpractice.

During the trial, the plaintiff's attorney entered in evidence drug company literature warning against using the most potent diuretics, Lasix and Edecrin, at any time in pregnancy. This woman had been given both drugs in the hospital to combat her swelling.

The doctor's defense: we all use these drugs, anyway. Five of his colleagues testified that the doctor had done all he could do and, despite his efforts, the mysterious "toxemia" had finally killed her. The treatment he gave was just what they all would have given. The jury found the doctor innocent. More recent decisions are going the other way.

Tom's new approach to the patient with MTLP involved giving the mother the substance her damaged liver could not synthesize—human serum albumin. If his theory were right, the woman's urinary output should markedly increase and her abnormal swelling should begin to disappear after administration of the albumin. This course of treatment would not heal her liver, but at least she would be spared hypovolemic shock and kidney shutdown.

It worked. Since then other researchers have confirmed his clinical trials. Dr. Peggy Howard of Chattanooga and Dr. Stella Cloren of Basel, Switzerland, working independently, have administered serum albumin to more than 175 mothers with MTLP. Their reports of excellent results lent weight to Tom's original study.

Others, interested in the increasing evidence that a blood volume that falls below the needs of an individual's pregnancy triggers a compensatory blood pressure rise, have contributed hundreds of articles on hypovolemia to the recent world medical literature. Eileen Gallery, D.M., of the Department of Medicine, University of Sydney, Royal North Shore Hospital in St. Leonard's, Australia, reported in 1982 on "Pregnancy-Associated Hypertension: Interrelationships of Volume and Blood Pressure Changes" in the journal *Clinical Experimental Hypertension.* By directly expanding her patients' blood volume, she noted a significant drop in blood pressure. Doctors Kaneoka, Taguchi, and Shirakawa, working in the Department of OB/GYN at Fukuoka University, Japan, concluded in 1983 that infusions of plasma albumin, (8–16 grams per day over a period varying from five to forty-six days) was a "safe and effective" treatment for intrauterine growth retardation. In their studies, albumin infusions led to a *lowering* of hematocrit values (due to increased plasma volume), an average increase in patients' serum albumin values from 2.4 to 3.3 grams per 100 cc's sampled, and an average increase in total blood proteins from 4.9 to 5.8 grams per 100 cc's sampled. All patients had

been screened by laboratory blood testing prior to admission to the study for low albumin values, a critical research point, since patients who are experiencing elevated blood pressure from some other cause are not proper candidates for albumin administration. Concurring in the finding that blood volume expansion correlates highly with birth weight are Doctors Leela Raman and K. Rajaloxmi of the National Institute of Nutrition, Hyderabad, India. They published "Plasma Volume Changes in Preeclampsia" in 1983, noting that an expansion of 40 to 50 percent over the values in the first trimester of pregnancy *is essential to normal pregnancy outcome.*

Tom's albumin work in 1960 was gratifying because it linked liver impairment to the classic signs of MTLP. However, his primary goal was not to rescue women suffering from advanced MTLP, but to prove that *sound nutrition alone* could improve the conditions of mothers who were developing MTLP and prevent it completely in all other mothers if adopted as routine prenatal management. As a trial, he instituted an experimental dietary intervention program at Jackson Memorial Hospital in Miami that had several unconventional features:

First, mothers with MTLP were placed on a high-protein (120 grams per day) diet. Dr. Maurice B. Strauss, the Harvard internist, had shown thirty years before that high-protein diets improved the conditions of mothers with what he termed "nutritional toxemia."

Second, the mothers were placed on regular, rather than salt-restricted diets. A salt shaker appeared on the tray at each meal and the mother was instructed to salt her food to taste.

Third, the women were encouraged to stay out of bed as much as possible, even to do chores on the ward if they were willing, rather than being ordered to the customary bedrest.

Fourth, diuretics and drugs to lower blood pressures were not used.

Fifth, following the work of Poth on the most effective way to suppress bacterial flora in the bowel, patients received oral antibiotics to reduce the detoxication load on their damaged livers.

Sixth, Tom personally discussed the program with each mother to obtain her permission and cooperation, then made a conscientious effort to see that each followed her diet well.

Not every patient admitted to the hospital with the diagnosis of "toxemia" was accepted for Tom's high-protein diet program. Often after consultation and laboratory work, it would turn out that the mother did not have MTLP at all. Though she presented the same set of signs and symptoms—the "toxemia syndrome"—characteristic of MTLP, it was found she could have a problem totally unrelated to liver malfunction. For instance, physiologic edema, bladder and kidney infections, nephritis, chronic hypertension, and obesity were often misdiagnosed by others as toxemia.

It became clear why other researchers had experienced such difficulty in identifying toxemia. Their definition had been imprecise, and even the simplest biochemical tests done on women with MTLP and women with nephritis, for example, turn up very divergent results.

Ten patients over two years met his program admission requirements. Nine improved, doing significantly better by all measures than women on traditional toxemia management.

The one mother who did not respond to the dietary program was carrying twins. She had made eight prenatal visits to the county clinic. At each visit she had complained about constant nausea and vomiting, but no steps were taken to help her correct it. As a consequence she had a very poor diet with low-protein intake. After nine days in the hospital, during which she was unable to eat an adequate diet, she spontaneously went into labor and gave birth to twins weighing three and a half and four pounds.

Tom observed: "This mother was so severely malnour-

ished that her protein reserves had been depleted. After delivery and subsequent mobilization of her edema fluid, she weighed only 72 pounds (height 5 feet, 2 inches) and looked as if she had just come out of a concentration camp. Her liver had been so compromised by malnutrition that nothing short of delivery could initiate the healing process."

This project was encouraging because it showed that poor nutrition, not some mysterious substance manufactured by the placenta, was responsible for the onset of MTLP. Also significant was the fact that no mothers got worse after being placed on the program—a clear refutation of all those who claim that eating salt leads to toxemia, that eating to appetite results in excess weight gain which leads to toxemia, that diuretics must be given to prevent toxemia, that forced bedrest is needed to improve the conditions of women with MTLP.

In 1963 Tom began the broad-based toxemia prevention project in the Contra Costa County prenatal clinics to which we have referred. He thought, "If MTLP can be eliminated among the group of mothers considered to be at greatest risk of developing the disease, then perhaps this medical-nutritional management would be tried by others. These clinical tests of the approach, I hoped, would form the basis of a new set of standards for routine prenatal care which would be institutionalized here and abroad."

The major innovation of the Contra Costa County project was the weekly nutrition seminar conducted with new clinic patients. The authority of the physician in charge was a crucial psychological factor in altering the behavior of the mothers in his care—especially in the culturally influenced area of food habits.

The informal discussion format encouraged mothers to ask questions and volunteer information about their past pregnancy experiences. In this way, mothers learned from one another as well as from the doctor what some of the hazards of malnutrition were. In addition to explaining the

physiologic changes the mother could expect as pregnancy advanced, the importance of good nutrition in promoting these changes and facilitating an easier birth and postpartum period was stressed.

The unique feature, though, was reviewing how many common complications of pregnancy are concretely linked with poor nutrition. When mothers learned the consequences of malnutrition for themselves and their babies, they became serious about eating correctly. No supplemental foods were distributed at the clinic. Nutritional counseling *given by the physician* was the sole mode of dietary intervention.

At each prenatal visit with individual mothers, the initial educational talk was reinforced. While being examined the mother could report on how well she was following the prescribed diet, discuss the problems she was having with it, or ask any questions she might have. Every mother was reminded to continue to eat good foods to appetite and to salt her food to taste. No mention was made of weight gain, except in cases where underweight mothers were failing to gain.

In this situation, where the authority of the doctor was used to encourage sound nutritional habits and not to impose strict limits on weight gain, *convulsive MTLP never once occurred in twelve and a half years, and mild MTLP was reduced to 0.5 percent.*

As the Contra Costa County project progressed, Tom gradually became confident that the nutritional thesis of MTLP was correct. As is customary, he published journal articles about the project and began to lecture at medical meetings and hospitals around the country, urging obstetricians to try these methods and abandon those being promoted by pharmaceutical interests. He also started petitioning the FDA to hold a hearing on the use of diuretics and low-salt diets in pregnancy. This campaign was to take ten years to come to fruition.

As he traveled, he found that clinics everywhere were being run as they had been when he was a medical student in 1950 and an OB/GYN resident in 1960. Although some clinics had introduced dietary counseling provided by nutritionists, the authority of the doctor in charge almost always ran counter to their best efforts. One nutritionist from Mobile, Alabama, summed up her experience:

> It has been our major teaching point to emphasize foods high in protein—specifically, lean meats, milk and eggs. We have an interview with every patient on each maternity clinic visit to instruct her in normal nutrition.
>
> The nutritionists here have been confronted with conflicting ideologies concerning prenatal nutrition. The low-calorie, low-sodium, diuretic treatment is used by the majority of obstetricians. *This has caused a head-on collision with the purpose of the nutritionists.*

Tom's Contra Costa project results confirmed those of Dr. Reginald Hamlin of Sydney, Australia, who, while chief of OB/GYN at the Crown Street Women's Hospital, also taught nutrition to clinic mothers from 1948 to 1951. For the preceding ten years there had been one case of convulsive MTLP in every 350 deliveries in his hospital. By the third year of his nutrition education efforts, there was not one case in 5,000 consecutive deliveries. As Hamlin expressed it, MTLP is caused by "a relative deficit of first class proteins and vitamins." He attributed his success to a program which "was aimed strategically at the occult basis of the disease instead of at its summit of classical late signs and symptoms." The result:

> The humicribs (incubators) were often empty now. By 1949 nurses and medical students were beginning to ask why they were no longer seeing enough eclamptics (patients with convulsive MTLP) . . . By 1950 it was felt that

one could say to the skeptics: Eclampsia will no longer afflict the patients of this hospital if the present methods of prevention are followed meticulously.

Hamlin's remarkable work, like that of Strauss, Burke, Ferguson, and others who linked MTLP with malnutrition, is fully discussed in a comprehensive book for medical professionals, *Maternal Nutrition and Child Health* (Springfield, IL: Charles C. Thomas, 1979) by Douglas Shanklin, M.D., past professor of OB/GYN and pathology at Chicago's Lying-In Hospital, and Jay Hodin, statistical consultant. Data is drawn from historical records, laboratory experiments, clinical observations, and evaluative studies of children from a variety of backgrounds. The book considers in detail more than 230 publications in the field, an excellent overview of the research.

The conclusion that MTLP is completely preventable by sound nutrition has been brushed aside in the rush to ever more far-fetched therapies. In the 1960s it was diuretics that were going to prevent toxemia. Now, technological detection of fetal illness and warehousing of large numbers of "high-risk" mothers and babies in regional perinatal centers are the rage. Rarely in the academic centers does one hear or read of the protective effects of scientific nutrition during gestation. Instead, because of the increasing willingness to terminate pregnancies long before term by Caesarean section and transfer the premature baby to a neonatal intensive care unit, we hear that toxemia isn't much of a problem anymore. Apparently, increasing the number of maternal deaths by this approach is of no consequence.

Examination of the current OB/GYN journals turns up the same preoccupation with diagnosis and treatment of disease as in the past. Rarely is a word about prevention published.

Probably the most bizarre, and embarrassing, example of

the confusion that continues to plague the field of MTLP research and prevention was the publication in January 1983 in the *American Journal of Obstetrics and Gynecology* of an article by Lueck and Aladjem of Loyola University in Chicago claiming that a "worm" in the blood of pregnant women causes preeclampsia/eclampsia. This astounding, and unprecedented, line of work had been conducted for the previous seven years at the university, but the "worm" evidence had not been sent out for evaluation by departments of parasitology prior to the publication of the article by the medical journal.

The announcement that a "helminth" of significant size was the cause of the killer disease of pregnancy created a media sensation. Every major newspaper, newsmagazine, and news wire worldwide carried the story, and the investigators were honored at the annual meeting of the American College of Obstetricians and Gynecologists in the presentation spot reserved for "the most promising new research of the year."

But many other medical researchers remained skeptical of the Lueck-Aladjem findings. Most asked: How could an organism of the size described in the Loyola work have gone completely unnoticed in the decades of intensive research already conducted on MTLP?

In May and June 1983, British pathologists writing in *The Lancet* solved the mystery:

> We were disturbed to read a paper from Lueck et al. stating that pre-eclampsia, eclampsia, and trophoblastic disease are associated with, and may be caused by, a newly discovered helminth, hydatoxi lualba. This helminth had been observed in smears from circulating blood, trophoblastic tumour tissue, and placentas from toxaemic patients. The organism was seen in variable form, as ova, larva and adult worm.
>
> Understandably this work has caused interest amongst obstetricians, pathologists, and the national Press. Obste-

tricians and the press are delighted because any treatable cause of these conditions can only be welcome. As pathologists we were concerned because these helminths have hitherto escaped our attention.

To investigate these findings we first looked at touch smears of placentas from normal pregnancies, using Lueck's staining technique which involved preliminary exposure of smears to concentrated sulphuric acid. All smears showed organisms identical to those described in the paper. Blood from non-pregnant predominantly male subjects with no evidence of trophoblastic disease was also examined. All smears were positive. Specimens not subjected to sulphation were always negative.

Subsequently, we looked at transverse sections of these "worms" by both light and electron microscopy and found that they did not have any helminth structure but consisted simply of space surrounded by an anuclear coagulum.

Clearly these organisms are artifacts produced by the preliminary sulphation in Lueck's staining technique and cannot therefore be responsible for gestational, nor in fact for any other, pathological process.

We agree with Dr. Gau and colleagues that these organisms are artifacts. However they are formed of coagulum around cellulose fibres. We have shown an "organism" identical to those reported by Lueck et al, in a blood smear from a placenta stained by Lueck's technique. The longitudinal channels inside the organism, which stain positively with toluidine-blue O, are continuous with a length of fibre outside the blood smear. It is only when the fibre is inside the blood smear that the cuticle-like artifact is produced by the sulphation step in the staining technique which causes plasma proteins to coagulate around the fibre.

It is because this coagulation occurs around long cellulose fibres that the artifacts appear like worms. Identical artifacts can be produced by mixing cardboard fibres, from the boxes in which glass slides are purchased, with peripheral blood and staining by Lueck's technique.

In summary, the "helminths" were cellulose fibers from the wrapping paper surrounding the glass slides Lueck and Aladjem used in their laboratory. The "helminths" only appear when stained by the specific technique Lueck used in her studies! This lab error, of course, has nothing whatever to do with MTLP. However, to date, not one publication or news agency that covered this story has retracted it or corrected it for the benefit of the millions of pregnant women who had been alarmed at the report, though most physicians and midwives have learned of the controversy in the OB/GYN press.

That an error of this magnitude could be hailed as one of the major medical discoveries of the century points out how far there is to go in bringing forward the nutritional thesis of MTLP to practicing physicians, midwives, and parents.

Since the bulk of practitioners continue to give traditional care when it comes to nutrition, two nonprofit organizations that counsel pregnant women directly and work for the establishment of official practice standards in maternal nutrition have been founded in the United States and Great Britain: The Foundation for Perinatal Education (offices at Box 290, Stony Brook Road, Oneida, NY 13421, U.S.A.) and the Pre-Eclamptic Toxaemia Society (offices at 33 Keswick Avenue, Hullbridge, Essex, SS 5 6 JL England). For more about the work of these groups, see the Information Directory at the end of this book. Only when official OB/GYN practice standards have been set for sound maternal nutrition will the idea become incorporated into medical school teaching. Until that time, *every* mother and *every* unborn baby will continue to be at risk from the known hazards of nutritional deprivation during pregnancy.

A third organization is pressing the case for protective standards in prenatal nutrition management directly through the courts. PLEAS (Perinatal Liability/Education, Action, Support) sponsors education for families and attor-

neys who specialize in causation and liability law. PLEAS also assists plaintiffs in pregnancy-related malpractice lawsuits. Referrals to experienced attorneys interested in perinatal issues are available by writing: PLEAS Clearinghouse, Box 605–University Station, Syracuse, New York, 13210.

Though a malpractice suit commonly takes years to settle, PLEAS seems to be making a difference. Two cases in particular have special relevance in the area of pregnancy diets and drugs.

In a precedent-setting decision (Smith v. Kopcha) in September 1977 an Indiana jury awarded a mentally retarded woman fifty thousand dollars in a malpractice suit that charged her mother's prescribed diet during pregnancy caused her retardation. A diet of polished white rice, fruit, and a daily dose of Epsom salts, plus shots of mercury diuretics, was prescribed for the mother during the last two months of her pregnancy for the treatment of toxemia. Expert witnesses for the family testified that the diet, because of its low protein content, caused the child's retardation.

Commenting editorially, the *Chicago Tribune* observed: "The jury's message is an urgent one to the medical profession . . . because it gives judicial recognition to the importance of proper nutrition during pregnancy." Jay Hodin, former executive director of the Society for the Protection of the Unborn through Nutrition, which assisted in the case by arranging for specialists' expert testimony, noted:

> The paucity of nutrition education in medical training by no means, the Indiana jury decided, relieves those obstetricians who impose inadequate diets upon expectant mothers from liability. The most significant outcome of the trial, and one whose implication is likely to reverberate throughout the medical community, is that malpractice may be construed to include obstetricians' casual attitudes toward nutrition in pregnancy. Many studies link inadequate prenatal diet to a wide range of newborn and childhood diseases and disorders.

In the second landmark case (Ricozzi vs. Doctors Parker and Balchunas, United Hospital, and Abbott Laboratories), a surviving husband and son were awarded $335,000 for the wrongful death of their wife and mother, Janine Ricozzi, in an out-of-court settlement in March of 1985 in Westchester County, New York.

Mrs. Ricozzi, age twenty-eight, died of MTLP in United Hospital, Port Chester, New York on March 10, 1977. It was her first pregnancy. She was faithful in keeping each of her prenatal appointments with her obstetricians, and she followed their advice meticulously as she had been trying for six years to become pregnant.

Unfortunately, her doctors' routine recommendation to their patients was a weight limit of two pounds a month, or no more than eighteen pounds over the entire course of the pregnancy.

According to medical records, on February 2, when Mrs. Ricozzi was about twenty-four weeks pregnant, her obstetrician wrote her a prescription for Abbott's thiazide diuretic, Enduron®, and told her to use no dietary salt because she had developed some swelling of her feet and ankles. This was *two years* after the FDA hearing which had found the diuretics to be without value in the prevention or treatment of MTLP.

On the low-calorie, low-salt diet and diuretic, her swelling increased markedly. Family members said it eventually became impossible to distinguish the tip of her nose from her cheeks. Mrs. Ricozzi left her job as a secretary as she became tired and weak on the diet/drug combination.

On February 28, after almost a month on the low-salt diet and drug, she developed acute nausea, vomiting, and abdominal pain which her doctor—without seeing her in person and after having identified her as developing toxemia in her records—diagnosed over the telephone as "the flu." These are classic signs of impending convulsive MTLP as

the liver becomes enlarged and painful as the disease worsens.

The doctor told her to double her dose of diuretics for her swelling and to take an antacid for her abdominal pain. Three hours later she had an eclamptic convulsion at home. She was rushed to the hospital where she suffered another seizure in the emergency room. A battery of drugs was then administered intravenously by United Hospital employees, including Valium®, magnesium sulfate, hydralizine, and furosemide (Lasix®). All of these drugs aggravate the liver, which was already compromised by the MTLP. Lasix®, according to the package insert, is *"contraindicated in women of childbearing potential due to its drastic blood volume depleting action."* It is one of the most potent diuretics ever manufactured. In the twenty-four hours after her admission to the hospital, Mrs. Ricozzi was given 200 milligrams of Lasix® intravenously, 180 milligrams of it *when she was already in profound shock.*

Mrs. Ricozzi's blood pressure, 150/ 100 on admission, ranged upward to 180/110 during the night while the obstetrician tried to start labor with an oxytocin induction. She was seriously short of blood supply, with her red cell count up to 45 percent (hemoconcentration due to the loss of the water compartment of her blood into her tissues).

Though she was clearly a very poor surgical risk, the next morning she underwent Caesarean section and was delivered under general anesthesia of a two-pound, five-ounce boy who was transferred to a high-risk neonatal intensive care unit in New York City.

Immediately after surgery her blood pressure dropped precipitously and her kidneys shut down. Four hours later, Mrs. Ricozzi was given more Lasix® because of her persistent massive swelling, even though her blood pressure was only 70/ 50. Twenty minutes after the injection, she went into profound shock with no blood pressure and no pulse.

She failed to breathe for five minutes, then seemed to rally with a blood pressure that wavered between 70/ 50 and 50/ 30.

Seven hours later, still unconscious, her blood pressure rose to a nearly normal 100/ 72, but her swelling remained the same. More Lasix® was administered, knocking her pressure down to 78/ 54 in twenty-five minutes.

An electroencephalogram taken at this time showed no evidence of cerebral activity. Mrs. Ricozzi had suffered brain death.

Placed on a respirator in the intensive care unit at United Hospital, she was kept legally alive for the next nine days though she never regained consciousness, remained swollen, and was completely unresponsive. With her family's consent, the respirator was removed on March 10 and she was allowed to die. During her stay in the intensive care unit she received only intravenous glucose and water solution for ten days.

The pathologist's report at autopsy begins with a medical cliché which is horrifying given Mrs. Ricozzi's prenatal management of months of imposed starvation and hazardous drugs: *"Well-developed, well-nourished, 28-year old white female . . ."*

By settling out-of-court the defendants had hoped to stifle reportage of this case because it is the first in which a pharmaceutical manufacturer has accepted liability for the adverse effects of the diuretics they promoted so widely for so long here and around the world.

PLEAS is currently involved with a dozen similar cases with attorneys and families across the United States. All involve physician-imposed diets and drug therapies. All involve maternal deaths. All of the deaths were due to MTLP.

The Contra Costa County clinic project demonstrated that no mother who is able to eat, digest, absorb, and metabolize a diet adequate for pregnancy will develop MTLP.

Whenever a mother in the project developed the "toxemia syndrome," one of two things was happening.

Either she was not following the diet.

Or she had something else.

7

"Toxemia" in the Well-Nourished

Mistaken Diagnosis

The majority of obstetricians dismiss the idea that malnutrition causes toxemia. Their reason: they have seen patients they thought were well nourished and still displayed the signs and symptoms of the "toxemia syndrome." Therefore, toxemia, as they have traditionally thought about it, could not possibly result from malnutrition.

Their position sounds reasonable, but it is based on a common clinical error.

When confronted by a mother with the "toxemia syndrome," these physicians customarily skip the important process of differential diagnosis. Instead, they make a reflex diagnosis of toxemia whenever one or more of the classic signs is present: swelling of hands and face, excess weight gain, protein in the urine or elevated blood pressure. No further evaluation is deemed necessary.

The result: many thousands of pregnant women have been diagnosed as toxemic and treated for toxemia they did not have.

Serious problems result from this mistake. The mother with some other condition which appears similar to MTLP continues to suffer her original malady because it goes un-

diagnosed and untreated. Further, the mother may well develop MTLP as a result of the low-salt, low-calorie diet and drugs prescribed for her. She and the baby may develop further symptoms from prescribed diuretics, amphetamines, and antihypertensives that cross the placenta.

Differential diagnosis is a routine practice in internal medicine. It means that the doctor carefully considers and selectively rules out different conditions which produce the same signs or symptoms in an individual patient.

In order to make an accurate diagnosis of what is causing the "toxemia syndrome" in a given mother, the obstetrician must be persuaded to withhold judgment and treatment until all the possibilities have been examined, consultations with specialists in other medical disciplines have been undertaken, and appropriate laboratory tests run whenever indicated.

Unfortunately, under current circumstances in which the obstetrician has not been trained to carry out differential diagnosis of the "toxemia syndrome," responsibility for insuring that an accurate diagnosis is made rests with the person least likely to know how to proceed—the mother herself! The mother who finds herself in this situation realizes that her responsibility is to herself and her unborn baby. She must insist that the doctor follow through with a complete evaluation of her condition before deciding whether any form of therapy is warranted. If she is not satisfied with the doctor's performance, she must not feel disloyal or ungrateful about requesting a consultation with a specialist in the suspected area. If necessary, she should make such arrangements on her own and request of the office nurse that her *complete* records be sent to the consulting doctor. Her main concern is not to appease the doctor but to obtain clear, complete explanations of his medical decisions before she decides whether to take his advice.

In order to become her own advocate in this troublesome

plight, the mother needs to know what conditions other than MTLP account for the most common signs and symptoms of the "toxemia syndrome." She must also be sure she does not have MTLP!

The first step is responsible evaluation of her diet. MTLP cannot be ruled out unless the mother is obtaining enough protein, calories, vitamins, minerals, salt and water to keep her liver and other organs functioning optimally throughout pregnancy. Unless someone has made a special point of giving her correct advice about pregnancy nutrition, she may well assume her customary eating habits are satisfactory for pregnancy. The idea that pregnancy is a nutritional stress for *every* woman, regardless of her prepregnancy diet or economic status, is not widely held.

A detailed program for identifying potential problems in an individual mother—and strategies for correcting them at every stage of pregnancy—is presented in another of our books, *The Brewer Medical Diet for Normal and High-Risk Pregnancy* (New York: Simon and Schuster, 1983).

To determine the true state of affairs, the mother has to consider what foods she has been eating recently and in what quantities. She should realize that flu or other gastrointestinal disturbances like nausea and vomiting interfere with her eating pattern. Her appetite may also suffer if she has been worried or depressed. Any of these conditions may result in malnutrition.

If her dietary evaluation shows she is well nourished, then MTLP can be ruled out and other explanations for the sign or symptom under consideration must be found.

A primer of mistaken diagnoses and how to avoid them is a distinct help to mother and physician.

Swelling of hands and face (*generalized edema*), as we have discussed, is probably the most commonly misdiagnosed sign. Sixty percent of normal pregnant women experience swelling of their hands and face as a manifestation of healthy adjustment in pregnancy—*if the mother is well*

nourished. It does not require treatment of any kind at any time in pregnancy.

Protein in the urine commonly occurs in pregnant women who develop a *urinary tract infection,* either in the kidneys or the bladder. Pregnant women are more likely to develop such infections because of continual pressure on the tubes which drain the kidneys early and late in pregnancy. Simple urinalysis may not reveal the presence of infection, so a quantitative urine culture should be done to establish the correct diagnosis and appropriate medication to combat the infection.

Many types of *kidney disease,* such as glomerulonephritis (Bright's disease), chronic-pyelonephritis, kidney cysts, and tumors, also cause protein spills in the urine. Differentiation between the various kidney disorders is the specialty of the renal expert, who should be consulted by the obstetrician when these diseases are under consideration.

Elevated blood pressure (*hypertension*) may result from many different causes. "Anxiety" hypertension is engendered by *emotional stress* of any sort. Many women become anxious during physical examinations or during laboratory testing. Women whose blood pressure has been normal throughout pregnancy may develop hypertension at the time of admission to the hospital for labor and birth. These mothers do not have MTLP; the liver is functioning normally and the blood volume is expanded.

"Essential," chronic, or benign hypertension is most common in women over thirty years of age. However, many black teenagers have already developed the condition and will continue to have it the rest of their lives. These mothers require exactly the same diet as mothers with normal blood pressures—including the use of salt to taste—since their blood volumes must expand, too, as pregnancy advances.

Sodium deficiency can trigger hypertension, as mentioned previously.

Obese women are often incorrectly diagnosed as hyperten-

sive when a standard-size blood pressure cuff is used to take a reading. When the cuff is too small, additional pressure on the mother's arm reads on the meter as elevated blood pressure. Using a larger cuff prevents this error.

Pheochromocytoma, an exceedingly rare tumor of the adrenal gland, also causes hypertension.

Kidney diseases also result in high blood pressure.

Other signs—pregnant women may develop medical diseases that affect the rest of the population: epilepsy, brain tumor, stroke, heart failure, cirrhosis of the liver, and poorly controlled diabetes mellitus may also be included in the differential diagnosis if the preceding conditions yield no answers.

Obviously, what was once considered a simple clinical diagnostic problem, is, in reality, quite complex. Varying combinations of the preceding conditions in a well-nourished woman can easily lead even the most thorough physician astray. It takes more effort to unravel the "toxemia syndrome" by differential diagnosis than it does to make a snap judgment.

Knowledge that malnutrition is responsible for the onset of MTLP and assiduous efforts to see that all mothers are well nourished does not mean that swelling, weight gain, protein in the urine, hypertension or convulsions and coma are going to disappear from the childbearing population. It does guarantee that mothers who are truly well nourished will not display these signs and symptoms due to MTLP.

Differential Diagnosis of Hypertension in Pregnancy

If the physician or midwife notices an elevation of blood pressure during the course of a prenatal visit, these steps should be followed to determine the cause of the blood pressure rise and what the treatment (if any) should be:

1. Complete *medical history,* in the patient's own words.
2. Check for *technical errors* in taking blood pressure (too narrow a cuff in a woman with a large upper arm, equipment out of calibration, stethoscope placed too far from blood vessel to obtain accurate reading, etc.) and recheck later.
3. Determine if patient under *stress of any sort* (temporary due to exertion or anxiety at having pressure taken or being examined, loss of family member or loved one, accident or illness in family, loss of job, onset of labor, etc.).
4. Rule out *medical diseases* (essential hypertension, kidney diseases, heart failure, coarctation of aorta, pheochromocytoma, adrenal tumor, central nervous system disorders, molar pregnancy) by clinical consultation with appropriate specialist and laboratory work.
5. Rule out *MTLP* (history of falling behind in dietary requirements as outlined in this book for any reason, commonly associated with nausea, vomiting, loss of appetite, diarrhea, pain in the abdomen, headache, dizziness, visual disturbances, *falling blood proteins*). **No mother should be treated, hospitalized, or operated on until her diagnosis is complete.**

To summarize, as Tom commented in the most recent edition of his book *Metabolic Toxemia of Late Pregnancy: A Disease of Malnutrition:*

In the last fifteen years obstetricians have narrowly focused on the blood pressure of the pregnant woman as being of central concern regardless of her nutritional-metabolic status, liver function, blood volume and placental function. If the diastolic blood pressure rises 15 or 20 mm Hg or the systolic rises 20–30 mm Hg, a diagnosis of "pregnancy-induced hypertension" (PIH) is made. All "PIH" is then "managed" the same as if every hypertensive pregnant woman were in jeopardy of convulsions, brain hemorrhage, abruption of the placenta, fetal death, etc. This is simply not true; *most hypertension in human pregnancy is physiological or benign, not related to MTLP at all.*

British investigators, Mathews et al. have shown the benign nature of hypertension in the well-fed pregnant woman. (*British Medical Journal,* vol. 2, p. 623, 1978) When these workers abandoned the traditional "therapies" for hypertension in pregnancy, bed rest, low calorie, low salt diets, sodium diuretics, sedatives, pre-term induction, for women with "non-albuminic hypertension" as they termed it, they found that their hypertensive patients achieved *the same outcome of pregnancy* as in women with normal blood pressures attending their prenatal clinics. Their recommendation for those with hypertension not attributable to any medical disease is simply to refrain from aggressive therapies and have [the patient's] case followed by the district midwife. In the United States this would translate to having her continue to be followed by her chosen care provider, not to be referred to a "high-risk" perinatal specialist.

The mother should keep in mind through all this that when she maintains a good diet her chances of developing MTLP are reduced to zero. She is also doing everything possible to reduce to the absolute minimum the chances that she or her baby will suffer any other complication of pregnancy or labor.

8

Other Pregnancy Complications

Safeguarding Mother and Baby

Every expectant mother wants to enjoy her pregnancy and give birth at term to a healthy baby. A good diet is the best insurance that she will.

In addition to safeguarding the mother and baby from MTLP, a good diet offers protection from many other common complications of pregnancy. Half a century of medical and nutritional research has proved that poor diets during pregnancy cause mothers to experience more anemias, infections, placental malfunction, difficult labors, Caesarean sections, poor postpartum healing, and failures at breast-feeding.

Effects of poor diet on the baby run the spectrum from prematurity and low birth weight to brain damage and stillbirth. Most of this difficulty is *preventable* through sound maternal nutrition every day throughout gestation.

Common anemias of pregnancy are primarily nutritional in origin. Most women take vitamin-mineral supplements with iron during pregnancy to maintain their red blood cell counts. If a mother shows signs of anemia, additional iron tablets are often prescribed. However, several other substances in addition to iron must be available at the same time

for the manufacture of red blood cells. Chief among these is protein. Also important are folic acid, vitamin B-12, cobalt, copper, and other trace elements. There may be others of which we are as yet unaware.

The best policy to follow with regard to nutrition during pregnancy is to eat a well-balanced diet each day from a wide variety of nutritious foods. In this way, protein needs are met in addition to providing other nutrients which may not yet have been recognized as important to health. The vitamin-mineral supplement is not harmful, but it cannot substitute for eating enough good foods. The mother who follows a good diet will protect herself from becoming anemic.

Late in pregnancy, many women show low red cell counts not related to true anemia. In the well-nourished woman who has not been restricting salt, the plasma volume expands dramatically. This means that her normal number of red blood cells has been diluted in the plasma so that, in a given amount of blood sampled, it appears there are fewer red cells than normal. The total number of red cells in the circulation may be actually increased. After delivery, these mothers have red cell counts that are normal since the extra fluid retained in the bloodstream during prgnancy has been mobilized and excreted.

Although anemia is generally seen to be nutritional in origin, the relationship between nutrition and severe infection remains somewhat less well acknowledged in our country despite scholarly volumes on the subject published in recent years.

The most exhaustive of these works, a World Health Organization monograph entitled *Interactions of Nutrition and Infection,* appeared in 1968. The authors are Dr. Nevin S. Scrimshaw, Professor of Nutrition and Head of the Department of Nutrition and Food Science at the Massachusetts Institute of Technology, Dr. Carl E. Taylor of the Johns

Hopkins University School of Hygiene and Public Health, and Dr. John E. Gordon, Emeritus Professor of Preventive Medicine and Epidemiology at Harvard. At the end of their work is a bibliography of 1,445 references to support their conclusions.

The authors show that common infections are more likely to develop into serious ones among the malnourished. In addition, infection can put stress on the body so that borderline nutritional deficiencies degenerate into severe malnutrition.

Scrimshaw and his collaborators point out that malnutrition allows certain bacteria and other germs to enter the body through the skin, respiratory tract and intestinal tract. Because the natural defense mechanisms in the poorly nourished person do not work well, once these infectious agents enter the body, they multiply at a rapid rate. Impaired by malnutrition are antibody responses, white-blood-cell function in combating germs, and other chemical and endocrine functions known to influence resistance to infection.

When the infection reaches the level of producing noticeable symptoms, the person's nutritional status is affected in several ways. Loss of appetite is one of the early signs of many infections. Treatments for disease may lead to more malnutrition, as when rigid diets or purgatives are prescribed. Infections can precipitate classical vitamin deficiency diseases such as scurvy, beri-beri, pellagra, and anemias due to deficiency of any of the elements necessary for building blood.

The well-nourished mother who gets a minor infection usually throws it off quickly. Rarely would a case of flu develop into pneumonia or a urinary tract infection become a severe kidney infection with sepsis. Even if the well-nourished pregnant woman should develop hepatitis due to a virus, she usually recovers without life-threatening problems.

Infections which are speedily overcome by the well-nourished woman's defense mechanisms are often severe and even fatal in the poorly nourished. Reports from India and Israel confirm that poorly nourished pregnant women have low resistance to liver infections; these disorders are a leading cause of maternal death in all the world's poverty areas. A pregnant woman who develops a liver infection is at greater risk because of the extra stress pregnancy imposes on this organ.

The liver is the master gland of nutrition. All food substances absorbed from the stomach and intestines pass directly into the liver where they are changed in various ways to provide all the cells of the body with food materials for growth, repair, and energy. Special proteins, such as the albumin discussed previously, are continually formed and released into the bloodstream.

During pregnancy there is an increased need for these special proteins. Growth and development of the baby, growth of the womb, growth of the placenta, expansion of blood volume, and storage of protein for use in later breast-feeding—all of these demand increased liver metabolism. A good diet throughout pregnancy provides the liver with the needed food substances to fulfill its round-the-clock task of cellular nutrition.

A second function the liver performs at higher levels in pregnancy is neutralizing and excreting harmful poisons which originate in the lower bowel. Termed its detoxication function, it has led to the liver being termed "the watchdog of the abdomen." All blood draining the stomach and intestinal tract goes first into the liver, where it is filtered before passing into the general circulation. The liver then excretes the toxic substances in the bile and urine.

Female hormones produced in large quantities by the placenta are also detoxified and excreted by the liver. Toward the end of pregnancy, the amount of hormones produced daily is several hundred times greater than the amount con-

tained in a birth control pill. If the mother is malnourished, the liver may fall behind in its task of clearing these hormones from the body. They then accumulate in the liver and body tissues. The well-nourished mother has a liver which can work at peak efficiency in detoxication, thus protecting herself and her baby from needless infection and MTLP.

There are other compelling reasons why the expectant mother should let nothing stand between her and good nutrition. The most feared difficulties, those which come about in labor, delivery and the postpartum period, are also related to poor nutrition.

Many women have been told that if they gain too much weight during pregnancy they will have a difficult labor and delivery. They fear being too fat by the time labor begins. They fear their baby will be too large. They fear their labor will be long and painful. They fear they will need a Caesarean section. They fear they will hemorrhage.

A look at the facts reassures the well-nourished woman. When mothers have a physiologic weight gain from eating the correct foods, very few gain excessive amounts of weight. In over 7,000 pregnancies in the Contra Costa County project, a weight gain of thirty to forty pounds was average. These mothers usually returned to their pre-pregnancy weight within six weeks after delivery. In twins, weight gains of fifty to sixty pounds are typical, reflecting, as we have seen, the greater needs of two developing babies and the marked physiologic water retention caused by the extra hormones from two placentas.

If the mother has been obese before pregnancy and switches to a higher-quality diet, she may actually lose a few pounds over the course of pregnancy and, after delivery, be in much better health than previously. The focus is on adequate nutrition, not pounds. Since many American women fear gaining weight because they have been so conditioned to fear "losing their figures," it is necessary to remind them that they must gain *enough* weight during pregnancy from

eating good foods. This is especially important for mothers who are underweight at conception. In fact, the only reason women should be weighed at prenatal visits is to insure they are gaining enough. When the pregnancy weight gain is the result of a sound diet, including adequate salt intake, the mother does not gain excessively, although she may gain significantly more than the old twenty-four-pound limit. One factor accounting for the larger gain is the increased amount of water retained when the mother salts her food to taste. This may add fifteen or more pounds to the mother's original weight and, usually within a week, these extra pounds vanish. Since the expanded blood volume of pregnancy required to service the placenta is no longer needed after the baby's birth, the kidneys respond by allowing the excess water to leave the body in the urine. This period of increased urination due to mobilization of fluid is called postpartum diuresis. The same nutritional factors which provide optimum conditions for maternal health during pregnancy and the growth and development of the baby also acccount for the physiologic weight gain in the well-nourished mother. The cultural obsession with the idea that "thin is beautiful" should be replaced, especially in the case of the expectant mother, with the concept that "health is beautiful." Not only will the healthy mother be less likely to have difficulty during pregnancy and more likely to have a larger baby who is easier to handle, but she recuperates from childbirth much quicker, too.

The works of Ebbs (1941), Burke (1943), and Higgins (1976) support the view that sound diet, increased weight gain, and larger infants do not increase the rate of obstetrical complications. In fact, they found that complications of labor and delivery are much more likely to occur among women with poor diets and underweight babies.

Dr. John Ebbs of Toronto compared the obstetrical outcomes in three groups of mothers. One group contained 120 women whose diets were deficient and who were not coun-

seled about nutrition in any way. The second group of 170 mothers on supposedly adequate diets received nutrition education that stressed the importance of high-quality proteins, vitamins, and minerals. Ninety women whose diets were judged deficient received food supplementation in addition to nutrition education.

Difficult, slow, and painful labor (dystocia) was observed in 24.2 percent of women on poor diets, compared to 2.3 percent in the supplemented group. The duration of labor and length of postpartum recovery was longest in the poor diet group. Labor averaged five hours shorter in the good diet groups. Overall, the rate of major complications reached 36 percent in the poor diet group, 12 percent in the adequate group, and 9 percent among supplemented mothers.

Dr. Ebbs concluded in 1942:

> During the whole course of pregnancy the mothers on a good or supplemented diet enjoyed better health, had fewer complications and proved to be better obstetrical risks than those left on poor diets.

It should be obvious to contemporary researchers that there is no justification for pregnant women being "left on poor diets" in any sort of experimental situation. The aim of their work should be to insure that every mother has a diet adequate for pregnancy.

Bertha Burke, a public health nutritionist at Harvard, demonstrated that sound nutrition prevented many labor and delivery complications, especially MTLP. She reported in 1943 that MTLP never occurred in mothers who consumed at least 68 grams of protein daily. In contrast, 44 percent of mothers on a poor diet developed it. Overall, major delivery complications were 50 percent higher among malnourished mothers than among the well nourished.

Both Ebbs and Burke, working in the 1940s, had no institutionalized low-calorie, low-salt diet regimens or diuretic

therapies to counter. However, neither one was an obstetrician, so their clinical observations made little impact on routine prenatal care or on priorities for further confirming research.

More recently, Agnes Higgins of the Montreal Diet Dispensary analyzed the obstetrical outcomes of 1,736 births to mothers in the Dispensary nutrition program. In 1,250 cases the mothers also received food supplementation. She found, contrary to general belief, that mothers with larger babies did better than those with smaller infants. Her mothers, most of whom come from low-income groups, generally gave birth to larger infants than the other patients delivering at the Royal Victoria Hospital, public and private alike. Dispensary mothers had a higher incidence of spontaneous births and a lower incidence of Caesarean sections than all other patients.

What accounts for the easier labors and deliveries of mothers with good diets? Probably most significant is the optimal growth of the uterus made possible by sound nutrition.

When a woman is not pregnant, her uterus is a small, almost solid organ about half the size of her fist and weighing only two ounces. By the end of pregnancy, it has increased in size thirtyfold to accommodate the baby, placenta, membranes and over a quart of amniotic fluid. Several changes occur to produce their striking growth. New muscle fibers are formed early in pregnancy, existing muscle fibers lengthen and enlarge, and new connective tissue, collagen, is built up between muscle groups to strengthen the uterine wall. Two important nutrients fostering this process of uterine growth are proteins and vitamin C.

When adequate nutrients are not supplied by the mother's diet, the uterus does not grow normally. During labor, it is more prone to exhaustion by the strong contractions necessary to deliver the infant. When this happens, the mother may receive drugs to stimulate the uterus into further con-

tractions, or, if labor has failed to progress for some time, a Caesarean section may become necessary.

Among doctors who use good nutrition as the foundation of their prenatal care, the Caesarean section rate is approximately three percent. Depending on geographic area, this is four to ten times less than currently reported in the general population.

Among the three percent who must have a Caesarean section for some unavoidable reason, most commonly when the baby is found to be in some unusual position during labor or the mother's pelvis is too small, the well-nourished woman is still ahead. She has few problems with healing of the abdominal and uterine incisions made to deliver the baby surgically. In a poorly nourished mother, the abdominal wound may burst open a few days after delivery and have to be restitched, or the uterine scar may be so weak that it ruptures in subsequent pregnancies. It is these cases which have given rise to the adage, "Once a section, always a section." The well-nourished woman with an adequate pelvis may be able to have a vaginal delivery with a subsequent pregnancy, depending on the reason for her first section. Her uterine and abdominal scars will have healed stongly and should be able to withstand the stress of normal labor.

Most American women who give birth in the hospital undergo another surgical procedure, even when they push their babies out spontaneously without assistance from the doctor's forceps. They receive an episiotomy, or incision in the vaginal outlet, to permit the baby's head to emerge more quickly. In the well-nourished mother, the episiotomy wound heals without difficulty after the initial swelling and soreness that accompany any surgical wound.

A final difficulty related to poor nutrition which has profound effect on the newborn baby is failure of the mother at breast-feeding. Though not technically a pregnancy complication, breast-feeding often develops into a serious postpartum problem for American mothers.

Much has been published by organizations which promote breast-feeding about how to establish successful lactation. Great emphasis is placed on the importance of a nutritious diet for the nursing mother, yet nowhere is there criticism of the low-calorie, low-salt pregnancy diets and diuretics that undermine the breast-feeding efforts of so many women.

What effect do restrictive pregnancy diets have on mothers who plan to breast-feed?

In talking with women, the same story unfolds time after time: their milk "dried up" a few days after they returned home from the hospital. Generally, these women are disbelieved and their failures attributed to their "not really wanting to nurse in the first place" or "being too lazy to take the time" or "just being too nervous." Overlooked is the fact that the mother who has cut down her salt intake, her calorie intake, and her protein intake during pregnancy is unlikely to have enough stored fluid, fat, and protein to sustain a good milk flow. Effectively, the mother has been "dried up" before she even begins breast-feeding.

Paradoxically, her baby also suffers dehydration at birth and will require more fluid in the early days of life to counteract the effect of the diuretics. This baby demands more from the mother who has least to give. Bottle supplementation with commercial formula is the usual prescription from pediatricians who are also unaware of the effects of the restrictive pregnancy diets. With less stimulation from the baby's suckling, the breasts produce even less milk. Breast-feeding becomes a token proposition or, more often, is wistfully terminated a few days after birth.

Both mother and baby lose when breast-feeding fails. Apart from the well-documented psychological advantages to mother and baby, breast-feeding provides each with incomparable physical benefits as well.

The uterus must stay tightly contracted in the days after birth in order to prevent excessive bleeding from the site

where the placenta was implanted during pregnancy. When the mother nurses her baby, a natural hormone is released which causes efficient uterine contractions. The mother who does not breast-feed runs a higher risk of postpartum hemorrhage due to uterine relaxation.

Research on the nutritional value of human milk supports what breast-feeding mothers have known all along: breast milk is best milk. The proteins in human milk are utilized almost 100 percent by the baby's immature digestive system, reducing the chances for stomach upset or colic in the newborn. Mata and Gyorgy reported in a symposium sponsored by the American Society for Clinical Nutrition that breast milk also containes immunological properties which can never be duplicated by any type of artificial formula. The early milk, colostrum, is especially high in these factors which are effective against an astonishing array of organisms responsible for the bulk of common pediatric disorders—and frantic calls to the pediatrician's office from new mothers! Diarrhea, salmonella, staph and strep infections, allergic reactions, Coxsackie virus, shigella, polio, and respiratory infections are all markedly less common in breast-fed infants. Every mother who desires the best start for herself and her baby will begin nursing as soon after the birth as possible, ideally on the delivery table or in the recovery room, but certainly within the first four hours. Thereafter, babies should be nursed on demand. This assures that the mother's milk will come in within a day or two at most so that the baby will not lose more than a few ounces in the early days of life. In all these ways breast-feeding smoothes the postpartum course for mother and baby.

The mother who follows a sound diet every day of gestation protects herself from common obstetrical complications. Moreover, she also protects her baby from the most ominous of newborn problems, low birth weight.

9

The Afflicted Child

Preventing Low Birth Weight

More than 240,000 low-birth-weight babies are born annually in the United States. The percentage of such babies has risen steadily since the early 1950s. By 1968, 7.7 percent of all American babies were underweight at birth according to government sources. A spring 1976 survey of four thousand new mothers done by *Mothers' Manual* reported 13.5 percent among middle and upper income families. In 1985, the March of Dimes' literature terms low birth weight "the number one birth defect in our country."

The 1972 United Nations Statistical Handbook discloses that low birth weight runs up to 60 percent higher in the United States than in some other advanced nations. The figures for Scandinavian countries show they have reduced low birth weight to 3 percent. In the People's Republic of China, it is less than 3 percent.

What has gone wrong?

Does a baby's birth weight matter that much?

Definitely. Birth weight is the most accurate indicator of a baby's health and future mental and physical development. Babies born underweight have markedly reduced chances for survival, for normal intelligence, and for coordinated movement. A report by the U.S. Department of Health, Education and Welfare in 1972 detailed the higher risks of

death and permanent disability faced by the underweight newborn. Two-thirds of all deaths occurring up to the twenty-eighth day of life happen to low-birth-weight babies. This death rate is thirty times higher than in babies of normal birth weight.

Half of all low-birth-weight babies will grow up with IQs of less than 70, the cutoff point for severe mental retardation.

Three and a half times more infants of low birth weight suffer other neurologic deficits, such as cerebral palsy, epilepsy, learning disabilities, and behavioral disorders.

It is a grim picture. Yet low birth weight does not arise from unknown cause. It is not a matter of heredity. In fact, the vast majority of cases are completely preventable. Every mother can take steps to protect her unborn baby from low birth weight by following a good diet during pregnancy.

It has been known since the 1920s that maternal nutrition influences birth weight more than any other factor. Many international researchers and practitioners have long since proved that the quality of the mother's diet has everything to do with her baby's birth weight and subsequent development.

A landmark volume presenting the writings of just a few standouts would include:

Honora Acosta-Sison, Philippines, 1929
Guttorum Toverud, Norway, 1931
Sir Edward Mellanby, England, 1933
Winslow T. Tompkins, 1941
John Ebbs, Toronto, 1942
Bertha Burke, Boston, 1943
A. N. Antonov, Russia, 1947
William Dieckmann, Chicago, 1951
Reginald Hamlin, Australia, 1952
Hilda Knobloch and Benjamin Pasamanick, New York, 1956
Benjamin Platt, England, 1964

Thomas Brewer, San Francisco, 1966
Leela Iyengar, India, 1967
J. F. Kerr Grieve, Scotland, 1974
Agnes Higgins, Montreal, 1976
Annette Gormican, Minneapolis, 1980

Jay Hodin, a biostatistician and coauthor of *Maternal Nutrition and Child Health* (Springfield IL: Charles C. Thomas, 1979), an exhaustive analysis of studies on malnutrition and developmental disabilities, has noted: "Many of these investigators report results in which the probability that prenatal nutrition is unrelated to infant health is *less than one in a billion.*"

In most of their papers one finds appeals for aggressive action to prevent low birth weight. The prescription, based on their own clincial experience, is almost always the same: improve maternal health by dietary intervention and low birth weight will virtually disappear.

Just what constitutes low birth weight? What size baby is normal? For many years, the figure five and a half pounds was used as a line of demarcation between low and normal birth weight. This figure was also used as the official standard for determination of prematurity. Most of these cases of low birth weight traditionally have been accounted for by a shortened period of gestation, with less than the thirty-eight weeks considered the minimum time necessary for complete fetal development.

In recent years, however, there has been a dramatic upsurge of low-birth-weight babies at term—those who weigh less than five and a half pounds after a full forty weeks gestation. There is evidence that these babies are at far greater risk than those born too early. The concept of "weight for gestational age" is replacing the straight five and a half pounds as an indicator of a baby's chances for normal health and development. Under this system, the underweight-

for-date baby causes more concern among high-risk nursery personnel than the infant who is premature but normal-weight-for-date. Both types of low-birth-weight infants result primarily from maternal malnutrition.

Agnes Higgins of Montreal has stated that any baby weighing less than seven pounds at birth reflects some degree of suboptimal maternal nutrition. Many agree with her that five and a half pounds may be a valid indicator for infant survival, but mere survival is not enough, especially when it is possible with our present knowledge and resources to feed every pregnant woman the diet she and her baby need for optimal health. Mrs. Higgins, whose program at the Montreal Diet Dispensary includes distribution of milk, eggs, and oranges to women who need them to supplement their diets, pegs the cost of this extra food at $125 per pregnancy. The cost of maintaining a low-birth-weight baby in an intensive care unit can exceed $1,000 a day. The cost of institutionalizing a severely retarded child for life runs to well over a million dollars.

Following the lead of Bertha Burke, with whom she studied, Mrs. Higgins stresses a high-protein, high-calorie diet: she aims for 100 grams of high-quality protein and 2,600 calories a day. Mothers with twins require an additional 30 grams of protein and 500 extra calories—all provided by an extra quart of milk daily.

Burke found that the level of protein intake in the diet is directly reflected in the length and weight of the child at birth. In her 1940's study groups at Harvard, all babies weighed at least six pounds when the mother's diet contained 80 or more grams of protein a day. The median weight in this group was eight and a half pounds. When mothers obtained less than 45 grams of protein daily, 47 percent of the babies weighed under five and a half pounds.

Burke determined that for every additional 10 grams of protein added to the mother's diet (up to 100 grams), the

baby's birth weight would increase by one-half pound. Iyengar in India substantiated that this could be done as late as the last four weeks of gestation with positive effect on the baby's birth weight.

How exactly does the mother's diet determine the way her baby grows? As we have mentioned, the placenta is the organ which nourishes the baby from the earliest weeks of pregnancy. A multiservice organ, it works as the baby's stomach, liver, kidneys, and lungs until the moment of birth. At birth, a healthy placenta weighs one and a half to two pounds, is the size and shape of a small dinner plate and is an inch or more thick. Its large flat surface is firmly attached to the wall of the uterus where, under normal conditions, it remains throughout labor, separating from the uterus and being expelled only after the baby is born. Blood vessels form a network throughout the placenta, feeding into the baby via the umbilical cord. The cord is the lifeline from mother to baby through which 300 quarts of blood per day are circulated. Many square yards of contact surface develop in the placenta over the course of pregnancy to facilitate the vital exchange of nutrients and waste products between mother and baby.

After the mother eats a meal, the food is digested, absorbed, and passed into her liver which then releases essential nutrients into her bloodstream. These predigested nutrients reach a level of concentration higher in the mother's blood than in the baby's, so they readily pass through the very thin walls of the baby's capillaries into the baby's circulation. This process of diffusion works the same way in the transfer of oxygen from mother to baby. The nutrient-rich blood finally circulates through the baby's liver, where the nutrients are recombined into the protein building blocks the baby needs for growth and development. There is no direct mixing of the baby's blood with the mother's. Each

remains in its own circulation. Yet, they are intimately connected.

The outdated idea that the placenta can somehow extract nutrients from the mother which are not in her circulation is a threat to sound pregnancy nutrition. In a sense, the baby is in competition with all the tissues of the mother's body which also require continual nourishment from her bloodstream. If the mother fails to take in all the essential nutrients in large enough proportions to sustain the increased demands of pregnancy, her baby will not magically receive what it needs for optimal growth. The baby does not have top priority for nutrients. In fact, there are numerous reliable studies that show the opposite.

Aaron Lechtig and his collaborators have reported that even moderate maternal malnutrition interferes with the process of placental cell proliferation, resulting in abnormally small placentas. When the size of the placenta is reduced, the surface area available for nutrient transfer is correspondingly reduced. Many researchers now conclude that small placentas result in low-birth-weight babies. Very simply, a small placenta cannot transfer as many nutrients to the growing baby as a larger one. So, the baby does not weigh as much as it should at birth, even if it is born at term.

During the last eight weeks of pregnancy the baby gains an ounce a day. Brain development is occurring at the most rapid rate ever. The baby requires more oxygen and nutrients of all types—including proteins, vitamins, minerals, and calories—than earlier in pregnancy. If the mother is told she has gained enough weight already and put on a low-calorie, low-salt diet at this crucial time, the baby will be denied the nutrients needed to accomplish normal development. A restrictive diet is also likely to cause the mother's blood volume to shrink, reducing the amount of blood flowing through the placenta. The baby can suffer intrauterine growth retardation from this reduction of placental blood

flow. When less blood passes through the placenta, fewer nutrients pass to the baby during any given period of time.

The National Institutes of Health "Collaborative Study of Cerebral Palsy," published in 1968, drew a clearcut relationship between weight of the placenta and birth weight of the baby. When the placentas in one study group weighed only seven to fourteen ounces, over 22 percent of the babies weighed less than five and a half pounds. In another group, the placentas weighed fourteen to twenty-one ounces and low birth weight dropped to 3 percent. In over 1,700 cases the placenta weighed more than twenty-one ounces. Low birth weight fell to 0.5 percent in this group! A total of 31,966 infants were evaluated in this study, a large enough sample to meet any standard of scientific evidence! Clearly, maternal nutrition governs the size of both placenta and baby. It is also responsible for the secure implantation of the placenta on the uterine wall.

Abruption of the placenta (its premature separation from the wall of the uterus before the baby is born) is one of the most lethal complications in obstetrics. Traumatic abruption is the unfortunate result of an accident in which the mother suffers puncture wounds to the abdomen. This freak occurence could happen to anyone, well nourished or not. Typically, however, abruption is a severe manifestation of malnutrition. Seen most frequently among the poor, medical literature reports case after case of recurrent abruptions in the same mother. Abruption often accompanies underlying metabolic disease, such as MTLP.

Any degree of abruption is an immediate hazard to the baby's survival. Once the placenta has separated, no oxygen can be transferred to the baby. Toxic wastes soon build up in the baby's tissues. The brain can only survive eight minutes of oxygen deprivation without irreversible damage. Roughly 50 percent of babies die before mothers with this complication can reach the hospital. Immediate delivery is the only

treatment. An attempt is made to save the baby, if possible, at the same time attention is being given to minimize the internal blood loss and resulting shock which can kill the mother, too.

Nontraumatic abruptions do not occur in well-nourished women. Good nutrition early in pregnancy fosters secure implantation of the placenta on the uterine wall. Continued good nutrition assures that the placenta will grow to meet the demands of the developing baby.

In the last trimester, a healthy placenta is necessary for optimal development of another crucial organ, the baby's brain. The brain grows in two ways. Cells divide to make new ones and individual cells enlarge as they mature. Malnutrition retards both these processes, but it is especially devastating during the period when new cells are forming.

Cell division is most rapid and, therefore, most vulnerable from one month before birth until five months after. Never again will the baby's brain experience such an incredible proliferation of new cells. All of the eleven billion neurons, the cells which process and analyze information, are formed before birth. Inadequate nutrition during gestation results in permanent, irreversible deficits in the number of cells that make up the baby's brain.

Other problems also arise. Without adequate nutrition, the brain cells which do exist are likely to be malformed and their interconnections impaired. Learning problems and poor motor coordination are traced by many pediatric neurologists to these abnormalities.

Dr. Arnold Gold of Columbia University, addressing the fall 1976 meeting of the American Foundation for Maternal and Child Health, stated his belief that minimal brain damage in all social groups is primarily the result of intrauterine malnutrition. In his own practice he sees children who have a variety of difficulties which he attributes in many cases to minimal brain damage not readily discernible at birth. Their

parents or teachers report the children are hyperactive, have a short attention span, are frustrated easily, are delayed in meeting developmental milestones, have poor coordination and poor school performance, or seem immature.

Citing the work of Knobloch and Pasamanick, who in the 1950s outlined a "continuum of reproductive casualty" caused by low birth weight, Dr. Gold charted the overt and minimal damage done to cerebral function by malnutrition:

FUNCTION	OVERT	MINIMAL
MOTOR	Cerebral palsy	Clumsiness
SENSORY	Blindness Deafness	Impaired spatial perception and shape memory
MENTAL	Low I.Q.	Poor abstract reasoning Hyperkinesis
SPEECH	Aphasia	Delayed speech Language difficulties
CONVULSIVE	Epilepsy	Abnormal electroencephalogram (EEG)

Neurologists Albert Galaburda and Thomas Kemper, working at Boston Children's Hospital on dissections of the brains of dyslexic individuals who have died in accidents, have found cells out of place, particularly in the left brain which is known to be an important center of language function.

As medical writer Sandra Blakeslee reported in *The New York Times* educational supplement of November 11, 1984, an issue devoted to the learning disabled, "Since the structures are formed during fetal development, it appears that some disorders stem from imperfections in prenatal 'hard-wiring'.... Many theoreticians have turned their attention

to prenatal events that might affect how the brain is 'wired'. During the second trimester of pregnancy, a fetal brain sends primitive neurons out from its center, through surrounding white matter, to form the outer cortex where thought, language, and other higher functions reside. It is a dynamic process that involves the migration and interconnection of billions of cells."

The dyslexic brains examined by Galaburda in microscopically-thin tissue sections exhibit these types of abnormalities:

- cells that failed to reach their intended destinations, stopping before connecting with other cells necessary for critical brain capacities;
- some cells that migrated to incorrect locations and blocked the functioning of other cells (clumping);
- nerve cells that failed to stop growing when they should have, causing over-growth in certain locations of the brain.

That these anatomical differences exist is now indisputable, along with the information that malnourished, underweight, and malformed infants have a very high rate of learning disorders.

Very little maternal malnutrition is required to produce these abnormalities. Researchers in England, for example, think even mild degrees of maternal undernutrition in the last few weeks of gestation can compromise the intricate process of brain cell division and integration. Especially vulnerable in their view is the cerebellum, the part of the brain that coordinates voluntary muscular movement.

Dr. Benjamin S. Platt, of the London School of Tropical Medicine, produced these disorders experimentally by restricting protein and calories in pregnant animals during his thirty years of research. He believed that the consequences of protein-calorie malnutrition which he documented in over

five thousand laboratory cases were the same in human mothers as in other species of mammals. A member of the World Health Organization Joint Expert Committee on Nutrition for many years, Platt wrote that his colleagues treated his thesis with "undisguised scorn ... because of the tendency, particularly marked among clinicians, to ignore or disparage experimental work on animals, often for no other reason than because the results have been obtained on animals."

Platt summarized his findings in 1968:

> We have found throughout our experimental work that the earlier in life the animal is subjected to dietary deficiency, the more pronounced and extensive are its effects.... Malnutrition lowers maternal efficiency and leads to the production of underweight babies, many of whom will die before reaching two years of age, whilst among their survivors there will be some who never reach their full physical or mental potential.... Expert committees have met to discuss the problem of "low birth weight," though, still, I may say, with scant attention to the possible role of the nutrition of the mother.

When physicians responsible for giving prenatal care discount the work done on nutrition in animals, they are left with few guidelines for human nutrition. Doctors who treat the malnutrition thesis of reproductive casualty with "undisguised scorn" often state that they would be convinced if somebody would show them results of a truly controlled experiment in which some mothers were starved and others fed. To obtain the results to satisfy them, human mothers, preselected to share characteristics of statistical significance, would have to spend their entire pregnancies in a laboratory. Their diets would be rigidly managed so no deviations would be possible. Their rates of exercise, rest and sleep would be recorded, along with notations of how much of

each food each mother ate. Mothers' weight gains and losses would be charted. Fetal and placental growth and maturation would be determined by a sophisticated battery of tests. All mothers would be monitored, as were the astronauts in space, twenty-four hours a day.

After the babies were born they would be wired for metabolic assessment, too. A computer might have to be installed to handle all the information about differences between deprived and well-fed infants.

The researchers would then spend five years converting all their data to mathematical models, publishing their formulas, addressing major scientific symposia and establishing their academic reputations as unbiased investigators of the most impeccable order.

In fact, it will never be possible to satisfy the demands of those who call for inhumane experimentation of this sort. So, these physicians will continue to remain unconvinced of the evidence that speaks for the importance of their pregnant patients' nutrition. They will continue to promote the view that "There's no hard data proving that nutrition has anything to do with pregnancy outcome"—a classic Catch-22.

History, however, has provided analogous situations in which human mothers, albeit not preselected, have been subjected to severe nutritional deprivation on a large scale. These historical "experiments" support the malnutrition thesis and discredit other theories which have obscured its role for many years.

The most stark example comes from the World War II Nazi blockade of Leningrad. During the seventeen-month siege, from August 1941 to December 1942, no food could be shipped into the city. The conditions of famine were so harsh that many women ceased menstruating, few conceived, and among those who did, the rates of spontaneous abortion, stillbirth, infant mortality, and low birth weight surged upward.

A. N. Antonov, a Russian pediatrician who lived and worked through the siege, reported his observations in one clinic in the *Journal of Pediatrics* in 1947. One of the most striking developments he noted was the drastic decline in births (despite the fact that much of the army had retreated into the city). From 3,867 in 1941 the number plummeted to 493 in 1942. Of these, 414 occurred in the first half of the year—babies conceived before the siege began. Only 79 were born in the second half of 1942—those conceived after the siege began.

The 414 babies born in the first half of 1942 were subjected to severe intrauterine malnutrition during the last half of pregnancy, the critical period of brain development and weight gain. Of them, 49 percent weighed less than five and a half pounds at birth. Forty-one percent failed to attain normal length, measuring less than eighteen and a half inches. In the first half of the year, 256 of the 414 died—an infant mortality rate of 618 per thousand. Antonov described the babies as being frail with thin skull bones and high-pitched cries. They sucked poorly on mothers who produced little milk.

Dr. Antonov concluded:

> Hunger, vitamin deficiency, cold, excessive physical strain, lack of rest, and constant nervous tension had their effect on the health of the women, and the intrauterine development of the fetuses, and the condition of the newborn children during the siege. . . .
>
> The cause of the unusually high proportions of premature births and of stillbirths in the first half of 1942 was hunger during pregnancy, that is, the insufficient quantity and unsatisfactory quality of the women's food.

In addition to these catastrophic effects on the unborn, maternal starvation was also responsible for a five-fold in-

crease in convulsive MTLP, reported later by Persianov, a Moscow OB/GYN specialist.

What does this tragic story from the past have to do with American obstetrics today? The message is clear: mothers must not be starved during pregnancy, and though most American women may not literally be hungry, those who receive inadequate and incorrect advice about their diets are starving for the nutrients they and their babies need.

At the top of the list of malnourished pregnant women are those who have been told by their doctors to:

1. restrict weight;
2. restrict salt;
3. take diuretics

Virtually every pregnant woman in America in the last thirty years has been exposed to one or another of these useless pieces of dietary advice at some point in her pregnancy, which accounts for the widespread upsurge of low-birthweight and brain-damaged children in our country. As Dr. Arthur Sackler, international publisher of the *Medical Tribune,* commented in 1974:

> I don't know how much more one needs to shock our medical consciences. One does not have to be a physician to be concerned with the epidemic of defective neonates (babies less than twenty-eight days old). . . . Nothing can be lost and potentially infinite suffering may be prevented by instituting simple, preventive nutritional measures and withholding questionable medications during pregnancy.

Dr. Charles Lowe, then scientific director of the National Institute of Child Health and Human Development, agreed in 1972 after reviewing the dramatic decline in low-birthweight rate (from 13.7 percent to 2.8 percent in women having their first babies) in the Contra Costa County prenatal

clinics during the toxemia prevention project. Recognizing that this result was obtained exclusively by the use of scientific nutrition education and the abandonment of symptomatic therapies, Dr. Lowe commented:

> These conclusions challenge the conventional wisdom, which demands constraint on weight gain by caloric restriction, a limitation of salt intake, and the use of saline diuretics. None of these were used in the Brewer series. . . . Why is our prematurity rate rising, a factor of life in no other advanced nation? The answer may well lie in our prenatal regimens. It looks as if we can make real progress on both questions merely by feeding pregnant women.

All these conclusions point to the fact that we already have a reliable method for the prevention of many of the common complications of pregnancy, in particular of the metabolic toxemia of late pregnancy and of low-birth-weight babies. It is clearly improper to say that we need "more studies" before implementing sound maternal nutrition for all pregnant women. To continue to study the ravages of these preventable complications in pregnant women and their babies is to cruelly ignore the evidence already available.

Obstetricians trained in the United States over the past twenty years will probably continue to have trouble accepting the "new look" in human maternal-fetal nutrition. Each one will only be able to learn for himself by trying these methods with pregnant mothers. As with all other stages in their training, they will have to learn by doing. As they do, they will be gratified by the healthful outcomes produced by this approach to pregnancy management.

10

"What Medical School Did You Graduate From?"

The Doctor's Training Excludes Nutrition

The mother who begins to question the wisdom of her doctor's diet and drug practices can act on the nutrition information she has and keep quiet about what she's doing. Or, she can attempt to persuade the doctor that there is merit in her ideas.

Mothers who choose the second course should be prepared for confrontation. Depending on his degree of tolerance for lay opinions, the physician's attitude toward a mother who tries to raise the issue of pregnancy nutrition may range from disagreeing to patronizing to hostile.

Sooner or later, the doctor who resents such attempts at continuing education from a patient will try to terminate the conversation with a question he knows to be irrelevant: "What medical school did you graduate from?" That medical school is the only repository of valuable information is a misconception commonly held by physicians. In fact, mothers should understand that junior-high-school home eco-

nomics courses probably teach more about applied human nutrition than the doctor has learned in his entire professional life. She has missed nothing in this area by not being a medical school graduate.

What does a mother need to know about her doctor's training in order to place his nutrition advice into proper perspective?

A review of the applied nutrition education programs provided by American medical schools leads one to conclude that knowledge of pregnancy nutrition is considered completely unnecessary for the trained obstetrician.

Not one U.S. medical school requires that every student study applied human nutrition in order to receive the M.D. degree.

Not one department of obstetrics/gynecology requires that residents know and apply the principles of scientific nutrition as part of their specialty training.

Not one professional medical organization, the American Medical Association (AMA) and the American College of Obstetricians and Gynecologists (ACOG) included, has adopted official standards for managing pregnancy nutrition.

Not one local, state or federal health agency has such standards.

Standards have been established that mandate tests for syphilis, rubella, Rh incompatibility, and anemia on every pregnant woman, yet nothing is done to require evaluation of her nutrition—even though far more mothers and babies are at risk because of malnutrition than all the other factors combined.

Several characteristics of OB/GYN training help explain how neglect of pregnancy nutrition has become institutionalized in our country. Most important, the emphasis in an OB/GYN residency is on learning how and when to do operations. Because the goal is to produce skilled

practitioners who can perform life-saving, complicated surgical procedures under the most adverse conditions, scant attention is paid to *preventing* the conditions which cause some of these dire problems. Gynecological surgery, because of its "interesting" surgical complexities—especially when cancer is involved—is in the forefront of most residents' minds. Each resident must carry out a specified number of each type of operation in order to meet the minimum requirements of the specialty. With residency requirements so skewed in the direction of technical competence in the operating room, it is not surprising that interest in pregnancy nutrition is virtually nil. Malnutrition cannot be corrected surgically.

In this training program, one waits for disease to occur, then valiantly struggles to restore some semblance of health to the patient. With few exceptions, the OB/GYN resident learns to view himself as an expert in the treatment of disease, rather than in the preservation of health. Scant attention is paid to what amounts to 90 percent of the obstetrician's routine practice—the birth of normal babies to healthy mothers. There is little study of the conditions that produce normality. A "normal" is rarely presented as a case worthy of study as senior physicians make rounds, quizzing residents as they go. As Frank Hytten has observed in his text *Physiology of Pregnancy,* it has only been in the past twenty years that any interest in the events of normal pregnancy has been shown by those in academic medicine. As it stands now, the health concerns of 90 percent of childbearing women are not being addressed in disease-oriented OB/GYN residencies. At the accustomed rate of change in medical practice, it will be another fifty years before preventive measures are given the same amount of attention now devoted to salvage efforts.

Another difficulty arises from the prevalent attitude that if the professor didn't say it or do it, it's not important. An un-

questioned line of authority governs the transmission of information and attitudes within the apprentice-system of physician training. Doctors seem to have great difficulty making changes in their practices because often no one in authority mandates them. Because nutrition is a relatively new science and medicine one of the oldest, few medical school professors know of the work that has been done in the field. Those who do not know cannot teach. *Optional* lecture courses on nutrition do not adequately reflect the importance of the subject in maintaining health. There is no quicker way to convey the impression that something is unimportant than to make it optional!

Increased specialization within the whole health care field has resulted in the isolation of the OB/GYN resident from other specialists and professionals from whom he could learn much about preventive prenatal care. The pediatrician's training should include constant interaction with the obstetrician, yet the tendency has been for the obstetrician to focus on the mother and let the pediatrician care for the baby after it is born. Even when prenatal regimens ordered by the obstetrician have proved damaging to the unborn baby, the pediatrician has been unwilling to suggest changes. Instead, a new, glamorous subspecialty has emerged in the last decade in pediatrics—perinatology. It delivers intensive care to sick, primarily underweight newborns, another addition to the world of "rescue" medicine.

An impasse results when professional training programs become so narrowly focused that they provide nutrition information, but no medical background, for nutritionists and a glut of pathology, but no nutrition education, for physicians. Worse yet, doctors who are ignorant of the protective benefits of sound prenatal nutrition tend to lack respect for the work of nutritionists. This observation could also be made with regard to nurses, physical therapists, laboratory technicians and public health workers. Many physicians

seem to have the attitude that these highly skilled people are menials whose only responsibility is to carry out the physician's orders.

It is ironic that the professional with the least competence in the field, the obstetrician, wields absolute authority over the pregnancy nutrition of his patients. At best, he views nutrition counseling as something apart from the scientific prenatal care he gives—an optional frill done by somebody else down the hall. At worst, he considers it not at all—often leaving the mother to follow a drug company diet sheet he routinely distributes to patients.

The epidemic of "high-risk" mothers and defective infants spawned by the adoption of low-salt, low-calorie diets and diuretics in the United States has curiously elevated the status of obstetricians, not lowered it. Commanding sophisticated hardware born of space-age technology, the obstetrician is being counted on to aggressively manage every pregnancy and labor with increasing emphasis on intervention. Amniocentesis, sonar, oxytocin challenge tests, external and internal fetal monitoring, fetal scalp blood sampling during labor, and the inevitable soaring rates of Caesarean section are the current answers to a problem which should never have materialized. Instead of asking *why* the epidemic exists, American obstetricians have plunged in to "rescue" the casualties—all in the best tradition of crisis medicine. "Regionalization" of perinatal health care is being urged since small community hospitals cannot afford to maintain the costly intensive care maternity and neonatal units now considered to be the hallmarks of quality obstetrical care. In the process, efforts to establish standards for scientific nutrition management in pregnancy stagnate.

A final consideration is the way OB/GYN physicians come to think about the women they see in their practices. Most medical training reinforces the idea that mothers, or any nondoctors, for that matter, cannot possibly assume re-

sponsibility for any aspect of their medical care. Quite simply, the common assumption is that it is too difficult for the average person to understand; therefore, the obstetrician doesn't need to try to share his knowledge with his patients. Many women complain about the paternalistic way their questions are handled by their obstetricians. Too often, the response boils down to: "Don't worry your pretty head over such matters. I'll take care of it just fine." The role of the doctor has not included a teaching function, except within the confines of medical school where knowledge is passed on to others deemed suitable for admission to the medical fraternity. The authoritarian tradition in obstetrical training has bred a generation of doctors many of whom are unprepared to deal with the increasingly better-educated women they serve in private practice. In the clinic situation, disparity in social and economic class between doctor and mother aggravates the problem. There is probably nothing further removed from the inclination and training of the obstetrician than sitting down with a mother in the clinic to discuss her diet.

Since the doctor's OB/GYN training excludes consideration of nutrition, every mother needs to know how to manage this aspect of her own pregnancy. The subject is not complicated. It originates in the mother's kitchen, in her food planning, and in her control over what she purchases for herself and her family. She does not require a prescription or a laboratory experiment to handle the weekly marketing intelligently.

11

Foods For Life

A Clinically Proven Pregnancy Diet

Nutrition science over the past fifty years has clearly defined what constitutes a good, balanced diet for pregnancy. Yet, whether an American mother and her unborn baby are adequately nourished continues to be a matter of luck, not science.

For most American women pregnancy may be the first time in their lives they give serious thought to their nutrition—*if the subject is brought to their attention.* When the mother knows that her baby's future health and mental development are at stake, she refuses to take chances with her diet. She seeks the best possible foods she can afford. She is not concerned with the bare minimums needed to scrape through pregnancy, though this topic seems of all-consuming interest to those who draft government nutrition standards. Her goal is giving birth to the healthiest infant possible. If this were established as governmental policy for every pregnant woman, not just those who manage to educate themselves about their needs, vast improvements in our country's maternal and infant health statistics would result.

Many women must accomplish optimum nutrition on a budget, but it is a fallacy to assume that just because a mother has plenty of money to spend on food she is well

nourished. In order to benefit from her affluence, the mother must choose, prepare, and eat the correct foods, that is, those of highest nutritional value. Unfortunately, even among physicians who recognize the value of good nutrition in pregnancy, there is a tendency to assume that every woman is well nourished unless she presents some obvious sign of serious nutritional deficiency, such as anemia. Instead, the doctor must learn to regard every expectant mother he cares for as malnourished until proven otherwise. And the proof does not come until the baby has been born!

Dr. Mary Ellen Avery reported from John Hopkins University that up to 80 percent of the six thousand mothers she studied had insufficient protein intake during pregnancy. "Ironically," she wrote, "the women in this study were not poverty-stricken. They had enough to eat, but chose the wrong foods."

What are the correct foods for pregnancy? Very simply, the basic foods that have been the foundation of healthful diets for centuries: dairy products, meat, seafood, fruits and vegetables, nuts and seeds, grains, salt and water. Eating well for pregnancy does not mean cutting out foods, but rather being sure to include enough foods from all the nutrient groups. For many, "going on a diet" for pregnancy will mean eating more, not less, than before while enjoying a wider variety of foods. This diet is one that emphasizes the pleasure as well as the healthfulness of good eating!

This is the same diet plan developed for the successful Contra Costa County toxemia prevention project. It is simply the U.S. Department of Agriculture's "basic four" adapted to the special needs of pregnant women. As charted below, the daily food plan groups foods according to their nutritional makeup. Key foods in each group are listed as superior sources of specific nutrients.

The overall aim is for the mother to have 2,600 calories and 100 grams of protein each day, plus all the salt and other

essential minerals and vitamins she needs. To simplify matters, quantities are expressed in servings. A look at the Protein Counter at the end of the book gives an idea of typical serving sizes. In normal pregnancy, the mother develops a good appetite, so the single rule governing amounts of food is: eat to appetite.

Mothers who are underweight at conception may have much larger appetites than those of normal weight. Mothers expecting twins, as we have discussed, need a minimum of 500 more calories and 30 grams more protein daily. One extra quart of milk each day satisfies these needs, but the mother may meet them by eating more of other high-protein foods if she prefers.

A quart of milk and two eggs a day form the foundation of this diet *for every pregnant woman.*

These foods provide high-quality, complete protein; they contain all other known vitamins and minerals in forms the body assimilates easily; and they are comparatively inexpensive as sources of high-quality nutrition—the best buys in the market in terms of food value per dollar spent. Though milk and eggs are balanced foods designed by nature for the sustenance of life, both have come under attack as contributors to ill health!

Some people worry about eating too many eggs because of the widespread publicity about their high cholesterol content. Many of these "cholesterol information" commercials seen daily on television are sponsored by companies who market "egg substitutes," and these advertisements fail to mention certain important facts: cholesterol is manufactured by the body independent of dietary intake. Also, experts in coronary disease are divided over whether it is excess cholesterol in the diet or a defect in the cholesterol manufacturing mechanism that produces a cholesterol buildup that can lead to heart attack. More important, it makes no difference to the pregnant woman who is right about cholesterol buildup.

PREGNANCY DIET CHART

FOOD GROUP	MINIMUM NUMBER OF SERVINGS PER DAY	SOURCES
MILK	4 glasses (one quart)	whole, skim, low fat, buttermilk, powdered, evaporated, yogurt or cheese may be substituted (see Protein Counter for equivalents)
EGGS	2	may be fixed any style, used in recipes
MEAT, FISH, POULTRY, MIXED VEGETABLE PROTEINS, CHEESE, NUTS	2	(see Protein Counter for complete lists of these foods)
DARK GREEN LEAFY VEGETABLES	1 large or 2 medium	beet, collard, dandelion, mustard or turnip greens, kale, Swiss chard, spinach, lettuce, cabbage, escarole, endive, broccoli

WHOLE GRAINS, BREADS, CEREALS	5	whole-grain flours, oatmeal, 100% bran flakes, Wheatena, shredded wheat, wheat germ, granola, corn bread, corn or bran or whole-wheat muffins and rolls, waffles, brown rice, whole grain pancakes, El Molino, puffed cereals
VITAMIN C FOODS	2—either piece of fruit or large glass of juice	whole potato (any style), large green pepper, grapefruit half, whole orange, lemon, lime, papaya or tomato, cantaloupe, strawberries, parsley
FATS	3 tablespoons	butter, vitamin A enriched margarine, oils
YELLOW OR ORANGE FRUITS, VEGETABLES	5 per week	apricots, cantaloupe, cherries, papaya, peaches, prunes, tangerines, oranges, watermelon, corn, pimientos, squash, sweet potatoes, tomatoes, wax beans
LIVER OR KIDNEY	once a week	beef, calf, chicken
SALT	to taste	
WATER	to thirst	

Some researchers believe that women in the childbearing years are protected from heart attack by their female hormones. The incidence of heart attack in women begins to rise after menopause, when their circulating hormone levels fall. Many other dietary and social factors affect the cholesterol level in the blood. Sugar and refined flour consumption are both associated with elevated cholesterol levels, for instance. Blaming heart attacks on eggs alone is really a very simplistic concept.

About one in three people don't eat eggs for another reason: they don't like them. Pregnant women in this group must come to look on eggs as medicine—a big pill—because of their nutrition. However, they needn't be gagged down plain. Recipes using them in eggnog, French toast, creamed soups and sauces, casseroles, puddings, and other desserts follow in the meal plans.

The current disenchantment with milk stems from certain theories of academic nutritionists who lack clinical experience. First, there are supposed to be large numbers of people, primarily Blacks, who cannot tolerate milk because they are reputed to lack an enzyme, lactase, which permits their bodies to metabolize lactose, the sugar in milk. This lactase deficiency theoretically produces severe cramps, nausea and diarrhea whenever milk is ingested. While this metabolic problem may indeed afflict a small number of people who made up the study groups for the researchers forwarding this thesis, Tom rarely encountered—in daily practice among a clinic population that was comprised of 50 percent Black patients—an individual who was truly allergic to milk. When someone did report such a problem, it was just as likely to be a white as a Black patient. He found when counseling pregnant women, regardless of their race, the question to ask was, "Can you drink milk?" not, "Do you like milk?" The answer to the first was almost always "Yes"; to the second, often "No." The pernicious effect of the "lactase defi-

ciency" theory has been to influence clinic nutritionists across the country to stop recommending milk as a basic food for Black mothers. Many of these nutritionists think it cruel to even suggest that these mothers drink milk. Instead of seeing "lactase deficiency" as the rare condition it is, the idea that "Blacks can't drink milk" has passed into general acceptance, thus robbing low-income Black mothers of an inexpensive, high-protein, vitamin- and mineral-rich food.

A second objection to milk for pregnant women comes from those who are still worried about a mother's sodium intake. As with most high-protein foods, milk does contain a good deal of sodium. But, as we have seen, excess sodium is efficiently excreted by the kidneys so there can be no retention of dangerous levels of the mineral in the body. Women need more salt when they are pregnant and milk is an excellent source.

The final concern about milk—whole milk, in particular—is that it is fattening. Whole milk does contain more butterfat than skim, and therefore more calories per glass, but whole milk meets the needs of pregnant women better than any other type, in part because it does have extra calories. The calories provided by fat are important in pregnancy to spare protein for use in building the baby's body and brain. The fat in whole milk also is present in the correct amount to promote the most efficient absorption of calcium by the body. Calcium is needed in much higher quantities throughout pregnancy to help grow strong teeth and bones in the developing baby. The primary teeth begin to form during the fifth month of gestation, and the baby's skeleton begins to change from cartilage to bone early in the sixth month. These processes are curiously undermined when the mother's diet is low in calcium. Furthermore, if her diet supplies plenty of calcium, but not enough fat, the calcium will not be assimilated. Sometimes in cooking, another type of milk—skim, low-fat, powdered, or evaporated—may be

called for, but as a rule whole milk is preferable. As far as protein is concerned, the values for the different types of milk are exactly the same, eight grams per eight ounces.

For those who dislike the taste of milk, there are many forms of it other than as a beverage. Yogurt, cheese and ice cream all are substitutes which, incidentally, are usually well tolerated by those with a true milk allergy. The Protein Counter indicates how much of each is the protein equivalent of a glass of milk.

In addition to sodium and calcium, milk contains other minerals and all vitamins except C. The other foods on this diet build on the complete nutrition foundation provided by milk and eggs.

Three of the most important vitamins for a pregnant woman are A, C and folic acid (part of the B complex). Vitamin A has been called the "anti-infection" vitamin since the 1930s. Mothers who have a balanced diet with adequate vitamin A seldom develop serious infections of the kidneys, bladder, uterus, lungs, liver, breast during pregnancy or after delivery. In malnourished women, on the other hand, such life-threatening infections are common. Vitamin A keeps skin healthy and helps the lining of the female tract, bladder, kidneys, stomach, intestines, and bronchial tree resist infection by bacteria. Foods containing vitamin A, in addition to whole milk and eggs, are the yellow and orange fruits and vegetables, and the dark, green leafy vegetables. There is vitamin A in butter and margarine. Most vitamin capsules also provide vitamin A. It is best to obtain nutrients from foods, but taking a vitamin and mineral supplement daily is additional insurance against a deficiency. Of course, such supplements do not provide protein, calories, or salt, so they must not be relied on for complete nutrition.

Vitamin C is exceptionally important. It helps the uterus grow strong, and so makes for an easier labor and birth. Poorly nourished women have thin, flabby wombs that

function poorly and result in longer labor. Sometimes the uterus is so weak it ruptures during labor—even with a very small baby. In addition to the citrus fruits, vitamin C is found in many other foods. Strawberries, cantaloupes, tomatoes, broccoli, cabbage, green peppers, and potatoes also supply considerable amounts.

Folic acid is part of the complex of nutrients needed to build red blood cells. Iron, protein, and vitamin B12 are also part of this complex. The best sources of these nutrients are liver and kidney, eggs, and dark green leafy vegetables. Liver may be ground and used as a spread for snacks or put into a loaf with other ground meat. Liverwurst is a more nutritious choice for a lunch meat than bologna. Since folic acid is water-soluble, cooking greens and throwing away the water, as most people do, results in loss of this vitamin. Using these vegetables in salads is far better. Raw spinach, especially for those who dislike it cooked, makes a delicious addition to or substitute for lettuce.

Eating these vegetables raw is the beginning of another healthful habit—processing food as little as possible in order to conserve nutrients. Raw fruits and vegetables of all kinds provide fiber for the digestive system, an important consideration for pregnant women who are often troubled with constipation as the uterus enlarges and displaces the intestines. For the same reason, whole grains—in breads, cereals, and baked goods—are much more healthful than white bread or flour.

Whole grains are whole because they contain the entire kernel as it grows in nature, including the bran and the germ, both of which are stripped in the refining process. The bran provides fiber and B vitamins, the germ is high in vitamin E. Bread and cereal manufacturers make a token attempt to replace these nutrients, adding back eight of the 22 removed, then calling their products "enriched." Breads and cereals are also significant in the pregnancy diet because they fur-

nish calories from carbohydrates to spare protein and provide energy. Nuts and nut butters, particularly the old standby, peanut butter, are excellent foods, too. They are high in protein, vitamin E, and energy calories from fats.

To accompany solid foods at mealtimes, or alone as snacks, fresh fruit and vegetable juices, milk and broth, or bouillon are far superior to coffee, tea, soda, juice "drinks," and "punches." These no-nutrient beverages should be sharply limited during pregnancy. They are expensive and a real impediment to good nutrition when they replace natural juices in the diet. Coffee, tea, and most soft drinks contain caffeine, a substance that overstimulates the glands that regulate blood sugar. Overconsumption of these drinks results in a metabolism that runs at top speed for a brief period, then "crashes" when the excess sugar is removed from the circulation. Mothers who rely on these beverages to satisfy their thirst and fill their stomachs between meals are subverting their own nutritional interests.

The same is true of mothers who smoke instead of eat during pregnancy. Much publicity has been given to the notion that smoking in and of itself causes low-birth-weight babies. Only when the mother uses cigarettes as a substitute for good food does she run the risk of having a sickly baby. None of the studies on smoking in pregnancy has compared the nutrition of the mothers as a variable influencing birth weight of babies in the study group. Yet, it is a truism that when people give up cigarettes, they begin to eat more.

Of course, it is a good idea to stop smoking at any time of life because cigarettes cause so many debilitating diseases. They also cost money, which might better be spent on good food. If stopping completely seems impossible, cutting back to a few cigarettes a day is still beneficial. Doing away with cigarettes usually rejuvenates the taste buds, so the mother who hasn't had a good appetite in pregnancy may suddenly experience a renewed interest in eating.

Other situations over which the mother has less control may also adversely affect her appetite—even when she has the correct information about nutrition and the means to obtain it. The most common one is the nausea and vomiting or heartburn many women at times experience in pregnancy. A related problem is the "too full" feeling of late pregnancy when it is uncomfortable to eat a complete meal. The best way of coping with these situations is to eat small meals throughout the day, "grazing" as it were, instead of sitting down to three large meals. It helps to eat protein, especially during the night when the mother has to get up to urinate. Having a glass of milk, a hard-boiled egg, a slice of cheese or meat, or a cup of yogurt helps keep the mother's blood sugar up around the clock. A protein feeding during the night helps prevent that weak feeling in the morning which can bring on nausea. So-called "morning sickness" usually goes away in a few weeks, but if the mother actually vomits after eating, she should try to keep up with her nutrition by eating again as soon as possible. In severe cases, she may require medication to control the vomiting. There is a tendency in a busy obstetrics practice for the doctor to brush aside this complaint simply because it is so common and because most physicians have not been trained to be vigilant in safeguarding the mother's nutrition. Because prolonged vomiting can threaten the mother's entire metabolism, it must be accorded importance by the physician and treated swiftly.

Nutrition awareness should make the prospective mother a very tough customer when she shops for food. First in her shopping cart are those foods she knows she needs for a healthy pregnancy and normal baby. She spends much more time at the fresh produce counter than in the canned vegetable section. The meat and poultry department wins out over the TV dinners. Rolled oats, nuts and raisins are taken home to be mixed into granola, while sugar-loaded imitations are left on the shelves. This mother knows that every procedure

done for her by someone in a food processing plant adds to the final purchase price of each item. So, she chooses to buy the basic foods in their most natural form and prepare them simply at home.

What an old-fashioned idea! Yet it not only conserves nutrients, it saves money as well. One stunning example: a fourteen-cent pound of peeled, sliced, raw potatoes cost $1.41 when purchased as potato chips. A tenfold increase!

The few extra minutes it may take a mother to carefully choose from the basic foods is made up when she completely bypasses those aisles crammed with garish displays of nutritionally bankrupt foods: soft drinks, snack foods, candy, commercial cakes, cookies and pastries, boxed cereals, white bread, dessert mixes, soup mixes, salad dressing mixes, bread and roll mixes, drink mixes, prepared breakfasts, prepared lunches, prepared dinners—all left behind. What a sense of triumph, a feeling of power, to breeze by these devitalized substitutes for real food! What a pleasure to find that the basic foods save money and build health for every member of the family!

A fine guide to this form of nutritionally alert shopping is Nikki and David Goldbeck's 1973 paperback *The Supermarket Handbook: Access to Whole Foods.* They guide the shopper through each section of the market, telling in great detail how to determine quality and freshness in every type of food. When possible, they recommend, by brand name, some prepared foods that, in a pinch, can substitute for homemade. Their main criteria for food selection are the products' freedom from additives and sugar. One hundred five pounds of sugar per year per person is consumed in the United States. That works out to five hundred totally empty calories every day, calories the pregnant woman should be getting from nutritious foods. Sugar does not build a baby's body or brain! The additives, ten indiscriminately mixed pounds of them per person per year in the United States, are

potential causes of birth defects. They have never been tested for their effects on the unborn baby, so it is best to avoid them during pregnancy.

Happily, any mother can remove herself and her unborn baby from the category of experimental animals by deciding to rely on the basic foods, prepared at home, for family meals. For women who were lucky enough to grow up in families where home cooking was the rule, respect for food preparation is handed down from mother to daughter. Years of helping stir the sauce, knead the dough and grate the cheese are cultural inheritances priceless in today's fast-food society. When she has a kitchen of her own to run, she sees cooking as a creative, loving enterprise—not a chore to be greeted with the same amount of enthusiasm usually reserved for taking out the garbage. She welcomes the opportunity to prepare good food for her loved ones, knowing she is shaping their health for years to come.

The late Adelle Davis, a pioneer in bringing nutritional awareness to millions of people, wrote:

> The health of yourself and your family is a mirror which reflects your intelligence, your efficiency and your cooking methods. If you purchase your foods wisely, plan your menus carefully, prepare meals with minimum nutritive loss . . . then you, your children and your husband can probably possess as vibrant and buoyant health as it is possible for good nutrition to give.
>
> To the mother of such a family come pride of accomplishment and deep satisfaction of a job well done. She has shouldered her tasks and seen to it that good health has come from good cooking.

The menus and recipes in the following chapters are designed with the nutrition-conscious, pregnant cook in mind. The menus are formulated to meet or surpass, on a daily basis, her pregnancy nutrition requirements. Recipes feature

a protein-per-serving notation. In this way, the mother who wishes to experiment with her own menus will find it easy to keep track of her daily protein intake. She need only remember to take in eighty to one hundred grams of protein a day. As long as the daily food plan is followed, the foods may be combined in any manner that suits the cook and her family!

For those who wish to create their own recipes or see how family favorites rate nutritionally, a Protein Counter lists basic foods, the amount of protein in a given amount of edible food (excluding skin, bones, peelings, etc.), and the source of the protein—either animal or vegetable. Since vegetable proteins are incomplete, that is, lacking some of the essential building blocks (amino acids) that make them completely usable by the body, it is wise to include protein from animal sources at the same meal or in the same recipe with vegetable proteins. Some familiar combinations are chili con carne or macaroni and cheese. Protein from animal sources —in these cases, meat and cheese—is complete and boosts the nutritive value of the vegetable proteins, the beans and noodles, it accompanies.

Ellen Buchman Ewald and Frances Moore Lappé have written extensively on combining vegetable and dairy proteins as a way of increasing the protein content of vegetarian diets.

Absolute vegetarians who use no animal protein in their diets must be extremely careful in planning their pregnancy diets. The Seventh Day Adventist Church provides information on total vegetarianism as it is part of their religious practice. A wiser course is to suspend absolute vegetarian diets during pregnancy and nursing. At the very least, they should be modified to include eggs and milk products. An absolute vegetarian diet that may sustain a nonpregnant woman will not suffice for pregnancy. For the sake of her baby, the sensible mother will obtain all the high-quality, complete protein she needs, regardless of its source. For a

complete presentation of vegetarian nutrition in pregnancy both for those who use some animal products and those who are vegetarians, consult *The Brewer Medical Diet for Normal and High-Risk Pregnancy* (NY: Simon and Schuster, 1983).

12

Menus For Life

Sample Menus for Pregnancy

DAY 1	
BREAKFAST * Tropical Oranges Fried eggs Sausage links Raisin toast Milk	SNACK Salted nuts Cantaloupe wedge
LUNCH * Cream of Tomato Soup Grilled cheese sandwich * Green Bean Salad Iced tea	DINNER * Salad Niçoise * Bouillabaisse Garlic bread
	DESSERT * Cream Puff Milk

* Recipes are given in the following chapter for all menu items marked with an asterisk. Recipes are indexed beginning on page 255.

DAY 2

BREAKFAST
* Ambrosia
* High-Protein Pancakes
Maple syrup, butter
Milk

LUNCH
* Coleslaw Deluxe
* Tuna Roma
Milk

SNACK
Banana filled with peanut butter
Milk

DINNER
* Nancy's Eggplant Salad
Baked potato
* Broccoli Parmesan
Roast chicken
* Real Lemonade

DESSERT
* Broiled Peach Amandine
Milk

DAY 3	
BREAKFAST * Stewed Prunes and Cashews * Cheese Omelet Cornbread	SNACK * High-Protein Brownies Milk
LUNCH * Tomato Salad with Basil Raw green pepper stuffed with chicken salad * Whole-Wheat Bun Milk	DINNER Escarole salad * Oil and Vinegar Dressing * Cream of Mushroom Soup Baked sweet potato Roast loin of pork, sliced
	DESSERT * Baked Apple, Bonne Femme Milk

DAY 4

BREAKFAST
* Apricots in Honey Cream
Poached eggs
* Bran Muffins
Milk

LUNCH
* Cream of Asparagus Soup
Lamb shish kebab
Middle East flat bread
Lemon tea

SNACK
* Charlotte's Gazpacho
Cheese and crackers

DINNER
Molded vegetable salad
Egg noodles
Green peas, buttered
Swiss steak
Milk

DESSERT
* Coconut Pudding

DAY 5

BREAKFAST
* Bananas Baltimore
* High-Protein Granola
Milk or yogurt

LUNCH
Marinated mushrooms
Italian Sweet Sausage in Pastry
* Mustard Sauce
Minestrone soup

SNACK
Raw vegetable platter
Deviled egg halves

DINNER
Tossed green salad
* Roquefort Dressing
* Corn Chowder
Sautéed liver
Fried onions and bacon

DESSERT
* Fresh Fruit Tart
Milk

DAY 6

BREAKFAST
* French Strawberry Pancakes
* Orange Sauce
Ham slice
Milk

LUNCH
* French Onion Soup
* Chef Salad
* Reuben Sandwich
Milk

SNACK
* Cheese popcorn
Cranberry juice

DINNER
* Antipasto
* Lasagna
Italian bread

DESSERT
Chocolate pudding
Espresso coffee

DAY 7

BREAKFAST
* Citrus Punch
Apple crisp
Sausage patties
Milk

LUNCH
* Avocado-Grapefruit Salad
* Fish Bisque
* Cheese Polenta

SNACK
* Stuffed Dates
Milk

DINNER
* Carrot-Raisin Salad
Creamed spinach
* Beef Fondue
French bread

DESSERT
* Rice Pudding

DAY 8

BREAKFAST
* Rhubarb with Pineapple Sauce
Lox
Whole-wheat bagels
Cream cheese

LUNCH
* Carrot Soup
Yellow wax beans, buttered
Corned beef hash with eggs
* Vermont Brown Bread
Milk

SNACK
* Stuffed Celery
Mixed vegetable juice

DINNER
* Vichyssoise
* Spinach-Orange Salad
Corn-on-the-cob, buttered and salted
* Shrimp Scampi

DESSERT
Mincemeat pie
Milk

DAY 9

BREAKFAST
Melon wedge with berries
Wheatena, cooked in milk, with raisins
Toast
Peanut butter

LUNCH
* Cream of Split Pea Soup
* Cheese Crackers
Egg salad sandwich with lettuce and tomato

SNACK
Yogurt with fresh fruit
Graham crackers

DINNER
Tossed green salad
* Oil and Vinegar Dressing
Boiled potatoes
Boiled beets
Corned beef and cabbage
Milk

DESSERT
* Pumpkin Pie
Cheddar cheese wedge

DAY 10

BREAKFAST
* Cranberry-Orange Relish
French toast
Bacon
Milk

LUNCH
* Cream of Chicken Soup
Submarine sandwich
Potato salad

SNACK
* Liver Pâté Anderson
Rye crackers

DINNER
* Chinese Asparagus Salad
Cauliflower with
  * Cheese Sauce
* Crêpes Lake Forest
Tomato juice

DESSERT
* Fruit Fondue
Milk

DAY 11

BREAKFAST
* Grape Delight
Poached eggs
* Blueberry Muffins
Milk

LUNCH
* Green Pepper Salad
Baked tomatoes
* Welsh Rarebit
Toast points

SNACK
Canned sardines
Whole-wheat melba toast
* Mustard Sauce

DINNER
* Greek Salad
* Elsie's Pizza

DESSERT
* Egg Custard

DAY 12

BREAKFAST
Honeydew melon with prosciutto
Whole-wheat toast
Scrambled eggs
Milk

LUNCH
* New England Clam Chowder
* String Bean Casserole
Bacon, lettuce and tomato sandwich

SNACK
Beef or chicken broth, bouillon or consommé (canned)
Croutons

DINNER
* Red Cabbage Salad
* Spinach Soufflé
* Bermuda Scallops
Iced tea

DESSERT
* Peach Upside-Down Cake
Milk

DAY 13

BREAKFAST
Tomato juice
Herbed omelet
Rye bread
Raspberry tea

LUNCH
* Cuban Black Beans
Yellow summer squash, buttered
* Baked Cod Fillet
* Susan's Buttermilk Biscuits
Milk

SNACK
* Peanut Butter Cookies
Eggnog

DINNER
Swiss chard salad
* Oil and Vinegar Dressing
* Ratatouille
* Cheese Fondue
French bread

DESSERT
* Strawberry Pie

DAY 14

BREAKFAST
* Fruit Curry
* Cheese Blintzes
Sour cream

LUNCH
Tossed green salad
* Yogurt Dressing
* Egg Drop Soup (Stracciatella)
* Turkey Pot Pie
Milk

SNACK
* Egg Custard

DINNER
Marinated artichokes, pimientos and olives
* Spaghetti and Meatballs

DESSERT
* Espresso Ice Cream Sundae

13

Recipes for Life

Preparing Quality Foods at Home

The most important thing about the recipes here is not the way the ingredients are combined, but *the ingredients themselves.* From the point of view of nutrition, it makes no difference at all whether a mother eats simply or elegantly. The food value of scrambled eggs, bacon, toast, and milk is the same as Quiche Lorraine! The only difference is in the way the dishes look when the preparation is complete, and, of course, for those who enjoy cooking, the adventure of making something special from simple ingredients.

All these recipes have been "pregnancy-tested"—with excellent results. Many of the Italian dishes I remember watching my grandmother prepare on holidays or vacation days when I would visit her farm in central New York. Others have been developed over the years. A few are delicious contributions from friends.

A major goal is to encourage mothers to try cooking from scratch instead of relying so heavily on the prepared and processed foods so readily available to us. When food is prepared at home, the cook knows exactly what's in it! And what isn't. The mother who gets into the habit of cooking from the basics is also much less likely to feed her baby prepared baby food, of compromised nutritional value.

Dishes listed in the Menus chapter, but not found here,

can be found in any good cookbook, such as those by Elizabeth David, Nika Hazelton, and James Beard.

I.
Eggs, Milk and Cheese

CHEESE BLINTZES

MAKES: 12 filled pieces
PROTEIN: 8 grams per piece

BATTER

AMERICAN (METRIC/IMPERIAL)

3 eggs, at room temperature
1 cup (2.3 dl/8 fl. oz.) milk
1 teaspoon (5 g/1 teaspoon) vanilla
2 tablespoons (40 g/2 dessert spoons) honey
1 tablespoon (15 g/1 dessert spoon) corn oil
¼ teaspoon (2 g/¼ teaspoon) salt
1 teaspoon (3 g/1 teaspoon) baking powder
¾ cup (90 g/ 3 oz.) whole-wheat flour
Butter

Beat eggs lightly in a bowl. Add milk, vanilla, honey, and oil. Sift salt, baking powder, and flour into liquid mixture and stir just until flour lumps dissolve.

Drop by the tablespoon onto a 6-inch buttered hot skillet or crépe pan, and tilt pan so that batter spreads evenly over the bottom. Cook over medium heat until light brown, then

turn and cook briefly on other side just to dry surface. Stack blintzes until ready for filling.

FILLING

AMERICAN (METRIC/IMPERIAL)

1½ cups (340 g/12 oz) cottage cheese, preferably small curd
2 eggs
3 tablespoons (55 g/3 dessert spoons) orange juice concentrate
¼ teaspoon (2 g/¼ teaspoon) salt
2 tablespoons (40 g/2 dessert spoons) honey
½ teaspoon (1 g/½ teaspoon) cinnamon

Preheat oven to 425°F. (220°C./gas mark 7).

Blend all ingredients thoroughly in a bowl. Place 2 tablespoons of filling in center of the darker side of each blintz. Roll into tube shape and turn ends under to seal.

Arrange filled blintzes in a single layer in a buttered glass baking dish, brush tops with melted butter. Bake for 15 minutes, or until golden brown. Serve hot, with sour cream.

CHEESE CRACKERS

MAKES: 5 dozen 2-inch crackers
PROTEIN: 2 grams per cracker

AMERICAN (METRIC/IMPERIAL)

2 cups (225 g/ 8 oz) sharp Cheddar cheese, grated
5 eggs, beaten
½ cup (35 g/2 oz) powdered milk
2 teaspoons (6 g/2 teaspoons) celery salt
1 teaspoon (3 g/1 teaspoon) garlic powder
1 teaspoon (5 g/1 teaspoon) Worcestershire sauce
2 teaspoons (6 g/2 teaspoons) paprika
1½ cups (180 g/6 oz) whole-wheat or rye flour
¾ cup (60 g/2½ oz) soy flour
¾ cup (60 g/2½ oz) wheat germ
¼ cup (15 g/½ oz) poppy seeds
⅓ cup (.75 dl/2½ fl oz) corn oil

Preheat oven to 400 °F. (200 °C./gas mark 6).

In large bowl, combine cheese, eggs, milk, and seasonings. Stir thoroughly so that all milk powder is moistened. Add flours, wheat germ, seeds, and oil. If necessary, a small amount of water may be added to form a stiff paste.

Roll out on floured surface to desired thickness. Cut into 2-inch squares and bake on an ungreased baking sheet for 10 minutes, or until lightly browned.

Serve warm with soups, dips, or as snacks.

CHEESE FONDUE

MAKES: 4 servings
PROTEIN: 35 grams per serving

AMERICAN (METRIC/IMPERIAL)

1¼ cups (2.8 dl/10 fl oz) dry white wine
¼ teaspoon (1 g/¼ teaspoon) garlic powder
1 pound (450 g/16 oz) Swiss cheese, grated
1 teaspoon (3 g/1 teaspoon) cornstarch
Salt and pepper to taste
2 loaves whole-wheat French bread, in 2-inch cubes

Pour the wine into a fondue pot or medium-sized saucepan and heat over medium heat until small bubbles rise to the surface. Do not boil. Add garlic powder, then cheese a handful at a time, stirring continually. Allow each portion of cheese to dissolve completely before adding more. Dissolve cornstarch in 2 serving spoons water and add. When mixture begins to bubble, add salt and pepper to taste and place serving pot on table over a warming candle or hot-tray.

Each person spears the bread chunks with a sharp-tined fork and swirls them around in fondue mixture until coated. Keep fondue at even temperature, just bubbling, to avoid cheese forming a ball. If mixture becomes too thick, stir in a little warm wine.

CHEESE OMELET

MAKES: 2 servings
PROTEIN: 19 grams per serving

BATTER

AMERICAN (METRIC/IMPERIAL)

4 eggs
¼ cup (.6 dl/2 fl oz) hot water
½ cup (55 g/2 oz) Cheddar cheese, grated
2 tablespoons (30 g/2 dessert spoons) butter

Beat eggs thoroughly in a bowl. Add water and mix well. Melt butter in a skillet and pour in egg mixture. Cook over medium heat. As eggs start to firm, gently lift up edges with spatula, tilting pan so that remaining liquid can seep underneath and cook. When eggs resemble a soft pancake, sprinkle cheese on top, then fold whole omelet in half. Bottom should be golden brown and center creamy. Cut in two pieces and serve at once.

To vary, omit cheese and use instead:

AMERICAN (METRIC/IMPERIAL)

2 tablespoons (12 g/2 dessert spoons) onions, diced
½ teaspoon (1 g/½ teaspoon) sage
¼ cup (15 g/4 dessert spoons) parsley, chopped
3 tablespoons (45 g/3 dessert spoons) sour cream

CHEESE POLENTA

MAKES: 8 servings
PROTEIN: 25 grams per serving

AMERICAN (METRIC/IMPERIAL)

6 cups (1.6 liters/2½ pints) milk
4 tablespoons (60 g/4 dessert spoons) butter
3 cups (420 g/14 oz) yellow cornmeal
1 teaspoon (8 g/1 teaspoon) salt
3 eggs, beaten
1 cup (120 g/4 oz) mozzarella cheese, grated
¾ cup (60 g/2 oz) Parmesan cheese, grated

Preheat oven to 375°F. (190°C./gas mark 5). Oil a large, shallow baking pan.

Heat milk and butter in a large saucepan until butter melts. Stir in cornmeal and salt and cook over medium heat stirring constantly for about 15 minutes, or until mixture thickens enough to hold spoon erect. Add eggs and cheese and mix thoroughly. Mixture should be somewhat dry.

Spoon mixture into pan and bake approximately 45 minutes. When done, polenta will be lightly browned and knife inserted into center will come out clean.

Let cool in pan until polenta can be cut into squares. Serve warm or cold.

COCONUT PUDDING

MAKES: 4 cups
PROTEIN: 21 grams per cup

AMERICAN (METRIC/IMPERIAL)

1 cup (100 g/3½ oz) powdered milk
⅓ cup (100 g/5 dessert spoons) clover honey
¼ teaspoon (2 g/¼ teaspoon) salt
4 whole eggs
2 egg yolks
3 cups (6.8 dl/1¼ pints) milk
1 tablespoon (15 g/1 dessert spoon) vanilla
2 tablespoons (20 g/2 dessert spoons) cornstarch
2 cups shredded (125 g/4 oz) coconut

In a large saucepan, combine powdered milk, honey, and salt. Add eggs and yolks and ⅓ of the milk. Stir until the powdered milk is dissolved and eggs are thoroughly mixed. Beat until smooth with an electric mixer. Add remaining milk and vanilla and bring to boiling point over medium heat.

In separate cup, put 4 serving spoons of the mixture and add cornstarch. Stir until cornstarch is completely dissolved, add to the contents of the large saucepan and stir for 1 minute.

Remove from heat and mix in shredded coconut.

Pour into serving dish, let cool to room temperature, then chill. Serve sprinkled with toasted coconut or semi-sweet chocolate slivers.

To vary, substitute two sliced bananas for coconut, or substitute 3 serving spoons cocoa for coconut and double the honey. Both of these variations make excellent pie fillings.

CREAM OF ASPARAGUS SOUP

MAKES: 4 bowls
PROTEIN: 11 grams per bowl

AMERICAN (METRIC/IMPERIAL)

1 pound (450 g/16 oz) fresh or frozen asparagus
2½ cups (5.6 dl/20 fl oz) chicken broth
½ cup (50 g/2 oz) onion, chopped
½ cup (60 g/2 oz) celery, chopped
1 large potato, thinly sliced
2 cups (4.5 dl/16 fl oz) milk
3 tablespoons (45 g/3 dessert spoons) butter
2 hard-boiled eggs, sliced

Rinse fresh asparagus, then cut off tips and place them in a basket to be steamed over the other ingredients as they simmer.

Cut asparagus stalks into pieces and place them in a large saucepan with the chicken broth, onion, celery and potato. Bring to a boil, then reduce heat and insert steamer basket with asparagus tips above liquid. Cover all and simmer for 25 minutes, or until soft.

In a separate saucepan, heat the milk and butter until butter melts.

Set steamer basket aside and beat cooked broth with an electric mixer until smooth, or pour 1 cup at a time into blender, cover, and blend for a few seconds at high speed. Then return to large saucepan.

Add hot milk and butter to vegetable mixture and stir thoroughly. Garnish with asparagus tips and egg slices. Serve hot.

CREAM OF CHICKEN SOUP

MAKES: 4 bowls
PROTEIN: 16 grams per bowl

AMERICAN (METRIC/IMPERIAL)

1½ cups (180 g/6 oz) cooked chicken, diced
2½ cups (5.6 dl/20 fl oz) chicken broth
1 cup (100 g/4 oz) onion, chopped
½ cup (40 g/1 oz) parsley, chopped
1 large potato, thinly sliced
2 teaspoons (15 g/2 teaspoons) salt
2 cups (4.5 dl/16 fl oz) milk
3 tablespoons (45 g/3 dessert spoons) butter

Place all ingredients except milk and butter in a large saucepan. Bring to a boil, then reduce heat and simmer, covered, for 20 minutes, stirring occasionally.

Blend with an electric mixer or blender until smooth. Add milk and butter and stir thoroughly while bringing just to boiling point. Serve hot, garnished with parsley.

To vary, substitute curry powder and garlic powder to taste for parsley. Garnish with paprika.

CREAM OF MUSHROOM SOUP

MAKES: 4 bowls
PROTEIN: 11 grams per bowl

AMERICAN (METRIC/IMPERIAL)

¾ pound (210 g/6 oz) fresh mushrooms, chopped
¾ cup (75 g/2½ oz) onion, chopped
4 tablespoons (60 g/4 dessert spoons) butter
2 tablespoons (15 g/2 dessert spoons) whole-wheat flour
1 teaspoon (8 g/1 teaspoon) salt
2 cups (4.5 dl/16 fl oz) beef broth
2 cups (4.5 dl/16 fl oz) milk
½ cup (75 g/2½ oz) powdered milk
4 egg yolks, beaten, at room temperature
Chives

In a saucepan, sauté mushrooms and onion in butter until onions become transparent. Stir in flour and salt, then add beef broth, milk, and powdered milk. Stir until all milk powder lumps dissolve. Bring to boiling point, but do not boil.

Remove from heat and cool slightly. Stir in egg yolks. Garnish with chopped chives. Reheat and serve hot.

CREAM OF SPLIT PEA SOUP

MAKES: 4 bowls
PROTEIN: 14 grams per bowl

AMERICAN (METRIC/IMPERIAL)

3-inch cube (90 g/3 oz) salt pork
1 cup (200 g/7 oz) dry split peas
1 cup (145 g/5 oz) fresh or frozen peas
¾ cup (90 g/3 oz) carrot, chopped
¾ cup (90 g/3 oz) celery, chopped
¾ cup (75 g/2½ oz) onion, chopped
1 large potato, thinly sliced
1 teaspoon (1 g/1 teaspoon) garlic powder
1 teaspoon (8 g/1 teaspoon) salt
2 cups (4.5 dl/16 fl oz) chicken broth
1 cup (2.25 dl/8 fl oz) milk
Pepperoni slices or crisp bacon

Place all ingredients except milk and pepperoni into a saucepan. Bring to boiling point, then cover and reduce heat. Simmer 30 minutes, or until split peas are soft. Check occasionally to see that there is enough liquid to prevent scorching, and stir often. Add water if needed.

Blend until smooth with an electric mixer or blender. Add milk and bring to boiling point. Garnish with pepperoni slices or bacon and serve hot.

CREAM OF TOMATO SOUP

MAKES: 4 bowls
PROTEIN: 10 grams per bowl

AMERICAN (METRIC/IMPERIAL)

4 tablespoons (60 g/4 dessert spoons) tomato paste
2 cups (450 g/1 pound) very ripe fresh tomatoes, chopped (canned whole tomatoes may be substituted in winter)
2 cups (450/1 pound) potatoes, thinly sliced
2 cups (340 g/11 oz) onions, thinly sliced
2 cups (4.5 dl/16 fl oz) beef broth
1 teaspoon (8 g/1 teaspoon) salt
1 cup (265 g/8 fl oz) Cream Sauce (see page 183)
½ cup (75 g/2½ oz) powdered milk
Croutons

Place all ingredients except cream sauce, powdered milk, and croutons in a large saucepan. Bring to a boil and simmer 30 minutes, covered, until potatoes and onions are very soft.

Blend with an electric mixer or blender until smooth. If necessary, pour through a strainer to remove seeds and skin of tomatoes. Add cream sauce and powdered milk, stirring until milk lumps dissolve. Bring to boiling point. Garnish with croutons and serve hot.

NOTE: This soup cannot be made with fresh tomatoes found in the supermarket in winter. Such tomatoes are too woody in texture and lack the succulence of those picked ripe from the vine in summer. Most often, they have been picked green and exposed to a gas during storage, which makes them look red though they are not anywhere near ripe. They are a waste of money.

CREAM PUFFS

MAKES: 12 3-inch puffs (7.5 cm diameter)
PROTEIN: 2 grams per shell; 7 grams per pudding-filled cream puff

SHELL

AMERICAN (METRIC/IMPERIAL)

1⅓ cup (75 g/5 dessert spoons) butter
½ cup (1.1 dl/ 4 fl oz) milk
⅔ cup (80 g/3 oz) whole-wheat flour
¼ teaspoon (2 g/¼ teaspoon) salt
3 eggs, at room temperature

Preheat oven to 450°F. (230°C./gas mark 8).

Heat butter and milk in a medium-sized saucepan until butter melts. Add flour and salt, and stir vigorously until mixture forms a ball in the center of the pan.

Remove from heat and drop in eggs, one at a time, stirring until each egg is completely absorbed and batter appears glossy, but stiff.

Drop by the tablespoon onto an oiled baking sheet. Each puff should be no larger than 3 inches (7.5 cm) in diameter or it may not rise during baking.

Bake at preset temperature for 10 minutes, then reduce heat to 350°F. (180°C./gas mark 5) for 25 minutes. Shells should be browned and crisp when done. Open the oven door to let them cool on baking sheet before removing from oven.

To fill, cut out a circle from the top of shell with a sharp knife. Remove any threads of moist dough from inside and let stand open briefly to dry inside. Spoon filling into shell, replace top and serve.

FILLINGS

Coconut or chocolate pudding, egg custard, whipped cream, ice cream, lemon pie filling, fresh fruit. For lunch, try creamed meats or vegetables—an elegant way to serve leftovers.

EGG CUSTARD

MAKES: 4 cups
PROTEIN: 17 grams per cup

AMERICAN (METRIC/IMPERIAL)

2½ cups (5.6 dl/1 pint) milk
¾ cup (110 g/3¾ oz) powdered milk
⅓ cup (100 g/5 dessert spoons) honey
¼ teaspoon (2 g/1 teaspoon) salt
4 eggs, beaten
2 egg whites
1½ teaspoons (8 g/1½ teaspoons) vanilla
Nutmeg

Preheat oven to 325 °F. (160 °C./gas mark 2). Oil a medium-sized shallow baking dish or casserole.

Place all ingredients into a bowl and blend until smooth with an electric mixer on low speed.

Pour mixture into the oiled dish and set it in a pan of hot water in the oven. Water should reach halfway up the sides of the dish. Bake for 50 minutes or more. Custard is done when a knife inserted near the edge comes out clean. Custard continues to cook while cooling. Cool to room temperature on rack, then chill.

Serve topped with fresh fruit.

EGG DROP SOUP (STRACCIATELLA)

MAKES: 4 bowls
PROTEIN: 8 grams per bowl

AMERICAN (METRIC/IMPERIAL)

2 eggs
2 tablespoons (10 g/2 dessert spoons) Parmesan cheese, grated
2 tablespoons (15 g/2 dessert spoons) whole-wheat flour
⅛ teaspoon (1 g/⅛ teaspoon) salt
3 cups (6.8 dl/24 fl oz) chicken or beef broth
Nutmeg or garlic powder

In a large bowl, beat eggs, Parmesan, flour and salt until smooth. Add ⅙ of the broth, and a pinch of nutmeg (for chicken broth) or a pinch of garlic powder (for beef broth). Mix.

Bring remainder of broth to a boil and pour in egg mixture, beating vigorously with a fork or wire whisk. Reduce heat and simmer about 2 minutes, stirring constantly, or until eggs form thready strands.

Serve hot.

EGGNOG

MAKES: 1 glass
PROTEIN: 18 grams per glass

AMERICAN (METRIC/IMPERIAL)

¾ cup (1.7 dl/6 fl oz) milk
¼ cup (40 g/1¼ oz) powdered milk
1 egg
½ teaspoon (3 g/½ teaspoon) vanilla
1 teaspoon (7 g/1 teaspoon) honey
Nutmeg

Place all ingredients in a blender and mix for 10 seconds at high speed, or place in a small bowl and beat with electric mixer for 30 seconds.

Pour in a tall glass and sprinkle with nutmeg.

ELSIE'S PIZZA

MAKES: 2 8-slice pizzas
PROTEIN: 16 grams per slice

DOUGH

AMERICAN (METRIC/IMPERIAL)

1 package dry yeast
¼ cup (.5 dl/2 fl oz) warm water
4 cups (480 g/1 pound) whole-wheat flour
1 teaspoon (8 g/1 teaspoon) salt
1 tablespoon (15 g/1 dessert spoon) olive oil

In a cup, dissolve yeast in warm water.

Place flour and salt in a large bowl. Add yeast liquid, then

slowly add water until flour gathers into a ball. Mix in oil with fingers and work until dough is elastic.

Cover with a damp kitchen towel and set in unheated oven to rise until doubled in bulk, about two hours.

SAUCE

AMERICAN (METRIC/IMPERIAL)

1 pound (480 g/1 pound) Italian sweet sausage, casings removed
1 large (120 g/4 oz) onion, chopped
½ teaspoon (1 g/½ teaspoon) garlic powder
1 six-ounce (90 g/12 dessert spoons) can tomato paste
1 32-ounce (1 kg/32 fl oz) can tomato purée
1 eight-ounce (240 g/8 fl oz) can mushroom pieces
2 bay leaves
2 tablespoons (8 g/2 dessert spoons) dried parsley

In a large skillet, brown sausage, onion, and garlic powder. Remove mixture from skillet and stir tomato paste in drippings until they are absorbed.

In a large saucepan, combine tomato purée, mushrooms, and seasonings. Add browned sausage mixture and tomato paste. Bring to boiling point over medium heat, then reduce heat and simmer about two hours.

TOPPING

AMERICAN (METRIC/IMPERIAL)

3½ cups (420 g/14 oz) mozzarella cheese, shredded
1⅓ cup (85 g/3 oz) Parmesan cheese, grated
Anchovies (optional)

Preheat oven to 400°F. (200°C./gas mark 6). Pour olive oil on pizza pans.

To assemble pizza, roll out dough on floured surface to fit size of pan. Lift with both hands and transfer to pan. Pizza will recede a bit from edges of pan, floating on the oil.

Spread tomato sauce generously over dough surface. (If there is more sauce than you need, save it for pasta.) Then sprinkle cheese evenly over top. Anchovies may be used as your taste dictates.

Bake for ½ hour on bottom rack of oven.

When done, crust will be golden brown and cheese will be melted. Use a spatula to lift pizza and a large dressmaker's scissors to cut it while hot. Serve immediately.

ESPRESSO ICE CREAM SUNDAE

MAKES: 1 serving
PROTEIN: 15 grams per serving

AMERICAN (METRIC/IMPERIAL)

⅔ cup (90 g/3 oz) vanilla ice cream
½ banana, sliced
½ cup (70 g/2½ oz) peanuts, salted
1-ounce square (30 g/1 oz) semi-sweet chocolate
¼ cup (60 g/4 dessert spoons) espresso coffee, hot

In a dessert bowl, place ice cream, banana, and peanuts. In a separate cup, dissolve chocolate in hot coffee. Stir until combined. Pour espresso sauce over other ingredients. Serve.

NOTE: Most commercial ice creams are synthetic concoctions that contain little milk and no eggs. When buying ice cream, choose those brands which list ingredients on the package and which contain few artificial colors, flavors, and texturizers. An alternative is to make your own ice cream or

ice milk at home, either with an ice-cream machine or the old-fashioned way, by hand. Most basic cookbooks give instructions. Real ice cream can provide good nutrition, especially protein, but should not be relied on exclusively as a milk source because of its high sugar content.

FISH BISQUE

MAKES: 4 bowls
PROTEIN: 18 grams per bowl

AMERICAN (METRIC/IMPERIAL)

¼ cup (25 g/4 dessert spoons) onion, diced
3 tablespoons (45 g/3 dessert spoons) butter
2 cups (480 g/1 pound) canned salmon, deboned and flaked
3 cups (6.8 dl/24 fl oz) Cream Sauce (see page 183)
3 tablespoons (45 g/3 dessert spoons) sherry
Milk, heated
Paprika and chives

In a large saucepan, sauté onions in butter until they are transparent. Add the salmon and cream sauce. Stirring constantly, bring to boiling point, but do not boil.

Remove from heat and add sherry. Add milk to desired thinness. Garnish with paprika and chives. Serve hot.

To vary, substitute for salmon an equal amount of tuna, diced shrimp, crabmeat, lobster, or minced clams.

NEW ENGLAND CLAM CHOWDER

MAKES: 4 bowls
PROTEIN: 23 grams per bowl

AMERICAN (METRIC/IMPERIAL)

3-inch cube (90 g/3 oz) salt pork or 3 strips bacon
½ cup (50 g/8 dessert spoons) onion, diced
2 cups (450 g/1 pound) potatoes, diced
2 tablespoons (15 g/2 dessert spoons) whole-wheat flour
½ teaspoon (4 g/½ teaspoon) salt
Pepper
3 bay leaves
Clam juice
3 cups (6.8 dl/24 fl oz) fresh or canned clams, coarsely chopped
2 cups (4.5 dl/16 fl oz) milk, heated
Butter

Cook salt pork or bacon in a large saucepan until fat is released, then remove. Stir onions into drippings and cook until just soft.

Place potatoes in a bowl and sprinkle with the flour, salt, and pepper. Add to onions along with bay leaves and juice from the clams. If needed, add enough hot water to cover potatoes and simmer until potatoes are tender, but not mushy.

Add clams, bring to a boil, and cook 2 more minutes. Do not overcook or clams will be leathery.

Stir in heated milk and a few chunks of butter. Remove from heat and let stand until butter melts. Remove bay leaves before serving. The traditional accompaniment is Oysterettes or saltine crackers.

PUMPKIN PIE

MAKES: 1 8-slice pie
PROTEIN: 8 grams per slice

WHOLE-WHEAT PIECRUST

AMERICAN (METRIC/IMPERIAL)

1 cup (120 g/4 oz) whole-wheat flour
¼ cup (20 g/4 dessert spoons) wheat germ
1 teaspoon (8 g/1 teaspoon) salt
⅓ cup (75 g/5 dessert spoons) corn oil
3 tablespoons (45 g/3 dessert spoons) milk

In a bowl, combine flour, wheat germ, and salt. Add oil and milk to dry ingredients and mix lightly with a fork until mixture is moistened, but not sticky.

Press dough evenly into an oiled large pie plate, making as high a rim as possible.

For pumpkin pie, do not prebake. If being used for a pie that requires a prebaked shell, crust should bake for 12 minutes at 400 °F. (200 °C./gas mark 6).

FILLING

AMERICAN (METRIC/IMPERIAL)

6 eggs
2 cups (480 g/16 oz) unsweetened pumpkin (not *pie mix*)
½ cup (160 g/8 dessert spoons) honey
½ teaspoon (4 g/½ teaspoon) salt
2 teaspoons (2 g/2 teaspoons) cinnamon
1 teaspoon (1 g/1 teaspoon) ginger
½ teaspoon (1 g/½ teaspoon) cloves
1 cup (2.3 dl/8 fl oz) evaporated milk
Whipped cream

In a large bowl, beat eggs until fluffy. Add pumpkin and mix thoroughly, then add all other ingredients. Stir until mixture is even-colored, with no streaks.

Pour into an unbaked shell and bake for 15 minutes at 425°F. (220°C./gas mark 7), then reduce heat to 350°F. (180°C./gas mark 4) and bake another 45 minutes, or until done. A knife inserted into center will come out clean when done. Cool before serving. Top with whipped cream.

RICE PUDDING

MAKES: 5 cups
PROTEIN: 10 grams per cup

AMERICAN (METRIC/IMPERIAL)

2 cups (390 g/14 oz) cooked brown rice
2½ cups (5.6 dl/1 pint) milk
½ cup (75 g/2½ oz) powdered milk
⅓ cup (100 g/5 dessert spoons) honey
3 tablespoons (45 g/3 dessert spoons) butter
2 teaspoons (10 g/2 teaspoons) vanilla
4 eggs, beaten
1 cup (145 g/5 oz) raisins
1 teaspoon (1 g/1 teaspoon) cinnamon
½ teaspoon (4 g/½ teaspoon) salt

Preheat oven to 350°F. (180°C./gas mark 4). Butter a quart-and-a-half baking dish or casserole.

Combine all ingredients in a large bowl. Pour into baking dish and bake about 40 minutes, or until set. Knife inserted into center will come out clean when done.

Custard will rise to top. If you prefer to have it mixed through pudding, stir two or three times while pudding is baking.

Serve warm or chilled.

SPINACH SOUFFLÉ

MAKES: 4 servings
PROTEIN: 16 grams per serving

AMERICAN (METRIC/IMPERIAL)

1 cup (265 g/8 fl oz) Cream Sauce (see page 183)
4 egg yolks
1 cup (115 g/4 oz) Cheddar cheese, coarsely grated
3 tablespoons (12 g/3 dessert spoons) parsley
3 tablespoons (20 g/3 dessert spoons) onion, minced
6 egg whites, beaten stiff
3 cups (165 g/5½ oz) dry raw spinach, chopped fine

Preheat oven to 350°F. (180°C./gas mark 4).

Heat cream sauce, then pour into a large bowl. Add egg yolks, cheese, parsley, and onion, and mix thoroughly. Fold in egg whites gently until no streaks of egg or cheese are left. Sprinkle spinach, a handful at a time, into mixture and combine gently.

Pour mixture into a buttered deep dish or casserole. A springform pan can be used successfully. Bake 40 minutes or until set.

Serve at once, as the soufflé falls rapidly after leaving oven.

VICHYSSOISE

MAKES: 4 bowls
PROTEIN: 8 grams per bowl

AMERICAN (METRIC/IMPERIAL)

4 leeks or onions, minced, about 1½ cups (240 g/1 pound)
3 tablespoons (45 g/3 dessert spoons) butter
1½ cups (225 g/8 oz) potatoes, thinly sliced
1½ cups (3.4 dl/12 fl oz) chicken broth
½ cup (75 g/1½ oz) powdered milk
1 cup (2.3 dl/8 fl oz) milk
½ cup (120 g/4 oz) sour cream
Chives, chopped

In a saucepan, sauté leeks or onions in butter until soft. Add potatoes and chicken broth, cover and simmer for 20 minutes, or until potatoes are very soft.

Pour potato mixture into blender with powdered milk and blend 10 seconds on medium speed.

Return to saucepan and add milk and sour cream. Stir thoroughly, then place in refrigerator to chill.

Serve garnished with chives.

WELSH RAREBIT

MAKES: 6 servings
PROTEIN: 20 grams per serving

AMERICAN (METRIC/IMPERIAL)

1 tablespoon (15 g/1 dessert spoon) butter
1 pound (450 g/1 pound) sharp Cheddar cheese, grated
1 cup (240 g/8 fl oz) beer
1 teaspoon (1 g/1 teaspoon) dry mustard
Water
Pepper to taste
2 egg yolks

In a saucepan or chafing dish, melt butter and cheese. Add beer when cheese is partially melted, stirring until well mixed.

Mix mustard with a small amount of water to form a soft paste. Add to cheese mixture along with pepper.

When mixture is slightly thickened, remove from heat and stir in egg yolks. Serve hot on whole-wheat toast or English muffins.

II.
Meat, Poultry and Seafood

BAKED COD FILLET

MAKES: 4 servings
PROTEIN: 36 grams per serving

AMERICAN (METRIC/IMPERIAL)

4 six-ounce (900 g/24 oz) fillets of fresh codfish
¾ cup (60 g/2 oz) wheat germ
Mayonnaise

Preheat oven to 400°F. (200°C./gas mark 6). Grease a large glass baking dish.

Spread both sides of each fillet generously with mayonnaise and coat with wheat germ. Bake for 15 minutes or until the cod starts to separate into large chunks when touched with a fork.

BEEF FONDUE

MAKES: 4 servings
PROTEIN: 30 grams per serving

AMERICAN (METRIC/IMPERIAL)

1½ pounds (670 g/24 oz) beef sirloin, ¾-inch cubes
1 cup (240 g/8 oz) unsalted butter or corn oil

Melt butter in a fondue pot, chafing dish, or saucepan over flame adequate to keep cooking heat constant. Spear one or two cubes of beef on long, sharp-tined forks and swirl in butter when it starts to turn brown. The meat cooks rapidly, so be careful not to leave it in too long or it will be quite tough. Dip the meat in sauces arranged on each plate.

SAUCES

Vary with these additions to taste:
Cream Sauce (see page 183) with curry powder
Ketchup with Worcestershire sauce and minced onion
Prepared mustard with chopped parsley and sage
Mayonnaise with anchovy paste and garlic powder
Welsh rarebit (see page 171)

BERMUDA SCALLOPS

MAKES: 4 servings
PROTEIN: 28 grams per serving

AMERICAN (METRIC/IMPERIAL)

1¼ pounds (560 g/20 oz) bay scallops
3 tablespoons (45 g/3 dessert spoons) corn oil
3 tablespoons (15 g/3 dessert spoons) lemon juice
½ teaspoon (1 g/½ teaspoon) ground cloves
¼ cup (25 g/1 oz) onion, minced
¼ cup (15 g/4 dessert spoons) fresh parsley, chopped
3 tablespoons (45 g/3 dessert spoons) butter

Marinate the scallops for one hour in a large skillet with oil, lemon juice, and cloves, turning two or three times.

Add the onions, parsley, and butter and cook over medium heat for 15 minutes, or until the scallops begin to release their juices. Serve immediately with sauce.

SAUCE

AMERICAN (METRIC/IMPERIAL)

1 cup (265 g/8 fl oz) cooled Cream Sauce (see page 183)
2 egg yolks, beaten
⅛ teaspoon (1 g/⅛ teaspoon) dry mustard
1 teaspoon (5 g/1 teaspoon) vinegar
2 tablespoons (8 g/2 dessert spoons) fresh parsley, chopped

In a saucepan over low heat add egg yolks, mustard, and vinegar to cream sauce. Mix thoroughly and remove from heat just before the mixture is about to boil. Add the parsley and pour over scallops.

BOUILLABAISSE

MAKES: 10 bowls
PROTEIN: 59 grams per serving

AMERICAN (METRIC/IMPERIAL)

1 pound (450 g/1 pound) each (cleaned and cut into 2-inch pieces): flounder, perch, haddock, cod, shrimp, or any other fish available
1 pound (450 g/1 pound) hard-shell clams
2 dozen live mussels, washed
1½ cups (150 g/5 oz) onions, minced
1 teaspoon (5 g/1 teaspoon) garlic powder
1 cup (250 g/8 fl oz) tomato purée
1 cup (240 g/8 oz) whole tomatoes, peeled and chopped
2 bay leaves
1 teaspoon (2 g/1 teaspoon) thyme
1 three-inch strip of orange rind
6 whole cloves
½ cup (120 g/4 fl oz) olive oil
¼ teaspoon (1 g/¼ teaspoon) saffron (optional)
2 quarts (1.8 liters/64 fl oz) water

In a large soup pot, place all the ingredients except the clams, shrimp, mussels, and water. Swirl the pot so that the fish is well covered with liquid. Add water and bring to a brisk, rolling boil over high heat. Boil for 8 minutes. Add the clams, shrimp, and mussels, and boil another 8 minutes, or until mussels open.

Serve the fish on a separate platter. The broth is served over thick slices of bread in soup bowls.

CRÊPES LAKE FOREST

MAKES: 4 filled crêpes
PROTEIN: 9 grams per piece

BATTER

AMERICAN (METRIC/IMPERIAL)

1 egg
½ cup (1.1 dl/4 fl oz) milk
⅛ teaspoon (1 g/⅛ teaspoon) salt
1 teaspoon (.5 g/1 teaspoon) corn oil
⅓ cup (30 g/1 oz) whole-wheat flour

Combine all the ingredients in a bowl. Drop by the tablespoon onto an oiled, hot skillet or crêpe pan. Do not overcrowd because mixture spreads widely. After one minute, turn and cook the other side until golden. Stack crêpes until ready for filling.

FILLING

AMERICAN (METRIC/IMPERIAL)

2 tablespoons (30 g/1 oz) butter
2 tablespoons (15 g/2 dessert spoons) whole-wheat flour
½ cup (120 g/4 fl oz) chicken broth
½ cup (120 g/4 fl oz) milk
2 tablespoons (10 g/2 dessert spoons) dry white wine
½ cup (120 g/4 oz) cooked mushrooms
½ cup (60 g/2 oz) Swiss cheese, grated
½ cup (60 g/2 oz) cooked chicken
¼ cup (15 g/4 dessert spoons) fresh parsley, chopped

Melt the butter in a medium-sized saucepan. Add flour and stir for one minute. Then add broth, milk and wine. Blend until smooth.

In a separate bowl, combine the remaining ingredients and stir into sauce.

To assemble crêpes, place ⅓ cup of filling into center of each crêpe. Roll into a tube shape and turn ends under. Serve hot.

ITALIAN SWEET SAUSAGE IN PASTRY

MAKES: 12 sausages
PROTEIN: 9 grams each

12 Italian sweet sausage links, throughly cooked

WHOLE-WHEAT PASTRY CRUST

AMERICAN (METRIC/IMPERIAL)

2 cups (240 g/8 oz) whole-wheat flour
½ cup (40 g/1½ oz) soy flour
⅓ cup (75 g/5 dessert spoons) cream cheese
⅓ cup (75 g/5 dessert spoons) butter
3 eggs, beaten
½ teaspoon (4 g/½ teaspoon) salt
Cold water

Place all the wheat and soy flour in a bowl. Using a table fork or fingertips, cut in the cheese and butter until mixture resembles small beads. Stir in the eggs and salt until dough forms a ball and leaves the sides of bowl clean. Depending on flour used, a few tablespoons of water may be needed to achieve correct degree of firmness and smoothness.

Chill pastry for 30 minutes, then preheat oven to 375°F.(190°C./gas mark 5). Roll out dough on a floured

surface to ½-inch thickness. Cut into oblongs large enough to cover sausage, overlapping the sides and tucking ends under.

With the seam edge down, place on an oiled baking sheet and bake for 25 minutes or until pastry is lightly browned.

Serve hot with Mustard Sauce (page 185).

NOTE: The best place to buy Italian sausage is at a store that makes its own fresh every day and does not use any additives to preserve or color the meat. My mother and aunts still prefer to make their own sausage at home. Italian specialty stores often make their own. Supermarkets generally do not, but ask the manager what their brands contain, as they often lack labels.

LASAGNA

MAKES: 8 servings
PROTEIN: 56 grams per serving

NOODLES

AMERICAN (METRIC/IMPERIAL)

1½ pound (600 g/20 oz) high-protein lasagna noodles (Buitoni brand)

2 tablespoons (30 g/2 dessert spoons) olive oil

ITALIAN TOMATO SAUCE

AMERICAN (METRIC/IMPERIAL)

¼ cup (90 g/4 dessert spoons) olive oil
1 cup (100 g/3½ oz) onions, chopped
1 teaspoon (2 g/1 teaspoon) garlic powder
2 six-ounce (360 g/12 fl oz) cans tomato paste
6 cups (1.4 liters/48 fl oz) tomato purée
3 tablespoons (6 g/3 dessert spoons) sweet basil
3 tablespoons (6 g/3 dessert spoons) oregano
Pepper
2 cups (4.5 dl/16 fl oz) water

FILLING

AMERICAN (METRIC/IMPERIAL)

1 pound (450 g/1 pound) mozzarella cheese, sliced
2 pounds (900 g/2 pounds) ricotta cheese
¼ pound (120 g/4 oz) Parmesan cheese, grated
2 pounds (900 g/2 pounds) ground beef, cooked and drained

Cook noodles according to package directions, adding 2 tablespoons of oil to prevent sticking.

In a large saucepan sauté the onions in olive oil until soft. Add garlic powder and tomato paste and stir continually until the oil is blended into the paste. Add the remaining sauce ingredients and bring to a boil. Reduce heat and simmer 30 minutes. Preheat oven to 375°F. (190°C./gas mark 5).

To assemble lasagna, spoon sauce into the bottom of a large baking pan with sides at least 3 inches tall (7.5 cm). Use just enough sauce to cover bottom of pan. Place lasagna noodles side by side, slightly overlapping them, until the bottom of pan is covered. Coat noodles lightly with more sauce. Spread half the ground beef on the noodles, then

cover with sauce. Spread half the ricotta cheese next, then cover with sauce. Make another layer of noodles, then all the mozzarella and Parmesan, followed by sauce, meat, sauce, ricotta, sauce, finishing with noodles and sauce. Bake 45 minutes. Serve hot.

LIVER PÂTÉ ANDERSON

MAKES: 2 cups
PROTEIN: 100 grams per cup

AMERICAN (METRIC/IMPERIAL)

1 pound (450 g/1 pound) chicken livers
2 medium onions
2 tablespoons (30 g/2 dessert spoons) butter
2 hard-boiled eggs, mashed
2 tablespoons (10 g/2 dessert spoons) water
Salt and pepper

Broil the livers 5 minutes on each side or until middles are no longer pink.

Sauté the onions in butter, then place in a bowl, reserving drippings in onion pan. Add the liver and eggs, and grind or mash until finely mixed.

Add water to onion drippings, then add to liver mixture a spoonful at a time until it reaches the consistency of spreadable paste. Season to taste. Serve with crackers or as sandwich filling.

REUBEN SANDWICH

MAKES: 1 sandwich
PROTEIN: 30 grams per sandwich

AMERICAN (METRIC/IMPERIAL)

2 slices rye bread, toasted and buttered
2 ounces (60 g/2 oz) corned beef, thinly sliced
2 ounces (60 g/2 oz) Swiss cheese
½ cup (85 g/3 oz) sauerkraut
Salt and pepper

Place the corned beef and cheese on one slice of toast. Place under the broiler or in a toaster oven until cheese begins to melt. Remove from heat, add sauerkraut, and top with other slice of toast. Serve hot.

SHRIMP SCAMPI

MAKES: 4 servings
PROTEIN: 30 grams per serving

AMERICAN (METRIC/IMPERIAL)

1½ pounds (670 g/24 oz) small shrimp, cleaned
¾ cup (180 g/6 fl oz) melted butter
Garlic powder
Paprika
Salt and pepper

Butter a flat baking sheet or shallow glass baking pan. Arrange shrimp in a single layer and pour melted butter over them. Sprinkle with garlic powder, paprika, salt and pepper.

Place under the broiler and cook until shrimps turn pink, basting occasionally with the seasoned butter.

Serve hot.

SPAGHETTI AND MEATBALLS

MAKES: 4 servings
PROTEIN: 40 grams per serving

AMERICAN (METRIC/IMPERIAL)

1 pound (450 g/1 pound) high-protein or whole-wheat spaghetti (Buitoni)
2 tablespoons (30 g/2 dessert spoons) olive oil
6 cups (1.4 liters/48 fl oz) Italian Tomato Sauce (see page 178)

MEATBALLS

AMERICAN (METRIC/IMPERIAL)

1 pound (450 g/1 pound) ground beef
1 cup (90 g/3 oz) bread crumbs
2 eggs
¼ cup (15 g/½ oz) fresh parsley, chopped
¼ cup (20 g/4 dessert spoons) Parmesan cheese

Cook spaghetti according to the package instructions, adding oil to keep pasta from sticking. Prepare the sauce.

Combine all meatball ingredients in a bowl and mix thoroughly. Shape into balls about 2 inches across (5 cm).

In a large skillet, heat olive oil and fry meatballs until well browned on all sides.

Drain on paper towels, then place into a large saucepan with the tomato sauce and simmer for 30 minutes.

Place the cooked spaghetti on a large platter or individual dishes, put meatballs on the side and cover both with tomato sauce. Serve hot with grated Parmesan cheese.

TUNA ROMA

MAKES: 4 servings
PROTEIN: 25 grams per serving

AMERICAN (METRIC/IMPERIAL)

1 cup (160 g/5½ oz) egg noodles, cooked
2 cups (320 g/11 oz) canned tuna, drained
⅓ cup (25 g/5 dessert spoons) dry white wine
2 cups (320 g/10½ oz) fresh green peas, cooked (frozen may be substituted in winter)
½ cup (30 g/1 oz) fresh parsley, chopped
¾ cup (180 g/6 fl oz) Italian Tomato Sauce (see page 178)
Salt and pepper

Place all the ingredients in a saucepan, heat and serve.

TURKEY POT PIE

MAKES: 6 servings
PROTEIN: 21 grams per serving

AMERICAN (METRIC/IMPERIAL)

1½ cups (180 g/12 fl oz) chicken broth
½ cup (90 g/3 oz) sweet corn
½ cup (90 g/3 oz) peas
½ cup (90 g/3 oz) carrots, diced
1 cup (150 g/5 oz) potatoes, diced
1 cup (100 g/3½ oz) onions, diced
2 cups (240 g/8 oz) turkey, cooked and diced
4 hard-boiled eggs, sliced
½ cup (30 g/1 oz) fresh parsley, chopped
2 cups (570 g/16 fl oz) Cream Sauce (see page 183)
1 Whole-Wheat Pastry Crust (see page 176)

In a large saucepan simmer corn, peas, carrots, potatoes, and onions in broth for 15 minutes.

Add turkey, eggs, parsley, and cream sauce and heat over medium heat for 5 minutes.

Preheat oven to 400°F. (230°C./gas mark 8). Butter a deep baking dish or casserole.

Spoon mixture into the baking dish and place pastry shell crust, cut to fit and rolled to ½ inch thick, over top. Make several slashes in pastry to allow steam to escape during baking.

Bake for 30 minutes or until pastry is browned. Serve with crust on bottom and turkey mixture spooned over top.

III.
Sauces and Dressings

CREAM SAUCE

MAKES: 2 cups
PROTEIN: 9 grams per cup

AMERICAN (METRIC/IMPERIAL)

4 tablespoons (60 g/4 dessert spoons) butter
4 tablespoons (30 g/1 oz) whole-wheat flour
2 cups (2.3 dl/16 fl oz) milk
Salt and pepper

Melt the butter in a saucepan. Sprinkle in flour and stir quickly to form a heavy paste. Add milk ¼ cup at a time,

stirring so that sauce becomes smooth. Combine to stir gently as sauce thickens to desired consistency. Salt and pepper to taste.

Cream sauce is the basis for many soups and may be used plain with vegetables, poultry and some seafood, or in pot pies.

There are numerous variations of cream sauce which can be found in basic cookbooks. One of the most valuable of these variations is:

CHEESE SAUCE

MAKES: 3 cups
PROTEIN: 15 grams per cup

AMERICAN (METRIC/IMPERIAL)

2 cups (4.5 dl/16 fl oz) cream sauce
1½ cups (180 g/6 oz) sharp, aged cheese, grated
Paprika

Add cheese to sauce after milk, stirring until blended. Garnish with paprika.

CHOCOLATE SAUCE

MAKES: 2 cups
PROTEIN: 11 grams per cup

AMERICAN (METRIC/IMPERIAL)

4 ounces (120 g/4 oz) unsweetened chocolate squares
2 tablespoons (30 g/2 dessert spoons) butter
⅔ cup (1.5 dl/5⅓ oz) evaporated milk
1 cup (2.3 dl/8 fl oz) honey
¼ cup (.6 dl/2 fl oz) water
2 eggs, beaten until fluffy
2 teaspoons (10 g/2 teaspoons) vanilla or rum

In a fondue pot or saucepan, place the chocolate squares, butter and milk, stirring over medium heat until chocolate and butter melt.

In a separate pan heat the honey and water until thinned. Add three tablespoons of honey mixture to eggs, then pour the remaining honey and eggs into chocolate mixture. Mix thoroughly. Add vanilla or rum just before serving. The sauce should be satiny and glossy.

If used as a dessert fondue, sauce may need to be thinned occasionally with a small amount of milk in order to maintain proper dipping consistency.

MUSTARD SAUCE

MAKES: 1 cup
PROTEIN: 6 grams per cup

AMERICAN (METRIC/IMPERIAL)

¾ cup (170 g/5½ oz) sour cream
¼ cup (50 g/1½ oz) prepared mustard
2 teaspoons (10 g/2 teaspoons) vinegar
2 tablespoons (30 g/2 dessert spoons) corn oil
Salt and pepper

Mix all the ingredients in a small bowl.

Serve over salad greens or as a dip for hors d'oeuvres.

OIL AND VINEGAR DRESSING

MAKES: 1 cup
PROTEIN: none

AMERICAN (METRIC/IMPERIAL)

½ cup (1.2 dl/4 fl oz) olive oil
3 tablespoons (45 g/3 dessert spoons) wine vinegar
Salt and pepper

Stir thoroughly in a cup or shake in a covered jar until oil and vinegar mix. Dressing should be made fresh for each salad.

To vary, add any one of these combinations to taste:

Tarragon and hard-boiled egg
Basil and oregano
Capers and anchovy paste
Rosemary and orange juice concentrate
Garlic powder and minced onion
Celery seeds and dill

ORANGE SAUCE

MAKES: 1½ cups
PROTEIN: none

AMERICAN (METRIC/IMPERIAL)

¾ cup (1.7 dl/6 fl oz) honey
4 tablespoons (75 g/4 dessert spoons) orange juice concentrate
Peel of one orange, finely grated
½ cup (1.2 dl/4 fl oz) canned apricots, puréed

Heat all the ingredients in a small saucepan over medium heat until honey is thinned. Stir occasionally. Serve warm. May also be used as a glaze for poultry.

ROQUEFORT DRESSING

MAKES: 1 cup
PROTEIN: 12 grams per cup

AMERICAN (METRIC/IMPERIAL)

½ cup (1.2 dl/4 fl oz) sour cream
¼ cup (45 g/1½ oz) Roquefort or blue cheese
¼ cup (60 g/2 fl oz) plain yogurt
3 tablespoons (45 g/3 dessert spoons) lemon juice
Pepper

Combine all ingredients in a small bowl. Serve over salad greens or as a dip for raw vegetables.

YOGURT DRESSING

MAKES: 1 cup
PROTEIN: 8 grams per cup

AMERICAN (METRIC/IMPERIAL)

1¾ cup (1.7 dl/6 fl oz) plain yogurt
3 tablespoons (45 g/3 dessert spoons) tomato paste
¼ cup (15 g/4 dessert spoons) chopped parsley
1 tablespoon (15 g/1 dessert spoon) lemon juice
Pepper

Combine all the ingredients in a small bowl. Serve over salad greens or as a dip for raw vegetables.

IV.
Breads and Grains

BRAN MUFFINS

MAKES: 12 muffins
PROTEIN: 3.5 grams per muffin

AMERICAN (METRIC/IMPERIAL)

2 cups (240 g/8 oz) whole-wheat flour
1 cup (50 g/1½ oz) wheat bran or 100% bran flakes
1½ teaspoons (8 g/1½ teaspoons) baking soda
½ teaspoon (4 g/½ teaspoon) salt
1½ cups (3.4 dl/12 fl oz) plain yogurt
2 eggs, beaten
¼ cup (80 g/2 fl oz) molasses

Preheat oven to 375°F. (190°C./gas mark 5).

Combine flour, bran, soda, and salt in a bowl. Mix thoroughly. Add the remaining ingredients and beat until mixed well.

Fill muffin cups about ⅔ full. Bake for 30 minutes or until a knife inserted comes out clean.

To vary, add up to 2 handfuls raisins or chopped dates to batter.

BLUEBERRY MUFFINS

Follow recipe for Bran Muffins

Substitute 1 cup (150 g/5 oz) of blueberries for bran flakes and ½ cup (160 g/4 fl oz) of honey for molasses.

CHEESE POPCORN

MAKES: 4 cups
PROTEIN: 4 grams per cup

AMERICAN (METRIC/IMPERIAL)

Popcorn kernels
Corn oil
¼ cup (60 g/2 fl oz) butter, melted
¼ cup (20 g/4 dessert spoons) Parmesan cheese
Salt

In a large saucepan, place oil to depth of ¼ inch and add 3 or 4 kernels of popcorn. Place over medium high heat. When test kernels pop, add enough more to cover bottom of pan one layer deep, shaking occasionally as it pops.

Turn out popped corn into a large bowl. In a saucepan, melt butter and pour it over corn. Add Parmesan and salt to taste. Toss well so that cheese and salt are evenly distributed. Serve hot.

FRENCH STRAWBERRY PANCAKES

MAKES: 12 filled pancakes
PROTEIN: 2.5 grams per pancake

AMERICAN (METRIC/IMPERIAL)

3 cups (450 g/15 oz) fresh strawberries
½ cup (160 g/4 fl oz) honey

Follow recipe for Cheese Blintz batter (see page 150) and place on a warm serving platter.

Put strawberries in a saucepan.

Add the honey and warm over low heat.

Fill pancakes and serve hot with Orange Sauce (see page 186).

HIGH-PROTEIN BROWNIES

MAKES: 12 brownies
PROTEIN: 8 grams per brownie

AMERICAN (METRIC/IMPERIAL)

½ cup (115 g/4 oz) butter
1 cup (320 g/8 fl oz) honey
1 tablespoon (15 g/1 dessert spoon) vanilla
½ cup (125 g/4 fl oz) evaporated milk
½ cup (75 g/2½ oz) powdered milk
⅓ cup (30 g/10 oz) cocoa powder
1¼ cups (100 g/3 oz) wheat germ
½ teaspoon (2 g/½ teaspoon) baking powder
½ teaspoon (4 g/½ teaspoon) salt
1½ cups (190 g/7 oz) walnut pieces

Preheat oven to 325°F. (170°C./gas mark 3). Oil baking pan.

Melt butter in a saucepan over medium-low heat. Remove from heat and add honey. Stir thoroughly, then add vanilla.

In a separate cup combine powdered and evaporated milk and stir until lumps disappear. Add milk to honey mixture, then stir in cocoa, mixing thoroughly. Add remaining ingredients and pour into a baking pan.

Bake for 25 minutes or until a knife inserted comes out clean. Cool in pan and cut into pieces. Serve with cream cheese, ice cream, or plain with milk for a snack.

If you prefer a more fudgey brownie, omit the baking powder.

HIGH-PROTEIN GRANOLA

MAKES: 20 cups
PROTEIN: 15 grams per cup

AMERICAN (METRIC/IMPERIAL)

7 cups (560 g/20 oz) rolled oats
2 cups (290 g/10 oz) peanuts, salted
2 cups (240 g/8 oz) pecans or almonds, chopped
1 cup (145 g/5 oz) sunflower seeds
1½ cups (225 g/7½ oz) powdered milk
1 cup (130 g/4½ oz) shredded coconut, unsweetened
1 cup (80 g/2½ oz) wheat germ
1⅓ cups (435 g/15½ oz) peanut butter
¾ cup (1.7 dl/6 fl oz) corn oil
1 cup (320 g/8 fl oz) honey
2 tablespoons (30 g/2 dessert spoons) vanilla
½ cup (1.1 dl/4 fl oz) water

Preheat oven to 375°F. (190°C./gas mark 5). Oil a very large roasting pan and mix all dry ingredients in it.

In a saucepan over medium heat, mix peanut butter, oil, honey, vanilla, and water.

Pour liquid mixture over dry ingredients and mix thoroughly until everything is just moistened. A few extra sprinkles of water may be needed if oats are very dry.

Bake until oats are golden brown, stirring every 5 minutes so that sides and bottom don't stick and burn. When done, open oven door and let cool in pan. Mixture forms small chunks as it dries. Store in a covered container.

Serve plain as a snack, with yogurt or milk and fresh fruit for breakfast or dessert, or crumbled over ice cream or pudding as a topping.

HIGH-PROTEIN PANCAKES

MAKES: 9 5-inch pancakes
PROTEIN: 4 grams per pancake

AMERICAN (METRIC/IMPERIAL)

¾ cup (90 g/3 oz) whole-wheat flour
¼ cup (20 g/4 dessert spoons) soy flour
½ cup (75 g/2½ oz) powdered milk
1 teaspoon (3 g/1 teaspoon) baking powder
½ teaspoon (4 g/½ teaspoon) salt
¼ cup (35 g/1¼ oz) shredded coconut, unsweetened
1 cup (240 g/8 fl oz) milk
2 eggs
¼ cup (.6 dl/2 fl oz) corn oil

In a bowl, combine all dry ingredients. Add milk, eggs, and oil. Stir thoroughly until lumps disappear. A bit of extra milk or water may be added if batter is too thick, or if it

thickens in the bowl while some pancakes are being cooked. It should be the consistency of a thick creamed soup.

Pour just enough oil in a large skillet to coat surface lightly. For each pancake, pour 3 tablespoons of batter slowly onto the skillet over medium-high heat. Turn when bubbles rise to surface in center and bottom is browned.

Stack pancakes and keep warm in oven at 200°F. (110°C./gas mark ¼) until ready to serve. Serve with butter and maple syrup or honey.

PEANUT BUTTER COOKIES

MAKES: 2 dozen 3-inch cookies
PROTEIN: 2 grams per cookie

AMERICAN (METRIC/IMPERIAL)

1½ cups (180 g/6 oz) whole-wheat flour
½ cup (75 g/2½ oz) powdered milk
½ teaspoon (2 g/½ teaspoon) baking soda
1 teaspoon (3 g/1 teaspoon) baking powder
½ teaspoon (4 g/½ teaspoon) salt
1 cup (260 g/9 oz) natural peanut butter
½ cup (1.1 dl/4 fl oz) honey
2 eggs, beaten
¼ cup (60 g/2 fl oz) butter, melted
1 teaspoon (5 g/1 teaspoon) vanilla

Preheat oven to 375°F. (190°C./gas mark 5).

Combine all dry ingredients in a bowl. Add remaining ingredients and mix thoroughly. Dough will be stiff.

For each cookie, drop two tablespoons of dough on a

baking sheet. With wet fork tines, press top of cookie once to flatten, then again at right angles to make pattern of squares on top. Leave room between cookies for them to swell a bit as they bake.

Bake for 15 minutes or until just lightly browned. Cookies should not be hardened. Remove from oven and cool on the baking sheet. Store in closed container so that cookies stay moist.

SUSAN'S BUTTERMILK BISCUITS

MAKES: 18 2-inch biscuits
PROTEIN: 3 grams per biscuit

AMERICAN (METRIC/IMPERIAL)

2 cups (240 g/8 oz) whole-wheat flour
¼ cup (20 g/4 dessert spoons) wheat germ
2 teaspoons (6 g/2 teaspoons) baking powder
½ teaspoon (2 g/½ teaspoon) baking soda
½ teaspoon (4 g/½ teaspoon) salt
5 tablespoons (75 g/5 dessert spoons) butter, hard, in small pieces
1¼ cup (2.8 dl/10 fl oz) buttermilk

Preheat oven to 400°F. (200°C./gas mark 6).

In a bowl, combine dry ingredients. Add butter and work in with fork until mixture is crumbly. Mix in buttermilk. Dough will be soft, but hold together.

Turn out on a floured surface and pat 1-inch thick. Cut with a biscuit cutter and place on an ungreased baking sheet.

Bake 10 to 15 minutes or until tops begin to brown. Serve hot.

VERMONT BROWN BREAD

MAKES: 2 large 9-by-5-inch loaves
PROTEIN: 115 grams per loaf

AMERICAN (METRIC/IMPERIAL)

3¾ cups (8.5 dl/30 fl oz) very warm water
½ cup (180 g/4 fl oz) plus 1 tablespoon honey
2 tablespoons (15 g/2 dessert spoons) dry yeast (2 packages)
1 egg, beaten until foamy
⅓ cup (.75 dl/5 dessert spoons) corn oil
2 teaspoons (15 g/2 teaspoons) salt
2 cups (160 g/5⅓ oz) rolled oats
1 cup (155 g/5½ oz) cracked wheat (bulgur)
1 cup (80 g/2½ oz) wheat germ
1 cup (80 g/2½ oz) soy flour
1 cup (130 g/4½ oz) rye flour
2 cups (300 g/10½ oz) powdered milk
7–8 cups (960 g/340 oz) whole-wheat flour

Into ½ cup of water, stir 1 tablespoon of the honey, then the yeast. Let settle, then stir again. Allow to sit in a warm place for 10 minutes until yeast is completely dissolved. Mixture should form bubbles as yeast begins to "work." If it does not, yeast is not active, so begin again with fresh ingredients.

In a large soup pot, mix remaining water, honey, egg, oil, and salt, stirring after each addition. Add yeast mixture, then all dry ingredients, except 3 cups whole wheat flour. Mix thoroughly until dough is quite sticky, and getting hard to stir.

Use 1 cup of flour to cover a large working surface. Turn dough out on it and sprinkle more flour over dough surface. Let rest 10 minutes before beginning to knead it.

Knead the dough for 10 minutes, adding one or more cups of flour, a bit at a time, to keep the dough covered with a thin layer of unabsorbed flour. This helps keep dough from sticking to hands and work surface. If dough does begin to

stick, just scrape the bits up, add them back to large dough mass and continue to knead.

Toward the end of the 10 minutes, you will notice a greater resistance to your handling. Stop adding flour and knead until all the excess flour on the dough mass is absorbed.

Oil a pot at least twice as large as the dough mass. Place the dough in, then turn it over so that its top is oiled. This keeps dough from forming a crust as it rises.

Cover with a wet cloth and place in a warm spot (inside an unlighted oven is usually good) for 2 to 3 hours, until doubled in bulk.

Punch dough down inside pot, forcing out trapped air bubbles. Turn out on a lightly floured work surface and divide dough in two. Flatten each piece and pat into rectangular shape.

Grease two loaf pans. Place dough loaves into pans. Cover with a damp cloth and return to warm place to rise for 1 hour.

Preheat oven to 400 °F. (200 °C./gas mark 6). Bake bread 15 minutes, then reduce heat to 325 °F. (170 °C./gas mark 3), and bake at least 45 more minutes. Do not open oven door to check bread until it has been baking for at least 30 minutes. When done, bread will sound hollow when tapped.

Turn out and cool upside down on a rack. Store in aluminum foil or plastic bags, but do not wrap until bread is thoroughly cool. This bread provides three times the protein of store-bought white bread.

WHOLE-WHEAT BUNS

MAKES: 8 hamburger-size buns
PROTEIN: 7 grams per bun

AMERICAN (METRIC/IMPERIAL)

1 cup (2.3 dl/8 fl oz) very warm water
1 tablespoon (7 g/1 dessert spoon) dry yeast (1 package)
1 tablespoon (20 g/1 dessert spoon) honey
3 cups (360 g/12 oz) whole-wheat flour
½ cup (75 g/2½ oz) powdered milk
1 teaspoon (8 g/1 teaspoon) salt
¼ cup (.6 dl/2 fl oz) corn oil
1 egg, beaten
¼ cup (.6 dl/2 fl oz) melted butter
Sesame seeds

In a cup, mix honey and water. Sprinkle in yeast. Combine and let stand 5 to 10 minutes until foamy. If bubbles do not appear, yeast is not active and you must begin again with fresh ingredients.

Place dry ingredients in a bowl and stir in yeast mixture. Add oil and egg. Mix thoroughly.

Turn out on a floured surface and knead for five minutes. Pat to 1 inch (2.5 cm) thick and cut with bun cutter. Brush melted butter on tops and sprinkle with sesame seeds. Place on oiled baking sheet. Let rise for approximately two hours or until almost doubled in bulk.

Preheat oven to 350°F. (180°C./gas mark 4). Bake for 15 to 20 minutes or until lightly browned.

Cool on a rack. Slice in half and serve with hamburgers or sandwich filling.

V.
Fruits

AMBROSIA

MAKES: 4 cups
PROTEIN: 2 grams per cup

AMERICAN (METRIC/IMPERIAL)

⅔ cup (100 g/3½ oz) pineapple chunks
⅔ cup (100 g/3½ oz) grapefruit sections
⅔ cup (100 g/3½ oz) bananas, sliced
⅔ cup (100 g/3½ oz) apples, chopped
⅔ cup (100 g/3½ oz) peaches, cut up
⅔ cup (120 g/4 oz) dates, pitted
½ cup (65 g/2¼ oz) shredded coconut, unsweetened
⅔ cup (180 g/5½ fl oz) orange juice

Combine all the fruit in a serving dish. Spoon juice over. Serve chilled.

APRICOTS IN HONEY CREAM

MAKES: 4 servings
PROTEIN: 5.5 grams per serving

AMERICAN (METRIC/IMPERIAL)

2 cups (500 g/17½ oz) apricots, fresh or canned in fruit juice
¾ cup (180 g/6 fl oz) heavy cream
½ cup (1.1 dl/4 fl oz) milk
½ cup (75 g/2½ oz) powdered milk
3 tablespoons (60 g/3 dessert spoons) honey

Cut apricots in pieces and place in a serving dish. In a separate cup, dissolve powdered milk in cream and whole milk. Stir in honey. Pour cream mixture over apricots and serve chilled.

AVOCADO-GRAPEFRUIT SALAD

MAKES: 4 servings
PROTEIN: 3 grams per serving

2 grapefruits, sectioned
2 avocados, cut in slivers
Mayonnaise
Walnuts, chopped
Lettuce leaves

Arrange grapefruit and avocado sections on a bed of lettuce. Top with a dollop of mayonnaise and sprinkle with walnuts. Serve chilled.

BAKED APPLE, BONNE FEMME

MAKES: 4 servings
PROTEIN: 2 to 4 grams per serving, depending on bread used

AMERICAN (METRIC/IMPERIAL)

4 tart apples, cored and peeled ⅓ way down sides
4 slices whole-grain bread, buttered and sprinkled with cinnamon
4 tablespoons (60 g/4 dessert spoons) butter
4 teaspoons (12 g/4 dessert spoons) cinnamon
Honey

Preheat oven to 375°F. (190°C./gas mark 5). Butter a shallow baking pan.

Arrange bread slices in pan. Place 1 apple on each slice of bread. Push 1 tablespoon butter into bottom of each apple center. Spoon in 1 teaspoon cinnamon. Fill the remainder of each apple center with honey.

Bake for 30 minutes or until tender but not mushy.

Serve warm or chilled with milk or cream.

BANANAS BALTIMORE

MAKES: 4 cups
PROTEIN: 6 grams per cup

AMERICAN (METRIC/IMPERIAL)

3 bananas, sliced
*1 teaspoon (3 g/1 teaspoon) garam masala**
¼ teaspoon (1 g/¼ teaspoon) chili powder
Pinch of dried red chili peppers
¼ teaspoon (2 g/¼ teaspoon) salt
3 cups (720 g/24 fl oz) plain yogurt
Anise seeds

* This spice may be obtained in Indian specialty stores.

Blend all seasonings (except anise seeds) with yogurt in a bowl. Add bananas and stir. Garnish with anise seeds.

Chill tightly covered for ½ hour.

BROILED PEACH AMANDINE

MAKES: 4 servings
PROTEIN: 1 gram per serving

AMERICAN (METRIC/IMPERIAL)

8 peach halves, peeled
8 tablespoons (160 g/8 dessert spoons) honey
8 teaspoons (120 g/8 teaspoons) butter
4 teaspoons (20 g/4 teaspoons) rum
Almond slivers, toasted

Place peach halves on a buttered baking dish. Distribute honey, butter, and rum evenly among them.

Broil 3 inches from heat until butter melts and peaches are warmed. Serve immediately, garnished with almonds.

CITRUS PUNCH

MAKES: 1 quart (9 dl/32 fl oz)
PROTEIN: none

AMERICAN (METRIC/IMPERIAL)

1 cup (2.3 dl/8 fl oz) light tea
Juice of 1 lemon
2 cups (4.5 dl/16 fl oz) pineapple juice
½ cup (1.1 dl/4 fl oz) orange juice
½ cup (1.1 dl/4 fl oz) grapefruit juice
Fresh strawberries, halved
Shaved ice

Stir all the liquids together. Add a few strawberry halves to each glass and serve over ice.

CRANBERRY-ORANGE RELISH

MAKES: 2 cups (4.5 dl/16 fl oz)
PROTEIN: none

AMERICAN (METRIC/IMPERIAL)

1½ cups (145 g/4½ oz) fresh cranberries, chopped
½ cup (1.1 dl/4 fl oz) orange juice concentrate
½ cup (70 g/2½ oz) yellow raisins
Peel of two oranges, slivered
Honey to taste

Combine all ingredients in a bowl. Place in glass jars and store, covered, in the refrigerator for at least two days before serving.

FRESH FRUIT TART

MAKES: 6 servings
PROTEIN: 13 grams per serving

CRUST

AMERICAN (METRIC/IMPERIAL)

1 recipe Whole-Wheat Pastry Crust (see page 176)
½ cup (65 g/2 oz) shredded coconut, unsweetened

Add coconut to whole-wheat pastry, then refrigerate for 30 minutes.

Preheat oven to 400 °F. (200 °C./gas mark 6). Butter an 8-inch pie tin.

Roll out the dough on a lightly floured surface. Lift into the tin and finish edge by crimping or rolling it over slightly. Prick surface of crust with fork. Bake for 12 minutes, or until crust is lightly browned. Remove from the oven and let cool to room temperature. Reset oven to 325 °F. (170 °C./gas mark 3).

FILLING

AMERICAN (METRIC/IMPERIAL)

3 cups (6.8 dl/24 fl oz) fresh fruit (mixed or one variety)
½ cup (1.1 dl/4 fl oz) honey
¼ cup (.6 dl/2 fl oz) apple juice, hot
1 tablespoon (7 g/1 dessert spoon) gelatin (1 package)

Cut fruit up into small pieces, peeled or unpeeled. Add honey and mix until fruit pieces are coated. Place fruit mixture into baked crust.

In a separate cup, dissolve gelatin in apple juice. Brush mixture over top of fruit in tart. This seals fruit and helps prevent discoloration if tart is not served at once.

MERINGUE

AMERICAN (METRIC/IMPERIAL)

4 egg whites
½ teaspoon (2 g/½ teaspoon) cream of tartar
⅓ cup (.75 dl/5 dessert spoons) honey

In a bowl, beat egg whites with an electric mixer until very stiff. Add cream of tartar, then the honey, 1 tablespoon at a time, until egg whites are glossy and stand in peaks. Oil brown paper and use it to line bottom of a baking sheet. Drop some egg white mixture onto paper with a large serving spoon, lifting up the spoon tip in center of each puff to make a peak. Immediately place puffs in the oven and bake for 20 minutes, or until meringues are dry. They need not become brown in order to be done. Turn off oven and allow meringues to cool on baking sheet with oven door open.

Use to decorate top of tart, either by arranging around the outside edge or by covering the entire top.

FRUIT CURRY

MAKES: 4 servings
PROTEIN: 1 gram per serving

AMERICAN (METRIC/IMPERIAL)

2 bananas, sliced
1 cup (155 g/5½ oz) pineapple chunks
1 cup (160 g/5½ oz) cantaloupe, in small pieces
Juice of 1 lemon
½ cup (125 g/4 fl oz) pineapple juice
1 teaspoon (4 g/1 teaspoon) curry powder

In a serving dish, slice bananas and squeeze lemon juice over them to prevent discoloration. Add the rest of the fruit and combine.

In a cup, stir curry powder into pineapple juice, then pour over fruit in bowl. Serve chilled.

FRUIT FONDUE

MAKES: 6 servings
PROTEIN: 5 grams per serving

AMERICAN (METRIC/IMPERIAL)

3 fresh pears, sliced
3 fresh peaches, sliced
2 cups (310 g/11 oz) sweet cherries, pitted
1 recipe Chocolate Sauce (see page 184)

Arrange the fruit on individual dessert plates. Heat the sauce in a fondue pot or chafing dish. Using long-handled, sharp-

tined forks, spear fruit, one piece at a time, and swirl in sauce until covered. Allow the sauce to harden a bit on the fruit before eating.

GRAPE DELIGHT

MAKES: 4 servings
PROTEIN: 7 grams per serving

AMERICAN (METRIC/IMPERIAL)

2 cups (*300 g/10½ oz*) *seedless green grapes, chopped*
1 cup (*140 g/4½ oz*) *pistachios or almonds, chopped*
¾ cup (*1.7 dl/6 fl oz*) *plain yogurt*
¼ cup (*.6 dl/2 fl oz*) *honey*
Candied ginger

Combine grapes and nuts in a serving dish. Toss with yogurt and honey. Sprinkle ginger over the top and serve.

PEACH UPSIDE-DOWN CAKE

MAKES: 8 pieces
PROTEIN: 4 grams per piece

AMERICAN (METRIC/IMPERIAL)

2½ cups (425 g/15 oz) fresh or canned peaches, peeled and sliced
½ cup (1.1 dl/4 fl oz) honey
1 lemon
1 teaspoon (5 g/1 teaspoon) cinnamon
1½ cups (180 g/6 oz) whole-wheat flour
½ cup (40 g/1¼ oz) wheat germ
2 teaspoons (6 g/2 teaspoons) baking powder
½ teaspoon (4 g/½ teaspoon) salt
2 eggs
2 egg yolks
¼ cup (60 g/4 dessert spoons) butter
⅓ cup (.75 dl/5 dessert spoons) evaporated milk
Sour cream or whipped cream

Preheat oven to 425 °F. (220 °C./gas mark 7). Butter a deep, straight-sided casserole that holds at least 2 quarts.

Place peaches and honey in the bottom of the casserole. Grate lemon peel on top of peaches, then cut lemon and squeeze juice over fruit. Mix cinnamon with ¼ cup of the flour and sprinkle over fruit. Dab 2 tablespoons butter over flour.

In a separate bowl, combine the remaining flour, wheat germ, baking powder, and salt.

In a small saucepan, heat the remaining honey, butter, and milk until thinned. Add to flour mixture. Stir thoroughly, then mix in eggs and yolks. Pour batter over the fruit in the casserole.

Bake for 30 minutes, then place a large plate over top of the casserole and quickly invert so peaches are on top. Serve warm with cream.

REAL LEMONADE

MAKES: 1 quart (.9 dl/32 fl oz)
PROTEIN: none

AMERICAN (METRIC/IMPERIAL)

ice cubes
Juice of 5 lemons
3 cups (6.8 dl/24 fl oz) boiling water
¼ cup (.6 dl/2 fl oz) honey

Fill a large pitcher halfway with ice cubes. Squeeze in lemon juice. In a separate pan dissolve honey in boiling water. Pour honey water into the pitcher and stir. Refrigerate to chill or serve over more ice in tall glasses. Decorate with a slice of lemon or a few mint leaves.

RHUBARB WITH PINEAPPLE SAUCE

MAKES: 4 servings
PROTEIN: 1 gram per serving

AMERICAN (METRIC/IMPERIAL)

2 cups (4.5 dl/16 fl oz) canned pineapple, puréed
2 cups (200 g/7 oz) rhubarb, in 2-inch pieces
1 cup (280 g/10 oz) cranberry sauce
½ cup (1.1 dl/4 fl oz) honey
1 teaspoon (4 g/1 teaspoon) cinnamon

Preheat oven to 375 °F. (190 °C./gas mark 5). Butter a small casserole.

Smooth cranberry sauce over the bottom and sides of the casserole. Add rhubarb pieces, honey and cinnamon, then cover with pineapple.

Bake 25 minutes or until rhubarb is tender. Serve warm.

STEWED PRUNES WITH CASHEWS

MAKES: 4 servings
PROTEIN: 8 grams per serving

AMERICAN (METRIC/IMPERIAL)

1½ cups (195 g/4 fl oz) boxed prunes, pitted
½ cup (70 g/4 fl oz) raisins
½ cup (1.1 dl/½ teaspoon) cream sherry
½ cup (1.1 dl/8 fl oz) honey
½ teaspoon (2 g/4 ½ oz) ground cloves
1 cup (120 g/8 fl oz) whipped cream
1 cup (140 g/6 oz) cashews, chopped

In a saucepan, cook prunes and raisins in sherry and honey for ½ hour. Add water if needed to prevent sticking. Sprinkle cloves over stewed fruit and stir. Mixture should be thick but not dry.

Cool to room temperature. Fold in whipped cream. Sprinkle generously with cashews.

STRAWBERRY PIE

MAKES: 6 servings
PROTEIN: 2 grams per serving

CRUST

AMERICAN (METRIC/IMPERIAL)

1⅓ cups (270 g/10 oz) graham-cracker crumbs
¼ cup (60 g/1 oz) butter, in small pieces
1 egg, beaten

Preheat oven to 375°F. (190°C./gas mark 5).

In a bowl, combine all ingredients and blend with a fork or fingertips until mixture is uniform. Turn out into an ungreased pie tin and press into an even-layered crust.

Bake for 8 minutes. Remove from oven and let cool to room temperature.

FILLING

AMERICAN (METRIC/IMPERIAL)

2 cups (300 g/10½ oz) fresh strawberries, hulled
1 cup (200 g/10½ oz) strawberry preserves

Combine ingredients in a bowl. Spoon into baked pie crust. Refrigerate ½ hour.

TOPPING

AMERICAN (METRIC/IMPERIAL)

1 cup (2.3 dl/8 fl oz) whipped cream, beaten stiff

½ cup (65 g/2¼ oz) shredded coconut, unsweetened and toasted

Spoon whipped cream over pie. Sprinkle coconut over top. Serve cold.

STUFFED DATES

MAKES: 1 cup
PROTEIN: 21 grams per cup

20 dates

20 walnut halves

Remove pits from dates and replace each pit with 1 walnut half. Serve as a snack. To vary, use cream cheese instead of walnuts.

TROPICAL ORANGES

MAKES: 4 servings
PROTEIN: 2 grams per serving

AMERICAN (METRIC/IMPERIAL)

4 large navel oranges
2 bananas, sliced
Juice of 1 lemon
4 tablespoons (60 g/4 dessert spoons) candied ginger, finely chopped
2 tablespoons (40 g/2 dessert spoons) honey
¼ cup (.6 dl/2 fl oz) orange juice

Peel oranges and slice into circular shapes. Place in a flat serving dish. Cover with bananas. Sprinkle bananas with lemon juice. Add layer of ginger bits.

Mix honey and orange juice in a separate cup. Pour over fruit. Cover and refrigerate overnight. Serve cold.

VI.
Vegetables

ANTIPASTO

MAKES: 4 servings
PROTEIN: 14 grams per serving

AMERICAN (METRIC/IMPERIAL)

1 head lettuce, quartered
8 Italian sweet peppers, pickled
12 black olives, pitted
4 slices Provolone cheese
4 slices Capicolo, or other spiced ham, thinly sliced
8 marinated artichoke halves
32 pimiento strips
4 anchovy fillets
4 hard-boiled egg halves
Oil and Vinegar Dressing (see page 186)

On a serving platter, arrange bed of lettuce leaves. Arrange other ingredients attractively and dress with oil and vinegar.

BROCCOLI PARMESAN

MAKES: 4 servings
PROTEIN: 6 grams per serving

AMERICAN (METRIC/IMPERIAL)

4 large stalks (720 g/24 oz) broccoli, cooked
¼ cup (60 g/2 oz) butter
½ cup (40 g/8 dessert spoons) Parmesan cheese, grated

In a bowl, mash broccoli heads with fork, removing any tough stems. Add butter and cheese. Mix thoroughly. Serve hot.

CARROT-RAISIN SALAD

MAKES: 4 servings
PROTEIN: 3 grams per serving

AMERICAN (METRIC/IMPERIAL)

2 cups (240 g/8½ oz) raw carrots, peeled and grated coarsely
½ cup (70 g/2½ oz) raisins
½ cup (60 g/2 oz) walnuts, chopped
6 tablespoons (90 g/6 dessert spoons) mayonnaise
Pepper

In a bowl, combine all ingredients and serve cold.

CARROT SOUP

MAKES: 4 bowls
PROTEIN: 5 grams per bowl

AMERICAN (METRIC/IMPERIAL)

2 tablespoons (30 g/2 dessert spoons) butter
¾ cup (75 g/2½ oz) onions, chopped
3 cups (360 g/13 oz) raw carrots, peeled and grated coarsely
1 potato, peeled and thinly sliced
2 teaspoons (10 g/2 teaspoons) tomato paste
3 cups (6.8 dl/24 fl oz) chicken broth
Paprika

In a large saucepan, cook onions in butter until soft. Add remaining ingredients and cook over medium heat for 30 minutes or until carrots are very soft.

Pour soup into a blender and mix for 10 seconds, or beat with an electric mixer while soup is still in saucepan.

Serve hot, garnished with a sprinkle of paprika.

CHARLOTTE'S GAZPACHO

MAKES: 6 servings
PROTEIN: 2 grams per serving

AMERICAN (METRIC/IMPERIAL)

1 cup (90 g/3 oz) soft bread crumbs
2 tablespoons (30 g/2 dessert spoons) wine vinegar
3 large garlic cloves, crushed
1 teaspoon (8 g/1 teaspoon) salt
4 tablespoons (60 g/4 dessert spoons) olive oil
1 28 oz can (6 dl/22 fl oz) peeled tomatoes, or 6 large, ripe tomatoes
Water, about 3 cups (6.8 dl/24 fl oz)
Vinegar and salt to taste (optional)
1 large cucumber, peeled and diced
2 large green peppers, diced
1 cup (90 g/3 oz) croutons

Combine bread crumbs, vinegar, garlic, salt, olive oil, and tomatoes in a blender or food processor. Blend until very smooth. Add water and chill. You may want to add more water, vinegar, or salt to taste before serving. Serve with cucumber, peppers, and croutons as a garnish.

CHEF SALAD

MAKES: 4 servings
PROTEIN: 16 grams per serving

AMERICAN (METRIC/IMPERIAL)

½ head of lettuce
2 tomatoes, chopped
1 medium onion, chopped
2 stalks celery, chopped
16 stuffed Spanish olives, sliced
½ cup (60 g/2 oz) cooked chicken, in julienne strips
½ cup (60 g/2 oz) cooked ham, in julienne strips
2 slices Swiss cheese, in julienne strips
2 hard-boiled eggs, sliced
Oil and Vinegar Dressing (see page 186)

In a large salad bowl, tear the lettuce into pieces, then add all other ingredients. Toss with dressing and serve.

CHINESE ASPARAGUS SALAD

MAKES: 4 servings
PROTEIN: 2 grams per serving

AMERICAN (METRIC/IMPERIAL)

2 pounds (400 g/32 oz) fresh asparagus, steamed
¼ cup (.6 dl/2 fl oz) soy sauce
2 teaspoons (30 g/2 teaspoons) olive oil
2 teaspoons (40 g/2 teaspoons) honey
¼ cup (40 g/1½ oz) sesame seeds

Place the cooked asparagus in a flat serving dish. In a separate cup, mix remaining ingredients and pour over asparagus. Refrigerate for ½ hour before serving.

COLESLAW DELUXE

MAKES: 4 servings
PROTEIN: 4 grams per serving

AMERICAN (METRIC/IMPERIAL)

2 cups (200 g/7 oz) cabbage, grated coarsely
1 cup (110 g/40 oz) raw carrots, peeled and grated coarsely
1 cup (140 g/4½ oz) pineapple chunks
½ cup (70 g/2½ oz) yellow raisins
½ cup (65 g/2½ oz) walnuts, chopped
¼ cup (60 g/2 fl oz) mayonnaise
¼ cup (60 g/2 fl oz) sour cream
¼ cup (80 g/2 fl oz) honey
Nutmeg
Salt and pepper

Combine cabbage, carrots, pineapple, raisins, and walnuts in a salad bowl.

In a separate cup, mix mayonnaise, sour cream, and honey. Pour dressing over ingredients in bowl. Sprinkle with nutmeg, season, toss, and serve.

CORN CHOWDER

MAKES: 6 bowls
PROTEIN: 8 grams per bowl

AMERICAN (METRIC/IMPERIAL)

¼ cup (25 g/1 oz) onions, chopped
3 tablespoons (45 g/1½ oz) butter
2 cups (330 g/11 oz) frozen corn
2 cups (4.5 dl/16 fl oz) milk
½ cup (75 g/2½ oz) powdered milk
2 cups (300 g/10 oz) potatoes, peeled and diced
1 cup (2.3 dl/8 fl oz) Cream Sauce (see page 183)
Salt and pepper
Paprika

In a large saucepan, sauté onions in butter until soft. Add corn, milk, powdered milk, and potatoes, and simmer over medium heat about 15 minutes, or until potatoes are tender, but not mushy. Add cream sauce and bring just to boiling point. Season and serve hot.

CUBAN BLACK BEANS

MAKES: 4 cups
PROTEIN: 12 grams per cup

AMERICAN (METRIC/IMPERIAL)

1½ cups (300 g/10 oz) black beans
1 large onion, chopped
1 large green pepper, chopped
¼ teaspoon (1 g/¼ teaspoon) garlic powder
6 tablespoons (1 dl/6 dessert spoons) olive oil
2 bay leaves
1 tablespoon (24 g/1 dessert spoon) salt
1 teaspoon (4 g/1 teaspoon) pepper
½ cup (80 g/2½ oz) pimientos, chopped
2 tablespoons (30 g/2 dessert spoons) vinegar
2 dashes Tabasco sauce

Cook beans in 2 quarts of water for 2 hours, or until tender. Reserve liquid.

In a large saucepan, sauté onion and green pepper with garlic powder in olive oil until soft. Add beans and 2 cups of the water in which beans were cooked. Add seasonings and pimiento and simmer over low heat for ½ hour. Add more salt and pepper if needed. Serve hot or cold.

FRENCH ONION SOUP

MAKES: 4 bowls
PROTEIN: 20 grams per bowl

AMERICAN (METRIC/IMPERIAL)

3 cups (300 g/10½ oz) onions, thinly sliced
½ cup (120 g/4 oz) butter
3 cups (6.8 dl/24 fl oz) beef broth
½ cup (120 g/4 oz) Parmesan cheese, grated
4 thick slices Vermont Brown Bread (see page 194) or similar bread

In a saucepan, sauté onions in butter until soft. Add broth and simmer for 20 minutes.

Place slices of brown bread in the bottom of soup bowls. Pour in soup and garnish with cheese. Serve hot.

GREEK SALAD

MAKES: 4 servings
PROTEIN: 9 grams per serving

AMERICAN (METRIC/IMPERIAL)

½ large head Romaine lettuce
1 cucumber, unpeeled and sliced
2 tomatoes, cut in sections
1 large onion, thinly sliced
12 large green olives
1 cup (120 g/4 oz) Feta cheese, cut in ½-inch chunks
6 anchovy fillets
Oil and Vinegar Dressing (see page 186)

Place all ingredients in a large salad bowl. Toss with dressing just before serving.

GREEN BEAN SALAD

MAKES: 4 servings
PROTEIN: 1 gram per serving

AMERICAN (METRIC/IMPERIAL)

1 pound (450 g/16 oz) fresh green beans or 2 packages frozen, steamed until tender
⅛ cup (25 g/1 fl oz) vinegar
¼ cup (60 g/2 fl oz) olive oil
Salt and pepper

Place green beans in a flat serving dish. Pour in oil, vinegar and seasonings. Toss lightly. Let sit at room temperature for one hour before serving.

GREEN PEPPER SALAD

MAKES: 4 servings
PROTEIN: 1 gram per serving

AMERICAN (METRIC/IMPERIAL)

1 cup (100 g/3½ oz) onions, thinly sliced
3 cups (360 g/12 oz) sweet green peppers, sliced
¼ cup (.6 dl/2 fl oz) olive oil
Salt and pepper

In a skillet, sauté onions and peppers in olive oil until soft. Season and let cool to room temperature.

NANCY'S EGGPLANT SALAD

MAKES: 4 servings
PROTEIN: 2 grams per serving

AMERICAN (METRIC/IMPERIAL)

4 tablespoons (60 g/4 dessert spoons) butter
*1 teaspoon (4 g/1 teaspoon) garam masala**
1 large eggplant, cut in ½ inch cubes
1 cup (125 g/4 oz) green beans, chopped
2 tomatoes, cut in wedges
2 tablespoons (20 g/2 dessert spoons) raisins
2 tablespoons (15 g/2 dessert spoons) coconut, grated

* This spice is available at Indian speciality stores.

In a large skillet, melt butter and sauté garam masala until fragrant. Add eggplant and beans, cover and cook until tender. Add tomatoes, raisins and coconut and cook another 5 minutes until raisins plump up and tomatoes are heated through.

Serve warm.

RATATOUILLE

MAKES: 8 servings
PROTEIN: 3 grams per serving

AMERICAN (METRIC/IMPERIAL)

1 six-ounce (140 g/6 oz) can tomato paste
5 cups (1.2 kg/40 oz) ripe tomatoes, sliced
1 large eggplant, sliced ¾ inch thick
2 medium zucchini, sliced ½ inch thick
2 cups (260 g/9 oz) summer squash, sliced ½ inch thick
2 cups (240 g/8 oz) green peppers, chopped
2½ cups (250 g/8 oz) onions, thinly sliced
¾ cup (1.7 dl/6 fl oz) or more olive oil
½ cup (30 g/1 oz) sweet basil
¼ cup (15 g/½ oz) rosemary
2 tablespoons (20 g/2 dessert spoons) garlic powder
1 cup (60 g/2 oz) fresh parsley, chopped
Salt and pepper

In a large skillet, sauté eggplant, zucchini, squash, peppers and onions in succession in olive oil.

Mix seasonings together in a small bowl.

Coat the bottom of a large soup pot with olive oil left from sautéing. Add layer of tomato paste, then layer of each vegetable in order, seasoning each layer in succession. Reserve a few eggplant slices for top.

Bring contents to a boil over medium-high heat, cover and reduce heat. Simmer for 30 minutes, occasionally bringing up some liquid to baste top of casserole.

Serve hot or cold.

RED CABBAGE SALAD

MAKES: 4 servings
PROTEIN: 1 gram per serving

AMERICAN (METRIC/IMPERIAL)

2 cups (200 g/7 oz) red cabbage, shredded
1 cup (120 g/4 oz) raw carrots, peeled and grated coarsely
1 cup (120 g/4 oz) celery, chopped
1 cup (180 g/6 oz) tart apples, chopped
½ cup (120 g/4 oz) mayonnaise
¼ cup (.6 dl/2 fl oz) pineapple

Mix all ingredients in a salad bowl. Serve chilled.

SALAD NIÇOISE

MAKES: 6 servings
PROTEIN: 13 grams per serving

AMERICAN (METRIC/IMPERIAL)

2 cups (300 g/10½ oz) boiled potatoes, quartered
1 cup (125 g/4½ oz) string beans, steamed
1 cup (2 jars) (180 g/6 oz) marinated artichoke hearts
1½ cups (360 g/12 oz) ripe tomatoes, quartered
1 cup (120 g/4 oz) green pepper, sliced into strips
6 anchovy fillets
1 six-ounce (180 g/6 oz) can tuna fish, packed in oil
18 black olives
3 tablespoons (25 g/3 dessert spoons) capers
2 tablespoons (10 g/2 dessert spoons) tarragon
3 hard-boiled eggs, sliced
Oil and Vinegar Dressing (see page 186)

Line bottom of a large salad bowl with potatoes, then arrange other ingredients attractively on top of them. Flake tuna and spread around. Stud top with olives and capers. Sprinkle tarragon and garnish with egg slices. Moisten everything with dressing, but do not toss. Serve immediately.

SPINACH-ORANGE SALAD

MAKES: 4 servings
PROTEIN: 2 grams per serving

AMERICAN (METRIC/IMPERIAL)

2 cups (110 g/4 oz) raw spinach, washed
2 oranges, peeled and sliced ½ inch thick
1 cup (100 g/3½ oz) onions, thinly sliced
Oil and Vinegar Dressing (see page 186)
¼ cup (75 g/4 dessert spoons) orange juice concentrate
1 tablespoon (10 g/1 dessert spoon) rosemary

Tear spinach into pieces, removing stems. Place in a large salad bowl with oranges and onions.

In a separate cup, mix dressing with orange juice and rosemary. Pour over contents of bowl, toss and serve.

STRING BEAN CASSEROLE

MAKES: 4 servings
PROTEIN: 14 grams per serving

AMERICAN (METRIC/IMPERIAL)

2 cups (250 g/8½ oz) string beans, steamed
½ cup (50 g/1½ oz) onions, chopped
2 tablespoons (15 g/2 dessert spoons) whole-wheat flour
½ teaspoon (4 g/½ teaspoon) salt
¾ cup (1.7 dl/6 fl oz) yogurt
2 tablespoons (40 g/2 dessert spoons) honey
1 cup (75 g/2½ oz) crisp bacon, crumbled
4 slices Swiss cheese, grated coarsely
1 cup (110 g/4 oz) almonds, finely chopped

Preheat oven to 350°F. (180°C./gas mark 4). Generously butter a casserole or baking dish.

Place beans and onions in casserole. Mix in flour, salt, yogurt and honey. Add a layer of bacon and a layer of cheese. Top with almonds.

Bake 20 to 25 minutes or until cheese melts and starts to sink into casserole. Serve hot.

STUFFED CELERY

MAKES: 4 large stalks
PROTEIN: 2.5 grams per stalk

AMERICAN (METRIC/IMPERIAL)

4 large celery stalks, washed
¼ cup (60 g/2 oz) cottage cheese
¼ cup (60 g/2 oz) cream cheese
¼ cup (15 g/½ oz) fresh parsley, chopped
1 teaspoon (4 g/1 teaspoon) garlic or onion powder
Salt and pepper
Paprika

In a small bowl, mix cheese and seasonings. Press into cavity of stalks. Garnish with paprika and serve.

TOMATO SALAD WITH BASIL

MAKES: 4 servings
PROTEIN: 5 grams per serving

AMERICAN (METRIC/IMPERIAL)

4 cups (960 g/34 oz) ripe tomatoes, sliced
1 cup (60 g/2 oz) fresh basil leaves, finely chopped
¼ teaspoon (1 g/¼ teaspoon) garlic powder
½ cup (40 g/1½ oz) Parmesan cheese
½ cup (1.1 dl/4 fl oz) olive oil

Place tomatoes in a flat serving dish. In a separate cup, mix remaining ingredients to form a paste.

Spread tomatoes with basil mixture and serve.

Protein Counter

(80 to 100 Grams Per Day Pregnancy Requirement)

I. ANIMAL SOURCES (Complete Proteins)

FOOD	SERVING SIZE	PROTEIN (GRAMS)
	DAIRY PRODUCTS	
	AMERICAN (METRIC/IMPERIAL)	
Butter	¼ lb. (110 g/4 oz)	0
Buttermilk	1 cup (2.3 dl/8 fl oz)	9
Cheese		
Cheddar	1 oz. (28 g/1 oz)	7
Cottage (creamed)	4 oz. (110 g/4 oz)	15
Cottage (uncreamed)	4 oz. (110 g/4 oz)	19
Cream	1 oz. (28 g/1 oz)	2
Gouda	1 oz. (28 g/1 oz)	7
Meunster	1 oz. (28 g/1 oz)	6
Mozzarella	1 oz. (28 g/1 oz)	6
Parmesan	1 oz. (28 g/1 oz)	10
Ricotta	4 oz. (110 g/4 oz)	19
Roquefort	1 oz. (28 g/1 oz)	6
Swiss	1 oz. (28 g/1 oz)	7
Cream		
Light	½ cup (120 g/4 fl oz)	4
Heavy	½ cup (120 g/4 fl oz)	2
Sour	1 cup (240 g/8 fl oz)	9
Egg	1 (55 g/2 oz)	6
Egg yolk	1 (17 g/¾ oz)	3
Ice milk	1 cup (130 g/4½ oz)	9
Mayonnaise	1 tablespoon (15 g/1 dessert spoon)	trace
Milk		
Evaporated, undiluted	1 cup (250 g/8 fl oz)	16
Powdered, dry	1 cup (100 g/3½ oz)	25
Skim	1 cup (245 g/8 fl oz)	9
Whole	1 cup (245 g/8 fl oz)	8
Yogurt	1 cup (245 g/8 fl oz)	8

MEAT AND POULTRY

Figures are for cooked, edible portions (no bones or trimmings) unless otherwise indicated.

FOOD	SERVING SIZE	PROTEIN (GRAMS)
	AMERICAN (METRIC/IMPERIAL)	
Beef		
Chuck roast	4 oz. (110 g/4 oz)	23
Corned	4 oz. (110 g/4 oz)	22
Dried, chipped	4 oz. (110 g/4 oz)	25
Ground, lean	4 oz. (110 g/4 oz)	22
Round steak	4 oz. (110 g/4 oz)	24
Sirloin steak	4 oz. (110 g/4 oz)	20
Bologna	2 slices (60 g/2 oz)	7
Chicken	4 oz. (110 g/4 oz)	23
Duck	4 oz. (110 g/4 oz)	13
Lamb		
Chop	4 oz. (110 g/4 oz)	18
Leg	4 oz. (110 g/4 oz)	20
Stew pieces	4 oz. (110 g/4 oz)	18
Liver		
Beef	4 oz. (110 g/4 oz)	20
Chicken	4 oz. (110 g/4 oz)	20
Liverwurst	1 oz. (28 g/1 oz)	4
Pork		
Bacon, crisp	2 slices (15 g/½ oz)	5
Chop	4 oz. (110 g/4 oz)	16
Ham slice, cured	4 oz. (110 g/4 oz)	16
Ham, lunchmeat	2 oz. (55 g/2 oz)	13
Hot dog	1 (50 g/1½ oz)	7
Loin, roast	4 oz. (110 g/4 oz)	21
Salt	4 oz. (110 g/4 oz)	5
Sausage, links	4 oz. (110 g/4 oz)	11
Spareribs, bone in	4 oz. (110 g/4 oz)	9
Rabbit, stew pieces	4 oz. (110 g/4 oz)	17
Turkey	4 oz. (110 g/4 oz)	23
Veal		
Cutlet	4 oz. (110 g/4 oz)	23
Stew pieces	4 oz. (110 g/4 oz)	23

SEAFOOD

Figures are for cooked, edible portions unless otherwise noted.

FOOD	SERVING SIZE	PROTEIN (GRAMS)
	AMERICAN (METRIC/IMPERIAL)	
Anchovies	1 oz. (28 g/1 oz)	5
Bass, pan fried	4 oz. (110 g/4 oz)	21
Clams, steamed	4 oz. (110 g/4 oz)	12
Cod, baked fillet	4 oz. (110 g/4 oz)	24
Crabmeat, cooked	4 oz. (110 g/4 oz)	14
Flounder, baked fillet	4 oz. (110 g/4 oz)	25
Haddock, fried fillet	4 oz. (110 g/4 oz)	16
Halibut, baked fillet	4 oz. (110 g/4 oz)	16
Herring		
fresh	4 oz. (110 g/4 oz)	14
kippered	4 oz. (110 g/4 oz)	23
Lobster, steamed	4 oz. (110 g/4 oz)	19
Mackerel		
fresh	4 oz. (110 g/4 oz)	25
smoked	4 oz. (110 g/4 oz)	27
Mussels, steamed	4 oz. (110 g/4 oz)	26
Oysters, raw	6–8 medium (120 g/4 fl oz)	8
Perch, pan fried	4 oz. (110 g/4 oz)	22
Pike, pan fried	4 oz. (110 g/4 oz)	21
Red snapper, baked fillet	4 oz. (110 g/4 oz)	22
Rockfish, baked fillet	4 oz. (110 g/4 oz)	21
Roe (Caviar)	4 oz. (110 g/4 oz)	28
Salmon		
Canned	4 oz. (110 g/4 oz)	24
Smoked	4 oz. (110 g/4 oz)	24
Steak	4 oz. (110 g/4 oz)	25
Sardines, canned	1 oz. (30 g/1 oz)	5
Scallops, baked	4 oz. (110 g/4 oz)	17
Shrimp, cleaned, steamed	4 oz. (110 g/4 oz)	20
Trout, pan fried	4 oz. (110 g/4 oz)	22
Tuna, canned	4 oz. (110 g/4 oz)	28

II. VEGETABLE SOURCES (Incomplete Proteins)

NUTS AND SEEDS

FOOD	SERVING SIZE	PROTEIN (GRAMS)
	AMERICAN (METRIC/IMPERIAL)	
Almonds	4 oz. (110 g/4 oz)	21
Brazil nuts	4 oz. (110 g/4 oz)	16
Cashews	4 oz. (110 g/4 oz)	19
Chestnuts, uncooked	4 oz. (110 g/4 oz)	3
Coconut, grated, fresh	2 oz. (60 g/2 oz)	2
Filberts	4 oz. (110 g/4 oz)	14
Macadamias	4 oz. (110 g/4 oz)	9
Peanuts, roasted	4 oz. (110 g/4 oz)	30
Peanut butter	⅓ cup (80 g/5 dessert spoons)	25
Pecans	4 oz. (110 g/4 oz)	10
Pignoli (pinenuts)	4 oz. (110 g/4 oz)	35
Sesame seeds	2 oz. (55 g/2 oz)	5
Sunflower seeds, hulled	2 oz. (55 g/2 oz)	13
Walnuts	4 oz. (110 g/4 oz)	17
Water chestnuts	4 oz. (110 g/4 oz)	1

DRIED BEANS

Figures for 1 cup (2.3 dl) *cooked* beans. Beans swell dramatically as they cook, absorbing more water the longer they soak or simmer.

Black turtle beans	3½ oz. (100 g/3½ oz)	22
Black-eyed peas (Cowpeas)	9 oz. (250 g/9 oz)	13
Chickpeas (Garbanzos)	3½ oz. (100 g/3½ oz)	20
Kidney beans	7 oz. (185 g/7 oz)	14
Lentils	8 oz. (200 g/8 oz)	16
Mung beans	4 oz. (105 g/4 oz)	25
Mung bean sprouts	4½ oz. (125 g/4½ oz)	4
Navy beans	7 oz. (190 g/7 oz)	15
Pinto beans	3 oz. (95 g/3 oz)	22
Split peas	7 oz. (200 g/7½ oz)	16
Soybeans	6½ oz. (180 g/6½ oz)	20

FOOD	SERVING SIZE	PROTEIN (GRAMS)
	AMERICAN (METRIC/IMPERIAL)	
Soybean curd (tofu)	4 oz. (110 g/4 oz)	9
Soybean milk powder, dry	1 oz. (¼ cup) (28 g/4 dessert spoons)	12
Soybean sprouts	4½ oz. (125 g/4½ oz)	7
Soy sauce	1 tablespoon (18 g/1 dessert spoon)	1
FLOURS AND GRAINS		
Figures are for uncooked portions, unless noted.		
Arrowroot powder	1 oz. (¼ cup) (32 g/1 oz)	0
Barley	3½ oz. (100 g/3½ oz)	13
Bran, 100%	1½ oz. (1 cup) (50 g/1½ oz)	8
Carob powder	1 oz. (¼ cup) (35 g/4 dessert spoons)	1.5
Cocoa powder, dry	1 oz. (28 g/5 dessert spoons)	5
Corn		
flakes, ready-to-eat	1 oz. (⅔ cup) (30 g/1 oz)	2
grits	6 oz. (1 cup) (160 g/6 oz)	14
meal	5 oz. (½ cup) (140 g/5 oz)	11
starch	1 tablespoon (8 g/1 dessert spoon)	trace
Oats, rolled, dry	3 oz. (1 cup) (90 g/3 oz)	12
Popcorn, popped	2 cups (28 g/1 oz)	1
Rice		
brown, dry	7 oz. (1 cup) (185 g/7 oz)	14
flour	1 cup (120 g/4 oz)	9
puffed, ready-to-eat	½ oz. (¾ cup) (14 g/½ oz)	1
Soy flour		
full fat	2½ oz. (1 cup) (70 g/2½ oz)	26
defatted	4 oz. (1 cup) (100 g/4 oz)	47
Whole wheat		
flour	4 oz. (1 cup) (120 g/4 oz)	16
germ	1 cup (80 g/2¾ oz)	22
biscuit	1 (28 g/1 oz)	3
puffed	1 oz. (1 cup) (28 g/1 oz)	4
PASTA Uncooked		
Noodles, Chow Mein, canned	4 oz. (110 g/4 oz)	15

FOOD	SERVING SIZE	PROTEIN (GRAMS)
	AMERICAN (METRIC/IMPERIAL)	
Noodles, egg, cooked	6 oz. (1 cup)/180 g	7
Macaroni, cooked high-protein	5 oz. (160 g/6 oz)	12
Spaghetti, cooked high-protein	5 oz. (245 g/8½ oz)	12
FRUIT		
Apple	1 medium (110 g/4 oz)	trace
Applesauce	1 cup (130 g/4½ oz)	½
Apricot		
fresh	3 medium (250 g/9 oz)	1
dried	4½ oz. (120 g/4½ oz)	7
Avocado	1 large (145 g/5 oz)	4
Banana	1 medium (145 g/5 oz)	1
Blackberry, fresh/frozen	1 cup (145 g/5 oz)	2
Blueberry, fresh/frozen	1 cup (270 g/9½ oz)	1
Boysenberry	1 cup (155 g/5½ oz)	trace
Cantaloupe	½ medium (95 g/3½ oz)	2
Cherry, pitted	1 cup (275 g/9½ oz)	2
Cranberry		
fresh	1 cup (145 g/5 oz)	trace
sauce	1 cup (180 g/6½ oz)	½
Currant	1 cup (60 g/2 oz)	2
Date, dried, pitted	1 cup (150 g/5½ oz)	4
Fig, dried	3 large (135 g/5 oz)	3
Grape, seedless	1 cup (100 g/3½ oz)	1
Grapefruit	½ medium (295 g/10½ oz)	1
Guava, fresh	1 large (75 g/2½ oz)	1
Honeydew melon	⅛ medium (60 g/2 oz)	2½
Lemon	1 medium (140 g/5 oz)	1
Lime	1 medium (140 g/5 oz)	trace
Nectarine	1 medium (90 g/3 oz)	1
Orange	1 medium (110 g/4 oz)	2
Papaya	1 medium (300 g/10½ oz)	trace
Peach	1 medium (100 g/3½ oz)	½
Pear	1 medium (165 g/6 oz)	1

FOOD	SERVING SIZE	PROTEIN (GRAMS)
	AMERICAN (METRIC/IMPERIAL)	
Pineapple, diced	1 cup (155 g/5½ oz)	½
Plum, raw	5 medium (150 g/5 oz)	1
Prune		
dried, soft	10 (110 g/4 oz)	2
stewed	½ cup (110 g/4 oz)	1
Pumpkin, raw	1 cup (245 g/2 oz)	2½
Quince	1 medium (60 g/2½ oz)	trace
Raisin	½ cup (75 g/4½ oz)	2
Raspberry, fresh/ frozen	1 cup (130 g/9½ oz)	½
Rhubarb, cooked	1 cup (270 g/5½ oz)	1
Strawberry, fresh/ frozen	1 cup (150 g/3 oz)	1
Tangerine	1 medium (90 g/15 oz)	1
Watermelon	1 slice (425 g/4 oz)	2
	VEGETABLES	
Artichoke, globe, cooked	1 large (120 g/3½ oz)	3½
Asparagus	6 spears (100 g/4 oz)	2
Beans		
green/string	1 cup (125 g/6 oz)	2
lima, cooked	1 cup (170 g/5 oz)	13
Beat greens, cooked	1 cup (145 g/6 oz)	½
Beets, cooked	1 cup (170 g/5½ oz)	2
Broccoli, cooked	1 cup (155 g/5½ oz)	5
Brussels sprouts, cooked	1 cup (155 g/3 oz)	½
Cabbage		
raw	1 cup (90 g/5 oz)	1
cooked	1 cup (145 g/5 oz)	½
Carrots, raw/cooked	1 cup (145 g/ 4 oz)	1
Cauliflower, cooked	1 cup (125 g/4 oz)	3
Celery	1 stalk (40 g/1½ oz)	½
Chard, Swiss, cooked	1 cup (175 g/6 oz)	3
Collard greens, cooked	1 cup (145 g/5 oz)	4

FOOD	SERVING SIZE	PROTEIN (GRAMS)
	AMERICAN (METRIC/IMPERIAL)	
Corn		
on cob	2 ears (130 g/4½ oz)	5
cooked, drained	1 cup (165 g/6 oz)	5
Cucumber, sliced	½ cup (30 g/1 oz)	trace
Dandelion greens, cooked	1 cup (210 g/7½ oz)	4
Eggplant, cooked	1 cup (200 g/7 oz)	2
Escarole/Endive	½ head (50 g/1⅔ oz)	1
Kale, cooked	1 cup (110 g/4 oz)	5
Leek	4 (100 g/3½ oz)	2
Lettuce		
Iceberg	¼ head (70 g/2½ oz)	1½
Romaine	¼ head (70 g/2½ oz)	½
Mushrooms, raw	1 cup (70 g/2½ oz)	2
Mustard greens, cooked	1 cup (140 g/4½ oz)	3
Okra, cooked	½ cup (80 g/2⅔ oz)	1½
Olives, pitted	10 medium (45 g/1½ oz)	½
Onions		
cooked	1 cup (210 g/7½ oz)	2½
raw	1 cup (170 g/6 oz)	2½
Parsley, fresh	¼ cup (15 g/½ oz)	trace
Peas, raw/canned	1 cup (160 g/5½ oz)	8
Peppers, raw, sweet	1 large (75 g/2½ oz)	1
Pimiento, canned	1 pod (40 g/1½ oz)	trace
Potato		
boiled/baked	1 medium (135 g/4⅓ oz)	2½
chips	10 (20 g/⅔ oz)	1
French fries	10 (60 g/2 oz)	2
hash browns	1 cup (150 g/5 oz)	5
Radishes	5 (20 g/⅔ oz)	trace
Spinach		
cooked	1 cup (190 g/2 oz)	5½
raw	1 cup (55 g/7 oz)	2
Squash, cooked		
summer	1 cup (190 g/2 oz)	2
winter	1 cup (205 g/7 oz)	4
Sweet potato/yam		
baked	1 medium (160 g/7½ oz)	2½
mashed	1 cup (255 g/5½ oz)	4

FOOD	SERVING SIZE	PROTEIN (GRAMS)
	AMERICAN (METRIC/IMPERIAL)	
Tomato		
canned, whole	1 cup (240 g/9 oz)	2½
paste	½ cup (115 g/8½ oz)	4
purée	1 cup (250 g/4 oz)	4
raw	1 medium (100 g/8 fl oz)	1
stewed	1 cup (240 g/3½ oz)	3
Turnip	1 large (140 g/8½ oz)	1
Turnip greens, cooked	1 cup (145 g/5 oz)	3
Watercress, raw	1 cup (50 g/5 oz)	1
	BEVERAGES	
Apple juice	1 cup (230 g/1⅔ oz)	trace
Apricot juice	1 cup (250 g/8 fl oz)	1
Beer	1 cup (240 g/8 fl oz)	½
Bouillon/broth/consommé (canned)	1 cup (240 g/8 fl oz)	5
Cocoa, made with milk	1 cup (240 g/8 fl oz)	9
Cranberry juice	1 cup (250 g/8 fl oz)	trace
Eggnog	1 cup (300 g/8 fl oz)	12
Grapefruit juice	1 cup (250 g/8 fl oz)	1
Grape juice	1 cup (255 g/8 fl oz)	1
Lemon juice, fresh	½ cup (120 g/4 fl oz)	½
Lime juice, fresh	½ cup (120 g/4 fl oz)	½
Milk		
whole, skim	1 cup (240 g/8 fl oz)	8
Malted	1 cup (270 g/8 fl oz)	13
Orange juice	1 cup (250 g/8 fl oz)	2
Pineapple juice	1 cup (250 g/8 fl oz)	1
Prune juice	1 cup (255 g/8 fl oz)	1
Tomato juice	1 cup (240 g/8 fl oz)	2
Club soda	1 cup (240 g/8 fl oz)	0
Coffee, black	1 cup (240 g/8 fl oz)	trace
Colas	1 cup (240 g/8 fl oz)	0

FOOD	SERVING SIZE	PROTEIN (GRAMS)
	AMERICAN (METRIC/IMPERIAL)	
Fruit-flavored "drink," canned/ powdered	1 cup (240 g/8 fl oz)	0
Ginger ale	1 cup (240 g/8 fl oz)	0
Liquor	1 oz. (28 g/1 fl oz)	0
Powdered "breakfast drink"	1 cup (240 g/8 fl oz)	0
Powdered imitation soda	1 cup (240 g/8 fl oz)	0
Root beer	1 cup (240 g/8 fl oz)	0
Tea, plain	1 cup (240 g/8 fl oz)	trace
Wine	½ cup (120 g/4 fl oz)	trace
	SWEETS	
Baked goods	Check recipes or commercial labels	
Candy		
caramels	5 (30 g/1 oz)	1
fudge	2 pieces (30 g/1 oz)	1
marshmallows	5 (30 g/1 oz)	1
milk chocolate	2 oz. bar (60 g/2 oz)	4
hard candy	5 pieces (30 g/1 oz)	0
Chocolate syrup	1 tablespoon (40 g/2 dessert spoons)	0
Corn syrup	2 tablespoons (40 g/2 dessert spoons)	0
Jam/jelly/preserves	2 tablespoons (40 g/2 dessert spoons)	0
Honey	2 tablespoons (40 g/2 dessert spoons)	trace
Maple syrup	2 tablespoons (40 g/2 dessert spoons)	0
Molasses	2 tablespoons (40 g/2 dessert spoons)	0
Sugar		
brown	1 cup (220 g/8 oz)	0
white	1 cup (200 g/7½ oz)	0

Information Directory

1. The Foundation for Perinatal Education
   Box 290 Stony Brook Road
   Oneida, NY 13421
   U.S.A.

   Sponsors continuing education seminars for medical professionals and a perinatal educator training program that offers upper-level or post-baccalaureate college credit (Professional Certificate). Summer Institute. Enclose self-addressed stamped envelope with brochure request.

2. American Academy of Husband-Coached Childbirth
   (AAHCC)
   The Bradley Method
   P.O. Box 5224
   Sherman Oaks, CA 91413
   U.S.A.

   A national organization which trains and certifies teachers of the Bradley Method of childbirth education, originated by Dr. Robert A. Bradley of Denver. Maintains referral service to affiliated teachers and information service (films, reprints, tape cassettes, student workbooks) on all aspects of the physiological approach to childbearing. The Bradley Method stresses sound nutrition, progressive relaxation for labor, father participation in birth and strong consumer orientation.
   Toll-free information and referral line: (800)423-2397

3. Hathaway Productions
4846 Katherine Avenue
Sherman Oaks, CA 91423
U.S.A.

Filmmakers whose catalog list features nutrition, childbirth, and breast-feeding subjects. "Nutrition in Pregnancy," a 30-minute, 16mm, color film, features Dr. Tom Brewer and a group of expectant parents in an informal nutrition counseling session modeled on those of the Contra Costa County toxemia prevention project. Available for rental or preview in addition to purchase. Currently in use in hospitals, clinics, childbirth classes, and other health care agencies. Available in Great Britain through P.E.T.S. (See #7).

4. Cesarean Prevention Movement
Box 152
Syracuse, NY 13210
U.S.A.

Publishes "The Clarion," a newspaper-format newsletter with articles contributed by members and invited specialists, reviews of books, and reprints from the medical press. Sponsors conferences to educate the public and the health professions about Cesarean prevention and vaginal birth after Cesarean (VBAC). Instructor training program.

5. National Association of Parents and Professionals for Safe Alternatives in Childbirth (NAPSAC), International
Box 267
Marble Hill, MO 63764
U.S.A.

Publishes newsletter and books on medically safe, family-oriented birth programs in home, birth center, and hospital settings which have won awards from the American Nurses Association. NAPSAC member groups sponsor regional conferences on current topics in the field. Individuals may become certified NAPSAC leaders by completing a prescribed course of study and projects.

6. Women's International Network (WIN)
187 Grant Street
Lexington, MA 02173
U.S.A.

Publishes *WIN News*, a comprehensive digest of international reportage about women's health and development. Includes worldwide calendars of conferences, seminars, and symposia in the field and resource lists for networking with groups involved in improving the status of women. Other publications include *The Childbirth Picture Book* and a training pamphlet about childbirth for local health workers.

7. Pre-Eclamptic Toxemia Society (P.E.T.S.)
33 Keswick Avenue
Hullbridge Essex
SS5 6JL
England
Telephone: (0702) 231689
Dawn James, Secretary

A recognized public charity which publishes an international newsletter dealing with preeclampsia/eclampsia (MTLP). Founded by a woman who experienced severe MTLP in her first pregnancy, the PET Society now has members around the world. Sponsors showing of the film "Nutrition in Pregnancy" (see No. 2 above) throughout the British Isles, lectures for the public and hospital personnel about MTLP prevention, and carries on correspondence with medical school faculty doing research on MTLP worldwide. Individual letters from MTLP sufferers referred to specialists. Maintains circulating library about MTLP (books, reprints, journals) available to members.

8. Dispensaire des Femmes
4 rue du Môle
Geneva 1211
Switzerland

Women's health clinic which maintains contact with similar

agencies throughout Europe. Personnel completed childbirth education preparation in United States.

9. Association for Improvement in the Maternity Services (AIMS)
1 Styche Hall
Market Drayton
Shropshire
England TF9 3RB

Sponsors classes for expectant parents and trains childbirth educators. Publishes comprehensive newsletter about childbirth issues in Great Britain.

10. Arbeitsgemeinschaft P.E.T.S. Deutschland
Kolpingstrasse 43
4173 Kerken-Alderkerk
West Germany
Telephone: 02833-1252
Sabine Kuse, Secretariat

Publishes newsletter in German for those who have suffered pre-eclamptic toxemia (termed e.p.h. gestosis in Europe) or those who want to learn more about pregnancy nutrition. Distributes booklet, "Gesunde Schwangerschaft, Gesundes Baby." Affiliated with P.E.T.S., England.

11. Organisation Gestosis
Gerbergasse 14
CH-4051 Basel
Switzerland
Professor Ernst Rippmann, Secretariat

An international organization of medical professionals and others interested in research on pre-eclampsia/eclampsia (e.p.h. gestosis). Sponsors symposia and newsletter. Distributes book, *Metabolic Toxemia of Late Pregnancy: a Disease of Malnutrition,* by Thomas Brewer, M.D.

12. PLEAS (Perinatal Liability/Education, Action, Support)
    Box 605—University Station
    Syracuse, NY 13210
    U.S.A.

    Operates clearinghouse for malpractice lawsuits involving prenatal nutrition and drug management. Referrals to experienced malpractice attorneys interested in perinatal issues. Sponsors education for families and litigation experts.

Catalogs of books and other materials about childbirth are available from:

1. Birth and Life Bookstore
   Box 70625
   7001 Alonzo Ave. N.W.
   Seattle, WA 98107
   U.S.A.

2. International Childbirth Education Association
   Box 20048
   Minneapolis, MN 55420
   U.S.A.

3. Orange Cat Goes to Market
   442 Church St.
   Garberville, CA 95440
   U.S.A.

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Recipe Index

Note: Recipes are organized in groups according to the types of foods they emphasize. The first page listing shows where the dish is used in a menu. The second reference, in heavy type, indicates where the recipe can be found.

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