

**Teenagers  
&  
Nutrition**

# **Teenagers & Nutrition**

**Improving Health with God-Given Foods**

**Foreword  
by  
Peter E. Chojnowski, Ph. D.**

**Dr. Anthony J. Cichoke**

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*Teenagers & Nutrition: Improving Health with God-Given Foods* is intended solely for educational and informational purposes and not as medical advice. Please consult your health care professional if you have any questions about your health.

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## **DEDICATION**

This book is dedicated  
to  
Almighty God  
From Whom all good things flow  
and in  
Thanksgiving  
for  
All His bountiful gifts  
of  
Fresh food,  
Clean water,  
Good health,  
Abundant life,  
and  
Our salvation.

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## FOREWORD

By Peter E. Chojnowski, Ph. D.

Why a book on nutrition, especially nutrition for young people, in the midst of a crisis in the Church? Aren't such considerations distractions from a spiritual life that is more and more difficult to maintain? To pose such a question as this is to fundamentally misunderstand the nature of man and the nature of the supernatural life. When we consider the teachings of St. Thomas Aquinas, the Angelic Doctor of the Church, who gives out remedies for melancholy (baths and sleep), we understand how the body and the soul are two principles of a single unified being that is both body *and* soul. Much more than this though, grace itself, the gift that is given us by God for our ultimate salvation is that which *restores, perfects, and elevates nature*; it does not supplant nature.

What all of this means is that *nature* matters; what we do with our own bodies and how we maintain them *matters*. This is why I attach such importance to Dr. Anthony Cichoke's new book directed especially to youth. It is during the ages of early adulthood and adolescence, that the virtue of *temperance* emerges as a necessary aspect of a healthy, wholesome, and attractive young life.

When St. Thomas Aquinas tries to explain the true nature of the cardinal virtue of temperance, one of the four "hinges" upon which swings the gate of life, he quotes St. Paul in his *1<sup>st</sup> Letter to the Corinthians* (12:24) as saying, *Deus temperavit corpus*, "Thus God has established a harmony in the body." Just as grace, however, must be freely cultivated, maintained, and used by the free will of man, so too the "harmony" which God has established in the body must be cultivated, maintained, and used by a free man or woman who understands the basic laws of human nature, their own bodies, *and* the basic laws of healthful living. The virtue of temperance, then, follows from the essential meaning of *temporare*, to dispose various parts (of the body) into one unified and ordered whole. We might ask here the perhaps obvious question, "Why do this?" Is it simply to keep the "mechanism" of the body functioning optimally so that we avoid serious illness? For anyone who knows the thinking of the Church and the thinking of St. Thomas Aquinas, the answer is obviously, NO! In this regard, St. Thomas indicates that a second meaning of temperance is "serenity of spirit" (*quies animi*). That is, typically, the opposite of the moral, psycho-

logical, and spiritual state that we expect teenagers to have. It is, however, exactly the consequence, which the Angelic Doctor says will result from the general order of God's creation being realized in the body and soul of the young person *through* the temperate, balanced, and wholesome life.

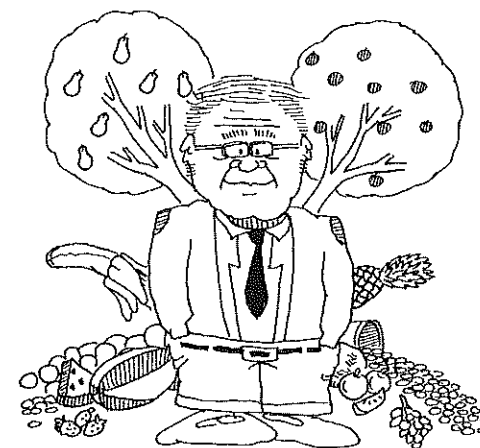
But there is another reason why a book about adolescent nutrition is important for *our* time. In our time, too many people, especially young people, are living in an unhealthy, virtual world, which is separated from the Order of Nature as God the Creator has established it. All around us we encounter a dislocation from what I would call the "basically human" or human nature as it has operated and shown itself before the artificial, toxic, synthetic, and virtual world in which we currently live. The explosion of child obesity and mental illness are all signs that the orderly and somewhat Spartan life of our ancestors, with their greater appreciation for and immersion in the processes of nature, has been destroyed and usurped by a virtual life of "food," "recreation," "sports," "enjoyment," and "fun"; a "world" and "realities" that must carry quotation marks around them if they are to honestly portray the situation of our time.

The task of our time is to re-awaken and regain the *normal* in life, religion, health, recreation, and education. That would sound boring if it were not for our common Christian recognition that rooted in the very mind of God Himself is an idea, and *ideal*, not only for mankind as a "type" but for each and every one of us as individual men and women.

This book by Dr. Cichoke perfectly fits the interests of youth, their parents, and anyone interested in the well-being of the Church and humanity at large, but it also responds to one of the most obvious characteristics of adolescents, *their focus on themselves*. Rightly ordered and set within the richness of the Created Order, this focus perfectly fits with the traditional demands of temperance itself which requires that each man look to himself and his own condition. Is this "self-concern" wrong? On the contrary, St. Thomas Aquinas says that, just as the primordial ideas of all things reside in God, so too the virtue of temperance has a type of existence in God, insofar as there is a "turning of the Divine Spirit to Itself." May this book help us all be the fit soldiers of Our Lord Jesus Christ so necessary in our Church and world today.

**Peter E. Chojnowski, Ph. D.**

May 1, 2012



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Finally, my eternal thanks to my wife Margie, for her continuous support and for enduring the mountains of paper in our home for these past years, and to my special children, Tony, David, Bill, and Kate.

## THE STORY OF DAVID

*But the souls of the just are in the hand of God, and the torment of death shall not touch them. In the sight of the unwise they seemed to die: and their departure was taken for misery: and their going away from us, for utter destruction: but they are in peace.*

Wisdom 3:1-3

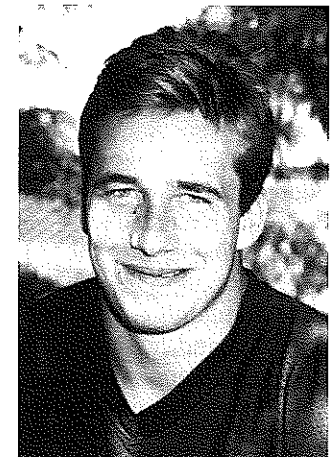
As I write this book on health and nutrition, significant events in my life flash before me, resonating through my mind and penetrating far into my very soul. The memories, deeply engrained in my mind, are those events surrounding my son David's life. Therefore, I am driven to share these memories with you in the hope that these events will inspire you and your life.

Return with me to that early Sunday morning some forty-four years ago in Pittsford, New York. Return with me to those troubled and painful days and experience how one young man turned an apparent defeat into ultimate victory.

This is the story of how our son struggled to overcome seemingly insurmountable odds and became a living inspiration to all those whose lives he touched. In the struggle to teach David to crawl, to walk, to run, even to eat, I learned a new respect for life plus a rededicated concern for my fellow man. Through these events, I could see the ever-present image of Jesus Christ—His Passion, Crucifixion, Death, and Resurrection. Through God, and the experiences He has sent me, I now more deeply appreciate the gift of life in every human and more thoroughly understand that only God and God alone has the power to give life or to take it away.

In 1967, I was conducting research and teaching at Eastman Dental Center, the University of Rochester Medical School, and the Al Sigmund Rehabilitation Center in Rochester, New York. At the time, we lived in a big, old, two-story house in suburban Pittsford.

That fateful Sunday morning, my wife Margie and I were asleep upstairs and were driven from our bed by a loud noise—like something violently falling down the stairs. We ran to the top of the stairs and there we saw our three-year-old son, David, slumped at the bottom of the stairs, vomit spewing from his mouth. His eyes were glassy and filled with fear. His arms flailed helplessly as he attempted to get up; his arms and legs would give way and he would fall with a numbing thud, his head crashing into the stairs. He was trying to climb back up the stairs but was unable to



control his movements. We carried him upstairs and called the doctor while holding him in our arms. We rushed him to the hospital where he received a brain scan and a spinal tap. We could hear David screaming as the doctors attempted to conduct the brain scan and to insert the needles into his back for the spinal tap. This terrified us and we begged the doctors to stop, but they said they needed the information in order to complete their diagnosis.

As the hours and days passed by, David showed no signs of improvement. His movements were limited and he remained bedridden. The projectile vomiting did not stop and either my lovely wife (who was eight and one-half months pregnant with our daughter, Katie) or I maintained a constant bedside vigil. We felt helpless as time and time again, the muscles in David's back would tighten and he would retch, his little three-year-old body arched like a bow.

The high side rails of his crib seemed like the ominous bars of a prison and David was the caged inmate. He was unable to function on his own and had to be fed and cleansed by hand and carried to the bathroom. David couldn't control the movement of his arms or legs. His eyes would roll back and his head would toss uncontrollably from side to side like a child with cerebral palsy. As David's vomiting continued, we were only allowed to give him tiny ice cubes to suck on.

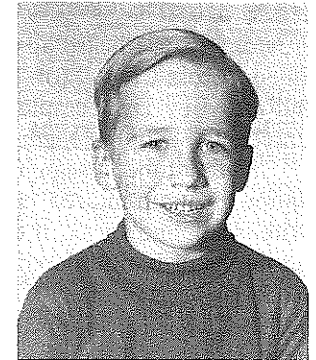
WHENEVER A  
HOPELESS CHILD  
IMPROVES, MY SON'S  
SPIRIT IS THERE

Ultimately, David was diagnosed as suffering from Acute Cerebellar Ataxia—a condition caused by damage to the cerebellum (that part of the brain responsible for equilibrium and muscle coordination) and was marked by David's inability to coordinate his movements. This was the result of injuries suffered in the fall. He was finally released from the hospital—not because he was cured, but because there were no treatment programs for a child in his condition.

### **An Uncertain Future**

David's doctors were guarded and uncertain about his future. They offered no help, no hope, no encouragement, basically advising us that "nothing could be done." David could develop like a child with cerebral palsy, possibly wearing braces and using crutches the rest of his life. I asked the doctors, "How long will he live?" They responded that they didn't know—he could be an invalid all his life or he could die at any time.

Further, I discovered that at various hospitals, universities, and rehabilitation centers, the impaired children were conveniently institutionalized, categorized, and pigeonholed for the remaining portion of their lives. If this was the case, it was inhumane! We vowed that this would NOT happen to David!



Since organized medicine had no answers, we turned to God and begged for His help. David's accident drove me back into the labyrinths and hallowed halls of research libraries and institutions. Fortunately, it was at that time that I re-discovered the healing powers of alternative health care, good nutrition, and rehabilitation, plus the importance of taking charge of one's own life and destiny.

### **God's Wake-Up Call**

As with many events in life, it was as if God had sent me a message—a "wake-up call"—through David's tragic injury. This event not only changed my life, but kick-started my return to good nutrition and also led me to the most meaningful career change of my life.

Because of his poor coordination, David kept falling and hitting his head. It appeared that his body lacked any protective mechanism. When falling backward, a "normal" child will hunch his back and bring his head forward. However, when David would fall, his head would swing back helplessly, thus exposing him to serious injury. To protect David's head, we obtained a football helmet and put it on his head to cushion any fall he might experience. And, since we didn't want David to feel "different," we also got helmets for David's two brothers, Tony, five years of age and Billy, one and one-half years of age.

Working with friends, my wife and I devised "David's Magic Room." To protect David, we attached swatches of carpet padding to all four walls (about four feet high) and covered the floor with six-inch-thick sponge rubber padding, dubbing the spongy floor "David's Magic Carpet."

We bought a stack of children's books and records. Although David wasn't old enough to read, he would sit for hours on his "Magic Carpet" listening to these records and judiciously turning the pages of the accompanying book just at the appropriate time, as though he were actually "reading" each book. This took care of the present, but what about David's future? Could David's body, mind, and spirit be rehabilitated? And, if so, how?

With God's help (God DOES inspire us if we ask Him), we began to look for answers. I contacted researchers and doctors all over the world.



## Cross-Crawl

Providentially, I heard about a controversial, new (at that time) technique called "Cross-Crawl" (or "Cross Patterning") which was being researched and tested by Dr. Temple Fay, Department Head of Neurology, Temple University School of Medicine.

At that time, researchers at Temple were studying neurological organization in brain-injured children who had difficulty in learning to read, write, spell, and speak. If these researchers were successful in reorganizing the brains of brain-injured children, why not try this program on David? We hypothesized that if David had injured certain areas of his brain, this "Cross-Crawl" technique might also help to reorganize those damaged areas.

The concept of "Cross-Crawl" recognizes a sequence in the learning process which could be likened to a series of stairsteps. That is, in climbing the stairs, one foot must be placed on the first step before moving on to the second. With David, his brain had been disoriented from the accident. Therefore, his head, his arms, his legs, his whole body had to be re-educated as to the most elementary processes of movement, reaction, and posture.

Since the essential "wires" from his brain to his body parts had been damaged, it seemed that we had to help reconnect these wires in David's brain. David had to relearn the basic body movements which he had "lost" in the injury, in order to know how to function normally (that is, to crawl and eventually walk under his own power).

I STRAPPED MY ARMS TO  
HIS ARMS AND MY LEGS TO HIS  
LEGS, SO THAT AS I MOVED, HE  
MOVED WITH ME

"Cross-crawl" involves the simultaneous movement of the head, the two arms, and the two legs. Ideally, one needs five individuals to perform these therapeutic tasks properly but, unfortunately, we did not have the five individuals to "work" the head, the arms, and the legs. My wife, Margie, had just delivered our beautiful daughter, Katie, so she was busy primarily tending to our new baby and to our other two boys. Therefore, I knew the bulk of David's rehabilitation would be up to me. I started by first strapping my arms to David's arms and my legs to his legs, so that as I moved, he would be forced to move in like fashion. We began using the basic cross-crawl movements, first, lying on our backs, progressing to a crawling position, and ultimately to an upright posture and to walking.

In relearning to stand and to walk in an upright position, David would repeatedly fall down and get up. And then he would fall down and get up again. Each time he would fall, I would run to him and, helping him up, say, "David! David! Are you OK?" And each time he would look up at me with those beautiful blue eyes, smile and say, very confidently and with great determination, "Daddy, I can do it! I know I can do it!" And struggling to his feet, he would say, "I'm OK, Dad! Don't worry!" Then, he would set his little jaw, squint his eyes, look me directly in the eyes, and say, firmly, "I can do it Daddy! I WILL DO IT!"

And somewhere down inside, I knew he was right. Somehow, I knew he could and would walk again. There was no question in my mind that he would walk again!

## David Would Not Quit

Even at three years of age, David would not, could not quit! And in those fragile moments of quiet desperation, we knew what it meant to be in the presence of a true champion—one who would face whatever challenge might come his way and never, *never* give up. David, you have taught me so much about life.

During this time, my family and I rededicated ourselves to David's rehabilitation and to the fight for David's life in order that he might reach whatever potential God had destined for him to achieve. Our goal was to help David "Reach for the sky and grab a handful of stars." We knew that the road would not be easy and that it would be filled with many road blocks, potholes, and detours. But, following David's example, we never gave up.

David first conquered walking inside the house. To accomplish this feat, he used the walls and furniture for support. He would fall down and get up, fall down and get up. He would fall down but he kept getting up! The stairs were his next challenge. And, ultimately, his final challenge was the outdoors, with no support to help navigate the problems of uneven ground, dirt, grass, rocks, and cement. Since he had no furniture or walls to grab for support, the rough surface of the outdoors was far more difficult. In spite of these problems, David conquered them all.

As David began to walk, we would take daily walks, then hikes, then even wind-sprints down the driveway, and finally, jogging.

## Help From the Greatest in Nutrition

Leaving no stone unturned, I contacted world-famous researchers and physicians—individuals such as Dr. Lendon Smith ("The TV Baby Doctor"), Dr. Abram Hoffer (world-famous physician and researcher on orthomolecular medicine), Dr. Roger Williams, Dr. Emanuel Cheraskin, and Dr. Linus Pauling—and received tremendous feedback plus constant encouragement. These men are great for a reason. Following their advice,

I devised a nutritional program for David. And, it worked! I can never thank these great men enough for their never-ending reinforcement and supply of vital nutritional information.

With the doctors' advice and direction, we eliminated from our diet, all processed and refined foods (including food preservatives, additives, flavors, and food coloring). Instead, we emphasized a "Caveman Diet," using whole, uncooked foods (rich in enzyme activity), such as fresh fruits, vegetables, nuts, and whole grains. Concurrently, we increased David's supplement program with special emphasis on minerals (such as calcium and magnesium), vitamins (particularly vitamins A, B, C, D, and E), plus protein, bioflavonoids, wheat germ oil, garlic, probiotics, antioxidants, and multiple enzyme combinations.

Further, my wife and I devised a new way to re-program David's protective mechanisms. For example, when reprimanding the children, we had them do push-ups. By using this exercise, we were teaching David to put his hands out in front of his body, thereby strengthening his arms to protect him in the event that he should fall.

In an attempt to learn more about David's neurological problem, I entered Case Western Reserve University working toward my Ph.D. in Rehabilitation (with an emphasis on speech pathology and audiology and focusing on anatomy and the neurologic aspects of the head and neck).

We continued working on David's neuromuscular coordination and placed him in a developmental gymnastics program with his brothers. Seeking to encourage conceptual development and his hand-eye coordination, we enrolled David in a Montessori School.

## Chiropractic

Since organized medicine had furnished me with few answers, I continued to seek information from recognized alternative sources. Because of its emphasis on the body's neuromuscular and skeletal mechanism, I turned to the field of chiropractic. My father had been a very successful chiropractor practicing in Peoria, Illinois. I had seen the thousands of people he had helped. I knew that chiropractic and nutrition would be viable programs for David's rehabilitation. Therefore, I wrote to practically every chiropractic college in the country and finally settled on the highly accredited National College of Chiropractic. At National, I studied, taught Gross Anatomy, and continued to do research on neuromusculoskeletal problems while earning my Chiropractic degree.

Leaving no stone unturned in my search for David's rehabilitation program, I fortuitously met Dr. Karl Ransberger (sole owner of Germany's huge pharmaceutical company, Mucos Pharma, producer of the world famous Wobenzym™, who with Dr. Max Wolf, discovered "Systemic Enzyme Therapy"). Dr. Ransberger took me under his wing and opened doors to hospitals, medical schools, and research centers throughout the

world. Through Dr. Ransberger's efforts, I learned the vast therapeutic potential of enzymes, enzyme combinations, and Systemic Enzyme Therapy in helping David and subsequently, thousands of other ill people around the world. God bless you and thank you, Dr. Ransberger! Thank you from the bottom of my heart! I will always cherish our friendship and your never-ending support.

## A Two-Part Plan

With God's help and the input from many world leaders in alternative health care, I eventually developed a two-part therapy program for David: Part one involved cross-crawl, chiropractic, and physical therapy to continue programming the neuropathways of his brain; in Part two, I drastically overhauled his fuel system (diet) by integrating even more whole foods, whole grains, and live, fresh fruits and vegetables (which are very high in natural enzymes). Refined foods, processed foods, preservatives, food additives, and artificial food colorings or flavors were drastically reduced and then eliminated. Further, a strong daily regimen of multi-vitamins, multi-minerals, plus enzymes and enzyme combinations was continually upgraded. Integrating David's diet into the family program brought dramatic improvements in every family member's health.

While prayer is our spiritual fuel, good, healthy, live food and supplement support are the fuels which run our physical bodies and give us the energy to perform our physical, mental, and spiritual activities.

With God's inspiration, I began using the pool and swimming to place David in an anti-gravity position. The basic swim strokes actually replicated the cross-crawl movements.

WE PLEADED WITH DAVID NOT TO  
PLAY CONTACT SPORTS, BUT  
FOOTBALL SEEMED SOMETHING  
HE HAD TO DO

David, now eight, took to the water like a fish. With Tony (age ten) as his constant companion and never-ending source of encouragement, they became the scourge of YMCA and AAU Age-Group swim meets throughout the region. David, Tony, six-year-old Billy, and four-year-old Katie swam for the perennial Illinois state championship team, B.R. Ryall YMCA. In the state championship, David took second in the butterfly against all competitors age eight and under.

After seeing the York High School cross country team (dubbed "THE LONG GREEN LINE") running one day, I contacted the head coach, Joe Newton, and asked if it would be possible for David to run with the team. The coach kindly agreed; so David (age eight) and Tony (age ten) worked

out daily with this nationally-ranked high school cross country team and even were allowed to participate in their high school cross country meets.

On my graduation from National College, we moved to Coos Bay, Oregon. We continued to work with David and the other children in the swimming pool. By the time we moved to Portland, David (now ten), had regained all motor coordination.

In Portland, David swam for the David Douglas Swim Team (as did Tony, Billy, and Katie). At the age of ten, David was ranked fourth fastest swimmer in the nation in the 200-meter individual medley and held the majority of Oregon and northwest swim records for his age and sex.

Stepping out of the pool, David ran a 5:07 mile and was again ranked in the top 10, nationally, for the mile for ten-year-olds. Not bad for a child who, at three years of age, was never supposed to walk again!

### The Lure of Football

However, David loved football. And, as each football season approached, he would beg to play. Repeatedly, we had explained to him that a hard blow to his head could mean his death. But, because it meant so much to David, it was difficult, but necessary, to say NO.

Denied football, David became a star in swimming, cross country, and track, all while concentrating on his studies.

While at David Douglas High School, he led the cross country team and still holds many of the distance records for freshmen and sophomores. In swimming, he was on two David Douglas state championship teams. He was nationally ranked in swimming and went to the state finals in swimming, cross country, and track.

DAVID LOVED FOOTBALL. AS EACH FOOTBALL SEASON APPROACHED, HE WOULD BEG TO PLAY. BECAUSE IT SEEMED TO MEAN SO MUCH TO HIM, IT WAS DIFFICULT, BUT NECESSARY, TO SAY NO

Academically, David was an Oregon Scholar, National Honor Student, and a four-year honor-roll student. After transferring to Jesuit High School, he helped lead the cross country team to third place in the state finals. When he outgrew distance running, Coach Bill Griffin encouraged him to throw the javelin and, in his first year of competition, he not only broke the school record, but placed first in the district meet, and went to the state finals in his event.

Though he loved football, he had never played the sport until he attended Oregon State summer football camp at Corvallis. This was under an assumed name (Brock McDonald). He went incognito because he was

embarrassed at never having played football before. His athletic talents were so tremendous, however, that he was offered a football scholarship on the spot by the Oregon State head football coach. But, David had already committed to Santa Clara University.

On his 20<sup>th</sup> birthday, while a student at Santa Clara University, he begged us to allow him to join their Broncos football team. We pleaded with him not to play contact sports. At that time, we were encouraged by a neurologist's examination, which showed David had no signs of his past injury and, fortunately, he had exhibited no neuromuscular problems for the past ten years. In addition, David had become a "Goliath." He was now 6 feet, 2½ inches tall and weighed 225 pounds with the build of a Greek god, *plus* he could still run like a deer!

Football seemed to be something he had to do. The first game he ever played in his life, he started as linebacker at Santa Clara University. He helped lead the team to a sixth place national ranking for Division II football. In fact, his coach had already been contacted ("unofficially") by the Green Bay Packers and Indianapolis Colts professional football teams concerning David. It seemed that David's future was filled with promise.

But, fate always has its way and a turn of events was to change our lives forever. In my office that fateful day, I was treating patients when my nurse called me out of a treatment room and somberly said, "Coach Terry Malley, head coach at Santa Clara University, is on the phone and he has something important to tell you." I picked up the phone and in a subdued voice, Coach Malley said, "Doc, are you sitting down?" I said "No." Then, apparently gathering all his strength, Coach Malley said, "Doc, you better sit down—DAVID IS DEAD!" Then there was a pause; it felt as though I had just been sucked into a vacuum and someone had just hit me in the back of the head with a sledge hammer, plus ripped out my heart and stomach. My knees gave way and I collapsed into the chair. I couldn't believe what I had just heard. "DAVID IS DEAD?"

Still in shock, I replaced the phone in its cradle. My son David was dead, the result of a head injury. It was his game-saving tackle against Cal State Northridge two days earlier which apparently caused the concussion (and subdural hematoma) that took his life.

That tragic day, David's teammates and friends had arrived at his apartment to congratulate and rib him on being voted "Player of the



Week” by conference officials. Instead, they found him stretched out on the floor, face down, reaching out for the phone.....alone..... and dead!

### **Recognizing the Hazards**

David, fully aware of his own vulnerability, recognized the general hazard of head injuries for all football players; and so, as an engineering major, he had been in the process of designing a football helmet to lessen that danger. He died before completing the helmet design.

David’s death has given us all a greater appreciation for the gift of life. God could have taken David at three years of age, but our family was blessed with his dynamic presence for eighteen additional and wonderful years. David, you will never be forgotten!

David’s spirit was his legacy. Whenever a hopeless child improves, David is there! Whenever a crippled child walks, David lives! David’s struggle and victory have taught me many things, most of all, never to give up caring for any human being. His death has also given me a new respect for the dignity of life and a renewed dedication to help all human beings.

As Henry Wadsworth Longfellow aptly put it in his *Psalm of Life*,

*“Lives of great men all remind us  
We can make our lives sublime.  
And, departing, leave behind us  
Footprints on the sands of time.”*

### **Epilogue**

On the 20<sup>th</sup> anniversary of David’s death, over 200 of David’s Santa Clara University classmates, football teammates, coaches, friends, and relatives gathered for a memorial Mass, picnic, and barbeque. The celebration was held on the football practice field adjacent to the Buck Shaw Football Stadium at Santa Clara University. Father Coz, David’s close friend and confessor, said the Mass. People came from Hong Kong, China, Hawaii, Boston, New York, Washington, D.C., the San Francisco Bay area, Europe—literally from all over the world—to remember and to laugh, to cry, and to celebrate David’s memory. David, you and your legacy will never be forgotten!

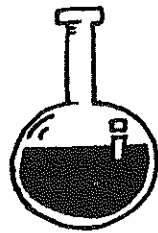
David has gone to see God, but his legacy will remain with us forever. The aura of David is everywhere. You could be a David. Or, you may see David in a family member or a friend. Take the moving story of David and live with his zest for life. Use David as your inspiration to *never* give up, and instead, to continue to “Reach for the sky and grab a handful of stars.”

**Let this be *your* new beginning!**

## **HOW TO USE THIS BOOK**

With this book, begin your adventure, your quest for better health. This is your solution for a longer, healthier life! The temptations of sugar- and fat-laden modern foods can be strong, but you can fend them off. Once you have reached your goal of better health, you will stand on the mountain of truth and the quest will be yours. You can hold your sword high and proclaim, “I am a soldier of Christ and I will use my God-given abilities to improve my health to fight these demons who would try to defeat me.”

Therefore, the purpose of this book is to teach you the basics of nutrition, how your diet affects your health, and how to improve your diet and, therefore, be the healthy person God wants you to be. Chapter One discusses digestion and absorption; Chapter Two covers the nutritional importance of macronutrients (including proteins, fats, and carbohydrates) and water. Chapter Three discusses micronutrients, that is, vitamins and minerals. Chapter Four covers enzymes and phytochemicals. Chapter Five shows you how to improve your diet and your life; which foods to avoid and which foods to include in a healthy diet. The first five chapters contain experiments to help you better visualize the learning concept, as well as a series of questions to test your knowledge of the subject matter. Chapter Six offers recipes to ensure a healthy diet. The Conclusion provides a summary of the book. Appendix A contains questions covering the entire text; Appendix B has a list of helpful resources; Appendix C contains answers to the questions posed throughout the text. The appendices are followed by a glossary of new terms you should know. These terms appear in bold the first time they are mentioned in the text. Reference numbers appear throughout the book whenever a particular study or text is mentioned. Please refer to the corresponding numbers in the References section for documentation.



Watch for this symbol for an experiment that you can try which will help you understand the concept.



This exclamation point helps explain an interesting fact.

Remember, our bodies are like beautiful machines. But each machine needs fuel to make it run; that fuel is food and water—all gifts from God. The birds of the air, the animals of the woods and fields, the fish in our streams, the plants and trees which grace our hillsides and valleys, the water in our oceans are all gifts from God. They should be used respectfully for health and wellness and for His greater honor and glory. God provides. We must listen to His words.

## INTRODUCTION

*Know you not, that you are the temple of God, and that the Spirit of God dwelleth in you? But if any man violate the temple of God, him shall God destroy. For the temple of God is holy, which you are.*

1 Corinthians 3:16-17

Sick of being sick? Tired of being tired? Feel worn down and wrung out like a dirty dish rag? Can't button that top button on your pants or skirt? Well, soldiers of Christ, this book is a roadmap, a guide to a longer, healthier—and more energetic—life.

Are you a junk food junkie? On a fast food frenzy?

Do you, like most American teenagers, live on a dead-food diet? Sadly, many teenagers only eat junk food, processed food, or baked or fried snack food and rarely eat anything that's real, live, and fresh. When is the last time you ate something uncooked or unprocessed, something that God provided directly to you in its natural state? Fresh fruits and vegetables are powerful and necessary sources of beneficial **vitamins, minerals, fiber, enzymes, and phytochemicals.**

A recent study found that fewer than one in ten Americans meets the government's recommendations regarding fruit or vegetable intake.<sup>1</sup> And, unfortunately, most adolescents (those aged twelve to eighteen years) get most of their fruit from fruit juice (especially orange juice) rather than from whole, enzyme-rich, fresh fruits. The intake of vegetables isn't any better. Most adolescents get their vegetables (along with an unhealthy dose of fat) from fried potatoes! Is this what God intended for you to eat? Is this the fuel you should use for your body, given to you by God?

If this type of fast-food, garbage diet sounds normal to you, it's because it has become the norm for too long. However, eating this way will eventually take its toll. The young teenaged body can get away with such a poor diet for a while—as it lives on the body's own reserves—but eventually, valuable and necessary resources (such as enzymes) will become deficient or depleted, and poor health and sickness will follow.

Is it possible to improve your diet? You bet. But it's not always easy. Believe me, I had to learn the hard way. As a child, my diet included plenty of fresh fruits and vegetables and everything (even the bread) was made

from scratch. No canned, frozen, or packaged foods, no preservatives, no food additives, and no taste enhancers were allowed. My father was a leading chiropractic physician in Illinois and he made sure that we only ate enzyme-rich, pesticide-free, live, fresh food.

I should have listened better to his advice after leaving home. Aren't we taught to respect our parents and obey them and other appointed servants of God? Follow your parents' advice to better nutrition and health. Our Lord, Jesus Christ, was subject to His own parents (Luke 2:51) and He has shown us the way, the truth, and the light.

When I left home for college, my diet changed drastically from the nutritious fare of my youth. It was then, in the university dining room, that I began eating institutionally-prepared foods and fast foods. What's worse, I probably only ate one meal a day. Later, while in the military, my diet was much of the same, as was my diet during my years in show business, but at least I ate more frequently (two to three times per day), even though my meals were nutritionally poor.

My diet dramatically improved after I married, but since I was a struggling graduate student with a wife and growing family, it was difficult to find the money to buy fresh fruits and vegetables. Somehow we did it. Although my diet was better than in my college, military, and show business days, my schedule and budget kept it from being optimum. However, my son David's accident and his subsequent rehabilitation drastically changed my life and my family's nutritional program (see *The Story of David* on page xiii).

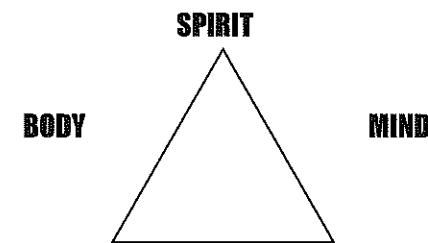
It wasn't until I attended chiropractic college that I began to thoroughly understand why my father had taught me the true value of healthy, whole foods, proper dietary supplementation, and the importance of eating at least three meals a day. Armed with the knowledge of how and why to improve my diet, I returned to my roots and to a healthier diet and lifestyle. And my health benefited because of it.

But what about your diet? Your health can benefit from improved nutrition, just as David's did. However, you most likely don't suffer from a condition as devastating as David's head injury. But, are you as healthy as you can be? Do you eat a nutritious diet? Or, is it packed full of fatty hamburgers, greasy fries, and rich milkshakes? Maybe a little heavy on refined **carbohydrates** and skimpy on fresh fruits and vegetables? Too much greasy, fast food? You're not alone. American teenagers eat more fast food than they ever have before. This means that too many empty **calories** come from fat and refined sugar, and too few from live, fresh vegetables and fruits. In fact, a California study found that nearly half of all California adolescents eat fast food every day and nearly two-thirds drink soda every day.<sup>2</sup> In the thirty years between 1965 and 1996, the consumption of soft drinks in the United States increased by nearly 300%.<sup>3</sup> And it seems that the more soft drinks we consume, the less milk we drink. Unfortunate

ly, the consumption of milk dropped 38% in the years between 1977 and 2001<sup>4</sup> – a disturbing trend.

But fast food and soft drinks aren't the only culprits. Even if you eat all of your meals at home, your nutrition may still suffer if you're picking the wrong foods or preparing healthy foods in unhealthy ways. A 2010 study found that, in the United States, 40% of all the calories consumed by children aged two to eighteen years were from empty calories—that is, from added refined sugars and solid fat.<sup>5</sup> What's worse, half of those calories came from soda, fruit drinks, dairy desserts, grain desserts, pizza, and whole milk (rather than reduced-fat milk).

Proper nutrition and a healthy lifestyle are the only ways to achieve true health. After all, health is a balance of the body, mind, and spirit. When this occurs, we have *ease* of bodily function, not *dis-ease*.



When we go against the laws of God, polluting our bodies and our minds, the result is an imbalance, a dis-ease of bodily function, and that leads to a diseased body or mind.

The maintenance of health is a sacred and personal duty for each person. Looking ahead to the Final Judgment, you must be ready to justify ALL of your actions when you are facing God. Since you will be judged not only on what you do, but what you *don't* do, lack of exercise or improper eating habits could be considered as disobeying the laws of God.

God has given each of us the gift of life. We are all made in the image and likeness of God. Because God has given you your body and mind, it is your personal responsibility to use these God-given gifts in the best way you possibly can. In order to do this, you must maintain your body and mind in an optimal state. This includes exercising your body and mind daily, but also providing nutritious food and drink to fuel that body.

As you grow into adulthood, your body changes, requiring different nutrients at each stage of your life. Now as a young adult, you must throw off some of your past habits and prepare for adulthood in body, mind, and spirit.

At the beginning of the world, God had established His own personal dietary plan (see Genesis 1:29). These same principles and guidelines exist for us, even to this very day. God so loves us that He wants us to be happy and healthy on this earth and to be with Him in the next. But when we

deviate from His dietary plan, sickness and premature death are sure to follow. Knowing this as fact, it is our responsibility to follow God's Biblical nutritional laws as we course through life. He has given us a guide to health and to salvation! Therefore, it is our own personal responsibility to follow His plan.

As St. Paul said, "When I was a child, I spoke as a child, I understood as a child, I thought as a child. But, when I became a man, I put away the things of a child." (1 Corinthians 13:11) So, as you approach adulthood, you must take on responsibility for your own diet and nutrition. This book will reveal to you God's roadmap for lifelong good health. So, let's get started.

## CHAPTER ONE

# DYNAMICS OF DIGESTION

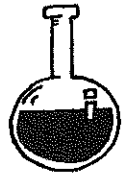
*Or know you not, that your members are the temple of the Holy Ghost, who is in you, whom you have from God; and you are not your own? For you are bought with a great price. Glorify and bear God in your body.*

I Corinthians 6:19-20

Even if you eat a nutritious diet, your body can't absorb those healthy nutrients without a properly-functioning digestive system. This is because it is the job of the digestive tract to convert the food you eat into usable fuel to power your body. It does this by breaking foods down into small units so the nutrients in the foods can then be extracted and absorbed into the body or eliminated from the body as waste.

Digestion begins the moment you place a bite of food in your mouth. Saliva contains various enzymes (including ptyalin, lysozyme, kallikrein, and peroxidase) which begin to break down the foods you eat (you will learn more about enzymes later in this book). Saliva also contains mucus to help lubricate the tissues of the mouth and to aid in swallowing. The better you chew your food, the easier it is for enzymes of the digestive system to attack the food surfaces and break them into smaller parts. Chewing is essential for proper digestion because enzymes involved throughout the digestive tract can only work on the surface of those food fragments. So chomp your food well.

Once swallowed, the food particles travel down your esophagus to the stomach. Shaped like the letter "J," the stomach is located in the upper left portion of the abdomen. The stomach is an expandable sac that acts as a food reservoir. It is here that the food is mixed with various hormones, enzymes, hydrochloric acid, intrinsic factor (necessary for vitamin B<sub>12</sub> absorption in the **ileum**), and mucus. These substances are all necessary to break food down into increasingly smaller particles so that their nutrients can pass through the intestinal walls and travel through the bloodstream.



### EXPERIMENT

To test the action of amylase, chew a cracker and hold it in your mouth before swallowing. You'll notice that it begins to taste sweet. This is proof that amylase, an enzyme in saliva, is breaking the starch in the cracker down to the sugar, maltose.

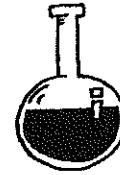
## THE SMALL INTESTINE

After it leaves your stomach, your food (now called **chyme**) empties into the first part of the small intestine, called the **duodenum** (the second and third parts of the small intestine are the **jejunum** and the ileum, respectively). About one-inch thick in diameter, the small intestine is about twenty-three feet long. You might think that most of your food is digested and absorbed in the stomach, but actually, most digestion and absorption occur in the small intestine.

When the chyme reaches the duodenum it triggers the release of **bile**. Secreted by the liver and normally stored in the gall bladder, bile is essential for the proper breakdown of fat (a process called emulsification), digestion, and absorption. The pancreas releases enzymes (that break down **proteins**, carbohydrates, and **fats**) and also releases sodium bicarbonate to help neutralize chyme (which has been made acidic by the stomach's hydrochloric acid).

In the duodenum, any dietary beta-carotene is converted into vitamin A. It is also here that many vitamins (including vitamin A, riboflavin, and thiamin) and minerals (including calcium) are absorbed. The chyme then travels to the second part of the small intestine, called the *jejunum* (the site of most fat absorption) and eventually to the *ileum* (where vitamin B<sub>12</sub> is absorbed).

The small intestine's lining contains many folds. These folds effectively increase the amount of surface area for absorption. The intestinal lining also contains millions of small fingerlike projections called **villi**. The villi, in turn, contain **microvilli** which increase the surface area. The microvilli also contain digestive enzymes (including disaccharidases and peptidases). These microvilli compose what is called the **brush border** (so named because of its brush-like appearance). The lining of the intestine also contains numerous transport systems which ensure that the nutrients from your food finally reach the cells in your body that require those nutrients.



### EXPERIMENT

Back in grade school, you probably conducted an experiment combining vinegar with baking soda, so you know what happens when an acid (such as vinegar) and an alkaline (such as baking soda) are combined. Don't remember it? Then place ½ cup of vinegar in a medium-sized bowl. Add 1 tablespoon baking soda to the vinegar and watch the reaction and the eventual neutralization of the acidic vinegar. This same process occurs in the small intestine when sodium bicarbonate neutralizes the acidic chyme.

## THE LARGE INTESTINE

By the time the chyme reaches the large intestine, most nutrients have been extracted. About two and one-half inches in diameter and five feet long, the large intestine is divided into several subsections: the ascending, transverse, descending, and sigmoid colon, and the rectum. The primary purpose of the large intestine is to eliminate those components of your food that the body couldn't break down and absorb. However, the body is very efficient and uses many of the bacteria present in the colon to ferment some of the undigested carbohydrates. In this way, it squeezes every nutrient out of the food you consume. It is estimated that the large intestine contains more than 400 different bacterial species. These bacteria produce enzymes that continue to digest any remaining fiber, food residues, cells, and mucus. Bacteria in the large intestine (most of which are anaerobic—meaning they don't require oxygen) synthesize vitamin K (necessary for proper blood clotting), thiamin, riboflavin, and vitamin B<sub>12</sub>.

Any remaining unusable bulk is excreted through the rectum and the anus as *feces*. Feces is 75% water, with the remaining 25% composed of dead bacteria, undigested fiber, fat, inorganic material, protein, and sloughed-off cells.

## WHAT IS THE RESULT OF POOR DIGESTION?

Because proper digestion is necessary to convert food into fuel and extract the nutrients your cells require for proper function, anything that interferes with digestion results in poor health. Poor digestion can lead to poor hair and skin quality. But poor digestion also allows toxins to accumulate in your body, leading to allergies, arthritis, toxicity, chronic fatigue, and other health problems. This is particularly true in the case of **Leaky Gut Syndrome**.



As mentioned earlier in this chapter, most nutrients are digested and absorbed in the small intestine. The intestinal lining assists in transporting nutrients and water from the gut into the bloodstream, but it also serves as a protective barrier, keeping large protein molecules, toxins, bacteria, and other substances from entering the bloodstream. It does this through a variety of means, including its **intercellular tight junctions** (that is, zonula occludens). However, in some individuals, the protective barrier malfunctions, leading to increased permeability of the intestinal lining, a condition known as “Leaky Gut.” When the gut becomes more porous, proteins, bacteria, toxins, and other microorganisms and substances may leak into the bloodstream.

Scientists aren’t sure what causes the gut barrier to become increasingly “leaky,” but they know that the intestinal bacteria play a role in maintaining its integrity. It is estimated that the human gastrointestinal tract contains over 100 trillion microbes belonging to over 500 different microbial species.<sup>6-8</sup> These bacteria are important for human health and are responsible for a number of jobs including helping to produce vitamins and synthesizing amino acids. A change of diet, antibiotic use, radiation treatment, illness, stress, our modern processed diets, and dozens of other reasons can upset the delicate balance of microbes—leading to a condition called “**dysbiosis**,” marked by a disruption in the equilibrium of the gut’s ecosystem.

Dysbiosis can cause inflammation and an altered immune system. Antigens and large protein molecules escape into the bloodstream where they can trigger a number of conditions, including those listed below:

- Acne. A 2008 Chinese study of more than 13,000 adolescents (between twelve and twenty years of age) found a significant association between gastrointestinal symptoms (including gastric reflux, constipation, and abdominal bloating) and the presence of acne.<sup>9</sup> A Russian study found that 54% of the 114 acne patients studied had impaired bacterial microflora.<sup>10</sup> Another study found that patients suffering from acne who were given milk fermented with lactobacillus (the bacteria commonly found in yogurt) every day for twelve weeks had a significant decrease in acne.<sup>11</sup>
- Allergies. Allergies can occur if the leaky gut allows larger than normal protein molecules to escape through the intestinal barrier into the bloodstream. This can trigger an immune reaction, and you can suffer from an **allergic response**.
- Arthritis. Numerous studies show a connection between the incidence of rheumatoid arthritis,<sup>12,13</sup> ankylosing spondylitis (a form of rheumatoid arthritis), and bowel permeability.<sup>13-15</sup>
- Autism. According to the National Institute of Neurological Disorders and Stroke, autism (technically “Autism spectrum disorder” or ASD) is not just one neurodevelopment disorder, but a

range of disorders. These disorders (of which autism is the most severe) are characterized by difficulties in communication, problems interacting socially, and certain behavior patterns (including rocking, twirling, head-banging, and more) that are repetitive or restricted.

- Although researchers aren’t sure what causes ASD, there are many theories, including genetics and environment. Regardless of what factor or factors ultimately may be determined to cause ASD, researchers know that many children with the condition suffer from gastrointestinal (GI) problems including constipation, diarrhea, bloating, abdominal pain, inflammatory bowel syndrome, food intolerance, and food allergies. In fact, gastrointestinal abnormalities are often apparent through the entire GI tract, from the esophagus to the colon.<sup>16</sup>
- Researchers do not yet know if the GI problems are the *cause* or the *result* of autism, but improving GI health can often improve autism symptoms. Removing foods containing gluten (such as wheat and rye) and those containing casein (the major protein in milk) can often improve behavior in autistic children.
- One study found that almost 40% of autistic patients and 21% of their relatives have abnormal intestinal permeability as compared to only 4.8% of normal subjects.<sup>17</sup> The same study found that autism patients had a reduced incidence of intestinal permeability when they followed diets free from gluten and casein.
- Chronic fatigue syndrome (CFS). CFS is marked by persistent and debilitating fatigue. Although the cause of CFS has not been determined (it may be caused by a virus, by stress, or by a number of factors, including an immune system dysfunction), CFS patients report a prior diagnosis of irritable bowel syndrome more often than those not suffering from CFS.<sup>18,19</sup> One study found that of the CFS patients tested, 92% had previously been diagnosed with irritable bowel syndrome.<sup>18</sup> Researchers in Belgium found that they could improve CFS symptoms in many patients when they improved the intestinal barrier by supplementing their diets with glutamine, N-acetyl cysteine, and zinc.<sup>20</sup>
- Chronic heart failure (CHF). Also called congestive heart failure, CHF not only involves abnormalities of the heart, but of many other systems, including the renal and the immune systems, as well. A growing body of evidence suggests that a leaky gut may allow bacteria or endotoxins (toxins created in the body) to travel

into the bloodstream and initiate inflammation (a crucial part of CHF development).<sup>21-24</sup>

- **Colorectal cancer.** Researchers have long known that the risk of colorectal cancer (cancer occurring in the large intestine and rectum) increases in those whose diets are high in animal protein, fat, and refined carbohydrates, yet low in fiber. Could the increased incidence have to do with the fact that intestinal microbes require fiber to function properly? In addition, a leaky gut allows toxins to enter the bloodstream and be re-circulated, which can lead to an increased risk of cancer.
- **Depression.** One theory holds that increased inflammation, as can occur due to a leaky gut, may play a role in the functional changes that lead to depression.<sup>25</sup> Additional factors that may predispose some individuals to depression include lower levels of omega-3 fatty acids, reduced activity of peptidase (protease) enzymes,<sup>26</sup> or low blood sugar levels.
- **Diabetes.** Type 1 diabetes is an autoimmune disease in which the body's immune system attacks and destroys the beta cells of the pancreas—the very cells responsible for producing insulin. Without insulin, the body has no way to deliver blood sugar to the cells, leading to high sugar levels in the blood, and therefore, diabetes. A number of studies have shown that individuals who already have Type 1 diabetes or are at risk for the disease exhibit altered gut permeability.<sup>27-31</sup> But a leaky gut may also play a role in the pathogenesis of Type 2 diabetes by triggering inflammation that leads to **insulin resistance**.<sup>32</sup>
- **Obesity.** Researchers know that there is a difference in gut **microbiota** (microorganisms) between lean individuals and those who are obese.<sup>33</sup> One theory holds that when the ratio of certain types of gut microbes is altered, too many of the normally indigestible carbohydrates are broken down and absorbed. This could lead to an excess of calories, with resulting weight gain.<sup>34</sup> An alteration in gut microbiota may also initiate the inflammatory process which, in turn, can lead to insulin resistance (a precursor of Type 2 diabetes).<sup>32</sup>
- **Psoriasis.** Psoriasis is an autoimmune disease marked by lesions on the skin. According to the National Psoriasis Foundation, there are five types of psoriasis; the most common is marked by patches of red skin covered with dead skin that appears silvery-white in color. Scientists don't know what causes psoriasis, but they do know that those suffering from the disease have a high incidence of **Crohn's disease**,<sup>35</sup> **celiac disease**, and **malabsorption**.<sup>36</sup>

Some 60 to 70 million Americans suffer from digestive diseases, including constipation, diarrhea, heartburn, and stomach upset (to name just a few).<sup>37</sup> Treating digestive diseases is expensive; in fact, in 2004, the cost was almost \$142 billion.<sup>37</sup> So what can be done to improve your intestinal health and, therefore, your digestion?

## HOW TO IMPROVE YOUR DIGESTION

Researchers know that there are several ways to help improve digestion and the health of the intestines. A few important keys to improving gut health are:

- **Improve your diet and eliminate all processed and other "dead" foods.** Dead food contains no enzymes and foods void of enzymes are very difficult for the body to process (read more about enzymes in Chapter Four). Dead food cannot properly nourish a LIVING organism, such as a human body, for the body is comprised of living cells. In addition, eliminate refined sugar, refined flour, and all artificial food colorings, preservatives, and flavorings which place a great deal of stress on the liver and the immune system. The body sees and must eliminate these non-nutrients. Therefore, the body is over-taxed by processing and eliminating them, resulting in reduced body energy to maintain normal function. A diet high in refined foods, such as white flour, refined sugar, and artificial chemicals can actually deprive us of needed energy and nutrients. Further, the pathways required to process these toxins may become dysfunctional.<sup>38</sup> Emphasize eating mainly live enzyme-rich fresh fruits and vegetables. All of the steps in the 10-Step Super Nutrition Program (see Chapter Five) can help improve the health of your gut.
- **Include probiotics in your diet.** Probiotics are foods or supplements that contain live bacteria (such as the lactobacilli bacteria in yogurt) which can help restore the body's beneficial bacteria (flora). Studies on rats have found that colonization with *Lactobacillus brevis* (found in many types of yogurt, as well as fresh sauerkraut) decreases bowel permeability.<sup>39</sup> Studies on children with atopic dermatitis found that probiotics (including *Lactobacillus rhamnosus* and *Lactobacillus reuteri*) not only helped stabilize the function of the intestinal barrier but also decreased gastrointestinal and dermatological symptoms.<sup>40,41</sup>
- **Eat plenty of prebiotics.** Prebiotics are a type of food fiber that stimulate the growth of beneficial bacteria in the intestinal tract. The human body does not make the enzymes necessary to break down fiber, so it travels to the intestines and is fermented by, and in turn, feeds the resident bacteria. Well-known prebiotics include fructooligosaccharides (FOS) found in vegetables (including Jerusalem artichokes, asparagus, jicama, onions, garlic, and leeks), fruits (including bananas

- and tomatoes), and grains (such as wheat and barley), and galactooligosaccharides, found primarily in soybeans.
- Eat foods rich in zinc. The trace mineral zinc is required for the proper function of over 100 different enzymes and is involved in maintaining immunity (read more about zinc in Chapter Three). Zinc is also required to maintain the integrity of the intestinal wall. The best food sources of zinc include red meat, poultry, and seafood (such as crabs and oysters). In a study on patients with Crohn's disease (a condition marked by leaky gut), researchers found that taking zinc sulfate supplements for eight weeks resulted in improved function of the intestinal barrier in ten of the twelve patients.<sup>42</sup>
  - Drink plenty of fresh water, thus keeping the digestive and excretory systems flushed out and healthy.
  - Consider taking nutritional supplements, including:
    - Enzymes. Digestive enzymes might be extremely helpful by breaking down the food particles, reducing irritation to the gut walls, and making foods more easily digested and absorbed into the body.
    - Glutamine. Glutamine is an amino acid which, when taken orally, can stabilize the function of the gut barrier and has been shown to decrease intestinal permeability in those treated with chemotherapy, Crohn's disease patients, and also low birth weight newborns. Food sources include those high in protein (including beef, chicken, fish, and dairy), corn, grains (such as wheat and barley), peanuts, milk, beans, beets, cabbage, and spinach.
    - N-acetyl cysteine. A form of the amino acid L-cysteine, N-acetyl cysteine is available as an amino acid supplement; it is an antioxidant known to enhance immune function.

Improving your digestion can be as simple as improving your diet, something you'll learn more about in the next chapters.

## CHAPTER ONE QUESTIONS

1. What is the primary job of the digestive tract?
2. When does digestion begin?
  - a) In the mouth
  - b) In the stomach
  - c) In the small intestine
3. Why does a cracker, when held in your mouth, begin to taste sweet?
4. Why is it important to thoroughly chew your food before swallowing?
5. Where in the body does most digestion take place?
  - a) The stomach
  - b) The small intestine
  - c) The large intestine
6. What are the three parts of the small intestine?
7. Which organ releases enzymes to help digest proteins, carbohydrates, and fats in the small intestine?
  - a) The liver
  - b) The stomach
  - c) The pancreas
8. What is the primary purpose of the large intestine?
9. What is the purpose of the bacteria present in the colon?
  - a) Bacteria in the colon are bad and should be eliminated.
  - b) Bacteria in the colon help ferment some of the undigested carbohydrates and squeeze every nutrient out of the food you eat.
  - c) There are no bacteria in the colon.
10. Name one possible result of poor digestion.
11. Name three conditions which can be triggered by dysbiosis.
12. What condition is marked by a disruption in the equilibrium of the gut's ecosystem?
13. An increased permeability of the intestinal lining is known as:
  - a) Dysbiosis.
  - b) Small intestine syndrome.
  - c) Leaky gut syndrome.
  - d) Probiotica.