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# Nutrition in Addiction Recovery

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# I. Introduction

## *Making the connection between addiction and nutrition: a literature review.*

This document has been prepared by Many Hands Sustainability Center (MHSC) as part of its *Nutritional Education and Job-Training Program*, a program that offers former prisoners recovering from drug and alcohol addiction an opportunity to develop job skills, learn about all aspects of organic farming, and become educated about proper nutrition and healthier lifestyle choices.

*Many Hands Sustainability Center, located in Barre, Massachusetts, is a nonprofit educational center established in 2007 to educate about sustainable living, organic farming, and good nutrition. The Center is an outgrowth of Many Hands Organic Farm, which since 1984 has offered over 300 educational workshops on food/nutrition and organic farming and has helped launch a number of successful farm education programs across Massachusetts.*

This document has been prepared to educate people about how drugs and alcohol can disrupt the normal functioning of the body and how better nutrition can help diminish some of these biochemical and digestive problems. This document only focuses on one specific component of a comprehensive recovery treatment program—better nutrition. It is not intended to be used as a substitute for a doctor's advice or as a recovery treatment program.

While research indicates that vitamin supplementation (e.g., amino acids, vitamins) may also be used successfully to support addiction recovery efforts, especially at the start of a recovery program when biochemical imbalances are at their highest, this document primarily focuses on how to get the proper nutrients from food. Although the information contained herein was specifically compiled to help recovering drug and alcohol addicts, it may be useful to a wide range of people who work or live with recovering addicts or for people who consume a "typical American diet" heavy in carbohydrates, sugar, and caffeine.

> *Although we all eat, few really think about what we are eating and what it can do to our bodies. We rely on very incomplete, simplistic, and often incorrect bits of nutritional "knowledge" in making our food choices, and we expect our bodies to cope with whatever we give them. In recovery, this kind of behavior simply doesn't cut it (Beasley and Knightly, 1994).*

Numerous resources relating to nutrition and addiction were consulted in the creation of this document, many of which are listed in the Section VII. *List of Resources* at the end of it.

# II. What Is Addiction?

## *Addiction is a complex physical and mental disease.*

Drug and alcohol addiction is a complex disease. According to the National Institute on Drug Abuse (NIDA), drug addiction is a chronic, relapsing brain disease. It is considered a brain disease because studies have shown that drugs and alcohol physically change the structure of the brain and how the brain works. In particular, drugs and alcohol have been shown to alter areas of the brain that can result in impaired judgment, lack of self control, the inability to regulate emotions, and lack of motivation, memory or learning function. These documented brain changes can lead to uncontrollable cravings that become more important than anything else—family, friends, career, or even one's own health, personal safety, and happiness.

While drug and alcohol addicts have been historically thought to be weak willed, moral wrongdoers, or mentally ill, this type of brain research suggests otherwise. It suggests that addiction has physical roots as well as psychological ones. These physical changes can often lead to severe biochemical imbalances (or exacerbate preexisting ones), nutritional deficiencies, and digestion problems. As the body becomes more and more imbalanced, it relies more on drugs and alcohol to alleviate the problems and to make it feel balanced. Unfortunately, however, drugs and alcohol can only temporarily change one's mood or emotional state. Once the effects wear off, the user often seeks another short-term dose of relief. So unless these biochemical imbalances are addressed and corrected, in part through proper nutrition, a vicious cycle occurs with a greater need for drugs and alcohol to correct the imbalances. In addition to these biochemical imbalances, genetic predispositions (i.e., nutritional needs, metabolism) and ethnicity, food allergies/sensitivities, poor dietary choices, psychological distress or mental illness, exposure to toxins and social pressures can make a person more vulnerable to addiction or make it more difficult for a person to stay clean and sober.

Research has shown that a majority of addicts suffer from some of the following biochemical, nutritional, and metabolic disorders. Each of these disorders is discussed further in this document and must be corrected before people can have the freedom and ability to choose addiction-free living (Finnegan, 1989).

- Depleted or malfunctioning brain chemicals called neurotransmitters.
- Hypoglycemia, or low blood sugar, that causes a wide range of symptoms like anxiety, fatigue, depression and panic attacks, as well as poor adrenal function.
- Digestive problems such as the overgrowth of yeast, Leaky Gut Syndrome, and the malabsorption of nutrients.
- Food allergies or sensitivities to common foods such as corn, wheat, sugar, and dairy products.
- Nutritional deficiencies of key amino acids, vitamins (e.g., B-complex and vitamin C), and minerals (e.g., zinc, magnesium, and calcium).

## Addiction Recovery Programs

Historically most drug and alcohol treatment programs have included counseling and 12-step approaches like Alcoholics Anonymous (AA). While these types of psychologically-based efforts are a necessary part of a successful recovery program, these approaches alone have not been shown to be very effective. For example, studies have shown that AA has a success rate of around 25 percent (Sehnert, 1992; Larson, 1992). Unfortunately, these efforts often address the psychological aspects of the disease without considering the physical aspects of the disease. As Dr. Charles Gant found after working as the physician and psychiatric consultant for the New York State prison system and dealing with hundreds of drug users and traffickers serving prison terms and documented in his book *End Your Addiction Now*: "Unless the biochemical imbalances which are the true causes of substance problems are corrected, the benefits of psychological counseling will be marginal for most people."

While traditional recovery programs do help many people across the world, some lesser-known integrated, holistic programs rooted in nutrition are reporting great success. Kathleen DesMaisons, Ph.D. and president of Radiant Recovery in Burlingame, California, for example, reports a 92 percent success rate in her nutritionally-based program with alcoholics. Joan Mathews Larson, Director of the Health Recovery Center, reports a 70 percent recovery rate in her program which connects drug dependence with malnutrition and addresses common sugar sensitivities. In addition to the psychological aspects of addiction, these types of nutritionally-based treatment programs focus on the physical aspects of addiction. They work to correct biochemical imbalances, fix nutritional deficiencies, and manage digestive problems—all keys to improving and stabilizing energy levels, mood, and mental clarity, which can lead to a more successful recovery (Atkinson, 2009).

# III. Addiction in the Brain

*Drugs and alcohol can disrupt how the brain functions.*

The brain functions primarily as the communication and control center of the body. It is made up of billions of cells, called neurons, which communicate within the brain and to other parts of the body to perform all physical and mental activities. The brain is composed of three parts—brain stem, limbic system, and cerebral cortex—that control all the bodily functions from breathing and digesting food to thinking and controlling emotions.

Neurons in the brain are working all the time, even during sleep. Because of all this activity, brain neurons require about twice the amount of fuel, or energy, that other cells in your body do (Franklin Institute, 2000). Neurons get this fuel from glucose, or blood sugar, which the body makes from the carbohydrates and other foods that you eat. Neurons in the brain do not have the ability to store glucose so they need a constant and steady supply of it to function properly.

This need for a steady supply of glucose is often met with sugary snacks, sodas, and refined and processed food—a common diet for recovering addicts who often trade one drug for a more widely accepted legal "drug" like sugar, caffeine, or nicotine. If too many sugary snacks filled with simple sugars are consumed, then severe fluctuations of glucose levels in the body can occur—affecting how the brain functions and leading to common problems facing recovering addicts such as hypoglycemia and adrenal fatigue (discussed below in Section IV. *Addiction in the Body*.)

## Neurotransmitters: Chemical Messengers in the Brain

Brain neurons communicate with each other through an intricate network of chemical messengers called neurotransmitters. Neurotransmitters work in the body to relieve pain, control stress, and produce all the reactions needed to shape how you think, act, and feel. These neurotransmitters travel from one neuron to the next to deliver messages to receptor sites. Once a message is received at the receptor site, the neurotransmitter returns to be reused for another message or it is broken down by enzymes in the body and destroyed.

Receptor sites are highly specialized and respond to only a particular set of messages carried by specific types of neurotransmitters. Some describe this process like a key fitting into a lock; only certain neurotransmitters can fit with certain receptors. Drugs and alcohol disrupt these natural processes in the brain by mimicking or otherwise interacting with the neurotransmitters at receptor sites to prolong or accelerate the brain's natural processes. Some drugs, for example, occupy receptor sites and turn signals to your body up or down while others turn signals on or off altogether.

Neurotransmitters are manufactured in the brain by assembling them from the nutrients in the food you eat, specifically amino acids found in protein-rich foods. If you have insufficient nutrients in your diet, like most recovering addicts, you may produce inadequate neurotransmitters —further disrupting your brain balances. Imbalances like these can alter your mood and behavior and set up more cravings for drugs, alcohol, and other substances like refined sugar for a temporary fix. More specific information about *Common Nutritional Deficiencies* for recovering addict can be found in Section V. of this document.

## An Imbalanced Brain

When the brain is receiving all the nourishment it needs through food and is not receiving any mixed signals from outside drugs and alcohol, the brain neurons can function properly and naturally maintain a proper balance of neurotransmitters. However, once the inner balance of the brain is disrupted because of these outside chemicals or because of inadequate diets that are nutrient deficient and too high in sugar, the natural balance is disrupted. The brain is then forced to compensate in other ways. The brain may open up more receptors (upregulate) or, if it not getting enough of a particular brain chemical, produce more of it. It may shut down receptors (downregulate) to produce less of a certain chemical if it appears to be getting too much. The brain may also communicate that it is unhappy by sending physical messages to the body in the form of such things as headaches, joint pains, irritability, or diarrhea; these flu-like withdrawal symptoms are common problems for most recovering addicts.

There are many different chemicals in the brain that function as neurotransmitters, but some common ones affecting mood and behavior and often linked with drug and alcohol addiction are described below—serotonin, endorphins, GABA, and catecholamines (e.g., dopamine and norepinephrine). Each of these can be severely disrupted and depleted in people with drug and alcohol addiction.

### Serotonin

Serotonin is a brain chemical that helps to regulate mood, sleep, pain, emotion, and appetite, as well as other aspects of brain function. This chemical influences self-control, impulse control and the ability to plan ahead. Normal serotonin levels, for example, prevent you from emotionally overreacting to difficult and frustrating situations.

Some drugs disrupt the production, release, and reuse of serotonin. Ecstasy (also known as MDMA or 3,4-Methylenedioxymethamphetamine), for example, causes serotonin chemicals to remain in receptors for an abnormally long time. This keeps the receiving neurons artificially stimulated and temporarily increases the amount of serotonin in the brain. Eventually, the brain thinks it is producing too much serotonin and thus slows the natural production down (NIDA, 2006).

The inability to produce serotonin in adequate amounts can result in emotional burnout from frequent emotional outbursts. It is also one of the primary causes of depression. People who have low serotonin levels do not have good impulse control and can often have shortened attention spans and feel depressed, and scattered. Low levels of serotonin can lead to cravings for simple carbohydrates like bread, pasta, and candy. Eating sugary and highly-refined or processed foods artificially stimulate the release of serotonin and elevates the serotonin levels in the brain, which make you feel more relaxed and comfortable after consuming them (Gant and Lewis, 2010).

Nicotine and other highly-processed foods can have a similar effect as well as (Wurtman and Wurtman, 1995).

## Endorphins

Endorphins are brain chemicals that are naturally manufactured in the brain when the body experiences pain or stress. Endorphins help you feel good and are sometimes referred to as "natural pain relievers" or the natural opiates of the body. Endorphins help block the transmission of pain signals and allow you to continue physical activity even in the presence of inflammation or injuries; they are responsible for what long-distance runners experience as the "runner's high."

Some drugs can disrupt the normal functioning of endorphins in your body. For example, opiate drugs like morphine, heroin, prescription painkillers (e.g., codeine, methadone, and Demerol), and alcohol have chemical structures that mimic the shape of natural endorphins produced by the brain. That means that these drugs can bind to and occupy pain receptors designed to accept naturally-occurring endorphins.

These drugs also interfere with the natural enzymes that break down the endorphins as part of the natural recycling of the neurotransmitters. As a result the drug occupies the receptors for longer periods of time, numbing pain and producing higher levels of euphoria. When the body's endorphins are not naturally being produced or the receptors are not working correctly, you have a strong urge to get opiates elsewhere (like from marijuana or poppy plants) which make you feel good for a while. Then it wears off. This is why these drugs can become highly addictive.

If your endorphin level is low, you may feel depressed, impulsive, or victimized. You may also feel isolated, touchy, and tearful. You may crave sugar, as many recovering addicts do. Researchers have discovered that the immune system is primarily made up of endorphin receptors. In fact, over 90 percent of the receptors on all the immune cells of our bodies are endorphin receptors (Cowen, 2008). That means that endorphins are the fuel for the proper functioning of the immune system and without them, you have a compromised ability to protect against such things as bacteria, viruses, cancer, and autoimmune diseases—problems that are often higher for drug and alcohol addicts.

## Gamma-Aminobutyric Acid (GABA)

GABA is a brain chemical associated with mental relaxation in the body, as opposed to the emotional relaxation produced by serotonin. GABA is important to help calm racing thoughts and is often associated with sleep. It has been labeled the "natural Valium of the brain" (Gant and Lewis, 2010) because it works so well. GABA also regulates moods by controlling other neurotransmitters in the body such as serotonin, nonradrenaline, and dopamine which are discussed below (Cass and Holford, 2002).

People often use alcohol and other depressants (e.g., Valium, Xanax) to unwind and relax. Part of what is really happening is that those substances are mimicking the effects of naturally-produced GABA in the brain. While initially the anxiety may be controlled, use of these types of substances can significantly impact the normal production of GABA in the brain. GABA production in the brain can also be disrupted when a diet is deficient in glutamine, which is one amino acid that makes GABA. Glutamine is the single most abundant amino acid in the body and is involved in most bodily biochemical reactions (Gant and Lewis, 2010). Glutamine is

especially important for the production of energy when sugar is in short supply. It is also important in digestion.

If a person is deficient in GABA, it can be more difficult to relax as GABA deficiencies are associated with chronic anxiety and panic attacks as well as sleep problems (Cass and Holford, 2002). Those deficient in GABA often have cravings for things such as carbohydrates, alcohol, nicotine, and other substances that temporarily help you relax.

### Dopamine and Other Catecholamines

Dopamine and norepinephrine are the two primary catecholamine neurotransmitters produced by the brain. These handle the energizing functions of the brain and are required for you to focus intently on tasks or stay alert. Dopamine regulates short-term activities such as a burst of intense concentration while norepenephrine controls more sustained alertness.

Stressful situations cause the brain to over-release catecholamines. When in the middle of a stressful situation at work or home, for example, you need more of the catecholamines to retain focus and keep going. This over-increased production can cause the body to become depleted, which can leave you tired and unmotivated or with an inability to concentrate.

Some stimulant drugs function by disrupting the natural production and recycling of dopamine in the brain. For example, amphetamines occupy dopamine receptors directly and mimic the effects of naturally-produced dopamine; they trick the brain into thinking it is naturally producing those chemicals. Cocaine and cocaine-like substances like Ritalin do not allow the dopamine neurotransmitters to be recycled back to be reused or destroyed after delivering the message to the receptor. This causes dopamine to build up to abnormally high levels in the brain and is what causes the initial euphoria commonly reported by cocaine abusers (NIDA, 2009).

## Recovery Foods for Neurotransmitters

As described above, addictive substances can disrupt the balance of neurotransmitters in your brain, thereby affecting your mood, mind, memory, and behavior. Your diet can also influence the balance of neurotransmitters as well. If your diet is too low in the amino acids derived from the protein you eat, then you cannot make the necessary neurotransmitters. You can work toward correcting these brain imbalances by eliminating addictive substances like nicotine and sugar—that are hard to quit—and by making sure you supply your brain with enough high-protein foods, which provide the body with the amino acids necessary to make neurotransmitters, along with essential fatty acids like Omega-3s which are discussed in detail in Section V. *Common Nutritional Deficiencies* later in this document (Cass and Holford, 2002).

The neurotransmitter serotonin, for example, is made from the amino acid tryptophan. If a diet is too low in tryptophan, then serotonin cannot be made. Julia Ross, author of *The Diet Cure* and *The Mood Cure*, suggests eating the following protein-rich foods containing tryptophan and serotonin along with moderate amount of carbohydrates at meals: pumpkin, sunflower, and sesame seeds, hazelnuts (a.k.a. filberts), almonds, pork, beef, wild game, shrimp, chicken, turkey, tempeh, tofu, kelp, bananas, and milk (if you are not dairy intolerant). Ross also recommends a few other techniques to raise serotonin levels: 1. Trying the herb St. John's Wort, which has been shown to increase serotonin activity; 2. Exercising to temporarily raise serotonin; and 3. Getting enough light, even if just from full-spectrum light bulbs that mimic the sun, to

help encourage the brain to take in extra tryptophan and help those who tend to get depressed in the winter and the evening. Full spectrum lighting also helps vitamin D levels and helps with absorption of vitamin C.

In general, most experts recommend that those in recovery consume a diet that consists of high-protein meals at regular intervals to regulate the production of neurotransmitters and keep you free from cravings. Many of the nutritionally-based programs reviewed for this document also recommend supplementation of multiple amino acids (see the "Nutritional Supplements" at the end of Section V. *Common Nutritional Deficiencies* further in this document).

## Summary of Abused Substances and Associated Health Problems

The table below outlines, by substance, the neurotransmitters disrupted as well as some of the other associated health problems, most of which are discussed further in this document. (Table information from Gant and Lewis, 2010.)

| Drug | Neurotransmitters Affected | Associated Health Problems |
|---|---|---|
| Alcohol | GABA<br>Serotonin<br>Endorphins/Enkephalins | • May cause an excessive production of insulin, which can lead to hypoglycemia and diabetes.<br>• Makes liver work overtime to detoxify the body, which can lead to liver disease.<br>• May lead to osteoporosis as alcohol has a diuretic effect and causes the body to get rid of fluids which depletes minerals, including calcium, as it draws fluids from the body.<br>• Disrupts neurotransmitters serotonin and GABA, which may lead to sleep disorders.<br>• Can cause migraine headaches and high blood pressure.<br>• Disrupts neurotransmitters that maintain a healthy emotional state which can lead to depression and anxiety.<br>• Disrupts production of the natural painkilling neurotransmitters endorphins/enkephalins, which can lead to an extremely low tolerance for pain.<br>• May lead to gastrointestinal disorders such as acid reflux and irritable bowel syndrome, leaky gut syndrome, maldigestion, yeast overgrowth, and intestinal bacterial infections.<br>• Impairs nutrient absorption by damaging the cells lining the stomach and intestines and disabling transport of some nutrients in the blood. May lead to nutritional deficiencies which cause further absorption problems. Common deficiencies are the amino acid glutamine, magnesium, calcium, and Omega 3 fatty acids. |
| Opiates (e.g., morphine, heroin, opium, oxycontin, codeine, methadone) | Endorphin/Enkephalins | • Artificially stimulates the neurotransmitter endorphin/enkephalin receptors in the brain (brain's natural painkillers) sending false signals that there are plenty of endorphins and enkephalins and that the brain's requirements for protein are satisfied. Makes user unaware of the need to eat, setting up a situation where malnutrition is common.<br>• Causes a downregulation (or reduction) in the normal production of the body's natural painkilling neurotransmitters to compensate for the over abundance of artificial opioids and can lead to chronic pain.<br>• Reduces manufacturing of endorphins and enkephalins, which are made from several amino acids, including tyrosine, glycin, phenylalanine, leucine, and methionine. This causes the brain to produce fewer amino acids and a deficiency which is further exacerbated by malnutrition. |
| Marijuana | Dopamine | • Causes junk food cravings that contribute to dietary imbalances and nutritional deficiencies, especially in such |

| | | |
|---|---|---|
| | | things as Essential Fatty Acids. Overconsumption of junk food also means that many people are consuming too many trans fats which do not support cell membrane function and repair. Also, THC (the psychotropic compound in marijuana) disrupts the normal repair and maintenance of cell membranes.<br>• Increases activity of dopamine, which regulates motivation and reward. May lead to depression, listlessness, and unmotivation. |
| Stimulants (e.g., cocaine, amphetamines, Ritalin) | Catecholamines (e.g.,Dopamine) | • Takes the place of catecholamine neurotransmitters in the brain and over-stimulates them, which eventually decreases the brain's ability to produce them. This can lead to problems such as anxiety, panic attacks, or depression.<br>• Occupies the neurotransmitter catecholamine receptors in the brain and sends false signals that the need for food has been satisfied, which can lead to long periods without food and result in malnutrition.<br>• Affects catecholamine receptors in and around the heart, which can cause heart arrhythmia or palpitations in severe cases and lead to an increased risk of heart attack.<br>• Over-stimulates excitatory neurotransmitters, which can lead to difficulty falling asleep or staying asleep.<br>• Exhausts the brain's ability to produce relaxing neurotransmitters and may lead to violent and/or criminal/psychotic behavior.<br>• Can lead to other health problems like high blood pressure and bronchitis. |

# IV. Addiction in the Body

*Addiction can lead to diet-related problems like hypoglycemia, adrenal fatigue, allergies, and digestive problems.*

As described above, drugs and alcohol disrupt the inner workings of the brain, causing depleted or imbalanced neurotransmitters in the brain. These biochemical imbalances are further aggravated by poor diet choices and nutritional deficiencies. All of these biochemical changes deplete the immune system and cause or exacerbate other diet-related problems such as hypoglycemia (low blood sugar), adrenal fatigue, allergies, and digestive abnormalities such as "Leaky Gut" syndrome and intestinal overgrowth of yeast. Each of these conditions is discussed below.

## Hypoglycemia

One common problem for recovering drug and alcohol addicts is hypoglycemia. In fact, some studies on inmates have shown that hypoglycemia rates can run higher than 85 percent (Stitt, 2004; Schauss, 1981). Hypoglycemia is a state of low blood sugar in the body. While certain illnesses (e.g., liver disease and some types of tumors) can cause some types of hypoglycemia, this is usually rare (Stitt, 2004). A more common form of hypoglycemia, called reactive or functional hypoglycemia, is caused by the type of food consumed (Pfeiffer, 1975; Stitt, 2004). In particular, this condition results when a person habitually consumes too many foods containing highly-refined sugar, including alcohol, as shown in the list below.

### Hypoglycemia and Alcoholism

Research has shown a connection between hypoglycemia and alcoholism. Below is a list of resources, most of which are published by Roberta Ruggiero, President and Founder of The Hypoglycemia Support Foundation, Inc., as listed in her book *The Do's and Don'ts of Hypoglycemia*.

•Dr. Atkins' New Diet Revolution: "Experience shows that when an alcoholic succeeds in getting off alcohol, he usually substitutes sweets. This is because almost all alcoholics are hypoglycemic and sugar provides the same temporary lift that alcohol once did."

•Dr. Joan Mathews Larson, Ph.D. in *Seven Weeks to Sobriety*: *The Proven Program to Fight Alcoholism Through Nutrition* lists a number of research studies that demonstrate the connection between hypoglycemia and alcoholism (e.g., J. Poulos, D. Stafford and K. Caron compared 100 alcoholics, outpatients and halfway-house residents, to a control group of nurses and teenagers. 96 of the 100 alcoholics were hypoglycemic while only 14 of the control group were. Emanuel Cheraski, M.D. found 75 to 90% of the alcoholics studied were hypoglycemic).

•James R. Milam, Ph.D. and Katherine Ketcham in *Under the Influence*: "While the diagnosis of hypoglycemia may be mistakenly used by people to explain unrelated psychological and emotional problems, there is no question that the great majority of alcoholics suffer from chronic low blood sugar. When given the 5-hour glucose tolerance test, over 95 percent of both early- and late-state alcoholics experience a spike in blood sugar after intake of sugar and then a rapid plunge."

•Dr. Harvey M. Ross in *Hypoglycemia: the Disease Your Doctor Won't Treat*: "What is most important is the plethora of doctors and counselors who ignore the results of the research that proves that the alcoholic has a blood sugar problem."

•Dr. Alexander Schauss in *Diet, Crime and Delinquency* suggests that if you treat the alcoholics for hypoglycemia there can be a success rate as high as 71% compared to 25% for approaches like AA.

•Dr. John D. Tintera, M.D concluded after years of research that even recovered alcoholics who have been sober for many years continue to suffer the effects of hypoglycemia and states that "…by far the most important part of the physiological treatment of alcoholics is the complete restriction of easily absorbed carbohydrates."

•Dr. David Williams in *Hypoglycemia: The Deadly Roller Coaster*: "To combat alcohol and other drug abuse, abstinence, proper diet, nutritional supplementation, and education about abuse and hypoglycemia must be part of the program."

## How Does It Work?

When foods are digested, they are broken down into many nutrients. These nutrients are then absorbed into the bloodstream to be used by the body. One of the nutrients absorbed is glucose, or blood sugar. Glucose provides fuel for the body through a complex process. Because sugary or highly-refined foods like white bread, donuts, soda and alcohol are already broken down into their simplest forms, they are rapidly absorbed into the bloodstream and can destroy the natural balance by sending the blood sugar levels skyrocketing (Tintera, 2000).

To counteract this surge in blood sugar, your body is forced to produce insulin from the pancreas. As the pancreas works to control the frequent and excessive intake of sugars, it can become over-sensitized and produce too much insulin (Larson, 1997), which in turn removes too much sugar from your bloodstream and causes your blood sugar to drop down below normal levels. When glucose levels drop, cells in the body (and brain) can be starved. This can lead to a host of physical and emotional problems—shakiness, mood swings, irritability, emotional instability, sudden fatigue, mental confusion—all common problems for recovering addicts.

When glucose levels drop, it also prompts the adrenal glands to start working and send out adrenaline. This signals the liver to release emergency sugar (glycogen) to prevent further insulin shock, which can then trigger more unpleasant reactions like shakiness, weakness, sweatiness, and rapid heartbeat (Larson, 1997). Caffeine, another commonly overused beverage for addicts, can also produce these symptoms as it stimulates the adrenal glands to trigger the release of stored glycogen to temporarily raise blood sugar levels.

Consuming excessive amounts of refined sugars in any form gradually breaks down the body's ability to manage blood glucose (Larson, 1997; Tintera, 2000). This process, however, may take place slowly over a long period of time. Like any addiction, you might notice it takes more sugar (or other drug-like substance) to maintain your inner balance and combat the periods of let down. This accumulated roller coaster of ups and downs can damage the adrenal glands because they are forced to work overtime. It can then lead to something known as Adrenal Fatigue, which is discussed in the next section.

## Recovery Foods for Hypoglycemia

Many recovering addicts have inconsistent eating patterns and diets full of highly-processed carbohydrates and sugar. This coupled with the extra assault from consuming drugs and/or alcohol can cause a person to have low blood sugar. The best way to manage this type of hypoglycemia is to have glucose enter the bloodstream steadily. This can be done by changing eating habits:

- *Eliminate simple carbohydrates from your diet, especially highly-refined and processed carbohydrates that are quickly absorbed by the body. (See Section V.* Common Nutritional Deficiencies *for more information about carbohydrates and other nutrients.)*
- *Replace simple carbohydrates with more complex carbohydrates, or starches, that can be found in foods such as whole grains and vegetables.*
- *Add protein and fats to your diet since carbohydrates are absorbed more slowly with fats.*
- *Do not skip meals. Instead eat at regular intervals throughout the day to regulate blood sugar levels.*

If you suspect hypoglycemia, work with a practitioner to get a glucose tolerance test and follow the diet tips as described in V. *Common Nutritional Deficiencies* and VI. *Eating in Recovery* later in this document.

## Adrenal Fatigue

Adrenal fatigue is another common problem facing recovering drug and alcohol addicts. Adrenal fatigue is the condition in the body where the adrenal glands do not function at optimal levels. While adrenal fatigue can occur because of stress or other factors, one common reason for adrenal fatigue in recovering addicts is the constant demands put on the glands to manage the rise and fall of blood sugar levels in the body as described above. This can cause the adrenals to become overworked and adrenal fatigue to set in.

### How Does It Work?

Adrenal glands are part of the endocrine system and help regulate your mind and body. They are located over the kidneys and are responsible for secreting hormones, particularly ones that deal with stress. These glands are particularly important because they are the prime regulators of the chemical processing that converts what we eat and drink into substances to help our bodies to function, grow, change, rebuild, and repair.

Adrenal glands are designed to cope with emergencies. For example, they release adrenaline, the hormone that gives you a quick surge of energy and mobilizes you when in danger. The adrenaline rush makes your heart pump faster and makes you more alert. It also tells your pancreas to release insulin to reduce the high levels of sugar in your blood. Unfortunately, if you are under stress, have infections, use drugs, smoke, or have poor eating habits, your body forces the adrenal glands to work more frequently than designed and can lead to adrenal fatigue.

Many people disrupt their adrenals because they consume too much sugar and/or highly-refined carbohydrates. Because these substances are stripped of their vitamins, minerals, and fiber, they are easily and quickly absorbed by the body. This shoots up the blood sugar levels and forces the adrenal glands to go into action. This can happen multiple times daily, something the adrenal glands are not designed to do. Eventually they begin to respond more slowly to the “danger” signals and do not reduce the rapidly rising blood sugar levels as quickly. When your adrenals are reacting slowly or late, your blood sugar continues to rise so your body releases more insulin to get the sugar out of your blood and into your cells. This sets up more pronounced blood sugar ups and down and symptoms such as fatigue, restlessness, confusion, shakiness, frustration, irritable, difficulty remembering, anger, weepiness, and/or anxiousness. These can lead to other problems like lack of sleep or stress.

### Recovery Foods for Adrenal Fatigue

Your adrenal glands are the regulators of your disposition, your mental efficiency, and your personality. “Whether they regulate well, and help you, or regulate poorly, and harm you, depends, in large measure, upon what you eat (Tintera, 2000).” Like hypoglycemia, adrenal fatigue can be best managed with the diet—stabilizing your blood sugar levels throughout the day by eating meals at regular intervals. It is especially important to eat a meal in the morning to offset the energy used up through the night. Meals should consist of unrefined carbohydrates (whole grains) with protein and oils (nuts and seeds) such as olive, walnut, fiber, flax and high-quality fish oil. Diets should also contain a lot of vegetables. Those with adrenal fatigue should also eliminate highly-refined carbohydrates, sugar, caffeine, chocolate, hydrogenated fats, and other types of “junk” food. More specific information about nutrients like carbohydrates, proteins, and fats can be found in Section V. *Common Nutritional Deficiencies* of this document. If you suspect adrenal fatigue, consider getting tested by your doctor.

## Allergies/Sensitivities

Allergies are another common problem for many recovering drug and alcohol addicts. Dr. Charles Gant, former physician and psychiatric consultant for the New York State prison system and author of *End Your Addiction Now*, notes that a high percentage of his substance abuse patients have multiple allergies and that “removing specific allergens from their diets and limiting their exposure to environmental allergens are often significant keys to restoring the emotional and biochemical foundations necessary for recovery.” If identified, foods and other allergens can be avoided in recovery until the digestive systems are healed and capable of handling them again.

Allergies to food, pollen, dust, and environmental chemicals can cause or contribute to a wide range of symptoms such as runny nose, headaches, hives, and asthma. In some cases, allergies have also been linked to increased violence (Stitt, 2004) and conditions such as Attention Deficit Disorder (Beasley and Knightly, 1994). Allergies can also lead to digestive problems and a depleted immune system.

### Environmental Allergies

A study at the Health Recovery Center in California showed that 56 percent of clients were sensitive to chemicals in the environment (Larson, 1997). The most common sensitivity was to ethanol, which is found in natural gas, gasoline, paints, automobile exhaust, alcohols, plastics, some hand lotions and perfumes, disinfectant cleaners, tobacco smoke, and hydrocarbons. Common reactions to those sensitive or allergic to environmental toxins are fatigue, exhaustion, “spaciness”, mental confusion, depression, cravings, and irritability. Because of the chemical exposures associated with certain jobs—house painters, garage mechanics, hair stylists, printers—people in these occupations may be more susceptible to alcoholism than others.

### Food Allergies

People recovering from drug and alcohol addiction often have “classic” allergies to pollen as well as allergies to various foods. Some common food allergies are: peanuts, milk, eggs, grains (wheat, rye, or corn), tomatoes, citrus fruits, yeast, soy, and chocolate. Studies indicate that some alcoholics may even be allergic to alcohol, or more specifically to the underlying ingredients in alcohol. As cited in Larson (1997), Theron Randolph, M.D. in his work with members of AA

discovered that many alcoholics were allergic and/or addicted to the sugars, grapes, and grains from which alcohol is made. Likewise, Dr. Herbert Karolus studied 422 alcoholics and found that most were allergic to wheat or rye, the grain bases of many distilled liquors (Larson, 1997).

Although some adverse food reactions may be present from birth, some develop over time because of chronic exposure or biological damage. Food allergies may develop with drug and alcohol addiction, due to damage to the gastrointestinal tract. Allergies may also develop over time when eating a limited or repetitive diet or because a diet lacks essential nutrients and fiber (Beasley and Knightly, 1994).

While some allergy symptoms may occur instantaneously like hives or swelling, other reactions make take hours or days to appear, which means they may go undiagnosed for a while. When allergies go undiagnosed, and you continue to eat the offending foods, the body is forced to adjust by "down regulating" the immune system to essentially ignore the threat. By ignoring threats, however, you are teaching your body to ignore other potentially dangerous threats, increasing your susceptibility to other illnesses and autoimmune disorders. Delayed food allergies can also lead to a variety of digestive problems, like Leaky Gut and yeast overgrowth as discussed below.

One Study: Milk and Crime

The Schauss-Simonsen study in 1978 compared the diets of 30 chronic juvenile offenders to the diets of kids who had behavior problems but no criminal background. They found that the children who got in criminal trouble drank a lot more milk. The results as described by Schauss (Schauss and Simonsen, 1979) and cited in Larson (1997) are:

> *The male offenders consumed an average of 64 ounces of milk a day, while their comparison group only drank an average of 30 ounces daily. Similarly, the delinquent females drank an average of 35 ounces of milk a day, while the comparison group of non-delinquent girls consumed only 17 ounces daily. Among the delinquent boys, two reported drinking more than 113 ounces of milk, or over 14 eight ounce glasses daily.*

If you crave certain foods, it may also be possible that you are allergic or addicted to those foods. Those foods may then be improperly metabolized in your body and trigger psychoactive chemicals that produce an initial high soon followed by a loss of control and other negative symptoms like fogginess, fatigue, and depression.

If you suspect allergies or food sensitivities, you should avoid those foods. In order to determine those foods specifically, you may also want to get skin testing and blood screens by your doctor. Or check out various diets designed to target allergies (i.e., elimination diet) (Larson, 1997).

## Leaky Gut

If you are allergic or sensitive to certain foods and do not realize it for years, you may unknowingly expose your digestive tract to substances that can upset the intestinal lining. The intestinal lining is an important barrier between your inner body and food and beverage you eat; it absorbs nutrients and rejects toxins. If your intestinal lining is inundated with a heavy load of toxins or allergens, it can become inflamed or damaged and disrupt the way the digestive system functions. This can lead to chronic health problems like arthritis and other autoimmune diseases.

Leaky Gut syndrome can occur as a result of taking certain medications, infections, food allergies, or a nutrient-deficient, low-fiber diet. What happens is that large spaces in the gut eventually develop and allow bacteria, toxins, and undigested food particles to mistakenly enter the bloodstream. Once in the bloodstream, the body recognizes them as "foreign" invaders and triggers the immune system prompting an allergic or autoimmune reaction. Leaky Gut syndrome

is a common problem associated with allergies, gas, bloating, systematic yeast infections, and arthritis.

### Recovery Foods for a Leaky Gut

Because the intestinal lining has the highest rate of cell turnover in the body, it has a great potential to heal itself; healing your digestive tract can be as important in recovery as rebalancing your brain chemistry (Gant and Lewis, 2010). Dr. Lauri M. Aesoph, N.D, naturopathic physician, medical writer, and Senior Editor for the *Journal of Naturopathic Medicine* in her book, *How to Eat Away Arthritis*, recommends a seven-day cleansing diet of salads, soups, and juices to give your liver a rest and reduce the amount of harmful compounds it must manage. Once the purifying week is over, she recommends a nutrient-dense week of basic whole foods to help start mending your gut. These foods are filled with fiber and complex carbohydrates and include fresh raw fruits, fresh vegetables (raw or lightly steamed), beans, and legumes, non-gluten whole grains (i.e., brown rice, quinoa, amaranth, millet), some cold water fish, and a small amount of raw, unsalted seeds along with water, herbal teas and a small amount of canola or olive oil.

Certain foods can stress the digestive system and should be avoided—foods like highly saturated fat, protein, and simple carbohydrates as well as refined foods. Additives and preservatives create intestinal changes which disrupt digestion and permit passage of oversized molecules into the blood. This not only overwhelms a hardworking liver, but disrupts your immune system. Unlike fresh, raw foods, cooked refined foods have very little or no natural enzymes left. This places a greater demand on your body's digestive enzyme reservoir.

## Yeast/Candida Problems

Yeast problems are another problem commonly associated with addiction, especially alcoholism and sugar addictions. This condition, widely known as Candida, or sometimes referred to as Candida-related complex (CRC) or *Candida albicans*, is widespread and causes a yeast overgrowth in the digestive tract, sinuses, and vaginal area. Pilot studies of the medical records of 213 patients treated at the Health Recovery Center in California were published in the International Journal of Biosocial and Medical Research in 1991. They showed that 55 percent of the women and 35 percent of the men had histories of probable Candida overgrowth (Larson, 1997).

### How Does It Work?

There are over 400 different types of single-celled organisms, primarily bacteria and yeast, which inhabit the large intestine and are sometimes referred to as intestinal flora. Some of the microorganisms, like acidophilus and bifidobacteria, are beneficial. Others like Candida, salmonella, and staphylococcus are harmful. For healthy individuals, a balance is maintained between the good and the bad microorganisms. This balance is critical to the digestive process, absorption of nutrients, and production of vitamins in the body. When the balance is disrupted, the harmful microorganisms, which are usually found only in small amounts in the intestinal tract, start to multiply and outnumber the beneficial ones. These harmful microorganisms release toxins that may cause localized infections which can spread to the liver and other organs. It also forces the immune system to produce antibodies and inflammatory mediators to counteract the effects of toxins.

## Recovery Foods for Yeast Problems

Yeast thrives with diets that are filled with highly-refined carbohydrates and/or sugar. When yeast digests sugar, it produces alcohol, among other toxins. These toxins kill off many forms of bacteria that are beneficial in the body and disrupt the natural balance. When the body's mechanism for keeping them under control is thrown out of balance (by poor nutrition and drug/alcohol use) the harmful bacteria will flourish and cause infection in the tissues. Because the yeast feed on carbohydrates, an overgrowth will cause intense cravings for and addictions to alcohol and sweets. These cravings will diminish once the infection is under control.

Diet can be used to control and reduce yeast problems. Among the resources reviewed for this document, many different types of foods and dietary plans are suggested. Most plans, however, contain three general steps, as described by Dr. John Finnegan in his book *Addictions: A Nutritional Approach to Recovery*:

> 1. *Stop feeding the yeast by eliminating highly-refined and sugary foods and simple carbohydrates and reducing complex carbohydrates;*
> 2. *Repopulate the gastrointestinal tract with beneficial bacteria using food and supplements;*
> 3. *Eat a nutrient-dense, high fiber diet so the beneficial bacteria can grow more easily. (Note: In his book he also recommends killing the yeast with various herbal extracts like golden seal, Fortune Delight tea, garlic, calendula, methylsulfanomethane, or other formulas. See book for more details.)*

Nutritionist Julia Ross, author of *The Mood Cure* and *The Diet Cure*, provides more specific information: she suggests eating a nutrient-rich diet for four weeks including eggs cooked at a low temperature, freshly prepared soups (without cream or milk), fresh nuts and seeds, goat cheese, unsweetened yogurt, buttermilk, legumes, beans, lentils, peas, protein (fish, antibiotic-free poultry, beef, lamb), vegetables, whole grains (basmati rice, millet, or amaranth). She also suggests you add some anti-yeast or anti-fungal foods, such as avocado, broccoli, Brussels sprouts, cabbage, spices (cinnamon, cloves, oregano, rosemary, sage, thyme, turmeric), non-hydrogenated coconut oil, collards, fresh lemon, garlic, kale, olive oil, flax oils, and onion. She also recommends avoiding alcohol and yeast-containing foods, like bread and dairy (except butter and unsweetened yogurt) as well as fermented products like apple cider vinegar, hops, malts, soy sauce, pickles and other pickled vegetables. Other foods to avoid are fresh and dried fruit, fruit juices, all types of mushrooms, processed meats, and simple carbohydrates, like cookies, muffins, soda, and candy. Her book also describes some anti-yeast supplement programs include lactobacillus, pau d'arco, grapefruit seed extract, garlic, oregano oil, ginger, and biotin.

In *Seven Weeks to Sobriety: The Proven Program to Fight Alcoholism through Nutrition* (1997), Larson recommends reducing yeast with some natural non-drug yeast supplements such as citrus seed extract (antifungal agent that fights Candida), caprylic acid (shown to heal the intestinal tract and eliminate or greatly reduce the Candida growth in the intestinal tract), kyolic garlic extract (antiviral, antibacterial, and antifungal herb), and lactobacillus acidophilus (friendly bacteria in intestines that compete with the bad bacteria). She uses these in conjunction with hydrochloric acid with betaine, which help to increase absorption of food and nutrients. She then recommends starving the harmful yeast by eating fewer carbohydrates while raising protein and fat intake and avoiding refined sugars and other simple-sugar foods, dairy products (except unsweetened yogurt and kefir), and foods that are high in mold and yeast (i.e., cheese, peanuts, alcoholic drinks, and dried fruits).

Acupuncture (Reuben, 1998)
As the Chinese discovered thousands of years ago, inserting needles into the skin at specific sites can make organs and glands work better, helping the body heal from disease. Despite this long history, only in the late 1970s did acupuncture start to become recognized as an effective tool in drug detoxification. Today over seven hundred drug treatment centers all over the world use acupuncture as part of their drug treatment programs. Acupuncture can be used to help stop headaches, muscle aches, nausea, insomnia, depression, and other disruptive discomforts of withdrawal that can block recovery.

Those who receive acupuncture for drug detoxification do it in conjunction with counseling and other recovery efforts. For example, those in drug treatment programs such as Recovery Systems in Mill Valley, CA and Radiant Recovery in Burlingame, CA receive acupuncture along with counseling, nutritional education, and biochemical restoration.

In addition to dietary changes, Larson (1997) also suggests strengthening the immune system. She recommends getting dry heat or sunlight because yeast thrives in wet, cold, and damp conditions; homes with little natural sunlight or homes that have mold or mildew promote yeast overgrowth. She also recommends avoiding exposure to toxins that can lower immunity—things like chemical sprays and solvents as well as highly-processed foods. She recommends exercise to encourage your lymph fluid to remove bacteria from the body. She also suggests acupuncture to restore the immune, digestive, and eliminative systems, as well as the adrenal glands (see box to the left).

# V. Common Nutritional Deficiencies

*Many recovering addicts are malnourished.*

Most recovering addicts have developed serious nutritional deficiencies of key proteins, fats, vitamins, and minerals and disrupted their ability to digest carbohydrates effectively (DesMaisons, 1998; Finnegan and Gray, 1990; Larson, 1997; Stitt, 2004; and others). While some of these nutritional deficiencies are caused by the physical and biochemical changes that occur from drug and alcohol use, others happen because of poor dietary choices. In fact, Barbara Reed Stitt Ph.D., a former probation officer and author of *Food & Behavior: A Natural Connection,* reviewed the diets of thousands of probationers and noticed the following common food patterns:

> *1. No breakfast.*
> *2. High consumption of sugar and refined carbohydrates.*
> *3. High consumption of processed foods.*
> *4. Low consumption of protein.*
> *5. Low consumption of fresh fruits and vegetables.*
> *6. High milk consumption.*

Dietary habits, such as those above, provide too much sugar and too few vital nutrients—nutrients that are especially important for recovering addicts who are battling chemically-depleted brains and bodies, digestive problems, and other health issues that prevent them from absorbing and utilizing nutrients effectively.

While research is still discovering new and intricate ways the body and brain chemistry work, we do know the brain and body require the presence of all nutrients [e.g., vitamins (Vitamin B), minerals, essential fatty acids] in order to function properly. Research shows that the lack of a single vitamin or mineral can cause metabolic imbalances that will create addictive cravings (Stitt, 2004; Finnegan, 1989). The late biochemist Roger Williams, for example, found that rats that were deficient in certain vitamins (e.g., Vitamin A, thiamine, riboflavin, pantothenic acid, and vitamin B6) consumed more alcohol than those that were not vitamin deficient. But once those vitamins were returned to the diet, alcohol consumption decreased (Beasley and Knightly, 1994; Williams, 1956).

In addition to setting up more cravings, nutritional deficiencies can also be a major cause of withdrawal-like symptoms such as fatigue, depression, irritability, mental derangement, and other conditions that block recovery and lead to a relapse. Below is a closer look at what specific

nutrients the body needs—carbohydrates, proteins, fats, vitamins, and minerals—and which ones are lacking for many recovering addicts.

## Carbohydrates

Carbohydrates provide the sugar, or glucose, needed by all parts of the body for fuel (e.g., brain, central nervous system, kidneys, and muscles). Carbohydrates are also important for intestinal health and waste elimination. The USDA recommends 45 to 65 percent of daily calorie intake should come from carbohydrates.

Carbohydrates can be found in many types of food and come in two different forms: complex or simple (sugar). Unfortunately, many recovering drug and alcohol addicts, like most Americans, consume too many simple carbohydrates and too few complex carbohydrates. Simple carbohydrates are found in highly-refined and/or processed foods, sugary colas, alcohol, pastries, and other types of food that contain white sugar and white flour. Simple carbohydrates have been stripped of all their nutrients (e.g., enzymes, vitamins, minerals) and fiber. They consist primarily of sugar that does not need to be broken down by the body. In fact, simple carbohydrates are broken down so quickly by the body that they are often absorbed into the blood nearly instantaneously, providing a jolt of energy.

In contrast, complex carbohydrates are found in food such as whole grains, nuts and seeds, potatoes, squash, and many other kinds of vegetables. Complex carbohydrates are sometimes referred to as starches and have sugars that are still combined with vitamins, minerals, and fiber. Because complex carbohydrates remain combined with other nutrients, the body slowly breaks them down into sugar to be used by the brain and body. This slow breakdown process allows the body to absorb sugar in the bloodstream over a longer period of time, which provides the body with a steady stream of energy.

### Carbohydrate Nutritional Deficiencies

Carbohydrates and sugar are highly addictive (Gant and Lewis, 2010) and often a problem for people recovering from drug and alcohol addiction. In particular, most consume too many simple carbohydrates and not enough complex carbohydrates, which can lead to severe malnourishment as well as problems related to digestion and nutrient absorption, like hypoglycemia and adrenal fatigue as discussed previously in Section IV. *Addiction in the Body* of this document.

### Recovery Foods for Carbohydrates

Hypoglycemia, adrenal fatigue, and other carbohydrate-metabolism health problems are best managed with the diet by increasing proteins, and reducing simple carbohydrates and replacing them with more complex carbohydrates in the form of vegetables and whole grains (Fishbein and Pease, 1988). Also, meals should be eaten at regular intervals to stabilize blood sugar throughout the day.

Simple carbohydrates that should be avoided or eliminated from the diet are things like cereals (except oatmeal), breads, pies, cakes, spaghetti and other white pasta, all sweet soft drinks, alcohol, caffeine, and other types of “junk” food that lack nutrients. These simple carbohydrates should be replaced with complex carbohydrates like whole grains, nuts, and seeds, and many vegetables that are more slowly absorbed in the body whereby placing less pressure on your

adrenal glands. Also add proteins and high-quality fats (i.e., olive, flax, fish oil) as carbohydrates are absorbed more slowly when consumed with fats.

Also note that when purchasing food at the store, check the labels to avoid food heavy in sugar. Sugar can be found in many forms such as sucrose, glucose, dextrose, corn sweetener, corn syrup, corn starch, molasses, brown sugar, and honey (Fishbein and Pease, 1988).

## Proteins and Amino Acids

Protein is needed for growth, tissue repair, healthy immune systems, essential hormone production, digestive enzymes, and energy when carbohydrates are not available. Protein also preserves lean muscle mass. Protein does not usually get absorbed directly into the bloodstream, but rather it is first broken down by the body into amino acids. Some amino acids can be manufactured by the body, but others—essential amino acids—cannot and must be consumed daily for proper functioning of the body. For example, neurotransmitters in the brain are made up of amino acids that you get solely from the protein you eat. Another neurotransmitter, serotonin, is derived from tryptophan-rich foods like turkey and milk.

**Essential Amino Acids**
*hysine, leucine, isoleucine, methionine, phenylalanine, threonine, tryptophan, valine*

According to the Dietary Reference Intakes published by the USDA, 10 to 35 percent of our calories should come from protein. However, research suggests that chemical substances like alcohol can impair the digestion of proteins into amino acids, the processing of amino acids by the small intestine and liver, and the amount of protein secreted by the liver (Feinman, 1989). That means you need to eat even more protein and amino acids when recovering from drug and alcohol addiction.

### Protein/Amino Acid Nutritional Deficiencies

People often underestimate how many proteins/amino acids are needed for the body to function properly. Every second the bone marrow makes 2.5 million red cells. Every four days most of the gastrointestinal tract and blood platelets are replaced. Most of the white cells are replaced in ten days. All this continuous repair work requires amino acids (Braverman, 1987).

**Eating "Complete" Proteins**
Eating any type of protein will raise the amount of amino acids in your bloodstream. However, for amino acids to function, you must either eat complete proteins that contain all the essential amino acids or supplement your diet with other complementary ones. Animal food proteins (meat, fish, eggs, dairy products) are usually complete while plant proteins (vegetables, beans, and grains) are generally incomplete.

If eating a vegetarian diet, you must be sure to combine different types of proteins to make sure the body is getting all the essential amino acids. For example, beans and rice combined makes a complete protein while separate they are incomplete. While historically it was thought that each separate meal needed to consist of a complete protein, research now suggests that getting a complete amount of protein over an entire day is sufficient (DeMaisons, 2008).

When a body is under stress or chemically imbalanced, as is the case for most recovering addicts, even more protein/amino acids are required than normal. For one thing, nonessential amino acids may become essential amino acids as the body works to supply the increased need for amino acids resulting from the increased breakdown caused by drugs and alcohol. Dr. Joan Mathews Larson, Ph.D., director of Health Recovery Center (a holistic center that combines psychological, spiritual, and nutritional components in treatment) notes in her book, *Seven Weeks to Sobriety: The Proven Program to Fight Alcoholism Through Nutrition,* that alcoholics and drug addicts are often so depleted of amino acids that their conversion

process from protein to amino acids often slows or stops altogether. This deficiency can lead to common recovery problems of depression, poor recall, hostile and aggressive behavior, mental confusion, anxiety, and paranoia.

Hundreds of research studies at Harvard, MIT, and elsewhere have confirmed the effectiveness of using just a few targeted amino acids "precursors" to increase the key neurotransmitters, thereby eliminating depression, anxiety, and cravings for food, alcohol, and drugs (Ross, 1999).

### Recovery Foods for Proteins/Amino Acids

The brain and the body depend on proteins/amino acids. They are especially important in recovery and can be found in meat, poultry, eggs, cheese, milk, nuts, and legumes as well as in smaller amounts in complex carbohydrates and vegetables. While many people consume a large quantity of their protein from beef (e.g., hamburgers), that particular protein source can be high in fat and not as easily digested as some other sources (Stitt, 2004; Lappe, 1975). Below is a list of alternative high-quality protein choices. The body doesn't store amino acids, as it does fats or carbohydrates, so it needs a daily supply of amino acids to make new proteins.

**High Quality Protein Choices** (Cass and Holford, 2002)

| Grains/Legumes | Fish/Meat | Nuts/Seeds | Eggs/Dairy | Vegetables | Combinations |
|---|---|---|---|---|---|
| Quinoa, Brown Rice, Tofu, Corn, Chickpeas, Lentils | Tuna, Cod, Salmon, Sardines, Chicken | Sunflower Seeds, Pumpkin Seeds, Cashew Nuts | Eggs, Yogurt (natural), Cottage Cheese | Peas, Other Beans, Broccoli | Lentils and Rice, Beans and Rice |

Because amino acids play a critical role in promoting good health and proper brain function, most programs reviewed for this document stressed the importance of eating three to six high-protein meals per day. In addition, most programs supplemented a good diet with amino acid supplements (see *Nutritional Supplements* discussed below), especially at the start of the program until the body can readjust from all the imbalances and start absorbing nutrients effectively.

> *Tyrosine is one of the common nutrients supplemented at the start of a recovery program. It is a non-essential amino acid that is a natural stimulant and thought to help turn off chocolate and caffeine cravings. It can be found in natural sources such as algae, kelp, and other seaweeds, milk, sunflower or sesame or pumpkin seeds, pumpkin pulp, banana, and turkey (Ross, 1999).*

## Fats

Fats are an important nutrient needed for normal growth and development as well as for energy. Fats are also needed to absorb certain vitamins (e.g., Vitamins A, D, E, K, and carotenoids) and are needed to maintain healthy cells in the body (Beasley and Knightly, 1994). Fat is also required for the production of serotonin to elevate mood and promote good sleep (Ross, 1999).

Fats are composed of fatty acids, two of which are known to be absolutely necessary to the body—linoleic acid (Omega-6) and linolenic (Omega-3) acid. These are called the essential fatty acids and they are what the body uses to construct a variety of substances that are important to the functioning of the cardiovascular, immune, and nervous systems. These two essential fatty acids are not produced in the body and must be obtained solely from the diet (Finnegan and Gray, 1990).

Although fats often have a bad reputation in the era of "low-fat" or "no-fat" options, the USDA recommends that 20 to 35 percent of your calories come from high quality fats. There are two main types of fats needed by the body—saturated and unsaturated fats—and a third type, hydrogenated/refined fats, which should be avoided.

- Saturated Fats: These can be found in food like butter, eggs, fish, chicken, meats, and un-hydrogenated coconut oil, and are typically high in cholesterol. Saturated fat and cholesterol help strengthen cell membranes, protect the liver from alcohol and other toxins, enhance the immune system, and help the body absorb the calcium needed for bone health. Cholesterol from saturated fats is also needed for the proper function of the serotonin receptors in the brain that regulate mood and emotions as discussed previously in Section III. *Addiction in the Brain* (Engelberg, 1999; Enig and Fallon, 2000). Some saturated fats like butter and un-hydrogenated coconut oil can also help keep you feeling full longer and stabilize your blood sugar levels because they take longer to burn off than other nutrients like carbohydrates (Ross, 1999).

> *A Note about Cholesterol*
>
> *While many are concerned about consuming saturated fatty acids because of the cholesterol levels and associated increase in the risk of heart disease, others suggest that the cholesterol issue is more complicated than simply avoiding saturated fatty acids or high cholesterol foods. In fact, studies show that high cholesterol is linked to overall lifestyle changes and diets in the modern age. "Heart disease, cancer, and other degenerative diseases rise precipitously whenever a natural, wholefoods diet, even one high in saturated fat, is replaced with a modern diet high in refined carbohydrates and processed foods (Beasley and Knightly, 1994)." It has been shown that sugar and junk foods raised blood cholesterol levels, despite their low cholesterol content (Braverman, 1989).*

- Unsaturated Fats: These fats can be found in high-quality fish oils and vegetable oils like sesame, safflower, corn, and flax seed. They are high in the essential fatty acids Omega-3 and Omega-6, which are the nutrients used in the largest amount by the body's digestive processes. The body uses these essential fatty acids to produce energy and heat, strengthen cells, and regulate many bodily functions like the immune system and nervous system. Most commercial vegetable oils contain very little Omega-3 fatty acids and large amounts of Omega-6 fatty acids.

> Essential Fatty Acids and Alcoholism
>
> Researchers have suggested that consuming a diet high in naturally-occurring essential fatty acids from fatty fish like mackerel and salmon have caused some people of seafaring areas like Scandinavia, Ireland, Scotland, and Wales to lose the digestive enzymes necessary to build essential fatty acids from other fat sources naturally. That means that once people switched to the more modern diets lacking in essential fatty acids, their bodies did not have the ability to get the proper essential fatty acids like they did from their old diet. Not all people from ethnic backgrounds are going to be deficient in essential fatty acids and develop alcoholism, but if you are a descendent of one of these countries there is a good chance you may have unique essential fatty acid needs. (Beasley and Knightly, 1994).

- Refined or Hydrogenated Fats: These fats are prevalent in many diets today as they can be found in margarines, shortening, or refined/hydrogenated oils. These hydrogenated oils are manufactured from a process that rearranges the fatty acid molecules and creates trans fatty acids, which are difficult to digest and may cause problems such as heart disease, diabetes, and obesity.

## Nutritional Deficiencies for Fats

While an excess of fats, particularly poor quality ones like hydrogenated oils, contributes to disease, an inadequate intake of fats can also cause poor health. Too little Omega-3 fatty acid, for example, can lead to asthma, heart disease, and learning deficiencies. Too much Omega-6 can cause imbalances that interfere with prostaglandins, a hormone-like substance which is important for a proper functioning of cardiovascular, immune, and nervous systems (Kinsella, 1988; Lasserre, 1985; Horrobin, 1983; Devlin, 1982; Fallon and Enig, 1996; Enig and Fallon, 2000).

Many doctors have found that alcohol and drug addicts have deficiencies of Omega-3 and Omega-6 fatty acids, and that adding them to their program greatly aided recovery (Rudin and Felix, 1987; Bates, 1987; Finnegan, 1989; Finnegan and Gray, 1990). They provide the body with raw materials to build the prostaglandins which are crucial to the recovering addict or alcoholic (Bates, 1987; Finnegan, 1989; Finnegan and Gray, 1990).

## Recovery Foods for Fats

High-quality fats are important in the diet. The best sources of dietary fat for people in recovery are natural whole grains and seeds, various fish (i.e., the best for fats being mackerel, herring, sardines, tuna, anchovy, salmon, trout), and unsaturated oils like extra virgin olive oil that are as fresh and unprocessed as possible. Dairy and meat should be used sparingly (Beasley and Knightly, 1994; Cass and Holford, 2002).

Because many people are especially deficient in Omega-3 fatty acids, the diet should also be supplemented with either high quality fish oils and/or flax seed oil. These oils are delicate and should be kept in the refrigerator and should not be used for cooking. Rather, they can be used to drizzle on salads, vegetables and the like (Enig and Fallon, 2000).

### Organic Foods and Essential Fatty Acids

Modern agriculture and industrial practices have reduced the amount of Omega-3 fatty acids in commercially-available vegetables, eggs, fish and meat. For example, organic eggs from hens feeding on insects and green plants can contain Omega-6 and Omega-3 fatty acids in the beneficial ratio of approximately one-to-one while commercial supermarket eggs can contain as much as nineteen times more Omega-6 than Omega-3 fatty acids. (Simopoulos, 1992; Enig and Fallon, 2000). The average US diet now contains one-sixth as much Omega-3 as the diets of 1820. It is one of the most deficient fats in modern day diets.

When purchasing oils, be sure they are in opaque containers and keep them refrigerated so they do not go rancid. Stay away from products that say “hydrogenated” or “partially hydrogenated” and synthetic products like margarine. Also, look for cold pressed oils as they are closer to their natural state, having been extracted by pressure alone rather than by heat as well. High heat can destroy nutrients. According to the Weston A. Price *Kitchen Transition* (Lipinski, 2003), here are three types of high-quality fats:

- ***Butter*** *is a useful fat as it a good source of soluble vitamins A, D, E, and K. Butter also contains important minerals like manganese, zinc, chromium, and iodine. The saturated fat in butter enhances our immune function, protects the liver from toxins, provides nourishment for the heart in times of stress, gives stiffness and integrity to our cell membranes, and aids in the proper utilization of Omega-3 essential fatty acids.*
- ***Olive oil*** *is a rich source of antioxidants, relieves the pain and inflammation of arthritis, normalizes blood fats and cholesterol, stimulates strong gallbladder contractions, and is known for increasing longevity. Olive oil is good for sautéing vegetables or as a base in salad dressings.*
- ***Coconut oil*** *is also a rich source of some saturated fatty acids, especially lauric acid, which has strong antifungal and antimicrobial properties. It is extremely heat stable and can be used for baking, frying, and sautéing.*

## Vitamins/Minerals

Vitamins and minerals are needed in small quantities each day in order for the body to function properly. These substances are needed for proper cellular function and for all bodily processes. No vitamin works on its own. Vitamins and minerals work together through a complex process that is not fully understood. Vitamins are required for every biochemical process in the body, but they cannot function unless the minerals are there too. Minerals are a catalyst for these biochemical processes. If all essential vitamins are not consumed in balanced amounts, the effectiveness of any single vitamin is greatly reduced, if not nullified entirely (Harte and Chow, 1964; Stitt, 2004).

**Nutrient-depleted soils = Nutrient-depleted food**

As soils become overused and treated with chemicals and synthetic fertilizers, minerals become depleted. That means that the food growing in those soils also becomes depleted. So when possible, opt for organic produce which has been shown to produce fruits and vegetables with higher vitamin and mineral content.

### Nutritional Deficiencies

Alcohol and drug users are often deficient in key minerals such as calcium, magnesium, zinc, and chromium as well as vitamin C and the B-complex vitamins (Public Health Service, National Institutes of Health, 2000; Marsano, 1989; Beasley and Knightly, 1994). Dr. Beasley in *Food for Recovery* notes that he has never cared for a recovering alcoholic or any other addict who was not deficient in vitamins and minerals—both because of their abysmal diets and because of the addiction-induced damage to the organs that process nutrients.

**Zinc:** Unbalanced meals and the over consumption of sugar, caffeine, alcohol, and drugs can leach out the liver's extra stores of zinc. Zinc is an essential mineral that can have many benefits in recovery. The processes are quite complicated and not completely understood, but zinc is believed to help with liver function, aiding a healthy immune system, as well as brain function. Zinc also helps insulin do its job and helps digest the food you eat (DesMaisons, 1998). Deficiencies in zinc may produce symptoms such as cold extremities, poor peripheral circulation, loss of taste, smell, poor wound healing, lethargy, poor appetite, acne, and hypothyroidism.

**Chromium:** Chromium is a mineral that is needed in trace amounts in the body to regulate blood sugar, or glucose. This is especially important for those who suffer from hypoglycemia as discussed previously in this document. Symptoms of chromium deficiencies are hypoglycemia, diabetes, and heart disease (Larson, 1997).

Also note that foods high in simple sugars are low in chromium (Kozlovsky, Moser, and Anderson, 1986; National Institute of Health, Office of Dietary Supplements website, 2010). Finnegan and Gray (1990) note that consuming refined sugars and carbohydrates can increase chromium loss up to 300 percent.

**Calcium/Magnesium:** Many drug and alcohol addicts have calcium deficiencies. This is due in part to a poor diet and inadequate intake of calcium. It is also due to the fact that sugar, caffeine, alcohol, and other drugs cause the body to eliminate calcium. Caffeine has been shown to double the urinary excretion of calcium (Werbach, 1987; Finnegan and Gray, 1990). Finnegan and Gray in *Recovering from Addiction* indicate that calcium

is one of the most important nutrients needed in ample amounts for the recovering addict (1990).

Similar to calcium, magnesium is also needed for a strong and calm nervous system but is often found deficient among those consuming high levels of sugar, caffeine, alcohol, and drugs (Finnegan and Gray, 1990).

Low calcium and magnesium levels are a major contributing factor to the irritability, pain, and muscular/nervous system disorders that alcoholics and addicts experience during the withdrawal and recovery phases.

**Iron:** Addicts and alcoholics are especially prone to develop anemia because substance abuse can damage the liver and prevent the body from absorbing iron efficiently. Poor eating habits can also lead to anemia. Those suffering from low iron levels may have a variety of symptoms such as fatigue, depression, poor memory, and headaches.

There are many factors involved in proper digestion of iron. A diet high in good quality protein, with many additional supportive nutrients such as Omega-3 fatty acids, copper, Vitamin C, and B-complex vitamins, may be needed to successfully treat anemia.

**Potassium:** Many recovering addicts have potassium deficiencies. Excessive consumption of salt, use of caffeine, alcohol, sugar, and poor dietary habits all contribute to the development of a potassium deficiency. Symptoms of this deficiency are muscle cramps, fatigue, weakness, and constipation. This deficiency is a major cause of high blood pressure and heat disease. Also, low potassium levels can weaken adrenal and liver function (Finnegan and Gray, 1990).

**Selenium:** Alcoholics were found to have below normal levels of selenium and those with liver disease found to have the lowest levels (Werbach, 1987; Finnegan and Gray, 1990). Low levels of selenium can lead to cancer and heart disease.

**Vitamin C:** Vitamin C plays an important role in brain function. It speeds detoxification and acts as a scavenger that consumes free radicals, which are the destructive by-products of toxin activity within your body. The body requires more Vitamin C in times of stress, such as recovering from drug and alcohol addiction.

Many nutritionally-based programs find Vitamin C to be one of the most essential ingredients in the treatment of addiction because it is a primary detoxifier of drugs and poisons from the system (Finnegan and Gray, 1990). Vitamin C also helps counterbalance some of the withdrawal difficulties and can help rebuild the liver, adrenals, and immune system. Vitamin C helps the adrenals recover from adrenal fatigue as described above. It also helps your brain chemicals work properly by supporting the conversion of the amino acid tryptophan into serotonin.

Vitamin C is a water-soluble vitamin that can be absorbed easily but is not stored in the body. It is “flushed” out in the urine so you need a steady and constant supply in your diet.

**B-Complex Vitamins:** B vitamins are important for metabolism and are required to break down carbohydrates to fuel the body. They also enhance the functioning of the immune and nervous system and promote cell growth, healthy skin, and muscle tone.

There are eight different B-complex vitamins. Deficiencies in the B vitamins, especially thiamin and niacin, can cause many psychological symptoms such as paranoia, hyperactivity, confusion, confabulation, and depression. Niacin, for example, is critical for the conversion of tryptophan into serotonin, which regulates mood and emotions. Thiamin is important for carbohydrate metabolism. Pantothenic acid is a nutrient that helps to combat stress.

> ***The eight B-complex vitamins are:***
> *Biotin*
> *Folate*
> *Niacin*
> *Pantothenic acid*
> *Riboflavin ($B_2$)*
> *Thiamin ($B_1$)*
> *Pryridoxine ($B_6$)*
> *Folic acid (or cobalamins, $B_{12}$)*

People who are recovering from drug and alcohol addiction and use excessive amounts of sugar, caffeine, alcohol, and drugs often develop serious Vitamin B deficiencies. Some of these deficiencies may have even been present *before* the addiction. In fact, B vitamin deficiencies have been shown to cause cravings for addictive substances. For example, Finnegan and Gray (1990) cite experiments in Finland by the *British Journal of Medicine* where rats deficient in B-vitamins were more likely to choose alcohol than water. But when the B-vitamins were replaced, the rats began to choose water again. Some symptoms of B-complex deficiency are fatigue, depression, anxiety, inability to concentrate, poor memory, insomnia, rapid/irregular heart beat, swollen/inflamed tongue, dry skin around the nose and cracking around the lips.

Bill Wilson, co-founder of AA, Dr. Russell Smith, Dr. Abram Hoffer, Dr. Janice Phelps, Dr. Roger Williams, Dr. Carl Pfeiffer and many other physicians have found B-vitamins to be a tremendous asset during recovery (Finnegan and Gray, 1990). Use of B-vitamins has been found to eliminate or greatly diminish withdrawal symptoms, help clear up cravings, improve mental outlook and stability and aid regeneration of the liver, endocrine glands, and nervous system.

## Recovery Foods for Vitamins and Minerals

Below is a list of foods that are rich in the commonly deficient vitamins and minerals listed above. In addition to a diet high in these key vitamins and minerals, many nutritionally-based addiction programs also recommend vitamin and mineral supplementation, which is discussed in the next section.

### Foods High in Key Vitamins and Minerals

| | |
|---|---|
| **Zinc** | Oysters, gingerroot, round steak, lamb, pecans, peas, shrimp, parsley, and potatoes (Larson, 1997). |
| **Chromium** | Chromium is widely distributed in food, but most contains only small amounts of it: meat and whole-grain products like whole wheat and rye, some fruits, shellfish like oysters and shrimp, vegetables, brewer's yeast, cornmeal, butter, and spices. (Anderson, Bryden, and Polansky, 1992; National Institute of Health, Office of Dietary Supplements factsheet website). |
| **Calcium** | Dairy products, almonds, sunflower seeds, parsley, meat, fish, eggs, whole grains, beans, and vegetables. |
| **Magnesium** | Leafy green vegetables, kelp, peas, molasses, nuts like almonds and cashews, brown rice, whole grains, and seafood (Merck, 2010; Beasley and Knightly, 1994; Larson, 1997). |
| **Iron** | Liver, oysters, leafy greens, red meat, blackstrap molasses, kelp, brewer's yeast, eggs, and beans (Finnegan and Gray, 1990; Merck, 2010). |
| **Potassium** | Potatoes, bananas, leafy green vegetables, oranges, whole grains, and sunflower seeds. |
| **Selenium** | Butter, smoked herring, wheat germ, bran, liver, and eggs. |
| **Vitamin C** | Fresh fruits and vegetables like green peppers, citrus fruits, tomatoes, potatoes, cauliflower, Brussels sprouts, broccoli, and cabbage.<br><br>*Note: Many nutritionally-based programs also supplement with large doses of Vitamin C; however, it is highly acidic and when used in moderate or large doses it can cause ulceration of the digestive tract and further depletion of calcium and magnesium levels in many people. If supplementing with large doses, be sure to consult a doctor.* |
| **B-complex** | Found in most whole, unprocessed foods such as potatoes, lentils, chili peppers, tempeh, beans, brewer's yeast and molasses.<br><br>*Note: Some supplementation may be required for those that are severely imbalanced; however, severe liver damage and other health factors sometimes associated with alcohol and drug addiction may make it especially difficult for some people to tolerate supplements of B-vitamins such as niacin (Finnegan and Gray, 1990). That means that a variety of healthy food alternatives is even more important.* |

## Nutritional Supplements

Many of the nutritionally-based addiction recovery programs reviewed for this document recommend supplementation of the various nutrients described above (e.g., amino acids, vitamins, minerals, and enzymes). Some argue that an oversupply of nutrients is necessary at the start of a recovery program because the body is so thoroughly depleted both of nutrients and of the ability to digest and absorb nutrients correctly. Larson (1997) asserts that just "eating right" cannot restore depleted levels of nutrients at the start of a program because of the significant deficiencies and absorption issues. In one study of alcoholics, for example, the B-vitamin pantothenic acid was administered orally but researchers found that the alcoholics couldn't absorb it; instead it was all eliminated in the urine. They found that it took 10 weeks before their bodies could absorb it (Tao and Fox, 1976; Larson, 1997).

If you opt to take supplements, they should be used in conjunction with a good diet and not instead of it, and you should always consult with your doctor. Taking supplements is not a quick fix. Kathleen DesMaisons, Ph.D., President and CEO of Radiant Recovery, a treatment program for alcoholism, drug addiction, depression, and compulsive behavior, puts it best in her book *Potatoes not Prozac*:

> *People with addictive bodies love to take something, be it pills, white powder or special mixtures from a can. Taking something becomes the solution rather than creating a lifestyle with a healthy relationship to food. Eating food as your solution to sugar sensitivity or addiction demands that you think about what food you will eat, when, how, and with whom.*

# VI. Eating in Recovery

*Food can be used to support addiction recovery efforts.*

Proper food and nutrition are essential in a recovery program as they keep the body and brain strong and functioning properly. Many biochemical and health problems can be diminished by changing food habits and food choices. In fact, changing food choices can be beneficial to most Americans, many of whom consume too many carbohydrates and sugar and not enough nutrient-dense foods.

> *Practitioners working with recovering addicts have repeatedly found that people become well much quicker, with far fewer symptoms—and stay drug free much longer—when they follow principles of good nutrition. Most substance abusers need three square meals a day with good quality protein, complex carbohydrates, and fats served at each meal. They often need snacks as well, especially during the early stages of recovery. (Finnegan and Gray, 1990).*

As you read through the tips below, keep in mind that it may be difficult to establish specific quantities and types of food; every person is different and has unique dietary requirements based their ability to absorb, transport, and digest nutrients. In addition, your metabolism depends on a wide range of individualized factors—genetic background, age, environment, activity level, food choices, and allergies. That means a diet for your neighbor or roommate may not be appropriate to meet all of *your* specific nutritional needs.

## What to Eat

All recovering drug and alcohol addicts can benefit from food that is of the very highest nutritional value to help balance their depleted bodies and brains. Below are some general guidelines for the types of foods to eat.

### Whole foods

Whole foods are foods that have not been altered extensively from their original state. That is foods that are *not* peeled, cored, refined or chemically changed from their original state. It is recommended that you eat food with all the parts, including peels or skin, to get all possible nutrients. A potato, lightly baked with the peel, contains fiber and extra nutrients. Potatoes that are cut, diced and fried into French fries retain very few nutrients but do contain lots of bad fats and cholesterol. Whole foods naturally provide the balance of nutrients needed to digest them easily. An egg, for example, is high in cholesterol. However, it also has just the right balance of nutrients to allow the body to process and use that cholesterol (Braverman, 1987). Often our grain is broken up, or refined, to remove bran from the wheat, rice and other grains. In doing so, that also removes key nutrients and fiber. Likewise, there is a major difference in the nutrients between a ripe apple from the tree and the syrup-sweetened one from a can.

### Whole Grains

You need carbohydrates for energy. It is recommended, however, that you consume complex carbohydrates from whole grains, like oatmeal and brown rice. Whole grains provide the outer (bran) and the inner germ layers along with the starch. Because the body cannot digest the whole grains as quickly as processed grains, it helps keep the blood sugar and insulin levels from rising and falling. This is particularly useful for those who are hypoglycemic.

### Fiber

Fiber is a tough, chewy plant substance that does not break down in the stomach and helps to move digested food smoothly through the intestine. Fiber also helps to moderate the absorption of carbohydrates. Even complex carbohydrates can break down too quickly into glucose and cause a hypoglycemic reaction if fiber is totally absent. Again eating the whole, natural food is better, as the skins, seeds, and bran are the richest sources of fiber.

### Protein

A majority of the nutritionally-based programs reviewed here stress the importance of a high-protein diet. Eat proteins, mainly from legumes, whole grains, brown rice, seeds, raw nuts, eggs, fish, and meats like organically-grown chicken. Be sure to get a good mix of proteins that are complete so that you get all of the essential amino acids.

### Fats

Good quality fats are an important component of the diet for a recovering addict. The best sources are from oils found in nuts, seeds, and fish. High quality flax seed oil and fish oils may also be useful for Omega-3 fatty acids, which are deficient in many people. Also look for extra virgin, cold-pressed oils (e.g., olive oil and coconut oils) that have not lost nutrients to processing. Stay away from highly-processed oils, hydrogenated or partially hydrogenated oils, as well as oils in fried foods (Ross, 1999).

### Fruits and Vegetables

Fruits and vegetables are among the most important foods in recovery as they are high in vitamins and minerals and low in fat and calories. Unfortunately, most recovering addicts, along with the rest of the American population, are not getting the amounts they need daily. If they are getting *some* fruits and vegetables they often consume a large portion of them in forms high in fat or low in nutrients like iceberg lettuce, French fries, and potato chips. (Putnam et al., 2002).

Eat locally-grown fruits and vegetables when they are in season. Fruits and vegetables that are fully ripened on a tree or a vine are more nutritious than those that are picked before they are ripened then shipped long distances before being stocked in your supermarket. A tomato, for example, that is ripened on the vine has more than twice as much Vitamin C as one that is machine-picked while still green (Beasley and Knightly, 1997). Also look for vegetables and fruit rich in color as they are usually the highest in nutrients (Ross, 1999).

Local farm stands, farmers markets, or CSAs are a good way to find these types of nutrient-dense, in-season food. If these are not available, then try to stick to organic fruits and vegetables if possible, as chronic pesticide exposure puts a tremendous strain on the body and detoxification system, compromises the immune system, and increases the body's requirements for certain vitamins, particularly A and C. (Beasley and Knightly, 1994).

Also remember that the food is only as good as the soil in which it is grown. Over-farmed, nutrient-depleted soil that has been heavily treated with chemicals produces nutrient-depleted crops. Organic farming balances the ecological environment: soil is enriched with organic materials such as fish meal, cover crops, and kelp rather than synthetic chemicals, and it relies on biological controls, such as predatory insects, rather than pesticides. Because of these types of measures, organically-grown fruits and vegetables have a higher nutritional value.

### Meat

Meat and poultry are an excellent source of protein as well as many essential vitamins and minerals. They are an important part of the diet for those in recovery. Animals raised in confinement and fed conventional grain, however, are loaded with saturated fat and cholesterol. Organic, free-ranged and grass-fed animals are far lower in saturated fats and cholesterol. Also, overuse of antibiotics in the meat and dairy business has led to potentially lethal antibiotic-resistant strains of salmonella that are now a significant health threat. Hormones ingested in meat, milk or poultry, as well, can upset the delicate balance of our bodies and brains.

### Seafood

Seafood is good for those in recovery as it provides complete proteins and vitamin B12. It is also a good source of Omega-3 essential fatty acids, which can reduce immunological problems like arthritis and asthma. It also provides you with important trace minerals like iodine, fluoride, selenium, zinc, and copper, and several major minerals. Phosphorus, magnesium, sodium, potassium, and iron are all found in fish. Choose carefully, though, as fish can collect toxins in their fatty tissues from chemical and biological wastes found in the sea.

## What Not to Eat

Poor nutrition is one of the critical risk factors for substance abuse. If you ignore your diet, then you put yourself at risk for a relapse (Gant and Lewis, 2010). If you eat a diet high in "junk food" you may find it hard to stay substance-free. Junk food is highly-processed, containing preservatives, hormones, artificial colorings, and sugar. Below is a list of some items to avoid.

### Sugar

Sugar is one of the common foods that a recovering addict turns to when trying to stay clean and sober. That is because sugar works much like drugs and alcohol to provide temporary relief from the low blood sugar levels common among recovering addicts. Unfortunately, consuming sugar in the form of candy bars, cake, doughnuts, and soda (along with other highly-refined carbohydrates like white flour) can exacerbate hypoglycemic problems.

Sugar is everywhere and comes in many forms like sucrose, corn sweeteners, honey, maple syrup, and molasses. It is found in many foods like flavored yogurts, fruit drinks, ketchup, pizza, hot dogs, bread, and some peanut butters. You can recognize sugars and avoid them in commercial foods by looking at the labels for ingredients that end in –ose or –ol (DesMaisons, 1999).

Refined sugars like sucrose, high fructose corn syrup, and dextrose provide no nutritional value. In fact, they do the opposite—they actually deplete the body of enzymes, minerals and vitamins, especially the B-complex vitamins. (Lipinski, 2003). When a meal is nutritionally poor, your

body must remove what nutrition it can from your own stores to metabolize the sugar, thus robbing you of precious nutrients.

Those that are trying to avoid sugar often turn to artificial sweeteners. These can cause problems with weight gain, increased cravings for sweets, impaired coordination, decreased mental function, diabetes, MS, Parkinson's, seizures, and migraine headaches. It is recommended that you replace artificial and refined sugar with naturally-occurring sweeteners like raw cane sugar, pure maple syrup, raw honey, or molasses. But use them sparingly, as natural sweeteners can similarly affect your blood sugar levels and contribute to cravings for sweets. Be sure to balance sugar with good fats and protein to help stabilize blood sugar and reduce cravings for sweets (Lipinski, 2003).

### Processed Foods

A majority of the sugar in our diets comes from prepared, processed foods (Stitt, 2004; US Dietary Goals, 1977). Processed foods are foods that have been altered from their original natural state for safety or convenience—food that has been cut, diced, cooked, puffed, ground, canned, or changed from its initial state. Not all processed food is bad. For example, frozen food is processed but is still a good source for fruits and vegetables when fresh is not available. There are many processed foods that are not healthy, however, because they are made with saturated fats, sugar, sodium, artificial flavorings and colors, and other unhealthy additives.

Many processed foods are stripped of nutrients. As Paul Stitt writes in his book *Beating the Food Giants* (2004 as cited in Stitt, 2004): "The milling process destroys 40 percent of the chromium present in the whole grain, as well as 86 percent of the manganese, 89 percent of the cobalt, 68 percent of the copper, 78 percent of the zinc, and 48 percent of the molybdenum. By the time it is completely refined, it has lost most of its phosphorus, iron and thiamin, and a good deal of its niacin and riboflavin. Its crude fiber content has been cut down considerably as well. White flour has been plundered of most of its vitamin E, important oils, and amino acids."

### White Flour

White flour is a highly-processed food choice and should be avoided. The body breaks down white bread like sugar and it can lead to many of the same problems. When whole wheat flour is processed and turned into white flour, the B-vitamins, as well as vitamin E, calcium, zinc, copper, manganese, potassium, and fiber are removed. Because it is lacking fiber, it can cause constipation and other bowel problems. Wheat is also a major allergen and may cause reactions like headaches, fatigue, malabsorption, irritability, upper respiratory congestion, nausea, diarrhea, and other bowel disorders like celiac and Crohn's disease.

White flour is found in most commercial breads, crackers, pasta, bagels and pancake mixes. Avoid these types of food and replace them with whole grains and complex carbohydrates.

### Additives

A number of additives in food have been associated with changes in the brain and can contribute to hyperactivity and/or learning difficulties. Some of these additives include: monosodium glutamate (MSG) found in commercially processed foods such as stocks, sauces, chips, dips, and processed meats; phenylethylamine found in chocolate; tyramine found in aged cheese and Chianti; xanthines from caffeine; and aspartame which is the artificial sweetener known as

NutraSweet. Aspartame has been shown to block the synthesis of serotonin (Wurtman, 1983; Fishbein and Pease, 1988). These additives can also cause some individuals to experience mania, shortened attention span, distractibility, and impaired problem-solving ability (Drake, 1986; Walton, 1986; Fishbein and Pease, 1988).

Phosphates are another group of additives used in processed foods that should be avoided. Phosphates can be found in beverages, oils, baked goods, soft drinks, and fruit products. They have been associated with hyperactivity in certain children whose behavioral problems diminished when the phosphates were removed from their diets (Walker, 1982; Fishbein and Pease, 1988).

Check your labels for all these additives and try to avoid buying products that contain them.

## High Fructose Corn Syrup

High fructose corn syrup is a common ingredient found in many processed and packaged food. It has shown in studies to lead to obesity and cardiovascular disease **(**USDA, 1984). It can deplete the body of nutrients and raise blood levels of cholesterol. It may also accelerate the aging process.

High fructose corn syrup is found in a wide range of foods, including bread, cereals, soft drinks, and even in some ketchup and spaghetti sauces. Check your labels and try to avoid it.

## Hydrogenated Oils

Hydrogenated oils are made by rearranging the fatty acid molecules. These create trans fats which are difficult to digest and can cause problems such as heart disease, diabetes, and obesity. Hydrogenated oils are found in almost all processed foods, commercial salad dressings, sandwich spreads, and margarine.

It is recommended to stay away from hydrogenated oils and replace them with real butter or oils, such as extra-virgin cold-pressed olive oil, flax seed oil, and coconut oil. All are rich sources of saturated fatty acids and some vitamins.

## Caffeine

Many recovering addicts turn to caffeine when trying to recover from drugs and alcohol. Unfortunately, caffeine is just another type of drug that alters your chemical balance. It pumps adrenaline into the bloodstream which temporarily provides energy. Adrenaline also dumps stored sugar into the bloodstream which triggers an outpouring of insulin. Caffeine stimulates the adrenal glands, leading eventually to adrenal exhaustion and symptoms like fatigue, lack of physical endurance and stamina, impaired ability to deal with stress, depressed immune systems, allergic reactions, weight gain, low blood pressure, dizziness and lightheadedness or blacking out when standing up. Caffeine also stimulates the liver to release more sugar in the blood stream and further stresses the body’s delicate sugar-regulating mechanism. It also impairs calcium absorption.

While it may be hard to kick the caffeine addiction, start slowly. For example, you may want to begin by cutting your caffeine intake in half each week until you no longer need it. Also, eat protein-based meals with natural carbohydrates and good fats to keep your blood sugar stable and reduce your craving for sugar and caffeine.

## When to Eat

Besides eating high-quality foods, eating at the right time is also an important part of the nutritional puzzle for recovering addicts, especially with those who are hypoglycemic or sugar sensitive. It is important for the body to receive a steady supply of fuel to control blood sugar levels. This can improve mood and self-control and provide adequate levels of important neurotransmitters like beta-endorphin and serotonin. This can also help to reduce cravings that often block recovery efforts.

In the studies reviewed for this document, several different eating patterns were shown to work well for recovering addicts. For example, *Food & Behavior* recommends three main meals along with light snacks every couple of hours so that your blood sugar does not drop to a crisis point. In contrast, *Potatoes not Prozac* recommends eating only three high-protein meals per day at regular intervals. That program does not recommend the "6 times a day" eating plans for sugar-sensitive people because snacking often leads to grazing for those that are sensitive to sugar. Instead, it is recommended that you never go more than 6 hours between eating, except between dinner and breakfast.

In general, you need to listen to your body and see what works for you. Also, since it is not always possible to time when you are hungry or need a snack, carry healthy snacks with you such as nuts and seeds, dried fruit (if you are not sugar sensitive), and sliced carrots.

## Can Food Work in Recovery?

While it is still up for debate and not widely used in many current drug and alcohol recovery programs, a number of studies indicate that correcting biochemical imbalances with nutrition can have an affect on behavior and recovery. Some studies are listed below in loose chronological order. More information can be found in Section VII. *List of Resources*.

| | |
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| 1940s - 1950s: | Roger J. Williams, the biochemist who named folic acid and found pantothenic acid (one of the B-vitamins), publishes findings from years of study at the University of Texas about the impact of diet on alcohol consumption in animals in the book called *Biochemical Individuality*. The data indicate that animals given the choice between alcohol and water chose alcohol more frequently when they were nutritionally deficient than when they were well fed (Williams, 1956; Williams, 1962; Beasley and Knightly, 1994). Rats on high quality diets voluntarily consumed far less alcohol (less sugar) than those on deficient diets. Williams is also able to shift alcohol consumption up and down based on deliberately subtracting and adding vitamins to their diet (Williams, 1962). |
| 1935 - 1945: | Studies indicate addiction is a disease with metabolic causes. Dr. J. W. Tintera, Dr. Abram Hoffer, Dr. Broda Barnes identify these metabolic imbalances as poor adrenal function, low thyroid, low blood sugar, and nutritional deficiencies (Finnegan and Gray, 1990). |
| 1960s - 1970s: | Dr. John Tintera, endocrinologist, studies the relationship between low blood sugar and alcohol abuse. His research indicates that recovered alcoholics continue to suffer from hypoglycemia, even after many years sober, and that controlling it is the most important part of physiological treatment of alcoholics (Tintera, 1974; Larson, 1997). |

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|---|---|
| 1970 - 1982: | Barbara Reed Stitt, probation officer for the Cuyahoga Falls Municipal Court in Ohio, starts a successful dietary therapy program for probationers. She reports that over 80 percent of her probationers were able to lead healthy, crime-free lives after going through her program focused on correcting biochemical imbalances with food and better nutrition (Stitt, 2004). For more information about her program consult her book *Food and Behavior: A Natural Connection*. |
| 1980: | Dr. Theron Randolf, the father of clinical ecology (a field of medicine that asserts that allergies to foods and environmental chemicals cause a number of physical conditions) finds that addictions to food and alcohol can produce alternating highs and lows. In his work with AA, he discovers that many recovering alcoholics are allergic and/or addicted to the sugars, grapes, and grains from which alcohol is made and finds that people begin to crave alcohol when exposed to the underlying component to which they are addicted (Randolph and Moss, 1980; Larson, 1992). |
| 1983: | Ruth M. Guenther, researcher at the University of Texas, studies alcoholics in a typical AA treatment program (28 day in treatment) and compares it to alcoholics in the same program with an added nutritional component consisting of dietary changes, vitamin and mineral supplements, and nutrition education. The nutrition education included weekly classes on the basics of nutrition, menu planning, shopping and food preparation, and how to read labels to recognize hidden sugars, alcohol, and preservatives. She finds that six months after discharge from the hospital, 81 percent of the study group were not drinking compared to 38 percent of the control study group (Gunther, 1983; Beasley and Knightly, 1994). |
| 1980s - 1990s: | Dr. Kenneth Blum, brain researcher at the University of Texas, is one of the early researchers to note that addiction is a biochemical disease. He finds that restoring natural endorphins and neurotransmitters destroyed or depleted by alcohol could restore normal moods (Larson, 1992). Alliance for Addictions Solutions (http://www.allianceforaddictionsolutions.org/resources/scientific-studies) provides further information about him and a partial list of his publications, some dating to the 1960s. |
| 1980s: | Research at Brunswick Hospital Center and Comprehensive Medical Care in New York apply a similar program to that of Ruth Guenther's program above. 111 patients with severe and chronic alcoholism participate, all with deficient diets, and many with failed recovery attempts. 80 percent are clinically malnourished, almost two-thirds have liver disease, and almost half are also addicted to other drugs. Patients spend 28 days in the hospital followed by a 12-month program of medical follow-up as well as aftercare and AA meetings. 91 of the original 111 patients were still in the program after one year and 74 percent were sober and stable (Beasley and Knightly, 1994). |
| 1986: | A study of patients receiving in-patient treatment for alcoholism where half receive only the regular treatment plan and half receive a nutritional program as well. Six months after discharge, only 33 percent of the patients in the regular program remain sober, whereas 81 percent of the nutritionally-supported group remain sober. (Phelps, Keller, and Nourse, 1986; Finnegan and Gray, 1990). |
| 1987: | Joan Matthews Larson, Ph.D. publishes findings of a study of 100 alcoholic patients who participate in an experimental 6-week outpatient treatment program concentrating on biochemical restoration combined with psychotherapy. 85 percent of the people reported themselves as abstinent and stable 12 and 42 months post treatment. This article can be found on the Alliance for Addiction Solutions website (http://allianceforaddictionsolutions.org/images/pdfs/HRC_Alc_Study_proofed.pdf). Also, more information about this type of treatment program can also be found at the Health Recovery Website (http://www.healthrecovery.com/HRC_2006/AlcoholismDrugAddict.htm). |

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|---|---|
| 1990s: | Kathleen DesMaisons, Ph.D., president and CEO of Radiant Recovery in Burlingame, California establishes a diet and nutrition-based recovery program. It is based on her three-year program working with DUI offenders in San Mateo County, California (called the Biochemical Restoration Program) on using diet and nutrition to reduce sugar cravings. People are educated about what foods to avoid, when to eat, and what to eat. She finds that people in the control group were charged again for more serious offenses at four times the rate of those in the nutritionally-based program (DesMaisons, 1992, 1998). See the Radiant Recovery website (http://www.radiantrecovery.com) for more information about this program as well as other helpful articles and resource materials. |
| 1990s - 2000s: | Dr. Stephen Schoenthaler, a professor of criminology and sociology at Cal State Stanislaus, has been studying the effects of vitamins on inmates in California for over 20 years. His findings show that young adult men receiving vitamin supplements have a 38 percent drop in serious behavior problems. In a larger study of prison diets in CA, NY, OK, VA, and FL, he finds that prisoner's eating habits could be used to predict future violent behavior. Shoenthaler's studies suggest that low concentrations of nutrients in the blood can wreak havoc on electrical activity in the brain and affect processing of neurotransmitters like serotonin. (The Crime Diet, 2003; Alliance for Addiction Solutions, 2010). |
| 2000: | Schoenthaler and Bier (2000) study the effects of vitamin-mineral supplementation on juvenile delinquency of school children. Their findings indicate that poor nutritional habits in children can lead to low concentrations of water-soluble vitamins in blood and impair brain function and subsequently cause violence and other serious antisocial behavior. Correction of nutrient intake, either through a well-balanced diet or low-dose vitamin-mineral supplementation, corrects the low concentrations of vitamins in blood, improves brain function and subsequently lowers institutional violence and antisocial behavior by almost half. |
| 2002: | Dr. Bernard Gesch and colleagues at the University of Oxford find that improving the diets of young offenders (adding vitamins, minerals and essential fatty acids) reduces criminal offenses by 25 percent (Gesch, B et al., 2002; BBC, 2002). |
| 2003: | Gesch, Hammond, and Hampson (2003) report evidence that adverse behavior in prison is reduced by vitamins, minerals, and essential fatty acids. Despite the results, however, Gesch noted that many offenders do not make the right food choices even when they are available. |
| 2004: | Grant et al. (2004) study nutrition education in substance abuse treatment programs. Results indicate that nutrition education is an essential component of substance abuse treatment programs and can enhance treatment outcomes. |
| 2010: | While serving as the medical director at Tully Hill Hospital and reported in his book *End Your Addiction Now* (2010), Dr. Gant reports an 83 percent success rate in ending patients' addictions. Gant and his colleagues believe that biochemical imbalances in the body must be attended to before recovery can happen and that alcoholism is primarily a brain chemistry imbalance fueled by a deficiency in certain nutrients. He shows that a critical part of treating addiction is to replenish missing nutrients through food and supplements. |

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# VII. List of Resources

*There are many resources available for more information about nutrition and addiction.*

## Books

***Addictions: A Nutritional Approach to Recovery (1989)*** by John Finnegan, a nutritional and environment consultant working in the holistic health care field. This book is very useful for information about the metabolic basis of addictions. It lists nutritional and medical therapies to help correct biochemical disorders at the heart of addictions. Also included in the book is useful information about herbal extracts that can be used to help detoxify the system, rebuild the endocrine glandular and liver function, and strengthen the blood sugar/nervous systems/metabolic function. The Appendices list herbal supplement purveyors as well as further resources.

***Cleansing the Body, Mind, and Spirit (1998)*** by Carolyn Reuben. This book contains a wide range of ways to detoxify the body. Chapter 14 "Addiction and Substance Abuse Detox" is particularly useful. This book is currently out of print but can be bought "used" on the Internet.

***The Diet Cure (1999) and The Mood Cure (2002)*** by Julia Ross, M.A., M.F.C.C., the Executive Director of Recovery Systems in Mill Valley, California. This book contains useful nutrition information, especially about amino acids that can be used to jump-start a recovery program. She also includes charts, work sheets, meal plans, and recipes to customize your own program.

***End Your Addiction Now (2002)*** by Charles Gant, M.D. and Greg Lewis, Ph.D. This book is useful to learn more about the health consequences of using addicted substances, especially information about neurotransmitters and the brain. Included in the book are questionnaires to help pinpoint nutritional deficiencies and information about nutritional supplements. Case studies are included as well as Appendices with resources for purchasing nutritional supplements and support organizations.

***Feed Yourself Right (1983)*** by Lendon Smith, M.D. This book contains useful information about a variety of health-related problems that recovering addicts may face, like abdominal discomfort and headaches. Under each section the author includes some restorative foods that would be helpful for the related health issue along with foods to avoid.

***Food and Behavior: A Natural Connection (2004)*** by Barbara Reed Stitt, Ph.D., a former probation officer for the Cuyahoga Falls Municipal Court in Ohio who developed a diet-baseed therapy program for probationers. This book describes the program and provides useful information about health issues related to addiction such as hypoglycemia, food allergies, adrenal gland fatigue, and nutritional deficiencies as well as specific food choices to help with each condition.

***Food for Recovery (1994)*** by Joseph Beasley, M.D., Director of Comprehensive Medical Care, P.D. in Amityville, Long Island, and Susan Knightly, co-owner of the first wholefoods restaurant in Amherst, Massachusetts, professional chef, teacher, and food writer specializing in recovery cooking. This book covers all topics related to food and addiction. The second half of the book includes numerous recipes, many of which contain a summary explaining why the recipe is suited for a recovering addict. For example, the Whole Wheat Pancakes with Strawberry Syrup recipe states: "Pancakes made from whole-grain flours have a richer flavor and are more filling. Here, the nutrient density is augmented by the topping of fruit. In addition to being high in vitamin C, the sauce has fewer calories than commercial maple syrup. This breakfast is high in B vitamins, manganese, calcium, protein, complex carbohydrates, and phosphorus." All the recipes use a variety of grains, few dairy products, and little to no sugar to accommodate people with food allergies or sensitivities.

***The Healing Nutrients Within (1987)*** by Eric R. Braverman, M.D., with Carl C. Pfeiffer, M.D., Ph.D., Ken Blum, Ph.D., & Richard Smayda, D.O. This book provides important information about amino acids which can be applied to addiction.

***Natural Highs (2002)*** by Hyla Cass, M.D., a Los Angeles holistic psychiatrist, author, and frequent presenter on integrative medicine, and co-author Patrick Holford, an author and leading nutritionist in the UK. This book contains useful information about how to feel good naturally by altering your brain, moods, and cravings using a combination of supplements and mind-body techniques.

***Potatoes Not Prozac (1998)*** by Kathleen DesMaisons, PhD, president and CEO of Radiant Recovery, a treatment program for alcoholism, drug addiction, depression and compulsive behavior using medical and holistic approaches. This book describes how to overcome sugar dependency. It includes self-tests to determine sugar sensitivity along with detailed information about dietary choices.

***Seven Weeks to Sobriety (1992)*** by Joan Mathews Larson, Ph.D., Director of Health Recovery Systems in Minneapolis, Minnesota. This book is a step-by-step, week-by-week resource on how to fight alcoholism through nutrition. Her research has identified a number of common nutritional deficiencies and biochemical imbalances for alcoholics that, when treated through dietary changes, has shown a 75 percent success rate.

***Sugar Shock! (2007)*** by Connie Bennett, C.H.H.C. and Stephen T. Sinatra, M.D. This book is full of information for people who eat too many processed sweets and simple carbohydrates. This book describes hypoglycemia in depth as well as other related problems.

***Under the Influence: A Guide to the Myths and Realities of Alcoholism (1983)*** by Dr. James R. Milam and Katherine Ketcham. This book is one of the earlier books suggesting the link between nutrition and addiction.

## Web Resources

***Alliance for Addiction Solutions***
(http://www.allianceforaddictionsolutions.org/home). This is an international nonprofit organization dedicated to promoting effective nutritional and other natural methods to treat

addiction. They advocate the use of innovative techniques to establish individualized biochemical balancing of the addicted brain and body. The website contains useful resources, especially in the "Scientific Studies" section.

***The Best Prognosis: Integrated, Holistic Approach to Addictive Disorders***
(http://www.allianceforaddictionsolutions.org/images/pdfs/integrated-holistic-approach.pdf). This is a recent article in the May/June 2009 edition of the magazine Addiction Today that describes seven areas of focus that can bring about a fuller recovery process: 1. Nutritional and Biochemical Repair; 2. Healthy Self-Care; 3. Healthy Emotional Management & Intelligence; 4. Trauma Healing; 5. Self-Acceptance; 6. Positive Relationships; and 7. Conscious Living.

***Center for Disease Control: Nutrition for Everyone***
(http://www.cdc.gov/nutrition/everyone/index.html). This CDC site has compiled a variety of resources to help educate you about nutrition and healthy eating habits.

***The Effects of Diet on Behavior: Implications for Criminology and Corrections***
by Diana Fishbein, Ph.D. and Susan Pease, Ph.D. This document (http://www.nicic.org/pubs/pre/006777.pdf) investigates the physiological dynamics of the human body and how the body relates to food such as carbohydrates and glucose. It provides an overview of studies up to the date of publication (1988) concerning the relationship between diet and behavior, particularly as it relates to practices in institutional corrections.

***The Institute for Integrative Nutrition***
(http://www.integrativenutrition.com/connect/recipes). This website provides some nutritional recipes from the world's largest nutrition school, offering education with Deepak Chopra, Dr. Andrew Weil, and many more of the world's leaders in health and wellness.

***The National Institute on Drug Abuse***
(http://www.drugabuse.gov). This website contains useful information about the science of drug abuse and addiction. Among the helpful resources is the "Drug Abuse and Related Topics" section, which contains links to specific information and publications about individual drugs.

***Pfeiffer Treatment Center Annotated Bibliography***
(http://www.hriptc.org/content/behavioralDisorders.php). This is a bibliographic list of articles, including summaries of each article, relating diet and behavioral disorders. The site also has a bibliography list and summaries for articles on depression (http://www.hriptc.org/content/depression.php) and violent/aggressive behavior (http://www.hriptc.org/content/aggressive.php).

***Radiant Recovery Treatment Center***
(http://www.radiantrecovery.com/). This website has a lot of information about alternative treatment programs. In particular, there is a "Resource" center that includes links to articles and further information about the science behind sugar sensitivities.

***The USDA Nutritive Value Foods Guide***
(http://www.ars.usda.gov/SP2UserFiles/Place/12354500/Data/hg72/hg72_2002.pdf). Published in 2002, this guide contains data on over 1,274 foods. Foods are listed along with their nutritional quality considering nutrients such as fat, fiber, vitamins, and minerals.

***Weston A. Price***
(http://westonaprice.org). Weston A. Price was a pioneer in recognizing the influence of diet on health. His research found that many aspects of human and animal health are affected by what our mothers and grandmothers chose to eat and to feed us in earliest childhood. You can search on this website for many in-depth articles about a variety of health issues related to addiction.

## Addiction Treatment Centers

Below are some treatment centers that focus on holistic, integrated approaches to addiction recovery and biochemical restoration.

***Bridging the Gaps, Inc.***
423 W. Cork St.
Winchester, VA 22601
540-535-1111
http://www.bridgingthegaps.com

***Cri-Help Inc.***
11027 Burbank Blvd.
North Hollywood, CA 91601
818-985-8323.
http://www.cri-help.org

***Health Recovery Center***
Joan Matthews Larson, Ph.D.
3255 Hennepin Ave. South
Minneapolis, MN 55408
612-827-7800
http://www.healthrecovery.com

***InnerBalance Health Center***
2362 E. Prospect Rd., Suite B
Fort Collins, CO 80525
877-900-QUIT
http://www.innerbalancehealthcenter.com

***Radiant Recovery***
Kathleen DesMaisons, PhD
901 Rio Grande Blvd. NW, Suite D-128
Albuquerque, NM 87104
888-579-3970, 505-345-3737
http://www.radiantrecovery.com

***Recovery Systems***
Julia Ross, M.A., MFT
147 Lomita Drive D
Mill Valley, CA 94941
415-383-3611
http://www.moodcure.com

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