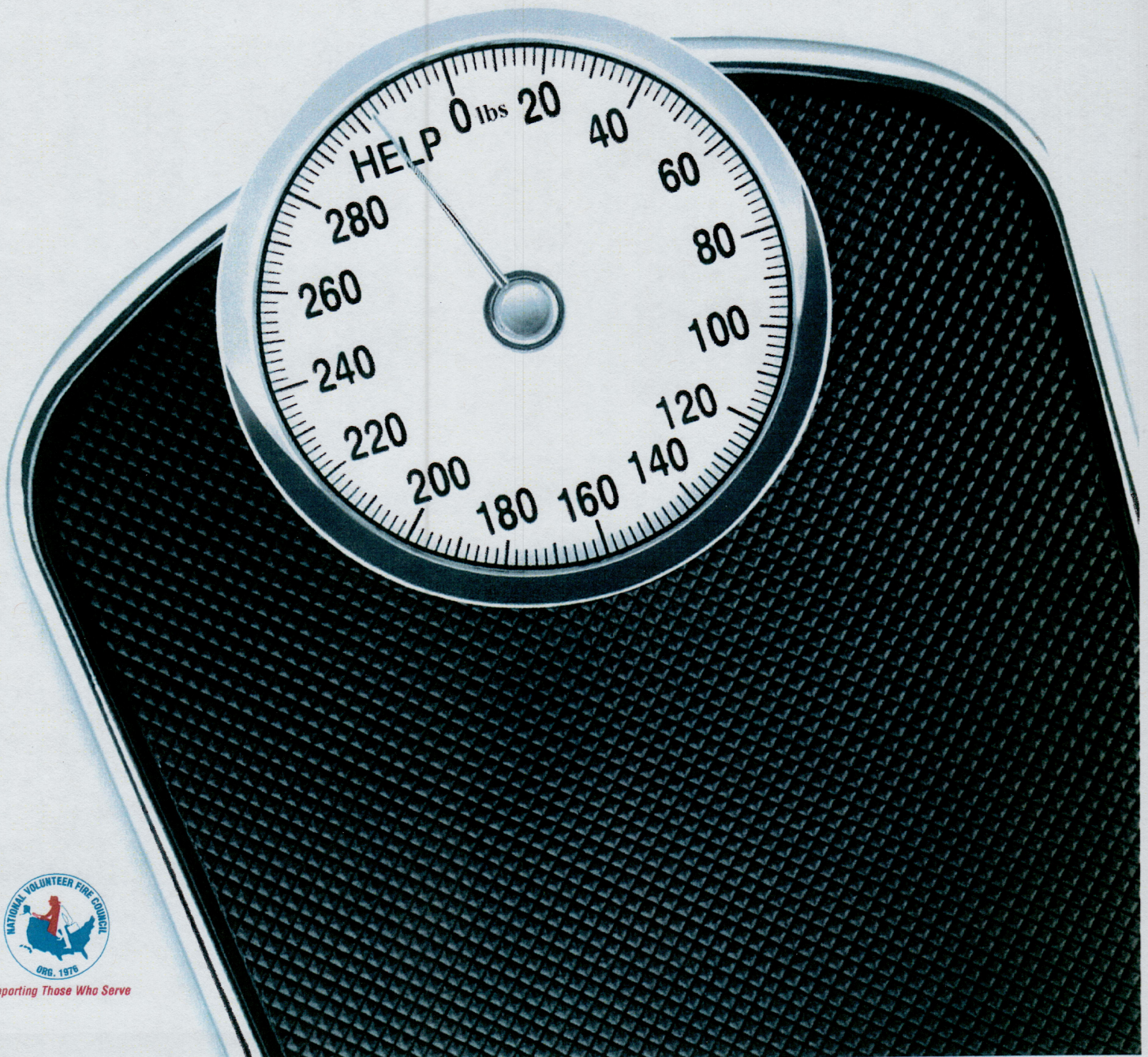


Addressing the Epidemic of Obesity in the United States Fire Service

A Report Prepared for the National Volunteer Fire Council

A great report - hot off the press
Haddock et al. just nailed it!
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Supporting Those Who Serve

Addressing the Epidemic of Obesity in the United States Fire Service

A Report Prepared for the National Volunteer Fire Council by:

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Supporting Those Who Serve
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Chapter 3

Why Is There An Epidemic of Obesity in the Fire Service?



Snacks | Nutrition | Environment | Portion Size | Sugar | Sleep | Processed Carbohydrate

the consumption of fewer calories from fats for foods such as meat, eggs, and butter and more calories from vegetables, fruits, and grains including wheat and corn. The most recent version of the United States Department of Agriculture (USDA) Nutrition Guidelines (see www.choosemyplate.gov/) continues to promote the message that your diet should primarily come from carbohydrates, including a large amount of grains, and to limit fat intake. For the most part, Americans have dutifully followed these dietary recommendations. According to the Centers for Disease Control and Prevention, during the period from 1971 to 2000, the amount of calories in our diet that comes from fat decreased in the American diet, although the overall caloric intake increased slightly; however, this increase appears to be due to consuming more carbohydrates.⁴

Given the health messages promoted over the past several decades, it is not surprising that Americans are now ingesting more carbohydrates and, in particular, have dramatically increased the amount of processed carbohydrates and sugar they consume. Until recently, if you went to a medical practitioner or diet center for help losing weight, they would inevitably suggest that you eat a low-fat, high carbohydrate, low-calorie diet. A barrage of low-fat products was created by the food industry, from low-fat cookies to low-fat hamburgers.

This morning, many well-intentioned parents served their children (and some firefighters served themselves) a “healthy” breakfast consisting of Honey Nut Cheerios or some other processed, sugar-sweetened, yet “whole grain” cereal and skim milk. One serving (3/4 cup – but who actually only eats 3/4 cup of cereal?) of Honey Nut Cheerios provides 22 grams of carbohydrates and only 2 grams of protein and 1.5 grams of fat. If you read the side of the box, you will notice that the second, fourth, and fifth ingredients are added sugars. Adding skim milk to your bowl will add another 12.3 grams of carbs (in 1 cup) and only 8.7 grams of protein (a single egg provides 12.6 grams of protein). Not to worry, the cereal box reassures you that eating what tastes curiously like a dessert is heart healthy. Your great-grandparents would make a funny face if they looked at this breakfast – it probably would not even look like food to them. In 1977, the average person consumed about 122 pounds of refined sugar per year (already way too much) – by 2000 that total had risen to nearly 154 pounds!

In fact, 75 percent of all the calories we now consume are in the form of highly processed foods, mostly packed with carbohydrates.⁵

Why Conventional Diets Fail

The result of Americans reducing the amount of fat they eat and consuming more carbohydrates, particularly from refined grains and sugar, has been a rapid increase in the prevalence of obesity and metabolic disorders. It is not unusual for a firefighter to eat over 300 grams of carbohydrates per day (one Einstein bagel has over 70 grams of carbohydrates; one medium Coke at McDonalds has 86 grams). This has likely contributed to an epidemic of obesity in the fire service. Ironically, the “fats are evil, carbs are good” claim has never been proven, and a growing body of scientific data now suggests that it is misguided. Even leading scientists writing in the *Journal of the American Dietetic Association*, the flagship journal for our country’s dietitians, are admitting that the war on dietary fat was likely a mistake.⁶ So why were we told that fat intake was responsible for us getting fat and out of shape?

The story of how “fat is bad” became conventional wisdom and continues to be propagated is probably best told in the bestselling book *Good Calories, Bad Calories*, by science writer Gary Taubes.⁷ In short, a dynamic and highly eloquent scientist working at the University of Minnesota named Ancel Keys promoted the hypothesis that eating fats, particularly saturated fats from animal products, leads to higher cholesterol levels and ultimately to heart disease. This hypothesis was based on several “facts” that have now been called into question, including the claim that countries where fat intake is low have lower rates of heart disease than countries where fat intake is high, and that heart disease was rare until the 1920’s when Americans shifted their diets from plant-based foods to animal foods which were high in fat.

The U.S. government adopted Keys’ hypothesis as their official view on diet and ever since has set out to both prove its basic tenants (through government-funded research) and to change the eating habits of Americans. Dietary recommendations are influenced by a number of interests, not just the science of nutrition, and conventional wisdom is difficult to change.⁸ However, a large chorus of respected scientific studies now question the conventional wisdom and our understanding of what constitutes a “healthy diet” is in transition. A few examples:

- > The **Framingham Heart Study** failed to support key elements of Keys’ hypothesis. It found no relationship between dietary cholesterol and blood cholesterol and participants who ate the most saturated and total fat

weighed the least and were the most physically active.⁹

- > The **Multiple Risk Factor Intervention Trial**, one of the largest human trials ever conducted with a staggering cost of \$115 million, had participants in their intervention cut dietary cholesterol, saturated fats, and total calories. The study found no significant impact on coronary heart disease or total mortality.¹⁰
- > The largest randomized trials of women to date, the **Women's Health Initiative**, randomly assigned over 48,000 women to either a low-fat diet high in fruits, vegetables, and grains or to general dietary education. At the end of the eight-year intervention, the authors concluded that the low-fat diet did not reduce the risk of coronary heart disease or stroke in women.¹¹

Given the results from these landmark studies, it was no surprise when researchers reviewed the literature on obesity interventions for both adults and children and found disappointing results, particularly in the long-term.¹² While large, well-conducted studies were discovering that low-fat, low-calorie diets were ineffective at improving health in the long-term, scientists began looking at whether it was wrong to adopt Keys' assumptions about diet and health. Some of their findings included:

- > Processed carbohydrates and sugar were introduced into our diets only recently, and our bodies are healthier without them. Jared Diamond, a Professor of Geography and Physiology and author of several bestselling books, wrote extensively about how we evolved eating a wide variety and wild plants and animals. Although our bodies still crave this diet, we have replaced it with lower-quality foods that are easy to produce cheaply: "While farmers concentrate on high-carbohydrate crops like rice and potatoes, the mix of wild plants and animals in the diets of surviving hunter-gatherers provides more protein and a better balance of other nutrients...The farmers gained cheap calories at the cost of poor nutrition. (Today just three high-carbohydrate plants – wheat, rice, and corn – provide the bulk of the calories consumed by the human species, yet each one is deficient in certain vitamins or amino acids essential to life.)"¹³
- > People from non-industrialized areas often eat diets high in fat and protein and low in carbohydrates, and they are healthier. Anthropological studies find that non-industrial groups such as the residents of the Tokelau Island or the Inuits consume diets very high in fats, including saturated fats, and do not have high rates of obesity and heart disease. In fact, when residents of the Tokelau Islands migrated to other countries and adopted Westernized diets lower in fat and higher in carbohydrates, their rate of heart disease and obesity significantly increased.¹⁴
- > Compelling research is emerging which challenges the conventional wisdom that fat causes obesity or that saturated fat is a cause of heart disease.¹⁵ On the contrary, saturated fat appears to be, at worse, neutral in its impact on our heart while poly-unsaturated fats are heart healthy. A meta-analysis (a mathematical combination of several individual studies) published in a 2010 issue of *American Journal of Clinical Nutrition* found that among almost 350,000 people studied, there was no significant connection between saturated fat intake and heart or vascular disease.¹⁵ Although you may have been told that saturated fat can increase your overall LDL ("bad" cholesterol) levels, you should know that LDL consists of many sub particles. Studies suggest that saturated fat primarily increases large LDL particles (which are widely considered harmless) and not small LDL particles (which are linked to heart disease). On another positive note, dietary fat intake tends to increase HDL, or good cholesterol.
- > **Low-carbohydrate diets appear to be effective in reducing weight and positively impact risk for cardiovascular disease.**¹⁶ For example, results from the A to Z Weight Loss Study published in the *Journal of the American Medical Association* found that the Atkins diet (which is very low in carbohydrates) resulted in twice the weight loss of the other diets tested and did a superior job of improving heart disease risk factors. Even when prescribed along with an effective weight loss medication (Orlistat), a low-fat diet failed to produce better results than a low-carbohydrate diet which did not include medications.¹⁶
- > Calorie restriction, which is typically a component of low-fat diets, results in a disproportionate decrease in energy expenditure and metabolism. Thus, weight loss by following a reduced calorie diet can only be maintained by permanent calorie restriction, which has proven to be difficult for most people.
- > Clinical trials comparing low-fat diets with low-carbohydrate diets generally ask participants in the low-fat group to restrict their total caloric intake (usually 1,500 calories or less for women and 1,800 for men) while those on the low-carbohydrate diet are not asked to restrict their calories. Even so, the low-carbohydrate diet generally outperforms the low-fat, low-calorie diet without prescribing that the dieters semi-starve themselves.¹⁷

- > Low-fat, low-calorie diets, even if effective for weight loss in the short term, tend to lower HDL (good cholesterol) and result in less fat loss in the trunk region (where body fat is more dangerous) compared to low-carbohydrate diets. In one study, a very low-carbohydrate diet resulted in three times the body fat loss in the trunk region compared to a low-fat diet.¹⁸ Low-carbohydrate diets seem to result in more fat loss and less muscle loss during weight reduction compared to low-fat, calorie-restricted diets.
- > High total carbohydrate consumption is related to oxidative stress and can cause inflammation. Reducing carbohydrates has a more favorable impact on the metabolic condition than a low-fat diet. Low-carbohydrate diets have even been found to improve attention deficit hyperactivity disorder, autism, diabetes, and epilepsy.¹⁹

The results for low-carbohydrate diets (particularly diets low in processed carbohydrates and sugar) are so impressive that two of the most highly regarded scientists in the area of nutrition, Dr. Jeff Volek and Richard Feinman, concluded that metabolic syndrome could be defined as “a set of markers that responds to CHO [carbohydrate] restriction.”²⁰ They point out that a reduction in carbohydrates results in lowering fasting glucose, insulin, triglycerides, and blood pressure and raising HDL. While there are still plenty of scientists and medical practitioners who continue to advocate low-fat, low-calorie diets, the tide seems to be turning. Why does carbohydrate restriction result in these health improvements? The answer partially lies in its role in the regulation of insulin and impact on insulin insensitivity.

Insulin 101 for Firefighters

There are three main macronutrients in the food that we eat: protein, fat, and carbohydrate. Your body uses these macronutrients for fuel. If you take in too much fuel, the body will attempt to store the excess for times when the fuel might not be readily available. Throughout history there have been times of plenty and times of famine, so the ability to store fuel was critical to survival as a species. Insulin plays a critical role in the body’s ability to store fuel. Understanding the role of insulin is imperative to adopting a healthy diet.

Insulin’s role in fuel storage was initially discovered by German scientist Paul Langerhans when he noticed particular cells in the tissues of the pancreas. These cells had the appearance of small islands and were therefore called the islets of Langerhans. These beta cells in the

pancreas have the ability to produce insulin. Although insulin plays an important role in our health, too much insulin negatively affects the body.

All consumed carbohydrates are eventually converted to a form of sugar called glucose. Although there are no “essential carbohydrates,” some carbohydrates are healthy and will support the active lifestyle of a firefighter. That is why it is best if to choose certain high-quality vegetables and some fruits to maximize the quality and reduce the total amount of carbohydrates in your diet. For example, 100 grams of raw broccoli has only 6.6 grams of carbohydrate and is packed with nutrients, while 100 grams of white bread has a whopping 50.6 grams of carbohydrate and is nutritionally anemic compared to most vegetables. A diet that consists of too many processed carbohydrates and sugars results in the body having more glucose than it needs for fuel. This can become toxic and the body needs a way of getting the glucose out of the bloodstream.

It is critical to note that carbohydrates largely control insulin; protein and fat do not produce as much of an insulin response. The beta cells of your pancreas monitor the amount of blood glucose in your body, and when it gets too high, they will secrete insulin. The more glucose in your body, the more insulin will be secreted by your pancreas. Insulin allows glucose to be stored in muscle and liver cells, up to a certain point. Once these cells are full, the remaining glucose gets converted into triglycerides in the liver and stored in fat cells.

If the body is forced to deal with too many carbohydrates, the muscle and liver cells respond by being less responsive to insulin and, as a result, more glucose remains in the blood stream. In medical terms, they become insulin resistant and stop responding to insulin’s message to store glucose. The beta cells of the pancreas notice that there is too much glucose in the blood and pump out even more insulin, resulting in more triglycerides being stored in fat cells. Bombarding our bodies with carbohydrates results in an increase of insulin insensitivity in muscle and liver cells – unless you are exercising at a very high level like a marathon runner. Unfortunately, this means fat cells will continue to grow as they store the excess glucose. Given the high amount of carbohydrates we are eating, it is not surprising that obesity is an epidemic!

In time, even our fat cells resist storing more glucose. When this happens, glucose stays in your blood longer which signals your pancreas to work harder and harder

to produce more insulin. Eventually, this results in blood glucose toxicity, chronically high levels of insulin, and nonfunctioning beta cells. All of this leads to high levels of inflammation, diabetes, and heart disease.

Chronically high levels of insulin has many negative effects on the body, including a decreased metabolic rate, lower testosterone and other sex hormones, lower energy throughout the day, and reduced cognitive functions. Feed your body lean, high quality meats, vegetables, fruits, nuts, and seeds and it will thank you.

Short-Term Effects of a High-Carbohydrate Meal

Not only can a high-carbohydrate diet lead to poor long-term health, it will also set a biological rollercoaster into motion leading to hunger, fatigue, and poor mood. For example, a high-sugar or high-carbohydrate meal for breakfast leads to tiredness and hunger throughout the day. The body will rapidly break down the carbohydrates, resulting in a sharp increase in blood sugar. In response, the pancreas will release a large amount of insulin and the blood sugar levels will decrease to the point where three or four hours later hypoglycemia (low blood sugar) sets in. This process occurs over and over during the day when following a low-fat, high carbohydrate meal plan.

In contrast, a meal consisting of a vegetable omelet and a bowl of blueberries (a balanced amount of fat, protein, and carbohydrate) stabilizes blood sugar and insulin levels and prevents the sharp drop in glucose levels. The fat in the meal will keep the body feeling full and energetic and will not spike insulin production. Followers of a diet moderate in carbohydrates coupled with plenty of healthy fats and protein report feeling less hungry and more energetic throughout the day.

Glycemic Index

What should we eat if diets high in carbohydrates, particularly from processed carbohydrates and sugar, can lead to bad health outcomes? One helpful tool is to focus on foods with a low glycemic index, which are typically meats, vegetables, some fruit, nuts, and seeds.²¹

The glycemic index is a measure of a food's impact on blood sugar. Carbohydrates that result in rapid rises in blood sugar have a high glycemic index (typically foods like cereals, pasta, bread, chips, and desserts), while those that break down relatively slowly during digestion and do not cause blood sugar to sharply increase have a low glycemic index. The glycemic index is based on

giving a score of 100 to glucose, and other foods are depending on a score above or below 100 given their propensity to raise blood sugar relative to glucose. Medical studies have found that people who concentrate their diets on foods with low glycemic scores have significantly lower rates of heart disease, diabetes, gallbladder disease, and breast cancer compared to those who regularly consume foods with a high glycemic index.

A number of lists providing the glycemic index of common foods are readily available on the Internet. Low glycemic index foods are primarily meats, vegetables, some fruits, nuts, and seeds, while high glycemic foods include starches, breads, pasta, rice, potatoes, grains, and sweets. Eating more low glycemic and less high glycemic index foods is an easy way to dramatically improve the quality of your diet. The chart below provides examples of low (GI < 55) and high (GI > 70) glycemic index foods.

Low Glycemic Foods

Eggs	Tomato	Blueberries
Turkey	Onion	Broccoli
Chicken	Mushrooms	Nuts
Salmon	Spinach	Salsa
Shrimp	Eggplant	Pineapple
Lamp	Asparagus	Cauliflower
Pork	Strawberry	Green beans
Lettuce	Zucchini	Milk, Whole
Apple	Cherries	Peach

High Glycemic Foods

Beets	Bagels	Muffin
Baked Beans	Raisins	Tortillas
French Fries	Biscuit	Potato Chips
Peas	Granola	Ice Cream
Potato	Cereal	Pancakes
Waffles	Grits	Bread
Dates	Corn	White Rice
Cornflakes	Rice Cakes	Jelly Beans
Puffed Wheat	Graham Crackers	Udon Noodles

One limitation of the Glycemic Index is that it does not consider the amount of carbohydrates a food has a typical serving. Charts listing the glycemic index of foods frequently standardize the amount of carbohydrates one obtains from each item (typically 50 grams). It takes a lot of some foods to get 50 grams of carbohydrates while for other foods have a large amount of carbohydrates in a small serving. This means that foods that are unlikely to provoke a large insulin response given the amount that is typically eaten, such as watermelon, have a high glycemic index. To provide fair comparisons among foods, many charts also provide the glycemic load of a food, which is the glycemic index multiplied by the amount of carbohydrates in a usual serving. One of the best web sites to compare the glycemic index and glycemic load among food items is www.glycemicindex.com.

Shift Work and Sleep

Emergency calls are not confined to the normal working hours of 9am to 5pm. Firefighters have to be ready 24 hours a day to respond to an alarm. This also means responding to calls in the middle of the night and interrupted sleep. Career firefighters have set duty days, while volunteers may be on call at any time and may experience more frequent interrupted sleep.

Shift work and interrupted sleep can be challenging for a number of reasons, including putting people at greater risk for obesity. For instance, researchers in Australia looked at a sample of nurses and midwives and found that, even after controlling for other variables, shift workers were 15 percent more likely to be overweight or obese than their peers who only worked days.²² Studies in the U.S. have also found that people who sleep less than seven hours each night have a higher likelihood of becoming obese than those who sleep seven or more hours.²³

The exact mechanisms that link sleep disturbance and obesity are not completely understood, but several pathways have been suggested including circadian disturbances that result in metabolic disruption.²⁴ The circadian rhythm is the physiological cycle the body and hormones go through in a 24-hour period. Disruption to the cycle by being awake and introducing light when the body expects to be asleep and in the dark can cause interruption to the typical cycle. As an example, glucose tolerance has a naturally decreasing cycle across the course of a day, which means that foods consumed at night are processed differently than the same meal dur-

ing the day.^{25,26} Lipid concentration also seems to follow a circadian rhythm, with meals eaten at night leading to higher serum triglyceride levels and less concentrated cholesterol lipoproteins when compared with daytime meals.²⁷

Another hormone that seems particularly important in the link between sleep and obesity is ghrelin. Ghrelin is produced in the stomach and is a circulating hormone that, along with leptin, signals hunger. Ghrelin increases before meals to let your body know you are hungry and decreases after meals to let your body know you are full. Interruptions in the circadian rhythms of ghrelin mean that the body signals that you are hungry even when you are not. Studies have found that, if sleep is interrupted, hormonal patterns are altered and people feel more hungry.^{28, 29}

Another likely reason shift work and interrupted sleep may be related to obesity in the fire service is the food intake that occurs before or after nighttime calls. As several participants in the Heart Healthy Heroes study discussed, there is often an abundance of high-carbohydrate, high-sugar foods at the fire station. Many firefighters discussed habits of snacking after calls during the night and excess intake that would not occur if they had not been awake at odd hours.

Physical Activity

We all know that exercise is important for good health. There is scientific evidence that exercise/physical activity also helps with weight maintenance or prevention of weight gain, but many people believe that if we exercise enough, then diet does not matter as much.³⁰⁻³² This is a sentiment that has been repeated by a large number of firefighters from all over the country. For example, one firefighter in the Heart Healthy Heroes study stated:

"I think everybody kind of thinks, well, I can eat this way here at work and eat healthy at home and work out also and it curbs a lot of that bad."

Firefighter in the Central U.S.

Another notion that has been discussed broadly in the popular media and scientific circles is that the current epidemic of obesity can be largely attributed to the gradual decline in physical activity over the last several decades. The following will review the evidence for these ideas, starting with the belief that physical activity levels have declined over the last several decades, and includes a review of the current rates of different

levels of physical activity. The section will conclude by answering the question about whether exercise can counteract a bad diet.

How Much Does Activity and Exercise Affect Weight and Obesity?

Most scientists and public health experts agree that physical activity and exercise are important for overall health and that most Americans are not active enough. The Centers for Disease Control and Prevention conducts an annual telephone survey of randomly selected Americans and found that that nearly one-quarter of adults were mostly inactive in 2004.³³ However, they also reported that since 1990 (when they started collecting physical activity information consistently) the percentage of Americans meeting current public health activity recommendations – which says all Americans should engage in at least 150 minutes per week of moderate-intensity physical activity – has been gradually increasing. Less than 25 percent of adult Americans engaged in the recommended levels in 1990, but this figure increased to over 26 percent by 2000, more than 40 percent by 2005, and nearly 51 percent by 2009.^{34,35-37} Despite these improvements, almost 50 percent of Americans are either irregularly active or not active at all.

Activity levels related to work and transportation also appear to have declined over the last several decades. A study that examined trends in occupationally-related physical activity found that only 20 percent of jobs now require at least moderate-intensity activity where it was closer to 50 percent in the 1960s.³⁸ The net result was estimated to be a 124 and 140 calorie reduction in energy output for women and men, respectively. This change reflects the shift away from jobs in manufacturing or agriculture and towards those that are mostly sedentary, i.e., sitting at a desk all day. Taken together, this has led some scientists to conclude that there has been an overall trend towards less physical activity over time and that this may help to explain the obesity epidemic in the United States.³⁹

In contrast, other scientists using more precise methods of measuring physical activity energy expenditure have found that activity levels have not really changed since the 1980s (when these methods became widely available for human activity studies). For example, Westerterp and Speakman pulled together data from a number of studies that used a method called Doubly Labeled Water (DLW) to measure energy output.⁴⁰ Put simply, hydrogen or oxygen ions in water are replaced

with non-radioactive tracing ions. Energy expenditure is estimated by measuring the rate at which these tracer ions move through the body and are expelled through urine and expiration (CO₂). Westerterp and Speakman found that from 1988 to 2006, physical activity energy expenditure slightly increased in both the European and North American samples. In that same time period, they reported that obesity rates increased from 5 percent to 10 percent in the same European region and from 8 percent to 22 percent in North America.⁴¹ It has been suggested that data from energy expenditure studies better reflect actual trends in energy output over time.

Another interesting study using DLW evaluated activity-related energy expenditure, physical activity level, and changes in BMI among 40 healthy, non-obese adults who were followed for an average of 11 years (the study began with an average age of 27 years).⁴¹ There were several interesting findings: 1) participants who had high baseline physical activity levels gained more fat at the follow-up than those with lower baseline activity levels; and 2) fat mass changes occurred even among participants who had not changed their physical activity levels between baseline and follow-up to the tune of about ½ pound per year, which was associated with aging. The authors concluded that when people change from a physically active lifestyle to a less active one over time, they do not appear to also reduce their food intake, even though they need less energy.⁴¹ These examples are not all inclusive; there are several other studies examining energy expenditure that have produced very similar results.⁴²

The Problem of “Compensation”

Why does it appear that physical activity may not play as big of a role in weight loss or the current obesity epidemic? A study by researchers at the Pennington Biomedical Research Center in Baton Rouge, LA, provided some insight.⁴³ Their study compared people who did not exercise with those who exercised for increasing amounts of time each week (72, 136, and 194 minutes per week with a personal trainer, respectively). At the end of the six month study the data suggested that there were no statistically significant differences between the groups with regard to actual weight loss; in other words, all groups lost weight (even the non-exercise group) and the differences between the groups were very small. Specifically, the non-exercise group lost about two pounds, while the group exercising the most (194 minutes per week) lost a little more than three pounds.

There are a number of initiatives that could dramatically improve the health and fitness of firefighters and significantly reduce the rate of overweight and obesity in the fire service. The recommendations in this chapter will focus on two issues that can propel the fire service into a more positive future in terms of health and fitness: 1) nutrition in the firehouse, and 2) fitness assessments and guidelines.

These recommendations will require firefighter buy-in, in addition to leadership endorsement. Fortunately, the culture in the fire service is ready for a paradigm shift when it comes to fitness and nutrition. This can be seen in changes already being made. For instance, there was a time when many, if not most, firefighters smoked cigarettes, but today the culture in many areas of the country has shifted radically. If this trend continues, it won't be long before it will be rare to find a firefighter who smokes, and tobacco use will be considered incompatible with the job duties. Similar paradigm shifts have happened in matters of firefighter safety, including wearing seatbelts and the use of SCBAs, in a number of regions. It is time for this same paradigm shift to occur regarding the diets and fitness of firefighters – who should see themselves as industrial athletes that must be ready for any contingency.

Nutrition Recommendations

Healthy nutrition is one of the most important components of health and fitness. It is difficult, if not impossible, to overcome the negative impact of an unhealthy diet with physical activity. A change in eating habits is critical to reversing the obesity epidemic facing our nation's fire service.

Eating has become a cultural phenomenon which has meaning well beyond how food nourishes the body or protects against disease. To complicate things further, many firehouses are in areas of the country where it is difficult to access healthy foods, and some firefighters face financial hardships that make it harder to afford healthier food options. Healthy eating can be even more challenging without the support of friends and family. As a result, eating an "ideal" diet may seem out of reach for some.

Despite the challenges, it is important to remember that nutrition will either enhance or inhibit a firefighter's readiness. Many individuals in the fire service, even those in very challenging circumstances, have transformed their eating habits and are now reaping the

rewards of improved health. Learning about nutrition and developing healthy eating habits is an important investment for your health, family, and crew.

Firefighters need to shift their nutrition, as much as possible, toward natural, whole foods and away from processed carbohydrates and sugar. Although an occasional celebration can be harmless, regularly eating foods that are toxic to your body will only worsen the epidemic of obesity and low fitness that plagues the fire service.

Here are 10 steps to take control of your nutrition:

1. **Decide to get serious about nutrition.** Think carefully about what you eat, plan ahead, and stock the kitchen at the firehouse with healthy foods and snacks. It is difficult to maintain a healthy diet when "what's for dinner" is determined at the last moment by what is on sale at the local market. We have been misled to believe that food should be fast, cheap, and require little thought – a belief that is wreaking havoc on our health. The community is counting on firefighters to be ready to respond, and having a proper diet plays a large role in physical readiness.

2. **Get informed.** Regularly visit reputable nutrition web sites by individuals who have worked and/or are popular with firefighters and other industrial athletes. Some of these include:

- > **Mark's Daily Apple** (www.marksdailyapple.com). Mark Sisson is a former high-level endurance athlete and the author of one of the most popular nutrition sites on the Internet. There are firehouses that follow his dietary advice.
- > **Robb Wolf: Revolutionary Solutions to Modern Life** (www.robbwolf.com). Robb Wolf, the co-owner of NorCal Strength and Conditioning, is one of the leading experts on performance nutrition and has worked with many firefighters on their diet and fitness.
- > **The Paleo Diet** (<http://thepaleodiet.com/>). This is the web site of Dr. Loren Cordain, Professor in the Department of Health and Exercise Science at Colorado State University and author of *The Paleo Diet for Athletes*.
- > **Gary Taubes** (www.garytaubes.com/). Guy Taubes is the author of *Good Calories Bad Calories and Why We Get Fat*. He regularly blogs on nutritional issues.
- > **Food Inc.** (www.foodincmovie.com/). This is the official web site of the identically-named documentary and contains nutritional advice.