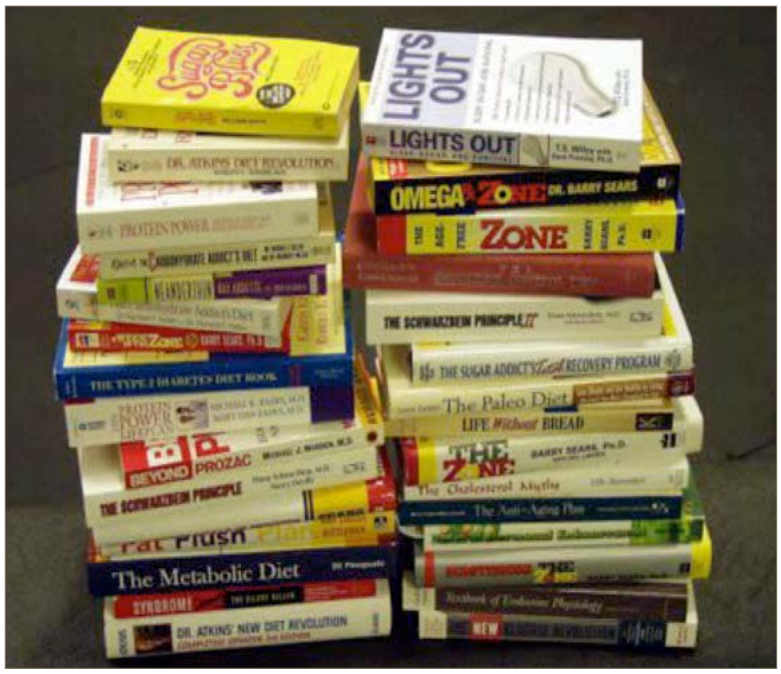
Nutrition: Avoiding Metabolic Derangement



Originally published in November 2003

CrossFit has been an active combatant in the diet wars. For decades it has been an exciting world of "us" versus "them."

"We" were the low-carbohydrate, low-calorie, good fat camp and "they" were the low-fat, low-calorie, high-carbohydrate opposition. The battle was for the hearts and minds of the public on the very personal and private matter of nutrition-what diet makes us healthy?

Sheldon Margin, publisher of the University of California Berkeley Wellness Letter, a leader of "them," accepted this characterization of battle lines when we presented it to him in 1996. In 1996, Dr. Atkins and Barry Sears were both publicly and regularly referred to as "quacks" and "frauds" by mainstream physicians, journalists, and nutritionists. While this was something that Sears would have to get used to, Dr. Atkins had been dealing with vicious assaults on his life's work and character since publishing his Dr. Atkins' "Diet Revolution" in 1972.

We write here today in 2003 gloating. Gloating, because it is our perception that we are decisively winning the diet war. In the public square, the realization that carbohydrates, not fat, make you sick and fat is spreading rapidly. Spreading like truth unobstructed. The position that carbohydrate is essentially toxic at common consumption levels was a truth suppressed by political and industrial corruption of science and journalism. Suppressing truth is like holding a beach ball under water; it takes constant work against a tireless resistance. They have slipped and our position sits like the beach ball on top of the water, where everyone can see it.

We interpret our position of being clearly visible, as winning the diet wars because our diet better models human nutrition and will always trump the opposition's model if tested. Ours works, theirs does not. Where theirs does work, ours works better. Their success required our being kept out of the marketplace. Underwater preferably.

In countless exchanges with doctors, trainers, nutritionists, and family we shared our position and the common

response was, "do you have any science? I need science." We had science and showed it proudly. No one would read it. The cry for peer-reviewed evidence is almost always a smoke screen. The guys who write it read it–the rest pretend. If you can train people to unquestioningly accept proposition X then you have largely inoculated these same folks from even considering "not X."

The science supporting our position while being produced at an increasing rate, was always there and is not responsible for the dramatic change over the last two years.

What has changed is that the public bought some 100 million diet books over the last 3 years, running the most important and successful science experiment ever conducted. To a constant and universal barraging of the "fat is bad" mantra from public health authorities, millions of people with no clinical or scientific credentials tried regimens found in "dangerous" books and found some of them marvelously effective.

Doctor Robert Atkins deserves credit for suffering unimaginable abuse while remaining steadfast, Gary Taubes for being the first journalist to expose the fraud and origins of the low-fat position and for later making the point that the science may have been behind Dr. Atkins all along, Barry Sears for super tuning a responsible diet, and Dr. Uffe Ravnksov for exposing the fraud and slop in anti-fat research so effectively that he needed to be completely ignored to be dealt with.

But the true heroes are each and every one of you who thought for yourselves, ignored the chorus of doctors, nutritionists, journalists and neighbors bleating like sheep, "faaaat is baaad," followed the logic of reduced carbohydrate consumption, and then, critically and most importantly, tried the diet. You try one diet and you feel great, you try another and your teeth fall out. Who needs a doctor?

Patients are telling their doctors about the Zone and Protein Power and Atkins, not the other way around. Doctors everywhere are themselves doing the Zone and Atkins on the advice of their patients–on seeing their patients' successes. The peer-reviewed literature remains unread, but, the reverberation of the good diet books' message is working its way from author to reader to doctor and finally back to patients.

Perhaps, this process is not so unusual but merely another example of the efficiency of decentralized networks. In any case it is consistent with this bit of philosophy from Dr. Uffe Ravnskov's epilogue to "The Cholesterol Myths":

"After a lecture, a journalist asked me how she could be certain that my information was not just as biased as that of the cholesterol campaign. At first I did not know what to say. Afterwards I found the answer.

She could not be certain. Everyone must gain the truth in an active way. If you want to know something you must look at all the premises yourself, listen to all the arguments yourself, and then decide for yourself what seems to be the most likely answer. You may easily be led astray if you ask the authorities to do this work for you.

This is also the answer to those who wonder why even honest scientists are misled. And it is also the answer to those who after reading this book, ask the same question."

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Glycemic Index

Originally published in November 2002

For several decades now, bad science and bad politics have joined hands to produce what is arguably the most costly error in the history of science–the low-fat diet. This fad diet has cost millions unnecessary death and suffering from heart disease, diabetes and, it increasingly seems, a host of cancers and other chronic and debilitating illnesses.

Gary Taubes, the esteemed science writer, has written two brilliant and highly regarded pieces on exactly this subject. The first appeared in Science Magazine in 1999 and the second in the New York Times in 2002.

A new age is dawning in nutrition: one where the culprit is no longer seen as dietary fat but excess consumption of carbohydrate–particularly refined or processed carbohydrate. In fact, there is an increasing awareness that excess carbohydrates play a dominant role in chronic diseases such as obesity, coronary heart disease, many cancers, and diabetes. This understanding comes directly from current medical research. Amazingly, the near universal perception that dietary fat is the major culprit in obesity has no scientific foundation.

There's a family of popular diets and diet books based on decreasing carbohydrate consumption. Most of them are excellent.

Chief among these books are Barry Sears' "Enter the Zone," Michael Eades' "Protein Power," Atkins' Dr. Atkins' "Diet Revolution," Cordain's "The Paleo Diet," and the Hellers' "Carbohydrate Addict's Diet." Each of these is an honest and accurate chronicling of the effects of the low-fat, fad diet and they all offer a rational, effective regimen for avoiding dietary ills. For those technically inclined, the mechanism by which excess carbohydrate causes disease state is known as "hyperinsulinemia." Hyperinsulinemia is the chronic and acute elevation of insulin as a result of habitual consumption of excess carbohydrate.

The list of ills linked to hyperinsulinemia is staggering and growing. The evidence linking excess carbohydrate consumption to hyperinsulinemia and coronary heart disease is compelling if not overwhelmingly convincing.

Additionally, excess consumption of carbohydrate may soon be shown to be linked to Alzheimer's, aging, cancers, and other disease through a process known as "glycosylation."

A Google search for "hyperinsulinemia" reveals hundreds of ills linked to this metabolic derangement. The rapidly growing awareness of the consequences of elevated blood sugar is one of the more promising avenues of medical advancement today.

Though frightening, the diseases brought about through hyperinsulinemia can easily be avoided by minimizing carbohydrate consumption–specifically carbohydrate that gives substantial rise to blood sugar and consequently insulin levels.

There is a singular measure of carbohydrate that gives exactly this information–"Glycemic Index." Glycemic index is simply a measure of a food's propensity to raise blood sugar. Avoid high-glycemic foods and you will avoid many, if not most, of the ills associated with diet.

Rick Mendosa has published one of the most complete glycemic indices available anywhere with a listing of over 750 common food items giving values based on glucose's score of 100.

We can increase the ease and utility of using such a list by dividing commonly eaten foods into two groups –one of high-glycemic foods, "bad foods", and one of low-glycemic foods, or "good foods." This is the rationale behind the CrossFit Shopping List.

You may notice that the "good foods" are typically meats, vegetables, fruits, nuts, and seeds, whereas the bad foods include many man-made or processed foodstuffs. There are some notable exceptions, but the trend is certainly instructive.

Glycemic Index continued

CrossFit Shopping List			
"Good Foods"–Low-Glycemic		**"Bad Foods"–High-Glycemic**	
Almonds	*Olives*	*Acorn Squash*	*Ketchup*
Apple	*Onion*	*Bagel*	*Lima Beans*
Asparagus	*Orange*	*Baked Beans*	*Mango*
Avocado	*Peach*	*Banana*	*Maple Syrup*
Beef	*Peanut Butter*	*BBQ Sauce*	*Melba Toast*
Black Beans	*Peanuts*	*Beets*	*Molasses*
Blueberries	*Pear*	*Biscuit*	*Muffin*
Broccoli	*Pineapple*	*Black Eyed Peas*	*Noodles*
Brussel Sprouts	*Plain Yogurt*	*Bread*	*Pancakes*
Canned Chicken	*Plum*	*Bread Crumbs*	*Papaya*
Canned Tuna	*Pork*	*Bulgar*	*Parsnips*
Cantaloupe	*Protein Powder*	*Butternut Squash*	*Peas*
Carrots	*Salmon*	*Cereal*	*Pinto Beans*
Cheese	*Salsa*	*Chocolate*	*Popcorn*
Chick Peas	*Sauerkraut*	*Cocktail Sauce*	*Potato*
Chicken	*Shrimp*	*Cooked Carrots*	*Potato Chips*
Cottage Cheese	*Soy Beans*	*Corn*	*Pretzels*
Cucumber	*Soy Burgers*	*Corn Chips*	*Prunes*
Deli Meat	*Soy Milk*	*Cornstarch*	*Raisins*
Dill Pickles	*Soy Sausage*	*Cranberries*	*Refried Beans*
Egg Substitute	*Spinach*	*Croissant*	*Rice*
Eggplant	*Spirulina*	*Crouton*	*Rolls*
Eggs	*Strawberry*	*Dates*	*Saltine Crackers*
Grape	*Swordfish*	*Doughnut*	*Steak Sauce*
Ground Turkey	*Tahini*	*English Muffin*	*Sugar*
Ham	*Tempeh*	*Figs*	*Sweet Potato*
Hot Dogs	*Tofu*	*French Fries*	*Sweet Relish*
Kidney Beans	*Tomato*	*Fruit Juice*	*Taco Shell*
Lamb	*Tomato Sauce*	*Granola*	*Teriyaki Sauce*
Lettuce	*Tuna Steak*	*Grits*	*Tortillas*
Macadamia Nuts	*Turkey*	*Guava*	*Turnip*
Mayonnaise	*Turkey Sausage*	*Honey*	*Udon Noodles*
Milk	*Water*	*Hubbard Squash*	*Vegetable Juice*
Mushroom	*Zucchini*	*Ice Cream*	*Waffle*
Oatmeal		*Instant Oatmeal*	
Oil		*Jelly*	

High-glycemic foods, or "bad foods", are typically starchy, sweet, or processed foods like bread, pasta, rice, potato, grains, and desserts.

More than a few observers have pointed out that low-glycemic foods have limited shelf life and are found on the perimeter of the grocery store where the high-glycemic foods have a longer shelf life and are typically found within the grocery store's aisles.

Though this approach is an oversimplification of much of nutritional science, it has the power to deliver nearly all of what more detailed and elaborate regimens offer, such as those by Sears, Eades, Cordain, Atkins, and the Hellers. Eat more of the "good foods" and less of the "bad foods" and you will garner much of what the more responsible eating plans offer. Many of our friends have radically transformed their health through this single tool.

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Glycemic Load

As stated in the "Glycemic Index" article, the Glycemic Index is a simplified classification that generally encourages people to eat more whole foods and less refined carbohydrates. This, by itself, proves its utility. However, the system is not a fool-proof strategy by which an individual should determine all dietary choices. There are high-glycemic or "bad" foods that are acceptable, and even healthy, to adopt on a regular basis.

How is this so? The Glycemic Index is calculated based on the individual eating a certain amount of carbohydrates from that food. The Glycemic Index does not take into account the actual quantity of that food eaten by the individual. While it is true that sweet potato raises blood sugar more quickly than blueberries, this is not necessarily problematic if a reasonable portion of sweet potato is consumed.

What is a reasonable portion? This is variable based on a variety of factors including body size and activity level, but this is why Zone proportions are useful in determining appropriate sized portions of any carbohydrate choice. Higher-Glycemic Index foods also allow many CrossFitters to achieve necessary amounts of carbohydrates on a reduced volume of food (i.e., not all green vegetables), which is generally more sustainable and enjoyable. As a general rule, include a greater quantity of lower-Glycemic Index foods when struggling with hunger.

Zone Meal Plans

Originally published in May 2004

Our recommendation to "eat meat and vegetables, nuts and seeds, some fruit, little starch, and no sugar" is adequate to the task of preventing the scourges of diet-induced disease, but a more accurate and precise prescription is necessary to optimize physical performance.

Finely tuned, a good diet will increase energy, sense of well-being, and acumen, while simultaneously flensing fat and packing on muscle. When properly composed, the right diet can nudge every important quantifiable marker for health in the right direction.

Diet is critical to optimizing human function, and our clinical experience leads us to believe that Barry Sears's Zone Diet closely models optimal nutrition.

CrossFit's best performers are Zone eaters. When our second-tier athletes commit to strict adherence to the Zone parameters, they generally become top-tier performers quickly. It seems that the Zone Diet accelerates and amplifies the effects of the CrossFit regimen.

Unfortunately, the full benefit of the Zone Diet is largely limited to those who have at least at first weighed and measured their food.

For a decade, we experimented with sizing and portioning strategies that avoid scales, and measuring cups and spoons, only to conclude that natural variances in caloric intake and macronutrient composition without measurement are greater than the resolution required to turn good performance to great. Life would be much easier for us were this not so!

The "meal plans" and "block chart" (on the following pages) have been our most expedient approach for eliciting athletes' best performances and optimal health.

Even discounting any theoretical or technical content, this portal to sound nutrition still requires some basic arithmetic and weighing and measuring portions for the first weeks.

Too many athletes, after supposedly reading Sears' book "Enter the Zone" still ask, "So what do I eat for dinner?" They get meal plans and block charts. We can make the Zone more complicated or simpler, but not more effective. We encourage everyone to weigh and measure portions for a couple weeks because it is supremely worth the effort, not because it is fun. If you choose to "guesstimate" portions, you will have the result of CrossFit's top performers only if and when you are lucky.

Within a couple weeks of weighing and measuring, you will have developed an uncanny ability to estimate the mass of common food portions, but, more importantly, you will have formed a keen visual sense of your nutritional needs. This is a profound awareness.

In the Zone scheme, all of humanity calculates to either 2-, 3-, 4-, or 5-block meals at breakfast, lunch, and dinner, with either 1- or 2-block snacks between lunch and dinner and again between dinner and bedtime. We have simplified the process for determining which of the four meal sizes and two snack sizes best suits your needs. We assume that you are CrossFitters; i.e., active.

Being a "4-blocker," for instance, means that you eat three meals each day where each meal is composed of 4 blocks of protein, 4 blocks of carbohydrate, and 4 blocks of fat. Whether you are a "smallish" medium-sized guy or a "largish" medium-sized guy would determine whether you will need snacks of 1 or 2-blocks twice a day.

The "meal plans" we give stand as examples of 2-, 3-, 4-, or 5-block meals, and the "block chart" gives quantities of common foods equivalent to 1 block of protein, carbohydrate, or fat.

Once you determine that you need, say, 4-block meals, it is simple to use the block chart and select four times something from the protein list, four times something from the carbohydrate list, and four times something from the fat list every meal.

One-block snacks are chosen from the block chart at face value for a single snack of protein, carbohydrates, and fat, whereas 2-block snacks are, naturally, chosen composed of twice something from the carbohydrates list combined with twice something from the protein list, and twice something from the fats.

Every meal, every snack, must contain equivalent blocks of protein, carbohydrate, and fat.

If the protein source is specifically labeled "non-fat," then double the usual fat blocks for that meal. Read "Enter the Zone" to learn why.

For those eating according to Zone parameters, body fat comes off fast. When our men fall below 10 percent body fat and start approaching 5 percent, we kick up the fat intake. The majority of our best athletes end up at X blocks of protein, X blocks of carbohydrate, and 4X or 5X blocks of fat. Learn to modulate fat intake to produce a level of leanness that optimizes performance.

The Zone Diet neither prohibits nor requires any particular food. It can accommodate paleo or vegan, organic or kosher, fast food or fine dining, while delivering the benefits of high-performance nutrition.

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What is a Block?

A block is a unit of measure used to simplify the process of making balanced meals.

- 7 grams of protein = 1 block of protein
- 9 grams of carbohydrate = 1 block of carbohydrate
- 3 grams of fat = 1 block of fat

Since most protein sources contain fat (e.g., meat), individuals should only add 1.5 grams for each fat block when constructing meals. The block chart on the following pages outlines an amount of each item to achieve 1.5 grams of fat.

When a meal is composed of equal blocks of protein, carbohydrate, and fat, 40% of its calories are from carbohydrate, 30% from protein and 30% from fat.

The following pages contain common foods in their macronutrient category (protein, carbohydrate, or fat), along with a conversion of measurements to blocks.

This "block chart" is a convenient tool for making balanced meals. Simply choose 1 item from the protein list, 1 item from the carbohydrate list, and 1 item from the fat list to compose a 1-block meal. Or choose 2 items from each column to compose a 2-block meal, and so on.

Here is a sample 4-block meal:

- 4 oz. chicken breast
- 1 artichoke
- 1 cup of steamed vegetables with 24 crushed peanuts
- 1 sliced apple

This meals contains 28 grams of protein, 36 grams of carbohydrate, and 12 grams of fat. It is simpler, though, to think of it as a 4-block meal.

Block Prescription Based on Sex and Body Type

Breakfast	Lunch	Snack	Dinner	Snack	Total Blocks	Body Type
2	2	2	2	2	10	Small female
3	3	1	3	1	11	Medium female
3	3	2	3	2	13	Large female
4	4	1	4	1	14	Athletic, well muscled female
4	4	2	4	2	16	Small male
5	5	1	5	1	17	Medium male
5	5	2	5	2	19	Large male
4	4	4	4	4	20	X-Large male
5	5	3	5	3	21	Hard gainer
5	5	4	5	4	23	Large hard gainer
5	5	5	5	5	25	Athletic, well muscled male

Sample Day | Block Requirements for Small (16-Block) Male

	Breakfast	Lunch	Snack	Dinner	Snack
Protein	4	4	2	4	2
Carbohydrate	4	4	2	4	2
Fat	4	4	2	4	2

Zone Meal Plans continued

Block Chart For Protein, Fat, and Favorable Carbohydrates

Protein (cooked)	
beef	1 oz.
calamari	1-1/2 oz.
Canadian bacon	1 oz.
canned tuna	1 oz.
catfish	1-1/2 oz.
cheese	1 oz.
chicken breast	1 oz.
clams	1-1/2 oz.
corned beef	1 oz.
cottage cheese	1/4 cup
crabmeat	1-1/2 oz.
deli-meat	1-1/2 oz.
duck	1-1/2 oz.
egg substitute	1/4 cup
egg whites	2 large
feta cheese	1-1/2 oz.
firm tofu	2 oz.
flounder/sole	1-1/2 oz.
ground beef	1-1/2 oz.
ground lamb	1-1/2 oz.
ground pork	1-1/2 oz.
ground turkey	1-1/2 oz.
ham	1 oz.
lamb	1 oz.
lobster	1-1/2 oz.
pork	1 oz.
protein powder	1 oz.
ricotta cheese	2 oz.
salmon	1-1/2 oz.
sardines	1 oz.
scallops	1-1/2 oz.
seitan	1 oz.
shrimp	1-1/2 oz.
soft tofu	3 oz.
soy cheese	1 oz.
soy burgers	1/2 patty
soy sausage	2 links
spirulina (dry)	1/2 oz.
swordfish	1-1/2 oz.
tuna steak	1-1/2 oz.
turkey breast	1 oz.
veal	1 oz.
whole egg	1 large

Favorable Carb (cooked)	
artichoke	1 small
asparagus	12 spears
beet greens	1-1/4 cups
black beans	1/4 cup
bok choy	3 cups
broccoli	1-1/4 cups
brussels sprouts	3/4 cup
cabbage	1-1/3 cups
cauliflower	1-1/4 cups
chick peas	1/4 cup
collard greens	1-1/4 cups
dill pickles	3 (3 inch)
eggplant	1-1/2 cups
fava beans	1/3 cup
green beans	1 cup
kale	1-1/4 cups
kidney beans	1/4 cup
leeks	1 cup
lentils	1/4 cup
oatmeal	1/3 cup
okra	3/4 cup
onion	1/2 cup
sauerkraut	1 cup
spaghetti squash	1 cup
spinach	1-1/3 cups
swiss chard	1-1/4 cups
tomato sauce	1/2 cup
tomatoes	3/4 cup
yellow squash	1-1/4 cups
zucchini	1-1/3 cups

Favorable Carb (raw)	
alfalfa sprouts	7-1/2 cups
apple	1/2
applesauce	3/8 cup
apricots	3 small
bean sprouts	3 cups
blackberries	1/2 cup
blueberries	1/2 cup
broccoli	2 cups
cabbage	2-1/4 cups
cantaloupe	1/4
carrot	1 large
cauliflower	2 cups
celery	2 cups
cherries	7
cucumber	1 (9 inch)
fruit cocktail	1/3 cup
grapefruit	1/2
grapes	1/2 cup
honeydew	1/2
kiwi	1
lemon	1
lettuce, iceberg	1 head
lettuce, romaine	6 cups
lime	1
mushrooms	3 cups
nectarine	1/2
onion	2/3 cup
orange	1/2
peach	1
pear	1/2
peppers	1-1/4 cups
pineapple	1/2 cup
plum	1
radishes	2 cups
raspberries	2/3 cup
salsa	1/2 cup
snow peas	3/4 cup
spinach	4 cups
strawberries	1 cup
tangerine	1
tomato	1 cup
watermelon	1/2 cup
zucchini	3 cups

Combo Items *	
milk	1 cup
soy milk	1 cup
soybeans	1/4 cup
tempeh	1-1/2 oz.
yogurt (plain)	1/2 cup
Fat (for 1.5 g)	
almonds	~ 3
avocado	1 tbsp
bacon bits	2-1/2 tsp
butter	1/3 tsp
canola oil	1/3 tsp
cashews	~ 3
coconut oil	1/3 tsp
cream cheese	1 tsp
cream, light	1/2 tsp
guacamole	1/2 tbsp
half and half	1 tbsp
lard	1/3 tsp
macadamia nuts	~ 1
mayo, light	1 tsp
mayonnaise	1/3 tsp
olive oil	1/3 tsp
olives	~ 5
peanut butter	1/2 tsp
peanut oil	1/3 tsp
peanuts	~ 6
salad dressing	1/2 tbsp
sesame oil	1/3 tsp
sour cream	1 tsp
sunflower seeds	1/4 tsp
tahini	1/3 tsp
tartar sauce	1/2 tsp
veg. shortening	1/3 tsp
vegetable oil	1/3 tsp
walnuts (chopped)	1 tsp

*Note: combo items contain
1 block of protein and
1 block of carbohydrate

Block Chart For Unfavorable Carbohydrates*

Vegetables	
acorn squash	3/8 cup
baked beans	1/8 cup
beets	1/2 cup
black eyed peas	1/4 cup
butternut squash	1/3 cup
cooked carrots	1/2 cup
corn	1/4 cup
french fries	5
hubbard squash	2/3 cup
lima beans	1/4 cup
parsnips	1/3 (9 inch)
peas	1/3 cup
pinto beans	1/4 cup
potato, boiled	1/3 cup
potato, mashed	1/5 cup
refried beans	1/4 cup
sweet potato, baked	1/3 (5 inch)
sweet potato, mashed	1/5 cup
turnip	3/4 cup
Fruit	
banana	1/3 (9 inch)
cranberries	1/4 cup
cranberry sauce	4 tsp
dates	1
figs	3/4
guava	1/2 cup
kumquat	3
mango	1/3 cup
papaya	2/3 cup
prunes	2
raisins	1 tbsp
Fruit Juice	
apple juice	1/3 cup
cranberry juice	1/4 cup
fruit punch	1/4 cup
grape juice	1/4 cup
grapefruit juice	3/8 cup
lemon juice	1/3 cup
orange juice	3/8 cup
pineapple juice	1/4 cup
tomato juice	3/4 cup

Grains And Breads	
bagel	1/4
baked potato	1/3 cup
barley	1 tbsp
biscuit	1/4
bread	1/2 slice
bread crumbs	1/2 oz.
breadstick	1
buckwheat	1/2 oz.
bulgur wheat	1/2 oz.
cereal	1/2 oz.
corn bread	1 inch square
cornstarch	4 tsp
croissant	1/4
crouton	1/2 oz.
donut	1/4
english muffin	1/4
flour	1-1/2 tsp
granola	1/2 oz.
grits	1/3 cup
instant oatmeal	1/3 cup
melba toast	1/2 oz.
muffins	1/4
noodles	1/4 cup
pancake	1/2 (4 inch)
pasta, cooked	1/4 cup
pasta, high protein	1/3 cup
pita bread	1/4
popcorn	2 cups
rice	3 tbsp
rice cake	1
roll (dinner)	1/2
roll (hamburger, hot dog)	1/4
taco shell	1
tortilla (corn)	1 (6 inch)
tortilla (flour)	1/2 (6 inch)
udon noodles	3 tbsp
waffle	1/2

Condiments	
bbq sauce	2 tbsp
brown sugar	1-1/2 tsp
catsup	2 tbsp
cocktail sauce	2 tbsp
confectioners sugar	1 tbsp
granulated sugar	2 tsp
honey	1/2 tbsp
jelly/jam	2 tsp
maple syrup	2 tsp
molasses	2 tsp
pickle (bread & butter)	6 slices
plum sauce	1-1/2 tbsp
relish (sweet)	4 tsp
steak sauce	2 tbsp
teriyaki sauce	1-1/2 tbsp
Alcohol	
beer	8 oz.
liquor	1 oz.
wine	4 oz.
Snacks	
chocolate bar	1/2 oz.
corn chips	1/2 oz.
graham crackers	1-1/2
ice cream	1/4 cup
potato chips	1/2 cup
pretzels	1/2 oz.
saltine crackers	4
tortilla chips	1/2 oz.

*Note: When building meals with "unfavorable carbohydrates" quantity becomes critical.

Sample Zone Meals and Snacks

2-Block Menus

Breakfast

Breakfast Quesadilla
1 corn tortilla
1/4 cup black beans
1 egg (scrambled or fried)
1 oz. cheese
2 tbsp avocado

Breakfast Sandwich
1/2 pita bread
1 egg (scrambled or fried)
1 oz. cheese
Served with 2 macadamia nuts

Fruit Salad
1/2 cup cottage cheese mixed with
1/4 cantaloupe, cubed
1/2 cup strawberries
1/4 cup grapes
Sprinkled with 6 chopped almonds

Smoothie
Blend together:
1 cup milk
1 tbsp protein powder
1 cup frozen strawberries
6 cashews

Oatmeal
1/3 cup cooked oatmeal (slightly watery)
1/2 cup grapes
1/4 cup cottage cheese
2 tsp walnuts, chopped
1 tbsp protein powder
Spice with vanilla extract and cinnamon

Easy Breakfast
1/2 cantaloupe, cubed
1/2 cup cottage cheese
6 almonds

Steak and Eggs
1 oz. steak, grilled
1 fried egg
1 slice toast with
2/3 tsp butter

Lunch

Tuna Sandwich
2 oz. canned tuna
2 tsp light mayo
1 slice bread

Tacos
1 corn tortilla
3 oz. seasoned ground meat
1/2 cup tomato, cubed
1/3 cup onion (raw), chopped
Lettuce (as garnish), chopped
10 olives, chopped
Served with Tabasco to taste

Deli Sandwich
1 slice bread
3 oz. sliced deli meat
2 tbsp avocado

Quesadilla
1 corn tortilla
2 oz. cheese
2 tbsp guacamole
Jalapenos and salsa as garnish
Serve with 1/2 orange

Grilled Chicken Salad
2 oz. chicken, grilled
2 cups lettuce
1/4 cup tomato, chopped
1/4 cucumber, chopped
1/4 cup green pepper (raw), chopped
1/4 cup black beans
2 tbsp avocado

Easy Lunch
3 oz. deli meat
1 apple
2 macadamia nuts

Dinner

Fresh Fish
3 oz. fresh fish, grilled
1-1/3 cups zucchini (cooked), with herbs
Serve with large salad with 1 tbsp salad dressing of choice

Beef Stew
Saute:
2/3 tsp olive oil
1/3 cup onion (raw), chopped
5/8 green pepper (raw), chopped
~4 oz. beef (raw), cubed
Add:
1-1/2 cups mushrooms (raw), chopped
1/4 cup tomato sauce
Seasoned with garlic, Worcestershire sauce, salt and pepper

Chili (serves 3)
Saute:
1/3 cup onion (raw), chopped
5/8 cup green pepper (raw), chopped
in garlic, cumin, chili powder, and crushed red peppers
Add:
9 oz. ground beef, browned
1 cup tomato sauce
1/2 cup black beans
1/4 cup kidney beans
30 olives, chopped
Add fresh cilantro to taste

Turkey and Greens
2 oz. turkey breast, roasted
1-1/4 cups kale, chopped and steamed
Saute garlic and crushed red peppers in 2/3 tsp olive oil, add the steamed kale and mix.
Serve with 1 peach, sliced

Easy Chicken Dinner
2 oz. chicken breast, baked
1 orange
2 macadamia nuts

3-Block Menus

Breakfast

Breakfast Quesadilla
1 corn tortilla
1/4 cup black beans
1/3 cup onions (raw), chopped
5/8 cup green pepper (raw), chopped
2 eggs (scrambled or fried)
1 oz. cheese
3 tbsp avocado

Breakfast Sandwich
1/2 pita bread
1 egg (scrambled or fried)
1 oz. cheese
1 oz. sliced ham
Serve with 1/2 apple and 3 macadamia nuts

Fruit Salad
3/4 cup cottage cheese
1/4 cantaloupe, cubed
1 cup strawberries
1/2 cup grapes
Sprinkle with 9 chopped almonds

Smoothie
Blend together:
1 cup milk
2 tbsp protein powder
1 cup frozen strawberries
1/2 cup frozen blueberries
9 cashews

Oatmeal
2/3 cup cooked oatmeal (slightly watery)
1/2 cup grapes
1/2 cup cottage cheese
3 tsp walnuts, chopped
1 tbsp protein powder
Spice with vanilla extract and cinnamon

Easy Breakfast
3/4 cantaloupe, cubed
3/4 cup cottage cheese
9 almonds

Steak and Eggs
2 oz. steak, grilled
1 fried egg
1 slice toast w/ 1 tsp butter
1/4 cantaloupe, cubed

Lunch

Tuna Sandwich
3 oz. canned tuna
3 tsp light mayo
1 slice bread
Serve with 1/2 apple

Tacos
2 corn tortillas
3 oz. seasoned ground meat
1 oz. grated cheese
1/2 cup tomato, cubed
2/3 cup onion (raw), chopped
Lettuce (as garnish), chopped
Serve with Tabasco to taste
15 olives, chopped
Serve with Tabasco to taste

Deli Sandwich
1 slice bread
3 oz. sliced deli meat
1 oz. cheese
3 tbsp avocado
Serve with 1/2 apple

Quesadilla
1 corn tortilla
3 oz. cheese
3 tbsp guacamole
Jalapenos and salsa as garnish
Serve with 1 orange

Grilled Chicken Salad
3 oz. chicken, grilled
2 cups lettuce
1/4 cup tomato, chopped
1/4 cucumber, chopped
1/4 cup green pepper (raw), chopped
1/4 cup black beans
1/4 cup kidney beans
3 tbsp avocado

Easy Lunch
3 oz. deli meat
1 oz. sliced cheese
1-1/2 apples
3 macadamia nuts

Dinner

Fresh Fish
4-1/2 oz. fresh fish, grilled
1-1/3 cups zucchini (cooked), with herbs
Serve with large salad with 1-1/2 tbsp salad dressing of choice
1 cup strawberries

Beef Stew
Saute:
1 tsp olive oil
1/3 cup onion (raw), chopped
5/8 green pepper (raw), chopped
~6 oz. beef (raw), cubed
Add:
1-1/2 cups zucchini (raw), chopped
1-1/2 cups mushrooms (raw), chopped
1/2 cup tomato sauce
Season with garlic, Worcestershire sauce, salt and pepper

Chili (serves 3)
Saute:
2/3 cup onion (raw), chopped
1-1/4 cups green pepper (raw), chopped
in garlic, cumin, chili powder, and crushed red peppers
Add:
13.5 oz. ground beef, browned
1 cup tomato sauce
3/4 cup black beans
1/2 cup kidney beans
45 olives, chopped
Add fresh cilantro to taste

Turkey and Greens
3 oz. turkey breast, roasted
2-1/2 cups kale, chopped and steamed
Saute garlic and crushed red peppers in 1 tsp olive oil, add the steamed kale and mix.
Serve with 1 peach, sliced

Easy Dinner
3 oz. chicken breast, baked
1-1/2 oranges
3 macadamia nuts

4-Block Menus

Breakfast

Breakfast Quesadilla
1 corn tortilla
1/2 cup black beans
1/3 cup onions (raw), chopped
5/8 green pepper (raw), chopped
2 eggs (scrambled or fried)
2 oz. cheese
4 tbsp avocado

Breakfast Sandwich
1/2 pita bread
2 eggs (scrambled or fried)
1 oz. cheese
1 oz. sliced ham
Serve with 1 apple and 4 macadamia nuts

Fruit Salad
1 cup cottage cheese
1/2 cantaloupe, cubed
1 cup strawberries
1/2 cup grapes
Sprinkled with 12 chopped almonds

Smoothie
Blend together:
2 cups milk
2 tbsp protein powder
1 cup frozen strawberries
1/2 cup frozen blueberries
12 cashews

Oatmeal
1 cup cooked oatmeal (slightly watery)
1/2 cup grapes
3/4 cup cottage cheese
4 tsp walnuts, chopped
1 tbsp protein powder
Spice with vanilla extract and cinnamon

Easy Breakfast
1 cantaloupe, cubed
1 cup cottage cheese
12 almonds

Steak and Eggs
3 oz. steak, grilled
1 fried egg
1 slice bread with 1-1/3 tsp butter
1/2 cantaloupe, cubed

Lunch

Tuna Sandwich
4 oz. canned tuna
4 tsp light mayo
1 slice bread
Serve with 1 apple

Tacos
2 corn tortillas
4-1/2 oz. seasoned ground meat
1 oz. cheese, grated
1/2 cup tomato, cubed
1/3 cup onion (raw), chopped
Lettuce (as garnish), chopped
20 olives, chopped
Serve with Tabasco to taste
Serve with 1/2 apple

Deli Sandwich
2 slices of bread
4-1/2 oz. sliced deli meat
1 oz. cheese
4 tbsp avocado

Quesadilla
2 corn tortillas
4 oz. cheese
4 tbsp guacamole
Jalapenos and salsa as garnish
Serve with 1 orange

Grilled Chicken Salad
4 oz. chicken, grilled
2 cups lettuce
1/4 cup tomato, chopped
1/4 cucumber, chopped
1/4 cup green pepper (raw), chopped
1/2 cup black beans
1/4 cup kidney beans
4 tbsp avocado

Easy Lunch
4-1/2 oz. deli meat
1 oz. cheese
1 apple
1 grapefruit
4 macadamia nuts

Dinner

Fresh Fish
6 oz. fresh fish, grilled
1-1/3 cups zucchini (cooked), with herbs
Serve with large salad with 2 tbsp salad dressing of choice
2 cups strawberries

Beef Stew
Saute:
1-1/3 tsp olive oil
1/3 cup onion (raw), chopped
5/8 green pepper (raw), chopped
~8 oz. (beef (raw), cubed
Add:
1-1/2 cups zucchini (raw), chopped
1-1/2 cups mushrooms (raw), chopped
1 cup tomato sauce
Season with garlic, Worcestershire sauce, salt and pepper
Serve with 1 cup strawberries

Chili (serves 3)
Saute:
2/3 cup onion (raw), chopped
1-1/4 cups green pepper (raw), chopped
in garlic, cumin, chili powder, and crushed red peppers
Add:
18 oz. ground beef, browned
2 cups tomato sauce
3/4 cup black beans
3/4 cup kidney beans
60 olives, chopped
Add fresh cilantro to taste

Turkey and Greens
4 oz. turkey breast, roasted
2-1/2 cups kale, chopped and steamed
Saute garlic and crushed red peppers in 1-1/3 tsp olive oil, add kale and mix.
Serve with 2 peaches, sliced

Easy Dinner
4 oz. chicken breast, baked
2 oranges
4 macadamia nuts

5-Block Menus

Breakfast

Breakfast Quesadilla
2 corn tortillas
1/2 cup black beans
1/3 cup onions (raw), chopped
5/8 cup green pepper (raw), chopped
3 eggs (scrambled or fried)
2 oz. cheese
5 tbsp avocado

Breakfast Sandwich
1/2 pita bread
2 eggs (scrambled or fried)
2 oz. cheese
1 oz. ham, sliced
Serve with 1-1/2 apples and 5 macadamia nuts

Fruit Salad
1-1/4 cups cottage cheese
1/2 cantaloupe, cubed
1 cup strawberries
1 cup grapes
Sprinkle with 15 chopped almonds

Smoothie
Blend together:
2 cups milk
3 tbsp protein powder
2 cups frozen strawberries
1/2 cup frozen blueberries
15 cashews

Oatmeal
1 cup cooked oatmeal (slightly watery)
1 cup grapes
1 cup cottage cheese
5 tsp walnuts, chopped
1 tbsp protein powder
Spice with vanilla extract and cinnamon

Easy Breakfast
1-1/4 cantaloupe, cubed
1-1/4 cups cottage cheese
~ 15 almonds

Steak and Eggs
3 oz. steak, grilled
2 fried eggs
1 slice bread with 1-2/3 tsp butter
3/4 cantaloupe, cubed

Lunch

Tuna Sandwich
5 oz. canned tuna
5 tsp light mayo
1 slice bread
Serve with 1-1/2 apples

Tacos
2 corn tortillas
6 oz. seasoned ground meat
1 oz. cheese, grated
1/2 cup tomato, cubed
1/3 cup onion (raw), chopped
Lettuce (as garnish), chopped
25 olives, chopped
Serve with Tabasco to taste
Serve with 1 apple

Deli Sandwich
2 slices bread
4-1/2 oz. deli meat
2 oz. cheese
5 tbsp avocado
1/2 apple

Quesadilla
2 corn tortillas
5 oz. cheese
5 tbsp guacamole
Jalapenos and salsa as garnish
Serve with 1-1/2 oranges

Grilled Chicken Salad
5 oz. chicken, grilled
2 cups lettuce
1/4 cup tomato, chopped
1/4 cucumber, chopped
1/4 cup green pepper (raw), chopped
1/2 cup black beans
1/2 cup kidney beans
5 tbsp avocado

Easy Lunch
4-1/2 oz. deli meat
2 oz. cheese
1-1/2 apples
1 grapefruit
5 macadamia nuts

Dinner

Fresh Fish
7-1/2 oz. fresh fish, grilled
1-1/3 cups zucchini (cooked), with herbs
Serve with large salad with 1/4 cup black beans and 2-1/2 tbsp salad dressing of choice
2 cups strawberries

Beef Stew
Saute:
1-2/3 tsp olive oil
2/3 cup onion (raw), chopped
1-1/4 cups green pepper (raw), chopped
~10 oz. beef (raw), cubed
Add:
1-1/2 cups zucchini (raw), chopped
1-1/2 cups mushrooms (raw), chopped
1 cup tomato sauce
Season with garlic, Worcestershire sauce, salt and pepper
Serve with 2 cups strawberries

Chili (serves 3)
Saute:
2/3 cup onion (raw), chopped
2-1/2 cups green pepper (raw), chopped
in garlic, cumin, chili powder, and crushed red peppers
Add:
22.5 oz. ground beef, browned
2 cups tomato sauce
1 cup black beans
1 cup kidney beans
75 olives, chopped
Add fresh cilantro to taste

Turkey and Greens
5 oz. turkey breast, roasted
2-1/2 cups kale, chopped and steamed
Saute garlic and crushed red peppers in 1-2/3 tsp olive oil, add steamed kale and mix.
Serve with 3 peaches, sliced

Easy Dinner
5 oz. chicken breast, baked
2-1/2 oranges
5 macadamia nuts

1-Block Snacks

1 hard-boiled egg
1/2 orange
6 peanuts

1/2 cup plain yogurt
Sprinkled with 3 cashews, chopped

1 oz. cheese
1/2 apple
1 macadamia nut

1 oz. canned chicken or tuna
1 peach
1/2 tsp peanut butter

1-1/2 oz. deli-style ham or turkey
1 carrot
5 olives

1 oz. mozzarella string cheese
1/2 cup grapes
1 tbsp avocado

1 oz. jack cheese
1 tbsp guacamole
1 cup tomato

1 cup strawberries
1/4 cup cottage cheese
1 macadamia nut

1 poached egg
1/2 slice bread
1/2 tsp peanut butter

1/4 cup cottage cheese
1/2 carrot
3 celery stalks
5 olives

3 oz. soft tofu
1/2 apple
1/2 tsp peanut butter

1 oz. tuna
1 large tossed salad
1 tsp salad dressing of choice

1 hard boiled egg
1 large spinach salad
1 tsp salad dressing of choice

1 oz. grilled turkey breast
1/2 cup blueberries
3 cashews

Blend:
1 cup water
1 tbsp protein powder
1/2 cup grapes
1/3 tsp coconut oil

Blend:
1 cup water
1/2 oz. spirulina
1 cup frozen strawberries
3 cashews

1 oz. cheddar cheese melted over
1/2 apple
Sprinkled with 1 tsp walnuts, chopped

1/4 cup cottage cheese
1/2 cup pineapple
6 peanuts

1 oz. sardines
1/2 nectarine
5 olives

1-1/2 oz. feta cheese
1 cup diced tomato
5 olives

1-1/2 oz. salmon
12 asparagus spears
1/3 tsp olive oil

1-1/2 oz. shrimp
2 cups broccoli (raw)
6 peanuts

1 oz. Canadian bacon
1 plum
1 macadamia nut

1-1/2 oz. deli-style turkey
1 tangerine
1 tbsp avocado

1/4 cup cottage cheese
1 cup sliced tomato
1/3 tsp olive oil

1-1/2 oz. scallops
1 sliced cucumber
1/2 tsp tartar sauce

1 oz. lamb
1/4 cup chick peas
1/3 tsp tahini

Typical CrossFit Block Prescriptions and Adjustments

To best understand the Zone Diet, CrossFitters should read Dr. Barry Sears book "Enter the Zone." This article gives more information regarding block prescriptions and "fat intake" adjustments for CrossFitters.

The chart based on sex and body type in the "Zone Meal Plans" article is perfect way to begin the Zone. In cases where the athlete chooses the wrong block size, this can be modified after a few weeks once the desired results are not achieved. While starting at a block higher or lower than ideal may slow progress, it is infinitely more important to start weighing and measuring intake than not to start at all.

Dr. Barry Sears details a more precise method to calculate one's block prescription in "Enter the Zone." It is:

> Zone block prescription = lean body mass (lb.) * activity level (g/lb. of lean body mass) / 7 (g protein/block)

The activity level ranges on a scale of 0-1. For those who work out several days a week and do not have a labor-intensive job, the activity level should be 0.7 (most CrossFitters). This simplifies to a Zone block prescription that is 10 percent of lean mass.

The activity factor should increase if the athlete does CrossFit two or more times a day, trains for another sport in addition to CrossFit, or holds a strenuous daily job (e.g., construction, farming, etc., and potentially coaching, if on one's feet all day). Although CrossFit workouts are relatively intense, they are not long in duration. An individual does not need to increase the activity level value based on intensity alone; activity volume determines this.

Sample Calculation Of The Zone Block Prescription

Suppose an athlete is 185 lb. (84 kg) with 16 percent body fat. He does CrossFit five days per week and works in a typical office environment. A sample calculation of his Zone block prescription follows.

First, lean body mass is calculated (calipers are a convenient, easy-to-use, and reasonably accurate method):

> lean body mass = 185 lb.–(0.16 * 185 lb.)
> = 185 lb.–29.6 lb. = 155.4 lb.

Because the activity factor is 0.7, the simplified formula is used:

> block prescription = 155.4 lb. * 0.10
> = 15.54 or ~15 blocks

This means that the example athlete above would eat 15 blocks/day, or:

Protein	15 blocks * 7 g	= 105 g (420 calories)
Carbohydrate	15 blocks * 9 g	= 135 g (540 calories)
Fat	15 blocks * 3 g	= 45 g (405 calories)
Total Calories		= 1,365

Note, the total calories presented here are underestimated due to hidden calories. Most foods are classified by a single macronutrient, despite some other macronutrients present (e.g., nuts are classified as a fat, but have some protein and carbohydrate calories). These less predominant macronutrients for each source are not included in the total calorie calculations.

This athlete could also choose to round up to 16 blocks, particularly if the athlete is more likely to have compliance issues. The Zone prescription is a calorie-restrictive diet and can be difficult especially for new-adopters. Rounding up to the next whole block when one's calculation has a decimal value may result in a slower progress, but may also get better long-term compliance. Once the athlete has become accustomed to the diet, then the total blocks can

be lowered to 15, particularly if desired body composition is not yet achieved.

Increasing Fat Intake

The caloric restriction leans out the athlete while providing enough protein and carbohydrate for typical CrossFit activity levels. However, the athlete can become too lean. The athlete is considered "too lean" when performance decreases in combination with continued weight loss. "Too lean" should not be based on body-weight or appearance alone. When a loss of mass coincides with a drop in performance, the athlete needs to add calories to the diet. This can be accomplished by doubling the fat intake.

For the 15-block example athlete, daily food intake at two times the fat would be:

Protein	15 blocks * 7 g	= 105 g (420 calories)
Carbohydrate	15 blocks * 9 g	= 135 g (540 calories)
Fat	30 blocks * 3 g	= 90 g (810 calories)
Total Calories		= 1,770

At twice the fat, the macronutrient ratio based on calories has changed from 30% protein, 40% carbohydrate, 30% fat to: 23% protein, 31% carbohydrate, 46% fat. Fat can continue to be multiplied if the athlete has further mass loss and performance decline. Many CrossFit athletes have a diet including five times the fat.

For the 15-block athlete, daily food intake at five times the fat would be:

Protein	15 blocks * 7 g	= 105 g (420 calories)
Carbohydrate	15 blocks * 9 g	= 135 g (540 calories)
Fat	75 blocks * 3 g	= 225 g (2,025 calories)
Total Calories		= 2,985

At five times the fat, the macronutrient ratio based on calories has changed to: 14% protein, 18% carbohydrate, 68% fat.

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Avoiding Disease

Originally published in October 2007

Nutrition can be a touchy topic, like politics or religion, that people take very personally, but good nutrition is the foundation not only for general health but also for high-performance fitness. Much of the public information about diet, particularly the emphasis on low-fat and high-carbohydrates, has resulted in a near epidemic of obesity and type II diabetes. In this first of a two-part lecture excerpt, Coach Glassman explores some of the science behind nutrition and the body, particularly the role of insulin in health and disease. "Syndrome X," the "deadly quartet" (obesity, glucose intolerance, high blood pressure, high triglycerides), and coronary heart disease, he claims, are avoidable through dietary means.

Video (13 min)
http://journal.crossfit.com/2007/10/nutrition-lecture-part-1-avoid.tpl

✦

Optimizing Performance

Originally published in November 2007

This addresses the refined dietary needs of athletes and what is required to optimize your performance. If you want elite physical output, you must be precise about your intake. "Close enough" will not cut it-or as Coach Glassman says, "If you want top-fuel-type performance, you need top fuel; you can't just piss into the gas tank."

Most of us are familiar with CrossFit's nutrition prescription: Eat meat and vegetables, nuts and seeds, some fruit, little starch, and no sugar. But to achieve top performance, you have to be specific about the balances of those things and accurate in your macronutrient consumption. You can get far on the workouts alone, but you will not-cannot-reach your true potential without getting particular about your fuel. There's a 1:1 correspondence between elite CrossFit performance and accuracy and precision in consumption.

Video (13 min)
http://journal.crossfit.com/2007/11/nutrition-lecture-part-2-optim.tpl

✦

Supplementation

Whole, unprocessed foods are the best source of both macronutrients and micronutrients in terms of composition, variety, and density, such that supplementation is generally not recommended. We contend that eating a high-quality whole food based diet in known quantities are the most important tenets of nutrition for improved performance and health. Not only are supplements generally poorer nutrient sources, but they are also an unnecessary focus for someone not following our basic diet plan of weighed and measured meat and vegetables, etc.

However, there is one supplement that we find is beneficial enough to make a blanket recommendation, and that is fish oil. Fish oil provides omega-3 fatty acids, which are a type of polyunsaturated fat.

Physiological fats are known as triglycerides in biological terms; they are composed of a glycerol backbone with three fatty acids attached (Figure 1). The attached fatty acids are mixtures of saturated, monounsaturated, and polyunsaturated fats. Although one fatty acid is prominent in each food, all three are represented to some degree. Figure 2 provides a summary of the types of fat and example foods of each.

The two types of polyunsaturated fats found most frequently in foods are omega-3 and omega-6 fats. Classifying a fatty acid as omega-3 vs. omega-6 is dependent on chemical structure. Polyunsaturated fats are sources of the two essential fatty acids, meaning they must be obtained from the diet. They are alpha-linolenic acid (ALA) (an omega-3) and linoleic acid (LA) (an omega-6). Omega-3 fats are known as "anti-inflammatory" fats, and omega-6 fats are known as "pro-inflammatory" fats based on their physiological functions. Both are needed in relatively equal quantities.

Current diets tend to have too many omega-6 fats, pushing the balance towards pro-inflammatory physiological processes. The current omega-6:omega-3 ratio is approximately 20:1 and higher, where primitive

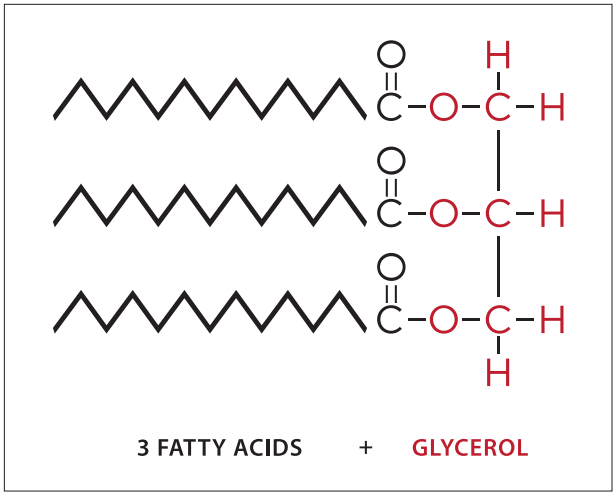

Figure 1. Fat in Food is in the Form of a Triglyceride.

populations likely had a ratio closer to 2:1. Sources of omega-6 fats to the diet are: vegetable oils, nuts, conventionally raised (grain fed/feed lot) meat and eggs, and farm-raised fish. Eliminating processed food according to our diet should reduce exposure to omega-6 fats from vegetable oils. However, most meat and eggs are conventionally raised, which result in greater omega-6 content than if they were wild or grass-fed. Nuts and seeds also have more omega-6 fats than omega-3. Therefore, it is possible that even though one eats the foods on our list, his or her diet could still be pro-inflammatory relative to the ancestral past.

Fish-oil supplementation improves the ratio of omega-6 to omega-3 fatty acids and reduces the inflammatory responses in the body. Fish oil provides two types of omega-3 fatty acids: eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), the form of omega-3 fats preferred by the brain and body. The body can convert ALA to EPA and DHA, but the conversion process is inefficient. Some practitioners have recommended a combined daily intake on the order of 3 grams of EPA and DHA for an otherwise healthy individual, although the exact amount is dictated by one's total omega-6 intake. Each brand of fish oil has a different concentration of EPA

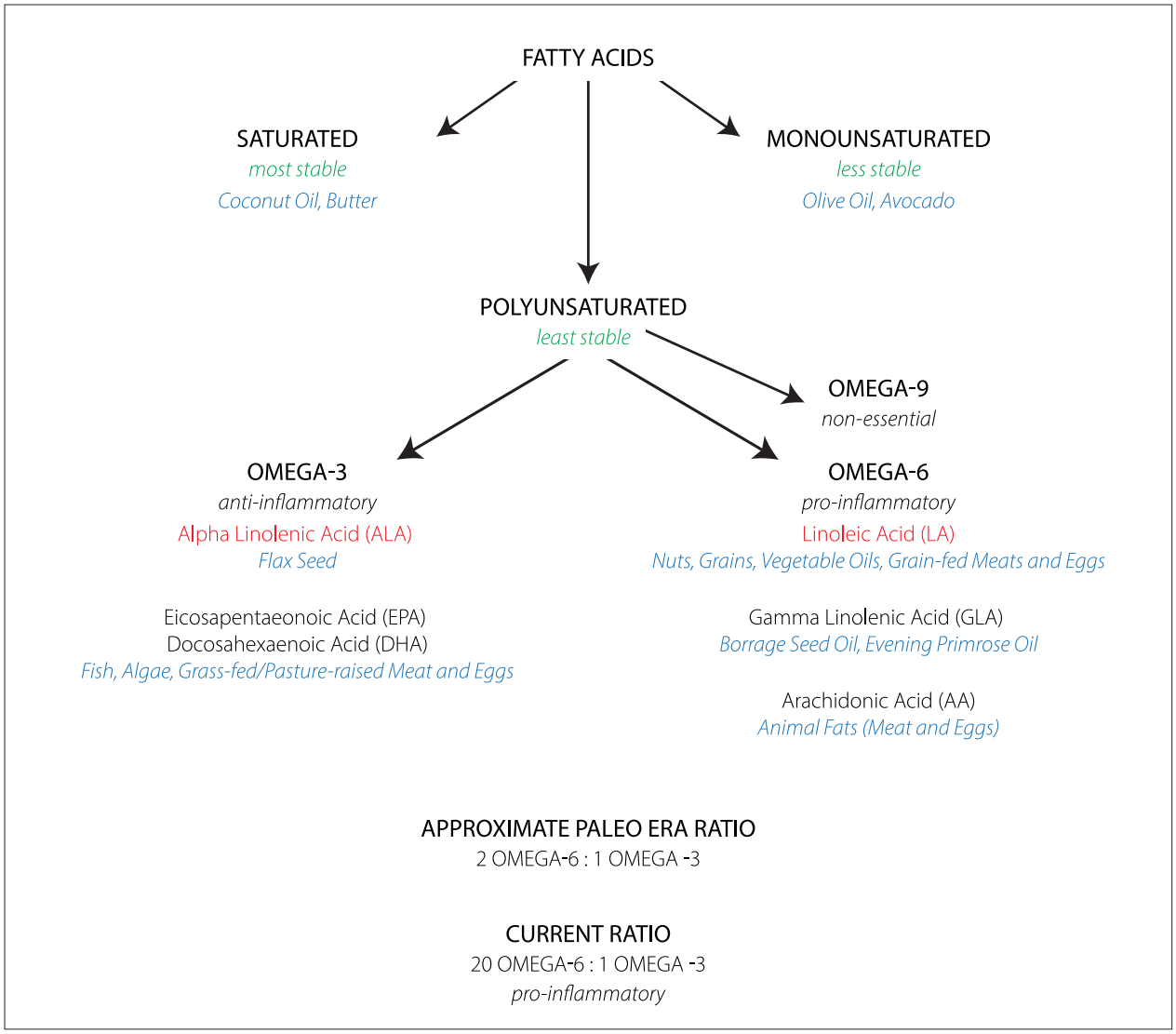

Figure 2. Summary of Fatty Acids and Example Food Sources.

and DHA per serving as indicated on the label. Individuals may have to take multiple servings to get 3 grams of EPA and DHA, as brands may include omega-3s that are not either (e.g., ALA). Flax seed or oil is not an appropriate supplement for omega-3's. Flax is a good source of ALA, but because of the poor conversion to EPA and DHA, it is not recommended. If the individual is vegan, DHA can be obtained with algae oil.

Research has indicated positive health benefits by supplementing with fish oil. Omega-3 fats help increase the fluidity of cell membranes, and research has indicated supplementation can improve insulin sensitivity, cardiovascular function, nervous-system function, immune health, memory, and mood issues. Omega-3's also function as an anti-coagulant, so military personnel should consider removing fish oil supplements from their diet a couple of weeks prior to deployment. It may also be appropriate for those with an upcoming surgery to stop taking fish oil two

weeks from that date. These individuals should talk with their doctor regarding these circumstances.

It is possible to avoid omega-3 supplementation depending on food intake, although the individual needs to be fastidious with his or her diet. This could be accomplished by avoidance of all vegetable oils (which are used at most every restaurant), and nuts and seeds. Meat would have to be grass-fed, eggs pasture raised, and wild-caught fish should be consumed a few times a week. Because this is not practical for many people, supplementation is used.

Besides the ratio of omega-6 to omega-3's in the diet, the total amount of polyunsaturated fat is an important consideration. It is not ideal to take in high doses of either omega-6 (vegetable oils, nuts) or omega-3 fats (based on the stability of polyunsaturated fats relative to other fats, Figure 2). Fish oil supplementation does not negate the effects of a bad diet (e.g., eating fast food or excessive amounts of nuts and nut butters). The total recommended polyunsaturated fat intake in a diet is not well-established; an equal representation of the three fats appears prudent. Individuals should work with a primary care doctor to determine if supplementation is appropriate, particularly in cases with specific medical conditions.

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