Nutrition; Considerations for Successfully Optimizing Your Nutritional Template

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Finally, I (Frankie) have published this post and believe this will have the most views on this website. This has been a long time coming over the last year with the aim to incorporate changes as to how my thinking has evolved over time and to help clarify for my peers, trainers, and trainees. Further, I am grateful to everyone who has read, shared, and learned something from this.

I must give credit where credit is due. Jeremiah L., my good friend and *Published Biologist* has helped me understand findings and readings of clinical research, graphs, and systematic reviews with respect to exercise and nutrition as it relates to health and optimizing performance and is forever patient when I send him my conclusion of studies (many of time embarrassingly inaccurate, "what is saline") thus, continuing to challenge me. I'm forever in your debt, Miah but since I have cooked the best steaks ever for you I'd say things are almost even. Thanks again!

I've received many questions regarding my personal nutrition with respect to making weight for fights and more recently gaining *strength* while losing weight which has prompted me to write this. Important here is self-efficacy,

defined as *an individual's belief in their own "capabilities to execute a course of action" or to achieve a goal* (McAuley 2011). Nutrition with respect to losing body fat or gaining muscle mass is elementary, the execution can be very challenging. Also said in BJJ and other Martial Arts, it's simple not easy. The aim here is to cover: - Important variables with respect to improving one's physical development via the combination of personal and professional experience as well as scientific research including references and evidence base studies. In this post reviewing common situations to training and nutrition as well as strategies to improve adherence to nutrition protocols.

Many of my considerations, recommendations, and positions with respect to nutrition come from peer-reviewed literature and the citation list is endless therefore they're not included here.

Do note the references with in addition to drawing from my personal and professional experience, research, and education. I am an evidence based personal trainer holding certifications from ISSA and USAPL, respectively with coaching experience throughout the world. Next, I'm a Professional Muay Thai Martial Artist (147 lb), and my best lifts are 405 squat, 260 bench press, and 485 deadlift. If wanting to know more about me, my background, and training do email me. Below is a down to earth yet efficient guide to setting up your own nutritional template.

Basics of Nutrition:

Macronutrient totals and caloric load are the primary nutritional parameters with respect to physical development. Do note macros determine calories.

Arguably less important in this game though when wanting to optimize ones nutrition are:

Meal timing Meal frequency Food quality

A good coach worth their pay will educate why calories matter, as a weight class athlete e.g. *fighter, powerlifter, bodybuilder* would agree. Additionally the before mentioned will attest to, so do macronutrients. The core of an effective nutritional aim is a strategy that increases one's compliance that yield results in a caloric surplus, caloric deficit, or maintenance ie. Change or maintaining calories.

Unfortunately, there are people with loud aggressive voices and/or a following who suggest uninformed diets who have you believe calories don't matter, one must eat a certain amount of feeds per day, carbs are detrimental, and to fast - mostly found in large group settings. Though with respect to compliance may be helpful to some but you'll note they do not account for individualism. Yes, I and many other great coaches could go through these with evidence based literature and debunk them though this isn't my aim and simply write -

> *"Ones individual goals, habits, experiences, genetics, history, and compliance will determine what you need to do to get desired results."*

A valuable coach educates on evidence based behavior changes and promotes self-efficacy which aims to increase ones compliance rather than recommend a diet e.g. low fat, keto, intermittent fasting, whole 30 as the latter is terribly irresponsible.

To help ensure progress with respect to optimizing one's nutritional program, the following are likely important:

Counting calories

Tracking Macro's

Weighing and measuring foods

Recording body composition and weight Recording performance info ie Session RPE

This can add complexity to one's daily life though it's not always necessary for everyone, yet from my experience if one desires high levels of performance and/or optimal physical development it is a necessary task. I must note that like most things, with more exposure and patience it becomes easier and faster.

While I agree eyeballing can work in the short-term for some, my experience proves there will come a time when more precise measures are needed to help people continue to gain weight optimally, lose body fat while improving strength, or otherwise optimize performance.

When programming or giving suggestions, information about their previous and current diet help tremendously. Metabolic rates vary wildly from person to person and the influence of dietary habits cannot be overstated. Let’s take 2500kCal* to illustrate this example.

Subject A - 2,500 Cal/Day Macros Protein - 250g (1,000kCal) Carbohydrate - 250g (1000kCal)

Fat - 55g (495kCal) or from

Subject B - Same 2,500 Cal/day

Macros

Protein - 100g (400kCal)

Carbohydrate - 350g (1400kCal)

Fat - 78g (700kCal).

These two seemingly equal calorie diets are not equivalent because there are inherent characteristics in the differing macros that exhibit different metabolic costs. Said differently, though calories are the same - the body utilizes different amounts of calories to extract energy from the macros and this is known as the thermic effect of food (TEF). Protein and fiber tend to be more thermogenic, i.e. they are less sensitive to convert into raw energy than simple carbohydrates or fats. So, while calories are absolutely significant, one could argue that macronutrient levels (protein/carb/fat) are more important. This argument rests on the fact that macros determine total calorie intake whereas a specific calorie level does not specify a particular macronutrient level. In addition to, macronutrient levels also influence aspects like satiety, muscle protein synthesis, and food reward (more below). With respect to nutrition protocols, tracking macros are likely more important than calories.

Fluctuations in daily weight can be normal though deviations upwards or downwards for weeks or months are often because of a concerted effort to alter ones weight. Overeating or under-eating are generally balanced out longer-term by under-eating or overeating, respectively.

We can understand that knowing what someone has been consuming previously, a coach has a more clear picture of where they've been regarding calories and macros and their response.

A normal scenario: A client would like me to assist with their nutrition. For two consistent weeks they've screenshot their MyfitnessPal or the like app (for proof) reporting eating 2,000Cal/day. Whether the client has lost, gained, or maintained in the previous two weeks since adhering to this nutrition protocol, I know the data represents some level of caloric restriction, surplus, or maintenance and therefore my recommendations can be accurately guided because I have this data.

Next, to every single person desiring to begin an intelligent nutritional plan is to use an app (writing works too) to record nutrition intake for a week without changing anything. Eat and train as normal so we can collect data on what is taking in and the response to that intake (macros & calories).

We want to track calories, macros, meal frequency, and timing to help the trainee understand their own nutritional requirements; anything less is likely a guess.

I'm not encouraging nor suggesting all meals to come from e.g. supplements, chicken, sundaes, and biscuits though I don't particularly care what macros

are eaten so long as the math with respect to caloric aim are met. I encourage eating in a sustainable manner that yields *optimal health*, performance (in both quality of life & athletics), and said wanted goals.

My suggestion is to eat “single-ingredient foods” and 80% of a person’s diet will come from “clean” foods. Clearly "clean foods" is arbitrary yet I believe most people have an idea what it means. You're correct to assume when I write or say "clean" I mean single ingredient foods. Additionally, this rests upon developing nutrient dense eating habits and meeting fiber minimum. Maybe later I'll write more on this topic though I support IIFYM (If It Fits Your Macros) given there is a fiber minimum and the diet is based around "clean" foods ie single ingredient foods.

Next, my anecdotal experience as well as clients experience with programming a low carb or the like diet has negative effects with respect to strength and conditioning and endurance. I start on the higher end of carbs then re-adjust as this protocol allows flexibility (oreos anyone?). Yes, low-carb diets work with respect to losing weight, they indeed do though my experience finds using them for long periods of time can be detrimental to training. Said differently, ideally the majority of carb intake is used to supple energy for the training session and the subsequent recovery. With respect to leaning out, retaining strength, or cutting weight strategically timed carb intakes have proved desired results. If unwanted body weight increases in an inefficient manner, i.e. more fat is accruing compared to lean muscle tissue, we can adjust.

When asked about protein e.g. *"how much is needed"*, not only is protein complex (more below) these and like questions imply the person wants to know the dose to not be deficient in the said macro. See the RDA below.

"The Recommended Dietary Allowance (RDA) - 0.8 g/kg/bw.

"The RDA is the amount of a nutrient you need to meet your basic nutritional requirements. In a sense, it's the minimum amount you need to keep from getting sick - not the specific amount you are supposed to eat every day"

**Fails to account for Protein Quality*

**Fails to account for Anabolic Resistant*

Anabolic - promoting, synthesize, associated with growth

Catabolic - break down of molecules, associated with skeletal muscle loss

Anabolic Resistant is responsible in part for skeletal muscle atrophy (loss of) with aging (sarcopenia), muscle disuse, and during diseased states.

AR describes the reduced stimulation of MPS to a given dose of protein/amino acid and contributes to declines skeletal muscle mass.

Sub-normal responses to a given dose of anabolic stimulus:

- Increasing age

- Inactivity (sedentary)

- Critical illness / chronic disease

Perhaps a more informed question is "how much protein is optimal"? These are completely different questions where the latter is framed around performance. And so it be, I nor can anyone answer this, yet. The subjects of high intakes of protein is well studied and **do not with certainty**, cause kidney problems in otherwise normal functioning kidneys. Interestingly, in contrast, a higher protein intake is reported to lower blood pressure and help fight diabetes, two of the main risk factors for kidney disease. More from J Int Soc Sports Nutr here.

Athletes and the general population are likely to benefit from increased dietary intake of protein relative to the current recommended daily allowance (RDA). Higher-protein (HP) promote greater muscle hypertrophy during periods of resistance training and increase the absolute amount of weight lost as well as preserve lean body mass during weight loss ie periods of cutting weight. HP intake (compared with the RDA) has also supported for older persons to preserve skeletal muscle mass loss due to sarcopenia. HP intake during weight loss can help increase satiety, resulting in lower daily energy intake i.e. calories and protein ingestion has an increased thermic effect, resulting in greater daily energy expenditure. Given the prevalence of overweight, obesity, and global aging, the preservation of muscle mass via consumption of an HP diet may be advantageous.

Do read more here, here, and here.

International Society of Sports Nutrition

1.4–2.0 g protein/kg body weight/day

>3.0 g/kg/d may have positive effects on body composition in resistance-trained individuals (i.e., promote loss of fat mass).

We record and log our workouts' exercises, reps, sets, and loads, yet recording nutritional parameters are somehow inappropriate?

Here's permission - start writing down a daily log of your food. Macronutrient totals will suffice on a meal-by-meal basis and at the end of the day add up your calories.

There are many smart phone apps that will do this and store your data for long periods of time, but writing it down works well too.

My suggestions are to eat 3-5 times a day with a minimum of 3 hours and a maximum time of 5 hours between meals (reason below). Again, I like 25-35% of total carbohydrates, ate in the meals before and after training.

- Effect of timing of protein and carbohydrate intake after resistance exercise on nitrogen balance - Journal of Physiological Anthropology

" In particular, high-intensity resistance exercise increases the synthesis of muscle protein for up to 24 h after exercise [1-4]. Because muscle protein synthesis peaks immediately after exercise and reduces over time, intake of dietary protein immediately after resistance exercise is important for

muscle protein accumulation [5-7]. Furthermore, the simultaneous intake of protein and carbohydrate facilitates this accumulation because carbohydrate intake inhibits muscle protein breakdown after resistance exercise [8-12]. (Mori, 2014)"

Unless needed (see here) I suggest programming small changes to one's diet,+/- 15-25g carbohydrates and 4-10g fat, rather than larger adjustments e.g. adding or subtracting 500 calories from X macro. Adding or subtracting 500 calories at a time may, in fact, cause the desired change to begin happening, yet it'd be a challenge to know where to go from there when it stops working, ya know?

It's difficult and easy to miss how to optimize nutrition strategies to most efficiently add lean muscle mass when nutritional adjustments are made on large scales.

I stress this isn't difficult if you take an intelligent approach and collect data to work with. It's similar to squatting, kicking, or securing an armbar. You didn't squat 2x body weight, have powerful kicks, or catch someone with experience in an armbar on the first day of training. You showed up and figured out where you were and progressively advanced.

Should you keep an OK log of training and nutrition, within weeks or <3 months time you'll have greater knowledge of how your body responds to particular nutritional intakes and strategies.

All else being equal a person at 20% bodyfat is healthier than the same person at 30%. We're writing more on this though for now here are cut-off points regarding at risk waist circumference from American Association of Clinical Endocrinologists and American College of Endocrinology.

MEN - ≥94cm (37in)

WOMEN - ≥80cm (31.5in)

*Americans and Canadians

The predictive value of WC is generally independent of, and stronger than, BMI (body mass index) and is evident at BMI <25 kg/m2. **WC is correlated with mortality more positively and linearly than BMI and is a stronger independent predictor of mortality at all levels of BMI.**

Performance in athletes and the general population tends to be higher relatively with those of a lower body fat at a higher weight because leverage is better. When aiming for performance goals we should strive to get our trainee to the top of their weight class with the best body composition. A 240lb athlete with 15% bodyfat has a greater muscle cross-sectional area than a 240lb athlete with 25% bodyfat. All things being equal, the first athlete has a greater potential to produce force with this increased muscle mass available for recruitment.

Suggested parameters as measures:

Photos (in same lighting) weekly, with aim to see changes if any in body composition Waist measurements - taken right at the level of the umbilicus Weight changes

Training progression/regression e.g. Session RPE

What is leucine?

Leucine, isoleucine and valine, the branched-chain amino acids (BCAA), make up about one-third of muscle protein (Garvey, WT). Leucine has been the most thoroughly researched because of its higher oxidation rate than isoleucine or valine and stimulates protein synthesis in muscle. One of nine essential amino acids in humans (provided by food), Leucine is important for many metabolic functions and contributes to regulation of blood-sugar levels; growth and repair of muscle and bone tissue; growth hormone production; and wound healing. It prevents breakdown of muscle proteins after trauma or severe stress (Wolfe, 2017). ***Muscle Protein Synthesis is the amount of skeletal muscle mass you carry at any time is the balance between MPS and Muscle Protein Breakdown.***

Leucine is the powerhouse driver of MPS.

700–3000 mg of leucine and/or a higher relative leucine content, in addition to a balanced array of the essential amino acids (EAAs) have been shown to drive Muscle Protein Synthesis.

What are *High Quality Proteins:*

You are correct to think of animal based proteins or soy though we need to understand what is meant by High Quality Proteins. Protein digestibility-corrected amino acid score (PDCAAS) is a *method of evaluating the quality of a protein based on both the amino acid requirements of humans and their ability to digest it.*

Said differently, the PDCAA score is a good way to make informed decisions about the protein feedings you choose for your needs. Protein sources with high PDCAAS scores (highest 1.0), for example, indicate that a protein will provide at or near to 100% of the essential amino acids, including the branched-chain amino acids (BCAA's) known to have the greatest effect of protein synthesis.

PDCAAS Score

Beef - .92

Egg - 1.0

Milk - 1.0

Soy Protein - 1.0

Wheat - .25

Peanuts - .52

"an intake of 1.5 g protein/kg/day, or about 15-20% of total caloric intake, is a reasonable target for elderly individuals wishing to optimize protein intake in

terms of health and function" - Journal of the American Medical Directors Association

With respect to protein intake, optimal protein intake per meal will be the amount of protein that yields ~3-4g of leucine because this dose reports maximal muscle protein synthesis. MPS is obviously important for the athlete, but it's also important for the general population, particularly the aging population who is at risk for sarcopenia, decreased work capacity, and as a result many other worse health outcomes. The literature suggests that the aging population benefits greatly with higher protein intakes. Whey supplement is often seen in the interventions. - Eat 3-5x per day tops, spread out 3-5 hours.

An example: Whey protein has ~3g of leucine per 20g serving

Brown rice protein has 3g of leucine per 40g serving.

These two doses with respect to driving MPS are equal though the rice has significantly more calories.

Example of feeding times to optimally maximize MPS: High Protein breakfast: 8AM then wait 3-5 hours and repeat. If a meal was consumed at any point within the refractory period (minimum three hours) of previous feed then by definition the meal is stored as energy - either glycogen or fat depending on many variables and would not drive another bout of MPS. With aims to optimize our results, the literature suggests to wait a minimum of 3 hours. Here is permission to question those who recommend eating every two hours or 6-8/day.

Determining optimal protein intake by considering the following.

Age- In general, the older and more sedentary the less sensitive (ie need more) they become to protein.

Dietary Preferences- As the quality of protein increases (based on bioavailability, PDCAA score, and amino acid profile) the total protein needed to optimize protein intake goes down. Read again before moving on.

Said differently, if vegan, more protein is required to maximally drive MPS. The lower quality the protein source is (e.g. lentils, pea, wheat) the more protein is needed for the same effect as one's who eat higher quality protein sources (e.g. eggs, whey, chicken).

This may be a concern for those wanting to lose weight and/or seeking body recomp.

Satiety background

Hunger is defined as a feeling of discomfort caused by *lack of food*, followed up with wanting to eat. *(Bernstien, 2018)* wrote in this paper "*that the majority of youth used physical cues as a way to identify hunger and fullness cues. For identifying hunger, participants most frequently reported using cues such as their stomach growling or stomach pain as an indication that they are hungry. For identifying fullness, the majority of participants relied on discomfort. Conversely, satiety is the feeling of being full and no longer desiring a meal".*

Satiety, a term used to define feeling full and loss of appetite after eating. Hunger and satiety both are influenced from the interactions of biological,

psychological, and social factors, which are factors of the biopsychosocial model for hunger and satiety, respectively. I've wrote about the biopsychosocial model before in *March 2019 Newsletter*. Although hunger may be hard to handle, there are techniques backed by evidence.

A scale called the satiety index measures this effect. It was developed in 1995, in a study that tested 240-calorie servings of 38 different foods. Eat **high satiety foods**. In a *1995 study by Holt et al* on the satiety index of common foods, white bread was used as a "control" and set its satiety index at 100. The highest SI score was produced by boiled potatoes (323 +/- 51%) which was seven-fold higher than the lowest SI score of the croissant (47 +/- 17%). Most foods (76%) had an SI score greater than or equal to white bread. Participants deemed different foods more or less satiating than the white bread and were scored accordingly.

High-protein diets appear to be effective when both in inducing weight loss and in preventing weight regain. This study found in obese men showed that protein at 25% of calories increased feelings of fullness and reduced the urge to snack in the evening by 50%. Women in this study who increased their protein intake to 30% of calories ate 441 fewer calories per day and lost 11 pounds in three months - simply by adding more protein to their diet. In a 16-week study, ones consuming a high-protein (34%)/lower-fat (29%) diet reported greater post-meal satiety than subjects consuming a standard protein (18%)/higher-fat (45%) diet Moran, 2005).

In a 6-month randomized trial of 60 overweight and obese subjects, those with a high-protein diet (25% energy; 128–139 g/d) lost near two times fat loss compared with a moderate-protein diet (12% energy; 76–80 g/d). The benefits

of a higher-protein diet have been consistently proved in longer-term studies too. In a recent 12-mo study, 50 overweight and obese subjects initially spent 6-months consuming a high-protein (25% energy) or medium-protein (12% energy) diet. Here again weight loss was greater in the high-protein group (−9.4 vs −5.9 kg). Interestingly, at a 6-month follow-up period, the high-protein group experienced a 10% greater reduction in intra-abdominal adipose tissue than the medium-protein group (Astrup, 2004).

High Satiety foods tend to meet these criteria:

High in protein: Studies show that protein is the most filling macronutrient. It changes the levels of several satiety hormones, including ghrelin and GLP-1.

High in fiber: Fiber provides bulk and helps you feel full for longer. Fiber may slow down the emptying of the stomach and increase digestion time.

High in volume: Choose foods containing a lot of water or air.

Low in energy density: AKA a food is low in calories for its weight. Foods with a low energy density are very filling. They typically contain a lot of water and fiber, but are low in fat.

Whole, unprocessed foods are also generally more filling than processed foods.

The takeaway: eat more high fiber, high protein foods, and less high fat/salt/sugar containing foods. More from *Journal Food Science and Nutrition* *here.*

In conclusion, if you choose to consider the above, we hope you enjoy and embrace it. If not, we'd like to wish you luck and success with whatever approach you go after.

Thank you,
Frankie

Resources:

For individual inquiries please send an email.

Squat Guide 101 - Guide to Squatting

Individual programming please see our Online Coaching Platform

Wanting to attend a seminar? View past Seminars Here.

CMT Facebook Page

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