



➤ Product Review ◀

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WHAT AMOUNT OF PROTEIN WILL GIVE THE BEST ANABOLIC RESULT? WHY IT IS MORE THAN YOU MIGHT SUSPECT!

INTRODUCTION

In this third installment of my series that is devoted to convincing you that protein, not micronutrients, may be the most under-appreciated supplement from both a preventive and therapeutic standpoint, I would like to discuss two papers that examine in great detail the ideal amount of protein needed to build muscle and maximize anabolic tissue growth/tissue repair mechanisms in many other parts of the body. The first paper is entitled “Update on maximal anabolic response to dietary protein,” and is written by Kim et al (Kim IY et al. *Clin Nutr*, Vol. 37, pp. 411-418, 2018). The first quote I would like to feature from this paper emphasizes what I have discussed before concerning the definition of an anabolic response:

“A net gain in protein balance (i.e., synthesis minus breakdown) is called an anabolic response, as opposed to a catabolic response caused by the rate of protein breakdown exceeding the rate of protein synthesis. An anabolic response refers to a gain of muscle protein, but can involve the entire body.”

Before continuing, please note again the last sentence of the above quote. Optimal protein intake and the optimal anabolic response that follows, which is generally considered only in terms of muscle mass, is actually important for virtually any part of the body. As I will discuss shortly, one part of the body that is particularly responsive to optimal protein intake is the gut.

More specifically, leaky gut and gut integrity, an issue that has become a major clinical issue in functional medicine and clinical nutrition today, is more than just a function of diet, hydrochloric acid/enzyme production, microflora, and the numerous other factors upon which we typically focus. While I do not want to, in any way, minimize these important factors, I do feel that the need for optimal protein intake has been greatly under-appreciated in terms of gut integrity and optimal gut health.

OPTIMAL ANABOLIC RESPONSE IS MORE THAN JUST AN ISSUE OF BUILDING MUSCLE

Over the years it has been a general convention in clinical nutrition to consider optimal protein intake strictly in terms of the amount needed to optimize muscle mass. However, the term “lean body mass,” which has been usually considered as a phrase synonymous with muscle mass, is, as will be demonstrated, much more than just muscle mass. Therefore, it stands to reason, if lean body mass is more than just muscle, and since we have traditionally only considered protein intake in terms of building muscle, then, to truly optimize health, much more dietary protein will be needed than the usual amounts that have been proposed.

This key, misunderstood and poorly appreciated aspect of protein intake and optimal anabolic response was addressed by Kim et al, starting with the following quote:

“The determination of the anabolic response to dietary protein intake at the muscle level is obviously important, since muscle is a major fate of essential amino acids (EAAs) absorbed from dietary protein. However, tissues other

than muscle account for more than half of the total protein turnover. Consequently, determination of the anabolic response at the muscle level could underestimate total anabolic response.”

Again, please note that total protein turnover that we are trying to optimize with dietary protein primarily involves tissues other than muscle. One tissue, in particular, as noted in the following quote, is the gut:

“In the fasted state there is a net amino acid efflux from muscle, i.e., a catabolic state. Consumption of dietary protein stimulates muscle protein synthesis (MPS) within an hour. In addition, a significant portion of the amino acids absorbed from the meal will be retained in the splanchnic area, mainly the gut.”

In addition, a mixed macronutrient meal that contains optimal amounts of quality carbohydrate, in addition to protein, will further enhance gut uptake due to the impact of a mixed macronutrient meal on insulin production:

“The retention of amino acids in the gut may be amplified by a systemic insulin response to a mixed meal.”

Therefore, it is important to appreciate that the many ultra-low carbohydrate diets that are now in vogue for so many in the nutritional community, while they may be beneficial for those individuals who have, for years, ingested a diet high in poor quality carbohydrates, can have an adverse effect on the gut when they are employed in excess for a significant period of time.

Kim et al go on to point out that, because of rapid turnover of the gut, significant losses of gut protein can occur if there is increased demand by muscles:

“Over time EAAs released from protein breakdown in the rapidly turning-over gut tissues can be released into peripheral blood and then be incorporated into new proteins in muscle.”

Kim et al continue:

“Our recent findings are consistent with the possibility that gut protein turnover plays a role in the anabolic response.”

Because of this, to supply the amount of protein needed for optimal total body health, more than what you might suspect is needed:

“In an acute metabolic study, we showed that muscle protein synthesis was stimulated to the same extent by two doses of protein intake (40 g vs. 70 g), while the higher protein intake resulted in a greater whole body protein synthesis (also net balance).”

More on the impact of insulin on protein metabolism and anabolic response

As was mentioned above, ingestion of carbohydrate along with protein can increase insulin response above that derived from protein ingestion alone, thereby improving protein/amino acid uptake in key tissues such as muscle and gut. As you will see from the following two quotes, not only does insulin promote increased anabolic responses but it also suppresses protein breakdown:

“If insulin is infused locally into skeletal muscle at a rate low enough to avoid systemic reductions in plasma amino acids, MPS is stimulated. This indicates a potential anabolic stimulatory effect of insulin on MPS, which would seemingly amplify the maximal anabolic response to dietary protein as compared to the ingestion of protein alone.”

(Dietary protein is almost always accompanied by carbohydrate.)

Furthermore:

“...the suppression of breakdown due to insulin may amplify the net gain in the balance between synthesis and breakdown following a meal as compared to ingestion of protein alone.”

How much can a mixed protein/carbohydrate meal suppress protein breakdown? Kim et al state:

“With regard to the maximal suppression of breakdown, we have previously shown that intake of a mixed meal containing protein suppressed breakdown by approximately 60%...”

HOW MUCH PROTEIN IS NEEDED FOR A MAXIMAL ANABOLIC RESPONSE?

As was mentioned above, due to the fact that most calculations on protein need are based solely on the amount needed to optimize muscle mass, and due to the fact that, in reality, muscle accounts for less than half of the total body protein need, much more dietary protein is needed than what has been typically suggested by researchers and instructors in the nutritional community. However, knowing that half of the dietary protein goes to organs other than muscle, how much dietary protein is needed to maximize muscle protein synthesis? To answer this question Kim et al first point out that traditional thought was that the maximal protein intake per meal should be no more than 20-35 g because higher intake would not stimulate further MPS. However, the authors feel that this approach is faulty because of the following:

“...this concept was based entirely on the measurement of muscle protein synthesis and thus ignored the potential contributions of suppression of protein breakdown to the anabolic response, as well as the possibility that tissues and organs other than muscle may also play a role in the anabolic response.”

In contrast, Kim et al feel, based on current research, that there is no limit to the anabolic potential of any given amount of protein per meal:

“We conclude that it is not likely that there is a practical limit to the maximal anabolic response to a single meal...”

WHAT ARE THE BEST TIMES OF DAY TO INGEST PROTEIN?

Is there value to ingesting equal amounts of protein in each of three meals throughout the day? Kim et al state:

“In a recent acute metabolic study we did not observe any beneficial effects of distributing the same amount of dietary protein equally over three daily meals as compared to the normal American pattern of 65% of dietary

protein with dinner as evaluated by measurement of whole body protein synthesis and breakdown as well as MPS.”

In contrast, given that whole body (not just muscle) protein synthesis is a function of protein intake per meal at levels higher than 20 – 35 g, the authors suggest the following:

“...increasing the amount of dietary protein eaten with breakfast and lunch will benefit the overall anabolic response for the day, but in doing this there is no metabolic reason to decrease the amount of protein eaten with dinner.”

Of course, as we all know, from a practical standpoint, ever increasing amounts of protein intake, no matter how it is distributed throughout the day, will eventually lead to adverse results in some form. Therefore, even though Kim et al feel very safe in not recommending a maximum allowable dose of protein per meal, it is important that we as clinicians have some sort of target amount to maximize anabolic response without causing adverse results. With this in mind, I would like to briefly discuss the conclusions of another paper on this subject, “How much protein can the body use in a single meal for muscle-building? Implications for daily protein distribution” by Schoenfeld and Aragon (Schoenfeld BJ & Aragon AA. *J Int Soc Sports Nutr*, Vol. 15, No. 10, 2018). In terms of maximizing muscle mass and strength the authors state the following:

“The collective body of evidence indicates that total daily protein intake for the goal of maximizing resistance training-induced gains in muscle mass and strength is approximately 1.6 g/kg, at least in non-dietary (eucaloric or hypercaloric) conditions.”

However, in line with the comments on the need for additional protein based on the need for non-muscle anabolic responses, the authors point out:

“However, 1.6 g/kg/day should not be viewed as an ironclad or universal limit beyond which protein intake will be either wasted or used for physiological demands aside from muscle growth.”

In addition:

“This reinforces the practical need to individualize dietary programming, and remain open to exceeding estimated averages.”

Before leaving this paper, though, I would like to highlight a quote that also emphasizes the need for protein intake to serve needs beyond muscle, with emphasis on the gut:

“It...can be speculated that some if not much of anti-catabolic benefits associated with higher protein intake was from tissues other than muscle, likely the gut.”

SOME CONCLUDING THOUGHTS

I realize that what I have been suggesting in this newsletter and the last two newsletters goes directly against powerful, decades-long dogma that suggests there is much to fear about exceeding the generally accepted minimum daily protein intake amount of 0.8 g/kg/day, starting with risks for kidney damage and so much more. However, current research has made it abundantly clear that the amount of daily protein intake that creates a clear risk for adverse health effects is, for most individuals, way beyond even double the usual amount mentioned above. Why? Probably the most important, under-appreciated reason is that muscle, which, traditionally, was the only consideration in determining daily protein requirements, in reality accounts for less than half of the total protein need. Therefore, given that I would guess that the vast majority of your patients, at the very least, need to increase muscle mass and function, restore gut lining integrity, and so much more in terms of protein-based anabolic responses, 0.8 g/kg/day simply will not get the job done. Based on the research performed over the last five years or so, I would suggest that at least 1.2 g/kg/day is going to be needed if you want to optimize total body anabolic responses and, for many patients, 1.6 g/kg/day or more may be needed.

FOUNDATIONAL PROTEIN/AMINO ACID-BASED PRODUCTS AVAILABLE FROM MOSS NUTRITION

Proteins

SarcoSelect (Whey)

SarcoSelect DF (Pea protein)

Select Meal Vanilla (Whey)

Select Meal Chocolate (Whey)

Select Meal DF Vanilla (Pea protein)

Select Meal DF Chocolate (Pea protein)

Select Whey Unflavored

Select Whey Vanilla

Select Whey Chocolate

Organic Select Pea Unflavored

Organic Select Pea Vanilla

Amino acids

Amino Acid Select

L-Leucine

