

# Protein 101

**WRITTEN BY DR. SOPHIE POLLON-MACLEOD, BSC, ND , CISSN**

Protein is an essential building block for human life. It is involved in vital biochemical processes occurring 24/7 in the body and is particularly important for growth, development, and tissue repair.

**As we age, protein is critical to preserving muscle mass and strength, and it can also increase metabolism to lose excess weight.**

We require this macronutrient in relatively large quantities, but many Canadians fall below the mark in its consumption.

## AGING AND LOSS OF MUSCLE MASS

One of the most striking effects of aging is sarcopenia- the involuntary loss of muscle mass, strength, and function. **Muscle mass decreases approximately 3-8% per decade after the age of 30; this rate of decline is even higher after the age of 60** [1] [2]. As we age there is a reduction in muscle protein synthesis due to biochemical and metabolic changes [3], making sarcopenia a multifactorial condition. Regardless of the reasoning behind this loss of muscle mass, it is important to ensure protein consumption increases with age to offset the effects of sarcopenia.



## PROTEIN AND WEIGHT LOSS

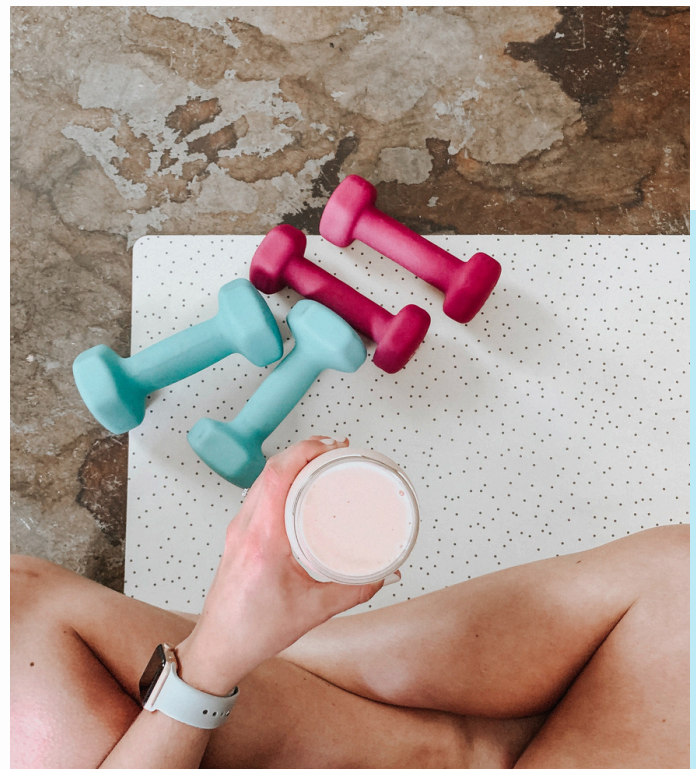
Higher protein diets have been a successful strategy to aid in weight loss. The rationale is likely because of changes in energy metabolism, appetite and satiety that occur when protein consumption increases [4].

**Studies on higher protein diets have shown greater weight loss**, fat mass loss and preservation of lean mass when compared to low protein diets [5]. Caloric restriction weight loss programs are another popular method for weight loss; however, these can result in muscle mass reduction and a decreased basal metabolic rate, contributing to difficulty sustaining weight loss [6].



### Important Factors Influencing Muscle Mass

- Resistance training
- Nutrition
- Hormones
  - *testosterone*
  - *thyroid*
  - *insulin*
- Sleep
- Hydration
- Stress



# The Three T's of Protein:

Type, Time, Total [7]

## Type

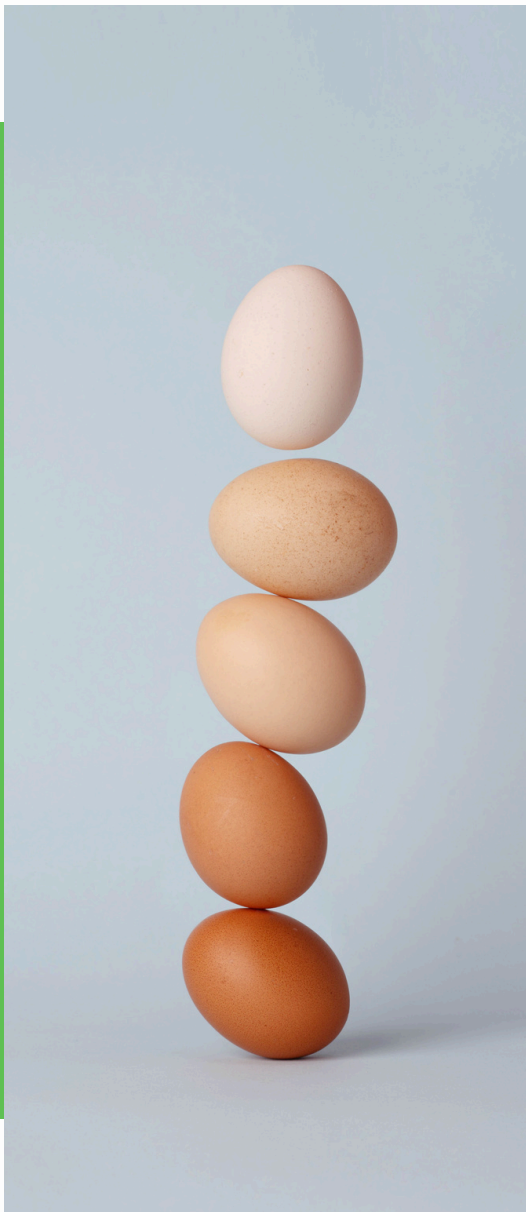
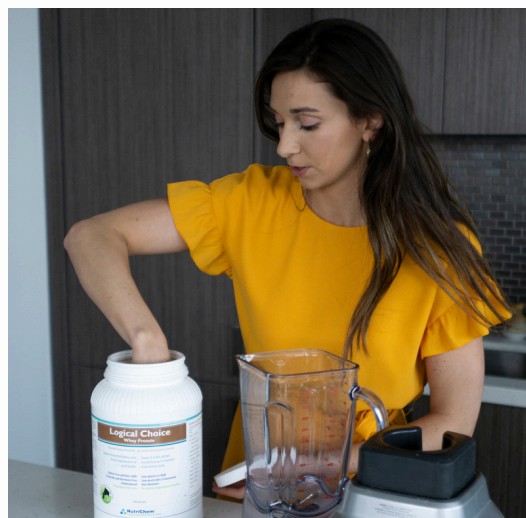
- Plant and animal proteins are not created equally when it comes to amino acid content and digestibility. There are nine amino acids considered to be essential that must be obtained through our diet. Of these essential amino acids, **leucine appears to have the most influence on muscle protein synthesis.**
- When consuming a plant based diet choose a variety of plant proteins to ensure you are obtaining all 9 essential amino acids.
- **When choosing a protein powder, to optimize muscle protein synthesis ensure it contains a minimum of 1-3g of leucine per serving.**

## Time [8] [9]

- Timing is crucial to ensure your body gets the full benefit of the protein you are consuming.
- **Protein consumption should be spaced evenly throughout the day, every 3-4 hours,** to maximize muscle protein synthesis.
- A post exercise meal containing protein should be consumed be within 2-4 hours.
- Consuming a light protein snack prior to sleep improves overnight muscle protein synthesis, and may help reach overall daily protein targets.

## Total

- The total protein you consume in a day needs to be enough to increase muscle mass and support metabolic function.
- To maximize muscle protein synthesis, **daily protein intakes should be:**
  - **~1.6g/kg body weight per day up to 2.2g/kg/day.**
  - each meal should contain 3-4 servings (~21-28 grams) of protein or 0.3-0.5 g/kg body weight per serving
- the exact value will depend on age, sex & activity level





## How to Calculate your individualized Daily Protein Requirements:

### Step 1: Determine your approximate activity level

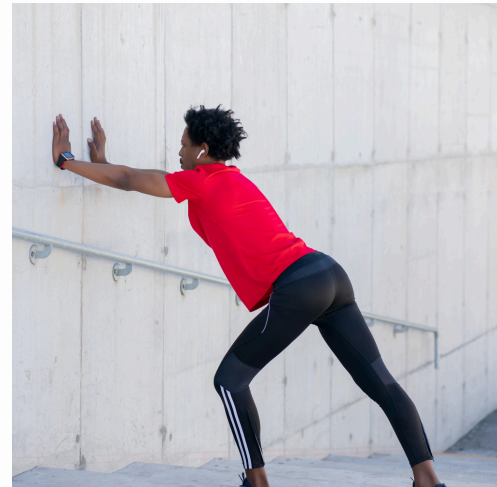
- Minimal/light activity :exercise 0-1 x per week
- Moderate activity : 2-3 x per week
- Highly active 4-6 x per week

### Step 2: Utilize weight and goals to determine approximate protein requirement

- Minimal/light activity : 1 g/kg/ day
- Moderate activity : 1.1-1.4 g/kg/day
- Highly active : 1.4 -2 g/kg/day

**NOTE: If you are trying to lose weight and build lean muscle mass, you will be at the higher end of the reference range > for example for someone trying to lose weight but is moderately active - they might choose 1.3-1.4 g/kg/day.**

*NOTE: increasing age> also a greater protein requirement*



### Step 3: Calculate weight in Kg

- Divide weight in pounds by 2.2 to calculate approx weight in kg.
- For example:  $150\text{lb} / 2.2 = 68\text{ kg}$

### Step 4: Calculate your daily protein requirement based on weight, activity level & goals:

Example 1: Anna exercises 3 x per week and weights 150 lb (68 kg)

- She is trying to build muscle and lose weight Moderate activity level.
- $68\text{ kg} \times 1.3\text{g/kg/day} = 88\text{ grams of protein daily}$
- ~ 25-30 grams per meal



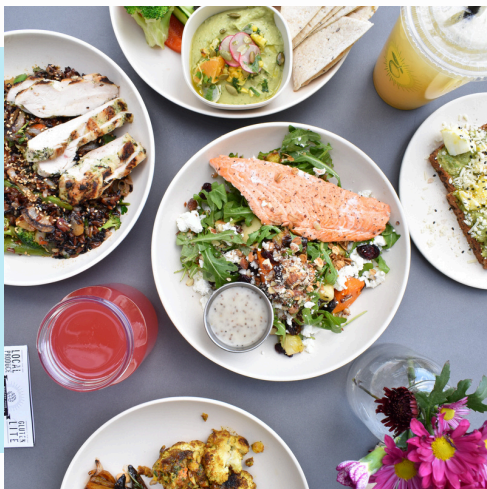
# Common Protein FAQ

## Are there risks associated with consuming higher amounts of protein?

- The research on protein focused diets has consistently reported an absence of any harm or detriment to kidney function in healthy, active individuals. In fact, the WHO released a statement citing the lack of evidence regarding protein intake and renal disease in a healthy population. However, individuals with kidney disease or renal failure will benefit from a protein restricted diet.

## What's the best protein source?

- one that contains all essential amino acids and is easily digestible
  - eggs are a great example.
- something you enjoy eating!



## Is protein powder still viable as a protein source if it is cooked/baked?

- yep! There is no problem with baking or cooking with protein powder.

Protein packed goodies are a great way to increase protein content snacks!

## What are factors that increase my protein requirement?

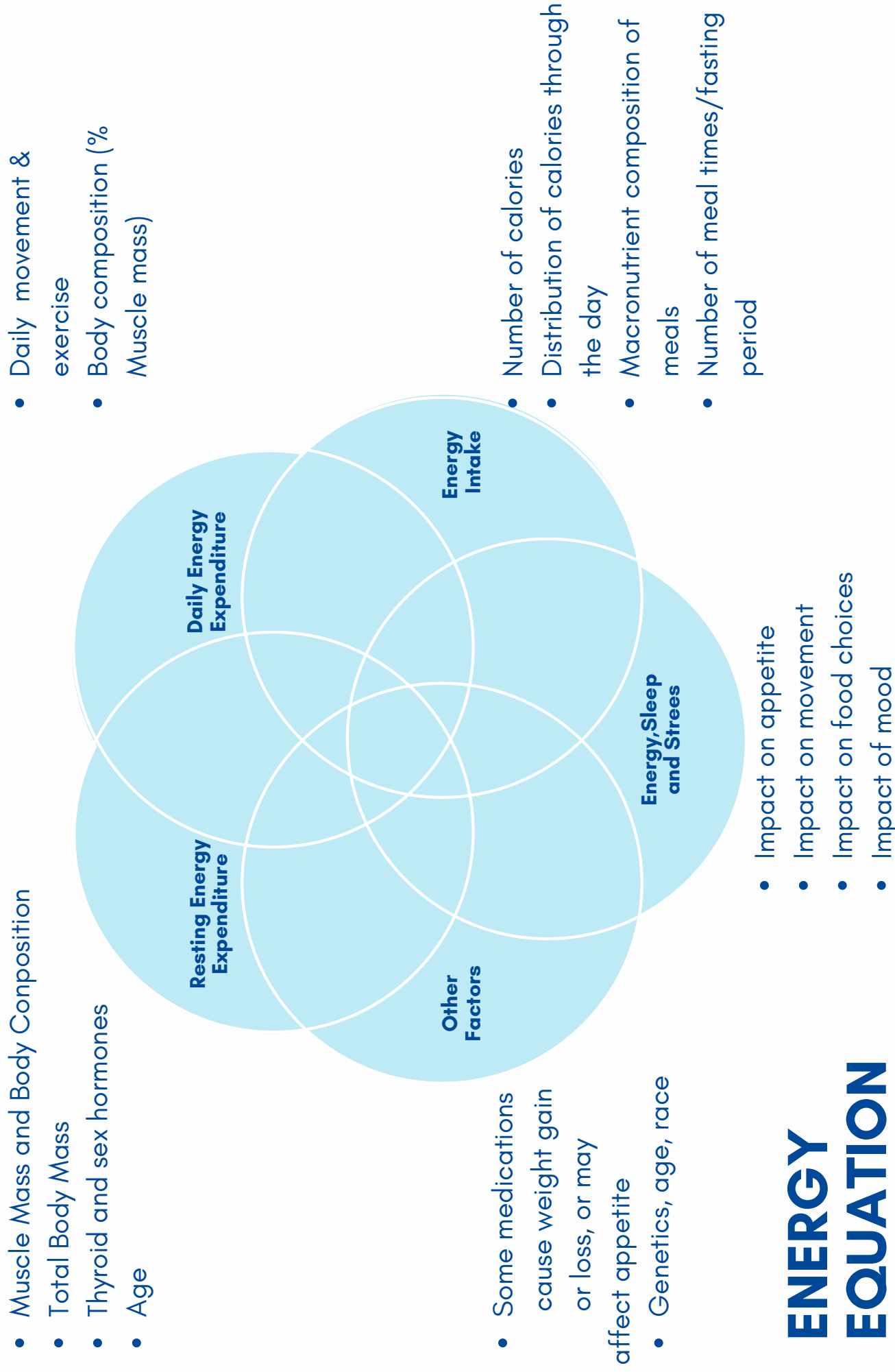
- activity level
- age
- energy intake

<b>MEAT</b>	<b>1 chicken breast</b> <b>2 chicken thighs</b> <b>3 oz steak</b> <b>1/3 cup ground beef</b> <b>1/2 cup ground pork</b> <b>82 g turkey bacon</b>
<b>FISH</b>	<b>3 oz atlantic salmon</b> <b>3 oz tuna</b> <b>3 oz shrimp</b> <b>3 oz haddock</b>
<b>DAIRY</b>	<b>3-4 eggs (~ 6 grams per egg)</b> <b>3/4 cup greek Yogurt</b> <b>1/3 cup Skyr yogurt</b> <b>1 cup cottage cheese</b> <b>1 scoop logical choice whey protein</b>
<b>PLANT PROTEINS</b>	<b>3/4 can chickpeas</b> <b>1 cup cooked lentils</b> <b>1 cup black beans</b> <b>1 cup hummus</b> <b>1 cup edamame</b> <b>2 cups green peas</b>
<b>SOY PROTEIN</b>	<b>1 cup tofu</b> <b>3/4 cup tempeh</b> <b>2 cup soy milk</b>

**FOR 10 GRAMS PROTEIN**

<b>WHOLE GRAINS</b>	<b>1 cup quinoa</b> <b>1/2-1 cup chickpea pasta</b> <b>1 cups kamut</b> <b>2 cup brown rice</b> <b>3/4 cup steel cut oats</b> <b>1 cup quick oats</b>
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<b>SOY PROTEIN</b>	<b>1 cup tofu 3/4 cup tempeh 2 cup soy milk</b>
<b>NUTS/ SEEDS</b>	<b>6 tbs chia seeds 4-5 tbs hemp hearts 1 cup pumpkin seed (12 GRAMS protein) 2 tbs nut butter 3/4 cup almonds 2 energy balls</b>



# ENERGY EQUATION

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## References

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