

Eat Real Food

Protein History

Longitudinal Studies

My thoughts

# Proteinology



**Elaine Chong**

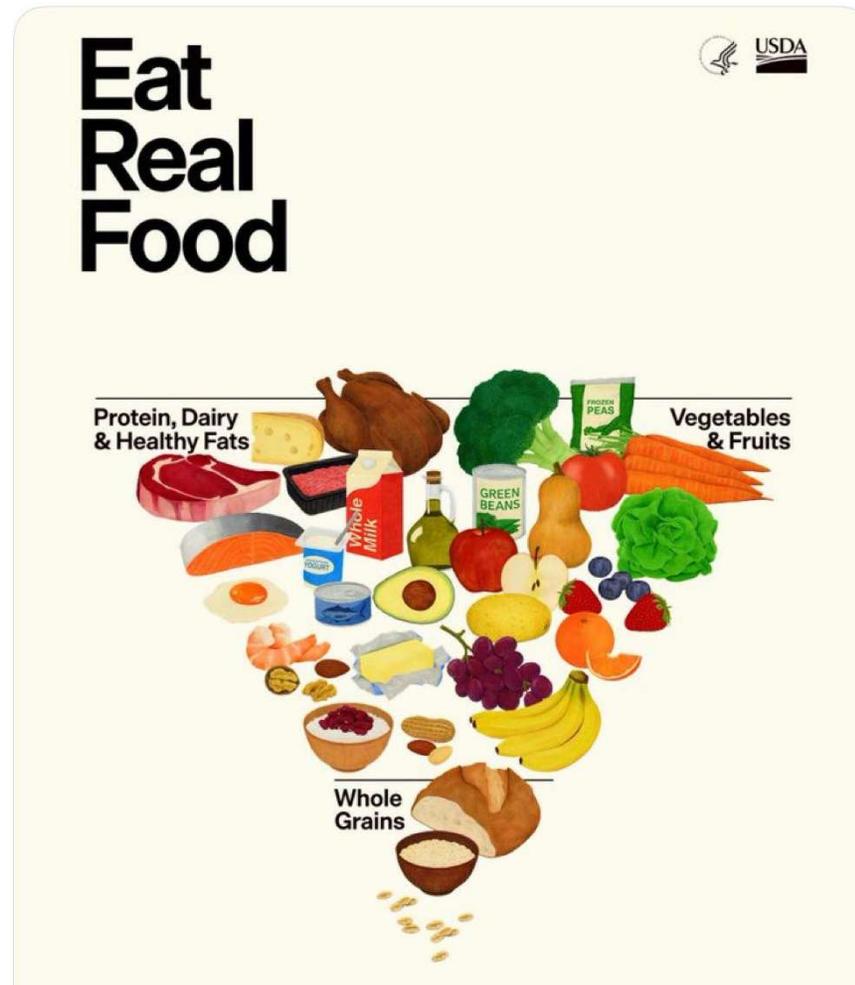
*Metabolic & Gut Health Dietitian | Health Coach*

*Monash FODMAP Trained*

*Nerva Practitioner*

# Eat Real Food

7<sup>th</sup> January 2026



<https://realfood.gov/>

# Eat Real Food



## Prioritize Protein Foods at Every Meal

- + Prioritize high-quality, nutrient-dense protein foods as part of a healthy dietary pattern.
- + Consume a variety of protein foods from animal sources, including eggs, poultry, seafood, and red meat, as well as a variety of plant-sourced protein foods, including beans, peas, lentils, legumes, nuts, seeds, and soy.
- + Swap deep-fried cooking methods with baked, broiled, roasted, stir-fried, or grilled cooking methods.
- + Consume meat with no or limited added sugars, refined carbohydrates or starches, or chemical additives. If preferred, flavor with salt, spices, and herbs.
- + Protein serving goals: 1.2–1.6 grams of protein per kilogram of body weight per day, adjusting as needed based on your individual caloric requirements.



## Eat Vegetables & Fruits Throughout the Day

- + Eat a variety of colorful, nutrient-dense vegetables and fruits.
- + Eat whole vegetables and fruits in their original form. Wash thoroughly prior to eating raw or cooking.
- + Frozen, dried, or canned vegetables or fruits with no or very limited added sugars can also be good options.
- + If preferred, flavor with salt, spices, and herbs.
- + 100% fruit or vegetable juice should be consumed in limited portions or diluted with water.
- + Vegetables and fruits serving goals for a 2,000-calorie dietary pattern, adjusting as needed based on your individual caloric requirements:
  - Vegetables: 3 servings per day
  - Fruits: 2 servings per day



## Focus on Whole Grains

- + Prioritize fiber-rich whole grains.
- + Significantly reduce the consumption of highly processed, refined carbohydrates, such as white bread, ready-to-eat or packaged breakfast options, flour tortillas, and crackers.
- + Whole grains serving goals: 2–4 servings per day, adjusting as needed based on your individual caloric requirements.



## Consume Dairy

- + When consuming dairy, include full-fat dairy with no added sugars. Dairy is an excellent source of protein, healthy fats, vitamins, and minerals.
- + Dairy serving goals: 3 servings per day as part of a 2,000-calorie dietary pattern, adjusting as needed based on your individual caloric requirements.

## Gut Health

- + Your gut contains trillions of bacteria and other microorganisms called the microbiome. A healthy diet supports a well-balanced microbiome and healthy digestion. Highly processed foods can disrupt this balance, while vegetables, fruits, fermented foods (e.g., sauerkraut, kimchi, kefir, miso), and high-fiber foods support a diverse microbiome, which may be beneficial for health.



## Incorporate Healthy Fats

- + Healthy fats are plentiful in many whole foods, such as meats, poultry, eggs, omega-3-rich seafood, nuts, seeds, full-fat dairy, olives, and avocados.
- + When cooking with or adding fats to meals, prioritize oils with essential fatty acids, such as olive oil. Other options can include butter or beef tallow.
- + In general, saturated fat consumption should not exceed 10% of total daily calories. Significantly limiting highly processed foods will help meet this goal. More high-quality research is needed to determine which types of dietary fats best support long-term health.

# Eat Real Food

Red Meat

Protein: 1.2 – 1.6g per kg/day

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<https://cdn.realfood.gov/DGA.pdf>

Less Vegetables servings per day

Saturated Fat less than 10% total calories

Healthy Fat definition

## Eat Real Food

70 kg,  
BMI within healthy range  
Sedentary lifestyle  
Minimal exercise



Daily Servings by Calorie Level

Food Group	Calorie Level of Pattern Serving Size Examples	1000	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	3200
<b>Protein Foods</b>	3 oz cooked meat, poultry, or seafood; 1 egg; ½ cup beans, peas, or lentils; 1 oz nuts or seeds; 2 tbsp nut or seed butter; 3 oz soy	1–1 ½	1 ½–2	2–2 ½	2 ½–3 ½	2 ½–3 ½	3–4	3 ½–4 ½	3 ½–4 ½	3 ½–4 ½	4–5	4–5	4–5
<b>Dairy</b>	1 cup milk; ¾ cup yogurt; 1 oz cheese	2	2 ½	2 ½	3	3	3	3	3	3	3	3	3
<b>Vegetables</b>	1 cup raw or cooked; 2 cups leafy greens	1 ¼	1 ¾	1 ¾	2 ½	3	3	3 ½	3 ½	4 ¼	4 ¼	4 ¾	4 ¾
<b>Fruits</b>	1 cup raw; ½ cup dried	1	1	1 ½	1 ½	1 ½	2	2	2	2	2 ½	2 ½	2 ½
<b>Whole Grains</b>	½ cup cooked oats, brown rice, barley, quinoa, or buckwheat; 1 slice bread; 1 tortilla	1–2	1 ½–2 ¾	1 ¾–3 ¼	1 ¾–3 ¼	2–4	2–4	2 ¼–4 ½	2 ¾–5 ¼	3–6	3 ¼–6 ½	3 ¼–6 ½	3 ¼–6 ½
<b>Healthy Fats</b>	1 tsp olive oil or butter	2 ½	2 ½	2 ½	3 ½	4	4 ½	4 ½	5	5 ½	6	7	8

<https://cdn.realfood.gov/Daily%20Serving%20Sizes.pdf>

## Dietary Requirements

- Eat Real food = **Limit ultra-processed food**
- Daily protein intake: **84 – 112g** (based on 1.2 -1.6 g/kg)
- Embrace ‘Natural’ healthy fat = **saturated fat is fine** as long as it is part of a whole food
- Aim for total Saturated Fat ≤ 10% of calories intake = **Less than 20g saturated fat a day**
- Gut Health = **A variety of colourful plant food**

## Eat Real Food



### 90g cooked Sirloin Steak

Protein 27 g  
Saturated Fat 6 g



### 1 size 7 poached egg

Protein 7 g  
Saturated Fat 1.7 g



### 50g Edamame

Protein 6.5 g  
Saturated Fat 1.3 g  
Fiber: 2.5 g



### 30g mixed nuts

Protein 4.7 g  
Saturated Fat 1.7 g  
Fibre 2.4g

### 3 ½ servings of Protein

Protein 45.2 g  
Saturated Fat 10.7 g  
Fibre 4.9 g



### 1 cup Full-Fat milk

Protein 8.3 g  
Saturated Fat 5.6 g



### ¾ cup Greek Yoghurt

Protein 9.5 g  
Saturated Fat 7 g



### 30g Grated Cheese

Protein 7.4 g  
Saturated Fat 6.9 g

### 3 servings of Dairy

Protein 25.2 g  
Saturated Fat 19.5 g  
Fibre 0 g

### 4 Servings of Healthy Fat



4 tsp Butter  
Protein 0 g  
Saturated Fat 11.2 g



4 tsp Beef Tallow  
Protein 0 g  
Saturated Fat 29.2 g

## Eat Real Food



### 1 slice Burgen Bread

Protein 6 g  
Saturated Fat 0.4 g  
Fibre 1.8 g



### ½ cup Wholegrain Oat

Protein 5.6 g  
Saturated Fat 0.5 g  
Fibre 4.8 g



### ½ cup brown rice

Protein 4.5 g  
Saturated Fat 0.8 g  
Fibre 4.0 g

### 3 servings of Wholegrains

Protein 16.1 g  
Saturated Fat 1.7 g  
Fibre 10.6g



### ½ Avocado

Protein 0g  
Saturated Fat 2g  
Fibre 5g



### 1 medium Apple

Protein 0g  
Saturated Fat 0g  
Fibre 4g

### 2 servings of Fruit

Protein 0g  
Saturated Fat 2 g  
Fibre 9 g

## Eat Real Food



### 1 cup leafy green

Protein 0.5g  
Saturated Fat 0g  
Fibre 1.3g



### 1/2 cup cherry tomatoes

Protein 0.6g  
Saturated Fat 0g  
Fibre 1g



### 1/2 cup red onions

Protein 0.5g  
Saturated Fat 0g  
Fibre 1g



### 1/2 cup peas & corn

Protein 3.8g  
Saturated Fat 0g  
Fibre 3.6g



### 1/2 cup broccoli

Protein 1.8g  
Saturated Fat 0g  
Fibre 1.8 g



### 1/2 cup carrots

Protein 1g  
Saturated Fat 0g  
Fibre 1.8 g

## 3 servings of Vegetables

Protein 8.2g  
Saturated Fat 0g  
Fibre 10.5 g

# Eat Real Food



## 3 ½ servings of Protein

Protein 45.2 g  
Saturated Fat 10.7 g  
Fibre 4.9 g



## 3 servings of Dairy

Protein 25.2 g  
Saturated Fat 19.5 g  
Fibre 0 g



## 3 servings Vegetables

Protein 8.2g  
Saturated Fat 0g  
Fibre 10.5 g



## 4 servings of Healthy Fat

Protein 0g  
Saturated Fat 11.2g  
Fibre 0 g



## 2 servings of Fruit

Protein 0g  
Saturated Fat 2 g  
Fibre 9 g



## 3 servings of Wholegrains

Protein 16 g  
Saturated Fat 1.65 g  
Fibre 10.6 g

## Eat Real Food

70 kg,  
BMI within healthy range  
Sedentary lifestyle  
Minimal exercise

**1800 kcal**  
Protein 94.6 g  
**Saturated Fat 45 g**  
Fibre 35 g



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- Gut Health = **A variety of colourful plant food**

# From the beginning in Mid -1800's



- 1838
  - Gerardus Johannes Mulder described it as *“without doubt the most important of the known substances in living matter, and without them life would be impossible on our planet.”*
  - Jöns Jacob Berzelius named it protein.



- 1840's Justus Von Liebig
  - Classified the 3 macronutrients; carbohydrate, protein and fat.
  - Called protein 'the only true nutrient' due to its vital role in tissue building and muscle growth.



- 1880's - earliest Dietary recommendation for protein by Carl von Voit
  - Around 100g/day for a sedentary adult.
  - Around 110g/day for a hard-working man.
  - Recommended levels were based on Carl's belief that
    - Protein is for muscle building. More protein means more power.
    - Rich people eat more meat.
- This recommendation was later debunked by physiologist Russell Henry Chittenden in 1904.



## Post-World War 2

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The Protein Gap: The Rise and Fall of a Charismatic Nutrient in  
International Public Health

HANNAH F. LEBLANC

- The Protein GAP
  - Protein Malnutrition and fight world hunger in underdeveloped countries.
  - Dairy, meat and egg are seen as superior or rich-man food.
  - Body Building - protein powder and supplements.

- Landmark Studies



Dr. Thomas Dawber (1913-2005)  
Lead researcher for Framingham Study



**Framingham Heart Study**

Three Generations of Dedication

<https://www.framinghamheartstudy.org/>



Dr. Ancel Keys (1904 – 2004)  
Lead Researcher (1958)

**7**  
*Seven Countries Study*

<https://www.sevencountriesstudy.com/>