

# PROTEIN IN PERSPECTIVE: **vegetables (+)**

Vegetables, mushrooms, and fruit contribute valuable vitamins, minerals, and fiber to the diet. However, the unfortunate reality is that these items are relatively low in protein, and the amount of protein they contribute to the diet, particularly when carb limitations are in place, is typically quite minimal. The aim of the data given here is twofold: 1) to provide guidance for those who wish to maximize their protein intake from vegetables, mushrooms, and avocados, and 2) to put into perspective the extent to which the aforementioned items contribute to meeting a person's overall protein requirement on a ketogenic diet.

Items are categorized from highest to lowest **protein to net carb (PRO:NC)** ratio. Those wishing to maximize their protein intake from vegetable (+) sources while minimizing their net carb intake should put attention towards consuming greater quantities of the items in Categories 1 and 2. Those with a higher carb limit may also wish to capitalize on the higher protein per 100g items in Category 3.

For ease of use, most protein and net carb data has been rounded to the nearest 0.5 grams. Non-rounded net carb values can be found in the food list, which is available on the resource page of the website.

FOOD ITEM	MACROS		PRACTICAL MEASUREMENTS 🍴
	PER 100 GRAMS PRO (g)	PER 100 GRAMS NC (g)	
<b>CATEGORY 1 (P:NC RATIO 2+)</b>			
alfalfa sprouts (20)	4	0.2	2 1/3 cups
basil (3)	3	1	2 1/3 cups
beet greens (3.5)	2	0.5	2 2/3 cups
broccolini (3) <sup>US</sup>	3.5	1	1 1/4 cups - 8 stalks
broccoli raab (23)	3	0.1	2 1/2 cups - 5 stalks
cilantro (2.5)	2	2	5 cups
collards (2)	3	1.5	2 3/4 cups
kale (13) 🍴	3	0.2	3 1/3 cups
mushrooms, straw (2) (canned)	4	2	1/2 cup - 18 'shrooms
mushrooms, white (2)	3	1.5	1 1/4 cups - 5 'shrooms
spinach (2)	3	1.5	3 1/3 cups
<b>CATEGORY 2 (P:NC RATIO 1 TO 1.9)</b>			
arugula	2.5	2	3 1/3 cups
asparagus	2	1.5	3/4 cup - 6 spears
avocado	2	2	3/4 avocado
Belgian endive	1	1	2 heads
bok choy	1.5	1	1 2/3 cups - 1 baby head
heart of palm	2.5	2	3/4 cup - 3 hearts
lettuce, most types	1	1	3 1/3 cups
mushrooms, portabella	2	2	1 1/4 'shroom
parsley	3	3	2 cups
Tenderstem broccoli <sup>UK</sup>	4	2.5	1 1/4 cups - 8 stalks

FOOD ITEM	MACROS		PRACTICAL MEASUREMENTS 🍴
	PER 100 GRAMS PRO (g)	PER 100 GRAMS NC (g)	
<b>CATEGORY 3 (P:NC RATIO 0.5 TO 0.9)</b>			
bean sprouts (mung)	3	4	1 3/4 cups
broccoli	3	4	1 cup - 1/3 crown
Brussels sprouts	3.5	5	1 1/4 cups - 5 sprouts
cabbage, napa	1	2	1 1/4 cups
cauliflower	2	3	3/4 cup
celery	0.5	1	2 cups - 2 1/2 stalks
chard	2	2	3 1/3 cups
kale 🍴	4.5	5	3 1/3 cups
lettuce, iceberg	1	2	1 3/4 cups
mushrooms, brown	2.5	3	1 1/4 cups - 5 'shrooms
mushrooms, shiitake	2	4.5	2 cups
okra	2	4	1 cup - 8 pods
snow peas	3	5	1 cup - 29 pods
zucchini	1	2	3/4 cup - 1/2 zucchini
<b>CATEGORY 4 (P:NC RATIO 0.1 TO 0.4)</b>			
beets	1.5	6.5	3/4 cup - 1 1/4 beets
bell pepper, green	1	3	3/4 cup - 3/4 pepper
bell pepper, red	1	2.5	3/4 cup - 3/4 pepper
bell pepper, yellow	1	5.5	3/4 cup - 3/4 pepper
cabbage, red	1.5	5.5	1 1/3 cups
cabbage, white	1.5	3.5	1 1/3 cups
carrot	1	6.5	3/4 cup - 1 1/2 carrots
eggplant	1	3	1 cup - 1/4 eggplant
fennel	1	4	1 1/4 cups - 1/2 bulb
green beans	2	4	3/4 cup - 18 beans
green onions	2	4.5	1 2/3 cups - 7 stalks
jicama	0.5	4	3/4 cup
onion	1	7.5	3/4 cup - 1 onion
pumpkin	1	6	3/4 cup
radishes, garden	0.5	1.5	3/4 cup - 12 radishes
tomatoes	1	2.5	1/2 cup - 3/4 tomato
turnips	1	4.5	3/4 cup - 3/4 turnip

## NOTES & TIPS 🍴

Practical measurements are based on the gram measurements and are approximate. Cup measurements are for cut pieces with the exception of alfalfa and bean sprouts. Whole food items are "medium-sized" items. For the most part, both cup and whole food item measurements are derived from USDA (United States Food & Drug Administration) data and, given the wide range of possible food item sizes, may differ substantially from the size of items you have available to you.

Kale underwent a nutritional transformation in 2019 when the USDA made changes to its database.

The color coding in the **net carb** columns corresponds with the **EAT... IN abundance/IN moderation/sparingly** categories in the food list.