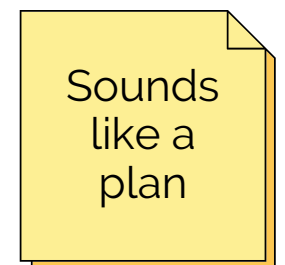
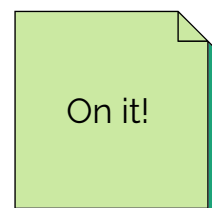
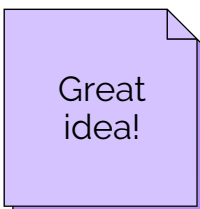


Group 12

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OR LAB PROJECT

Nutritional Diet Plan



This presentation is optimized for whiteboard use

Let's get started

The Diet Problem

- The goal of the diet problem is to select a set of foods that will satisfy a set of daily nutritional requirement at minimum cost.
- The problem is formulated as a linear program where the objective is to minimize cost and the constraints are to satisfy the specified nutritional requirements.
- The diet problem constraints typically regulate the number of calories and the amount of vitamins, minerals, fats, sodium, and cholesterol in the diet.

Cholestrol

Total_Fat

Calcium

Iron

Vitamin C

Vitamin A

Proteins

Calories

PROBLEM STATEMENT

GIVEN A SET OF FOODS, ALONG WITH THE NUTRIENT INFORMATION FOR EACH FOOD AND THE COST PER SERVING OF EACH FOOD.

THE OBJECTIVE OF THE DIET PROBLEM IS TO SELECT THE NUMBER OF SERVINGS OF EACH FOOD TO PURCHASE (AND CONSUME) SO AS TO **MINIMIZE** THE COST OF THE FOOD WHILE MEETING THE SPECIFIED NUTRITIONAL REQUIREMENTS.

Food Selection Menu

- Frozen Broccoli
- Carrots, Raw
- Celery, Raw
- Frozen Corn
- Lettuce, Iceberg,Raw
- Peppers, Sweet, Raw
- Potatoes, Baked
- Tofu
- Roasted Chicken
- Spaghetti W/ Sauce
- Tomato,Red,Ripe,Raw
- Apple, Raw, w/Skin
- Banana
- Grapes
- Kiwifruit, Raw, Fresh
- Oranges
- Bagels
- Wheat Bread
- White Bread
- Oatmeal Cookies
- Apple Pie

- Chocolate Chip Cookies
- Butter, Regular
- Cheddar Cheese
- 3.3% Fat, Whole Milk
- 2% Lowfat Milk
- Skim Milk
- Poached Eggs
- Scrambled Eggs
- Bologna, Turkey
- Frankfurter, Beef
- Ham, Sliced, Extralean
- Kielbasa, Pork
- Cap'N Crunch
- Cheerios
- Corn Flakes, Kellogg'S
- Raisin Bran, Kellogg'S

- Rice Krispies
- Special K
- Oatmeal
- Malt-O-Meal, Choc
- Pizza w/Pepperoni
- Taco
- Hamburger w/Toppings
- Hotdog, Plain
- Couscous
- White Rice
- Macaroni, cooked
- Peanut Butter
- Pork
- Sardines in Oil
- White Tuna in Water
- Popcorn, Air-Popped
- Potato Chips, BBQ
- Pretzels
- Tortilla Chips

- Chicken Noodle Soup
- Splt Pea&Ham Soup
- Veggie Beef Soup
- New Eng Clam Chwd
- Tomato Soup
- New Eng Clam Chwd, w/MLk
- Crm Mshrm Soup, w/MLk
- Bean Bacon Soup, w/Watr

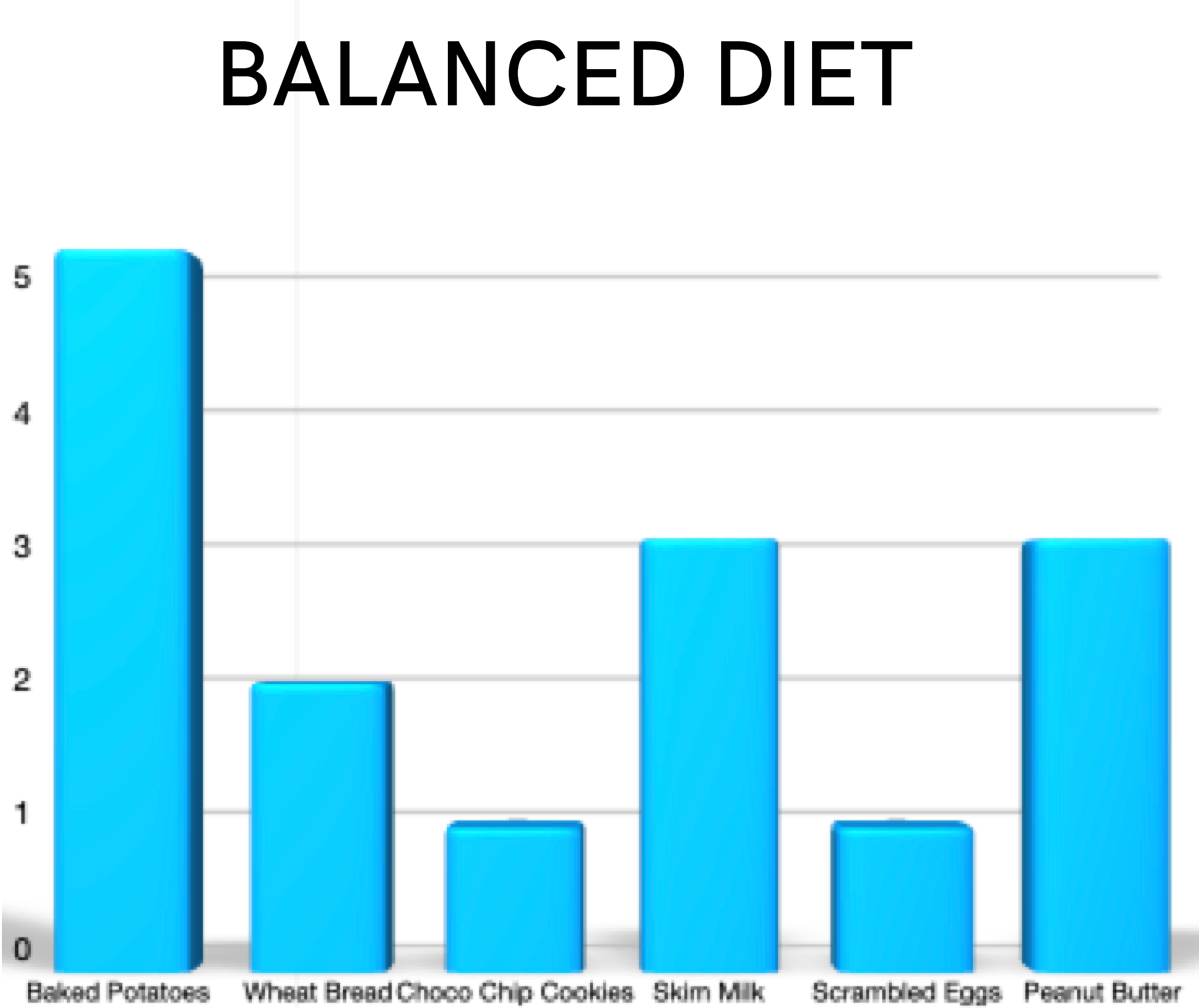
Nutritional Requirements for Different Diseases

Nutritional values	BALANCED DIET	ANAEMIA (IRON DEFICIENCY)	OBESITY	VITAMIN C DEFICIENCY (SCURVY)
CALORIES (CAL)	2000-2500	2000-2500	1500-2000	2000-3000
CHOLESTEROL (MG)	0-20	0-20	0-20	0-100
TOTAL_FAT (G)	0-20	0-20	0-20	2-50
SODIUM (MG)	1000-2000	1000-2000	1000-2000	1000-2000
CARBOHYDRATES (G)	200-400	200-400	200-400	225-325
DIETARY_FIBER (G)	20-40	20-40	20-40	20-40
PROTEIN (G)	100-200	100-200	100-150	100-150
VIT_A (IU)	2000-3000	2000-3000	2000-3000	2000-3000
VIT_C (IU)	50-20000	50-20000	50-20000	500-20000
CALCIUM (MG)	500-2000	500-2000	500-2000	1000-2000
IRON (MG)	20-30	25-50	20-20	15-20

FEATURES OF CODE

DECISION VARIABLE	NUMBER OF SERVINGS.
NUMBER OF CONSTRAINTS	19
NUMBER OF VARIABLES	NUMBER OF FOOD ITEMS ((SUBJECT TO CHANGE)
CHECKBOX	BASED ON AVAILABILITY OF FOOD ITEMS FOR A USER DEPENDING ON CHOICES

NUTRITIONAL VALUES	
CALORIES	2000-2500
CHOLESTEROL	0-20
TOTAL FAT	0-20
SODIUM	1000-2000
CARBOHYDRATES	200-400
DIETARY FIBER	20-40
PROTEIN	100-200
VITAMIN A	2000-3000
VITAMIN C	50-20000
CALCIUM	500-2000
IRON	20-30

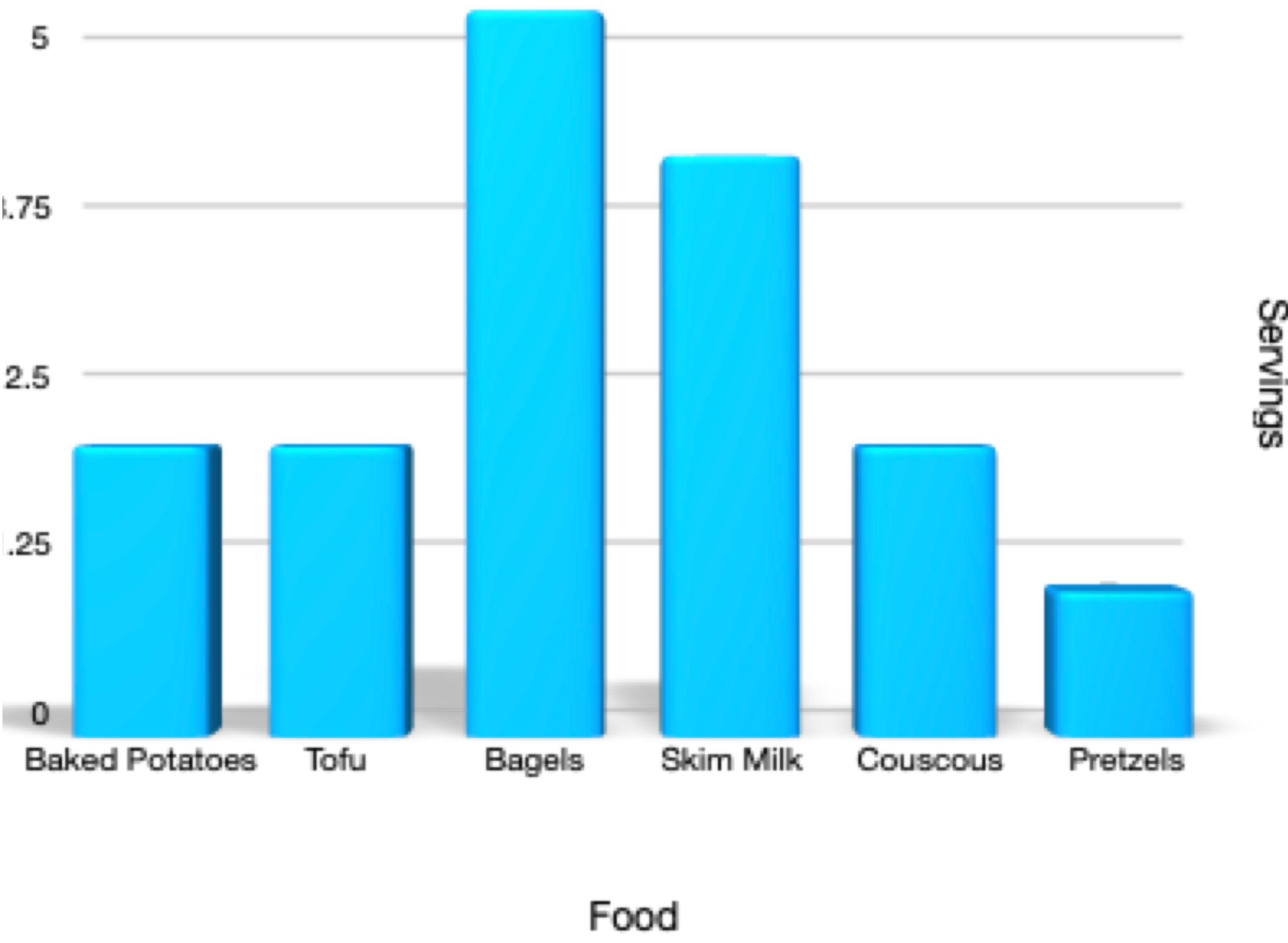


Nutritional Values	
Calories	2000-2500
Cholesterol	0-20
Total Fat	0-20
Sodium	1000-2000
Carbohydrates	200-400
Dietary Fiber	20-40
Protein	100-200
Vitamin A	2000-3000
Vitamin C	50-20000
Calcium	500-2000
Iron	30-50

Fact:
Tofu is considered to be one of the top sources of iron

ANAEMIA

Ideal Diet for Anaemia

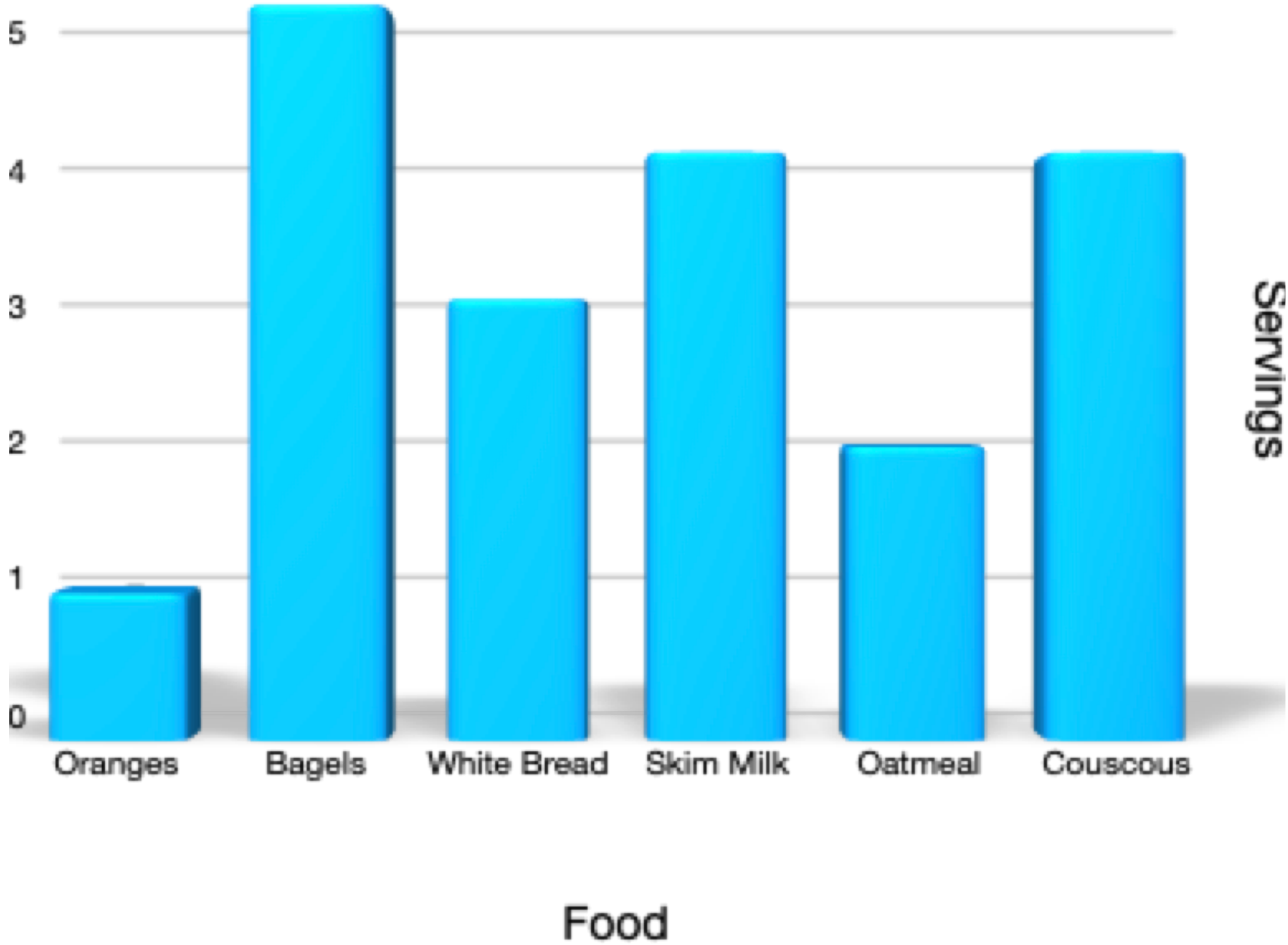


NUTRITIONAL VALUES

CALORIES	1500-2000
CHOLESTEROL	0-20
TOTAL FAT	0-20
SODIUM	1000-2000
CARBOHYDRATES	200-400
DIETARY FIBER	20-40
PROTEIN	100-150
VITAMIN A	2000-3000
VITAMIN C	50-20000
CALCIUM	500-2000
IRON	20-20

OBESITY

Ideal Diet for Obesity

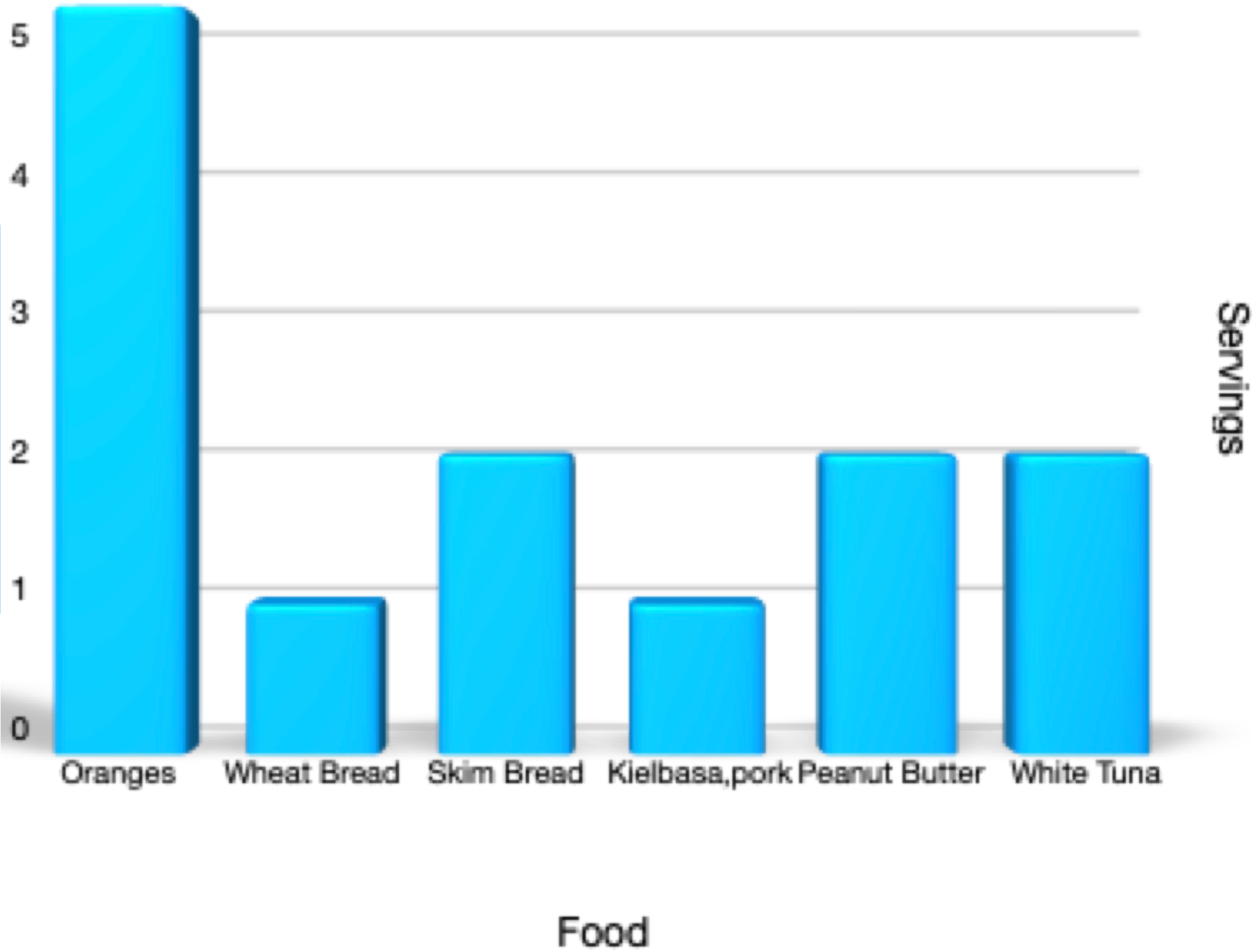


NUTRITIONAL VALUES	
CALORIES	2000-3000
CHOLESTEROL	0-100
TOTAL FAT	2-50
SODIUM	1000-2000
CARBOHYDRATES	225-325
DIETARY FIBER	20-40
PROTEIN	100-150
VITAMIN A	2000-3000
VITAMIN C	500-20000
CALCIUM	1000-2000
IRON	15-20

FACT
1 Orange contains
about 70 mg of
Vitamin C,
thus making it one
of the top sources
of Vitamin C

SCURVY

Ideal Diet for Scurvy



References

- The Diet Problem(DATA) -
<https://data.nal.usda.gov/dataset/fooddatacentral>
- The Diet Problem(IDEA): A WWW-based Interactive Case Study in Linear Programming - Mathematics and Computer Science Division Argonne National Laboratory Argonne, IL 60439-4844

**GET REDIRECTED THROUGH THIS LINK TO GET
ACCESS TO OUR CODE**

[HTTPS://GITHUB.COM/IITKGP2025/ORPROJECT1](https://github.com/IITKGP2025/ORPROJECT1)