

## Team (2)

Mohamed Erfan  
Malak Ahmed  
Beshoy George  
Mina Faiez  
Rawan Sherif  
Raghad Ahmed

### 1. Cleaning Process

- Split column (region, type, allergy) columns
- Used conditional formatting to check if there's any duplicates
- Remove duplicates with space (allergy) column
- Used this formula ( $\text{=IF(COUNTIFS([Food],[@Food])>1, IF([@[Carbon Footprint(kg CO2e)])=MINIFS([Carbon Footprint(kg CO2e)],[Food],[@Food]), [@[Food] \& "(Eco-friendly)", [@[Food]], [@[Food]])}$ ) because there were duplicates with the same meal name but different categories like different ingredients and so on then made it display eco-friendly next to them.

Food
Vietnamese cold Spring Roll
Soya wrap
Shredded Chicken with Soya Sauce
Rice Flour Wrap with Tofu And Veggie
Soya Tikki
Soya Flour Gobhi Stuffed Paratha
Saute Tofu
Soya Flour Cheela
Tofu Tikka Saute in Green Chutney
Soya Flour Cheela

#### Before

Food	Associativity	Column1
Soya Flour Cheela		1 Soya Flour Cheela (Eco-friendly)
Soya Flour Cheela		1 Soya Flour Cheela

#### After

Meals	Ingredients
Saute Tofu	Cauliflower-15 gms; Onion-15 gms; Ginger-4 gms; Cumin seeds-4 gms;...
Saute Tofu (Eco-friendly)	carrot-15 gms; CABBAGE-15 gms; Capsicum-15 gms; mushroom-15 gm...
Soya Flour Cheela (Eco-friendly)	Cauliflower-20 gms; carrot-20 gms;Capsicum-20 gms;Black Pepper-4 g...
Soya Flour Cheela	Lettuce Leaf-20 gms; Chicken-70 gms; Tomato-120 gms; Cucumber-62 ...
Chicken Kebab (Eco-friendly)	Soyabean-30 gms; Ginger-15 gms;Garlic-15 gms; Cooking oil-7 gms; Ca...
Jowar Cheela (Eco-friendly)	Rice-250 gms; Mustard oil-15 gms; Onion-77 gms; Capsicum-62 gms; C...
Pasta salad (Eco-friendly)	Soya bean-125 gms;
DHANIYA CHUTNEY (Eco-friendly)	Turmeric powder-15 gms; Cumin seeds-15 gms; Common salt-15 gms; ...
GREEN CHUTNEY (Eco-friendly)	Chicken-300 gms; Sunflower oil-15 gms; Garlic-15 gms; Zucchini-125 g...
Upma (Eco-friendly)	RAJMA-250 gms; CUCUMBER-15 gms; Tomato-15 gms; Chillies-4 gms; ...
Upma	Common salt-15 gms; Coriander leaves-15 gms; Tofu-150 gms; Red chi...
Jowar Cheela	Chicken-60 gms; soya sauce-15 gms; VINEGAR-7 gms; Ginger-15 gms;G...
Pasta Salad	Common salt-15 gms; Ginger-1 slice; Black pepper-7 gms; CURRY LEAV...
Dhaniya Chutney	Onion-120 gms; Ginger-5 gms;Garlic-5 gms; Cooking oil-2 gms; Comm...
Chicken kebab	Common salt-15 gms; Black pepper-15 gms; Cooking oil-30 gms; Onion...
Green Chutney	Common salt-15 gms; Onion-10 gms;Garlic-2 gms; Ginger-7 gms; Tom...
Hung Curd Salad	Cumin seeds-15 gms; Turmeric powder-15 gms; Common salt-15 gms; ...
Paneer Kebab (Eco-friendly)	Papaya-150 gms; ORANGE-90 gms; Almond-4 gms; PUMPKIN SEED-15 ...

- This was how the ingredients column looked at the beginning, before any transformations.

Meals	Ingredients.1	Ingredients.2	Ingredients.3	Ingredients.4
Saute Tofu	Cauliflower-15 gms	Onion-15 gms	Ginger-4 gms	Cumin seeds-4 gms
Saute Tofu (Eco-friendly)	carrot-15 gms	CABBAGE-15 gms	Capsicum-15 gms	mushroom-15 gms
Soya Flour Cheela (Eco-friendly)	Cauliflower-20 gms	carrot-20 gms	Capsicum-20 gms	Black Pepper-4 gms
Soya Flour Cheela	Lettuce Leaf-20 gms	Chicken-70 gms	Tomato-120 gms	Cucumber-62 gms
Chicken Kebab (Eco-friendly)	Soyabean-30 gms	Ginger-15 gms	Garlic-15 gms	Cooking oil-7 gms
Jowar Cheela (Eco-friendly)	Rice-250 gms	Mustard oil-15 gms	Onion-77 gms	Capsicum-62 gms
Pasta salad (Eco-friendly)	Soya bean-125 gms		null	null
DHANIYA CHUTNEY (Eco-friendly)	Turmeric powder-15 gms	Cumin seeds-15 gms	Common salt-15 gms	Coriander leaves-15 gms
GREEN CHUTNEY (Eco-friendly)	Chicken-300 gms	Sunflower oil-15 gms	Garlic-15 gms	Zucchini-125 gms
Upma (Eco-friendly)	RAJMA-250 gms	CUCUMBER-15 gms	Tomato-15 gms	Chillies-4 gms
Upma	Common salt-15 gms	Coriander leaves-15 gms	Tofu-150 gms	Red chilli Powder-15 gms
Jowar Cheela	Chicken-60 gms	soya sauce-15 gms	VINEGAR-7 gms	Ginger-15 gms
Pasta Salad	Common salt-15 gms	Ginger-1 slice	Black pepper-7 gms	CURRY LEAVES-5 gms
Dhaniya Chutney	Onion-120 gms	Ginger-5 gms	Garlic-5 gms	Cooking oil-2 gms
Chicken Kebab	Common salt-15 gms	Black pepper-15 gms	Cooking oil-30 gms	Onion-100 gms
Green Chutney	Common salt-15 gms	Onion-10 gms	Garlic-2 gms	Ginger-7 gms
Hung Curd Salad	Cumin seeds-15 gms	Turmeric powder-15 gms	Common salt-15 gms	Soya flour-75 gms
Paneer Kebab (Eco-friendly)	Papaya-150 gms	ORANGE-90 gms	Almond-4 gms	PUMPKIN SEED-15 gms

- Split Column using Semicolon (;) to separate each ingredient from its quantity.

Meals	Attribute	Value
Saute Tofu	Ingredients.1	Cauliflower-15 gms
Saute Tofu	Ingredients.2	Onion-15 gms
Saute Tofu	Ingredients.3	Ginger-4 gms
Saute Tofu	Ingredients.4	Cumin seeds-4 gms
Saute Tofu	Ingredients.5	chillies-15 gms
Saute Tofu	Ingredients.6	Coriander leaves-15 gms
Saute Tofu	Ingredients.7	Red chilli Powder-15 gms
Saute Tofu	Ingredients.8	Garam Masala-15 gms
Saute Tofu	Ingredients.9	Common salt-15 gms
Saute Tofu	Ingredients.10	Soya flour-250 gms
Saute Tofu	Ingredients.11	Atta-30 gms
Saute Tofu (Eco-friendly)	Ingredients.1	carrot-15 gms
Saute Tofu (Eco-friendly)	Ingredients.2	CABBAGE-15 gms
Saute Tofu (Eco-friendly)	Ingredients.3	Capsicum-15 gms
Saute Tofu (Eco-friendly)	Ingredients.4	mushroom-15 gms
Saute Tofu (Eco-friendly)	Ingredients.5	Garlic-7 gms
Saute Tofu (Eco-friendly)	Ingredients.6	Ginger-7 gms
Saute Tofu (Eco-friendly)	Ingredients.7	soya sauce-15 gms
Saute Tofu (Eco-friendly)	Ingredients.8	Gingelly oil-7 gms
Saute Tofu (Eco-friendly)	Ingredients.9	Onion-15 gms
Saute Tofu (Eco-friendly)	Ingredients.10	Atta-125 gms

- Unpivot Columns to bring all ingredients into a single column, while repeating the meal name for each ingredient.

Meals	Value.1	Value.2
Saute Tofu	Cauliflower	15 gms
Saute Tofu	Onion	15 gms
Saute Tofu	Ginger	4 gms
Saute Tofu	Cumin seeds	4 gms
Saute Tofu	chillies	15 gms
Saute Tofu	Coriander leaves	15 gms
Saute Tofu	Red chilli Powder	15 gms
Saute Tofu	Garam Masala	15 gms
Saute Tofu	Common salt	15 gms
Saute Tofu	Soya flour	250 gms
Saute Tofu	Atta	30 gms
Saute Tofu (Eco-friendly)	carrot	15 gms
Saute Tofu (Eco-friendly)	CABBAGE	15 gms
Saute Tofu (Eco-friendly)	Capsicum	15 gms
Saute Tofu (Eco-friendly)	mushroom	15 gms
Saute Tofu (Eco-friendly)	Garlic	7 gms
Saute Tofu (Eco-friendly)	Ginger	7 gms

- Split Column using Hyphen (-) to separate the ingredient name from its quantity.

A <sub>C</sub> <sup>B</sup> Meals	A <sub>C</sub> <sup>B</sup> Cauliflower	A <sub>C</sub> <sup>B</sup> Onion	A <sub>C</sub> <sup>B</sup> Ginger	A <sub>C</sub> <sup>B</sup> Cumin seeds
2 Pieces Stuffed idli		250 gms		15 gms
20% flaxseed flour 80% wheat flour Roti		62 gms		
50% Barley Atta & 50% Oats Atta Roti				24 gms
ACHARI TIKKA (PANEER)				
ALMOND FLOUR CHEELA				7 gms
ALMOND FLOUR ROTI (100% almond flour)				15 gms
ALMOND FLOUR ROTI (20% almond flour + 80% wheat flour)				
ALMOND FLOUR ROTI (50% almond flour + 50% oats flour)				15 gms
ALMOND MUSHROOM SOUP				
ALMOND SOUP (WITH ALMOND MILK)				
APPLE STEW		62 gms		15 gms
Aam Ras		1 gms		15 gms
Almond Flour Roti				
Almond Flour Wrap		50 gms		15 gms
Almond Soup				
Almond and Raisins Raita				15 gms
Almond coriander soup				15 gms
Almond roti (50% almond flour and 50% normal atta)				
Almonds and Walnut Raita		125 gms		

- Pivot Column so that each ingredient has its own column, and each meal appears in a single row with all its ingredient quantities.

A <sub>C</sub> Meals	A <sub>C</sub> Cauliflower	A <sub>C</sub> Onion	A <sub>C</sub> Ginger	A <sub>C</sub> Cumin seeds
2 Pieces Stuffed idli	0	250 gms	0	15 gms
20% flaxseed flour 80% wheat flour Roti	0	62 gms	0	0
50% Barley Atta & 50% Oats Atta Roti	0	0	0	24 gms
ACHARI TIKKA (PANEER)	0	0	0	0
ALMOND FLOUR CHEELA	0	0	0	7 gms
ALMOND FLOUR ROTI (100% almond flour)	0	0	0	15 gms
ALMOND FLOUR ROTI (20% almond flour + 80% wheat flour)	0	0	0	0
ALMOND FLOUR ROTI (50% almond flour + 50% oats flour)	0	0	0	15 gms
ALMOND MUSHROOM SOUP	0	0	0	0
ALMOND SOUP (WITH ALMOND MILK)	0	0	0	0
APPLE STEW	0	62 gms	0	15 gms
Aam Ras	0	1 gms	0	15 gms
Almond Flour Roti	0	0	0	0
Almond Flour Wrap	0	50 gms	0	15 gms
Almond Soup	0	0	0	0
Almond and Raisins Raita	0	0	0	15 gms
Almond coriander soup	0	0	0	15 gms
Almond roti (50% almond flour and 50% normal atta)	0	0	0	0
Almonds and Walnut Raita	0	125 gms	0	0

- Replaced Values to change any Null or Error into 0.

Power Pivot for Excel - Data Modeling.xlsx

File Home Design Advanced

Paste Paste Append Paste Replace From Database From Data Service From Other Sources Existing Connections Refresh PivotTable Data Type: Format: Sort A to Z Sort Z to A Clear All Filters Sort by Column

Clipboard Get External Data Formatting Find Calculations Data View Diagram View Show Hidden Calculation Area

	Meals	Associativity	Region	Type	Category	Allergy	Serving	Total Weight (gms)	Energy(kcal)	Proteins	Carbohydrates	Fat
1	2 Pieces ...		14 South	Lunch	Veg	no-allergies	2 number	424	386	14	73	
2	ALMOND ...		1 North	Lunch	Veg	no-allergies	1 medium	435	757	19	48	
3	Aam Ras ...		10 North	Beverages	Veg	no-allergies	1 glass	400	208	7	26	
4	Almond c...		0 Continental	Appetizer	Veg	no-allergies	1 medium b...	216	157	3	4	
5	Aloo /Sha...		0 North	Snacks	Veg	no-allergies	2 medium	6	79	1	19	
6	Aloo Curry		2 North	Dry Curry	Veg	no-allergies	1 small bowl	482	490	8	75	
7	Aloo Gob...		2 North	Dry Curry	Veg	no-allergies	2 small bowl	230	89	2	8	
8	Aloo Mata...		2 North	Dry Curry	Veg	no-allergies	2 small bowl	815	244	11	36	
9	Aloo Mata...		2 North	Dry Curry	Veg	no-allergies	2 small bowl	495	180	9	24	
10	Aloo Tikki		6 North	Appetizer	Veg	no-allergies	1 medium	406	279	2	32	
11	Amaranth ...		1 North	Lunch	Veg	no-allergies	1 medium	193	323	10	60	
12	Amla water		10 North	Beverages	Veg	no-allergies	1 glass	11	16	0	3	
13	Anjeer Wa...		10 North	Beverages	Veg	no-allergies	1 glass	50	0	0	0	
14	Apple Sha...		12 Continental	Beverages	Veg	no-allergies	1 glass	354	116	5	22	
15	Apple and ...		0 Continental	Appetizer	Veg	no-allergies	1 medium b...	424	150	6	24	
16	Arugula S...		0 Continental	Appetizer	Veg	no-allergies	2 large bowl	995	112	2	8	
17	Avocado ...		0 Continental	Lunch	Veg	no-allergies	1 small bowl	485	492	15	15	
18	Avocado...		0 Continental	Lunch	Veg	no-allergies	1 small bowl	486	393	12	13	
19	BAINGAN...		2 North	Dry Curry	Veg	no-allergies	1 medium k...	135	232	4	27	
20	BAINGAN...		2 North	Dry Curry	Veg	no-allergies	1 medium k...	279	237	8	23	
21	BAKED B...		0 Continental	Lunch	Veg	no-allergies	1 small bowl	206	642	6	22	

Meals data Ingredients after

Record 1 of 753

Power Pivot for Excel - Data Modeling.xlsx

File Home Design Advanced

Clipboard: Paste, Paste Append, Paste Replace, Copy, From Database, From Service, From Other Sources, Existing Connections, Refresh, PivotTable, Data Type, Format, Sort A to Z, Sort Z to A, Clear Sort, Clear All Filters, Sort by Column, Find, Find, AutoSum, Create KPI, Data View, Diagram View, Show Hidden, Calculation Area

	Meals	Cauliflower	Onion	Ginger	Cumin seeds	chillies	Coriander leaves	Red chili Powder	Garam Masala	Common salt	Soya
1	2 Pieces ...	0	250 gms	0	15 gms	0	0	0	0	15 gms	0
2	20% flaxs...	0	62 gms	0	0	0	0	0	0	0	0
3	50% Barle...	0	0	0	24 gms	0	0	0	0	0	0
4	ALMOND ...	0	0	0	7 gms	0	3 gms	0	0	15 gms	0
5	ALMOND ...	0	0	0	15 gms	0	15 gms	0	15 gms	15 gms	0
6	ALMOND ...	0	0	0	0	0	0	0	0	15 gms	0
7	ALMOND ...	0	0	0	15 gms	0	5 gms	0	15 gms	0	0
8	ALMOND ...	0	0	0	0	0	0	0	0	15 gms	0
9	ALMOND ...	0	0	0	0	0	0	0	0	0	0
10	APPLE S...	0	62 gms	0	15 gms	0	0	0	0	0	0
11	Aam Ras	0	1 gms	0	15 gms	0	0	15 gms	0	15 gms	0
12	Almond FL...	0	0	0	0	0	15 gms	0	0	15 gms	0
13	Almond FL...	0	50 gms	0	15 gms	0	0	0	0	15 gms	0
14	Almond S...	0	0	0	0	0	0	0	0	0	0
15	Almond c...	0	0	0	15 gms	0	0	0	0	15 gms	0
16	Almonds ...	0	125 gms	0	0	0	0	0	0	15 gms	0
17	Aloo /Sha...	0	0	0	0	0	0	0	0	15 gms	0
18	Aloo Curry	0	0	0	0	0	0	0	0	7 gms	0
19	Aloo Gob...	0	0	0	15 gms	0	15 gms	0	0	15 gms	0
20	Aloo Mata...	0	0.5 medium	0	0	0	0	0	0	15 gms	0
21	Aloo Mata...	0	0	0	0	0	0	0	0	7 gms	0

Meals\_data | Ingredients after

Record: 1 of 753

- Then used Power Pivot to model and merge the data.

AutoSave Off Merged - Saved to this PC

File Home Insert Draw Page Layout Formulas Data Review View Automate Help Acrobat Power Pivot Table Design Query

Clipboard Font Alignment Number Styles Cells Editing Add-ins

	A	B	C	D	E	F	G	H	I	J	K
	Meals	Associativity	Region	Type	Category	Allergy	Serving	Total Weight (gms)	Energy(kcal)	Proteins	Carbohydrates
1	Meals										
2	2 Pieces Stuffed Idli		14 South	Lunch	Veg	no-allergie: 2 number		424	386	14	73
3	20% flaxseed flour 80% wheat flour Roti		1 North	Lunch	Veg	gluten 1 medium		170	195	7	13
4	50% Barley Atta & 50% Oats Atta Roti		1 North	Lunch	Veg	gluten 1 number		250	367	12	70
5	ACHARI TIKKA (PANEER)		6 North	Appetizer	Veg	dairy 1 medium		401	1186	68	68
6	ALMOND FLOUR CHEELA		1 North	Lunch	Veg	no-allergie: 1 medium		435	757	19	48
7	ALMOND FLOUR ROTI (100% almond flour)		1 North	Lunch	Veg	nut 1 medium		200	33	1	1
8	ALMOND FLOUR ROTI (20% almond flour + 80% wheat flour)		1 North	Lunch	Veg	nut 1 medium		107	385	11	48
9	ALMOND FLOUR ROTI (50% almond flour + 50% oats flour)		1 North	Lunch	Veg	nut 1 medium		365	340	10	33
10	ALMOND MUSHROOM SOUP		0 Continental	Appetizer	Veg	nut 1 medium bowl		187	192	8	7
11	ALMOND SOUP (WITH ALMOND MILK)		0 Continental	Lunch	Veg	nut 1 medium bowl		350	328	16	22
12	APPLE STEW		0 Continental	Breakfast	Veg	nut 2 cup		893	143	1	37
13	Aam Ras		10 North	Beverages	Veg	no-allergie: 1 glass		400	208	7	26
14	Almond Flour Roti		1 North	Lunch	Veg	nut 5 medium		522	149	4	4
15	Almond Flour Wrap		0 Continental	Lunch	Veg	nut 1 medium		291	640	23	23
16	Almond Soup		0 Continental	Appetizer	Veg	nut 4 medium bowl		1075	223	8	12
17	Almond and Raisins Raita		4 Continental	Appetizer	Veg	dairy 1 medium kator		295	168	8	9
18	Almond coriander soup		0 Continental	Appetizer	Veg	no-allergie: 1 medium bowl		216	157	3	4
19	Almond roti (50% almond flour and 50% normal atta)		1 North	Lunch	Veg	nut 1 medium		300	112	4	12
20	Almonds and Walnut Raita		4 Continental	Appetizer	Veg	nut 1 medium kator		310	351	13	11
21	Aloo /Shakarkandi		0 North	Snacks	Veg	no-allergie: 2 medium		6	79	1	19

Data after cleaning

Ready Accessibility: Investigate

- also used Power Query to merge the data.

## 2. Objectives

- Analyze the average carbon food print of dishes from each country so we can know the highest value and know the country or region and check how to deal with that like how to reduce the carbon food print value or ratio.
- Analyze high protein dishes by checking the average carbon food print of veg and nonveg options.
- High protein dishes but have low carbon.
- Avg carbon food print of food like checking the highest value of carbon at each meal.
- Use the total weight with ingredients to check the categories of food that are the most heavy or costly ingredients.
- Analyze meals that might have zero gluten for breakfast or lunch or even dinner and that gonna fill gabs like safely introduce this data to people with allergies.
- Which region has the highest calorie dishes?
- Which meal type contributes the most to the carbon food print?
- Which food type maximize nutrition and at the same time minimize carbon food print?
- Which meals looks healthy but have a great portion of sugar and fats?
- Do veg meals have less CO<sub>2</sub> than nonveg meals?
- Do regions have their own nutrition identity?
- Is breakfast the most balanced meal of the day?
- Which foods have the highest fiber percentage?
- Which food are safe to people with dairy allergy?
- Which meals rely most on dairy ingredients?
- Which ingredients appear most across meals?
- Which meals are most risky for many types of allergies?
- Distribution of meals by Region, Type (Lunch/Dinner), Category (Veg/nonveg), Allergy restrictions.
- Average nutritional values (Calories, Protein, Weight) by meal type and region.
- Meals with highest/lowest calories.
- Comparison of Veg vs nonveg nutrition and which one have the most CO<sub>2</sub> effect.
- Unique/rare ingredients.
- Ingredient associations (which ingredients appear together often).
- Which regions favor like what kind of meals?
- Correlation between ingredients and calorie/protein content.
- how many unique ingredients are used in each meal?
- group meals by similarity in nutrition or ingredients.
- Recommendation potential: If someone likes one meal, suggest similar ones based on ingredients/nutrients.
- Balanced diet planning: Identify meals that best fit specific nutritional goals (high protein but low calorie).
- How many meals are there in total, and how are they distributed across different regions?
- What is the distribution of meals by type (Lunch, Dinner, Appetizer)?
- How many meals are Veg vs nonveg?
- What are the most common allergy categories among the meals?
- How does the nutritional profile vary across regions?
- How do vegetarian and non-vegetarian meals compare in terms of energy and protein content?
- Which meal types (Lunch, Dinner, Snack) tend to be highest in calories?



- How do ingredient preferences differ between regions?
- Do Veg meals use a wider variety of ingredients compared to nonveg ones?
- What is the relationship between total meal weight and calorie content?
- Are heavier meals always higher in calories?
- Which ingredients are most correlated with high protein meals?
- What patterns emerge if we cluster meals based on their ingredients?
- Which are the top 10 highest-calorie meals and top 10 lowest-calorie meals?
- Which are the top 10 meals richest in protein?
- Which region has the most diverse meals (by count and ingredient variety)?
- What are the top 5 most popular meal categories overall?
- Which meal has the highest protein-to-calorie ratio?
- Which meal has the lowest fat-to-weight ratio?
- How are calories distributed across all meals (normal, skewed, heavy tailed)?
- What is the distribution of serving sizes across different regions and categories?
- Do South region meals tend to weigh more than North region meals?
- Which meals are the most fiber rich?
- Which meals are lowest in carbohydrates but high in proteins?
- Are veg meals healthier on average (lower calories, higher fiber)?
- Which meals could be considered “balanced” (good ratio of carbs, protein, fat)?
- Which ingredients appear together most frequently?
- Are certain allergens like gluten or dairy more common in specific meal types?
- Which meals contain the largest number of unique ingredients?
- Can we predict the region of a meal based only on its ingredients?
- Can we classify whether a meal is Veg/nonveg using ingredient presence?
- Which nutrients (protein, fat, carbs) contribute most to total calories?
- What hidden clusters exist among meals (healthy, high calorie, light snack, protein rich)?
- What are the “outlier meals” that have unusually high or low nutritional values?

رواد مصر الرقمية