Climate Friendly Food Sustainability Project: Food Items Labelling

UBC Food Services

Jenny Lee, CFFS Data Analyst

OUTLINE

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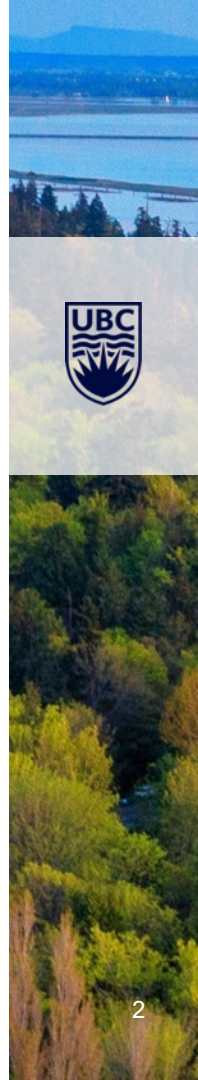
2. Methodology
3. Results
4. Discussion

OPEN KITCHEN

Feast

GATHER AT VANIER

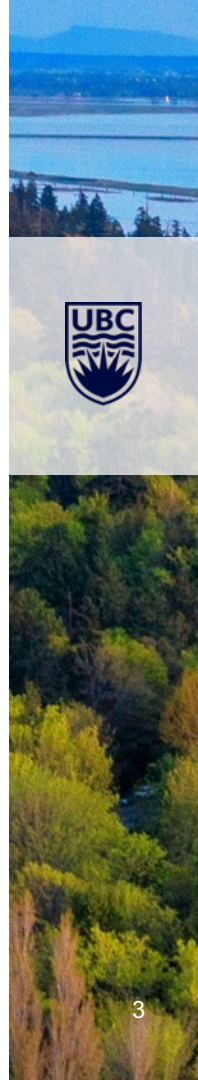


Research Purpose, Goals, and Objectives

- **Purpose:** Adhering to UBC's commitment to the CAP 2030, the CFFS project aims to achieve 50% GHG emission reduction by 2030 in comparison to 2019.

- **Goals:** To develop a campus-wide Climate-Friendly Food Systems (CFFS) Label and observe consumer responses corresponding the labels. Ultimately aims to increase sustainable dietary choices and habits.

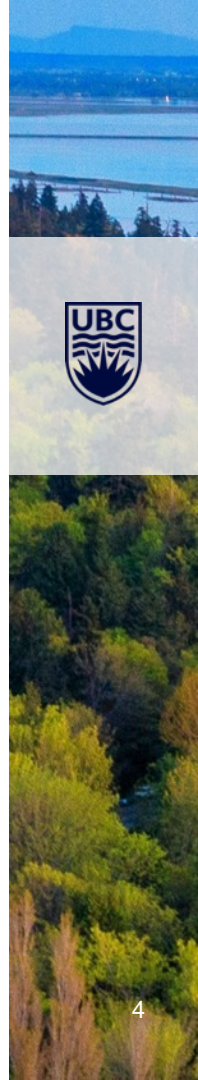
- **Objectives:** Develop a semi-automatic flow that assigns CFFS labels based on the environmental impact of producing the item.



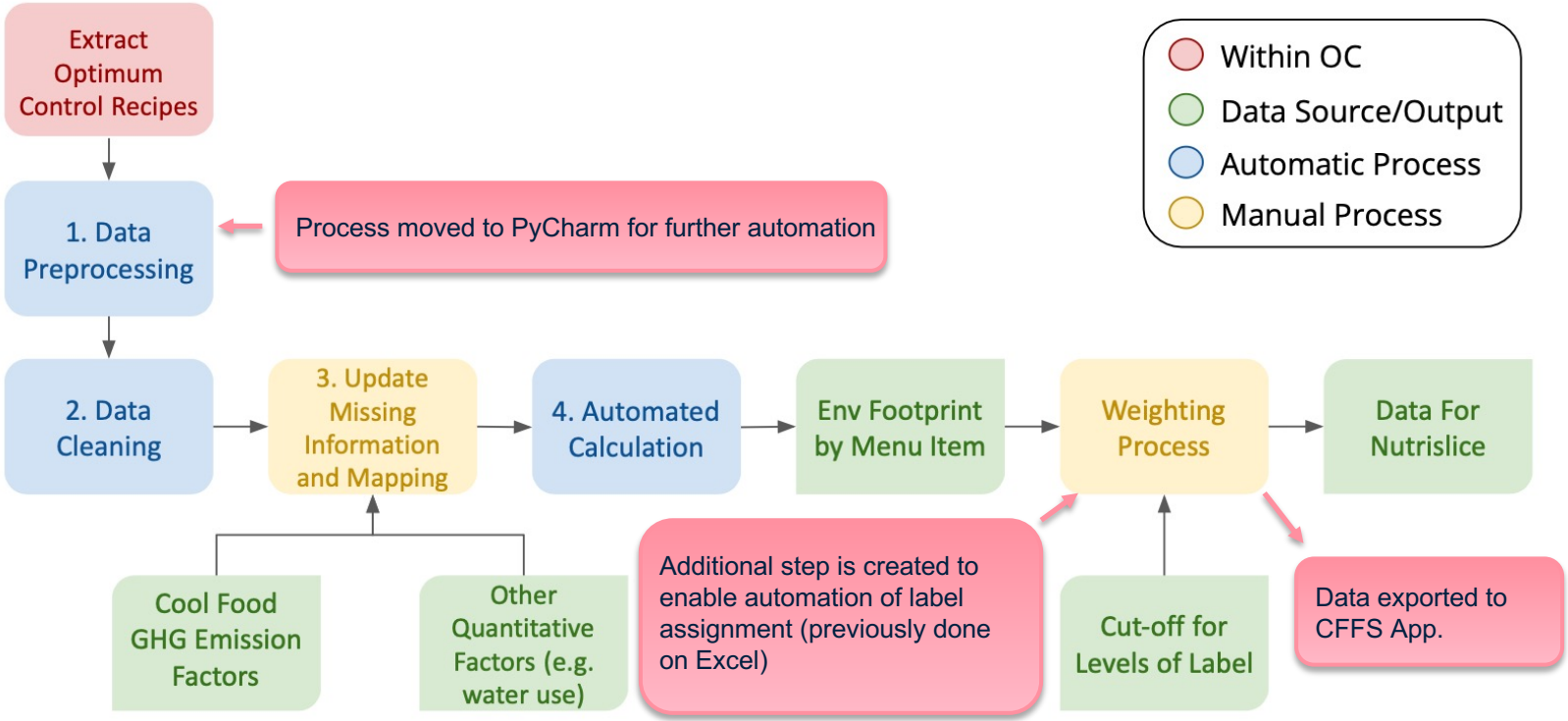
Research Background

- This research is a **continuation** from *Silvia Huang's* pilot project, which was successful in assigning food labels at the Open Kitchen, Gather, and Mercente from 2019 to 2021 Summer.

- Calculation metrics, such as *impact baseline* for considered factors, are developed by Silvia's team in 2021 and is continued to be used for this study.



METHODS (Retrieved from Silvia Huang's report)



Methodology (Importing OC data)

- All products and ingredient data are derived from **Optimum Control.**
  - Items, ingredients, products, preps, conversion factors.

	ItemId	Description	CaseQty	CaseUOM	PakQty	PakUOM	InventoryGroup
0	I-29389	APPLES DICED IQF FRZ	1.000	bag	18.180	Kg	PRODUCE
1	I-4472	AVOCADO MX	20.000	CT	1.000	CT	PRODUCE
2	I-4973	AVOCADO PULP CHUNKY	12.000	bag	454.000	g	PRODUCE
3	I-27410	BACON 3MM NATURALLY SMKD	5.000	Kg	1.000	Kg	MEAT

Items

	IngredientId	Qty	Uom	Conversion	InvFactor	Recipe
79	I-29389	2.500	Kg	1.00000000	1.0000	P-50739
1398	I-29389	600.000	g	0.00100000	150.0000	P-57344
1673	I-29389	15.000	g	0.00100000	1.0000	R-56966

Ingredients

	PrepId	Description	PakQty	PakUOM	InventoryGroup
3	P-50739	COMPOTE|Apple Cinnamon	2.500	L	PREP

Preps

	ProdId	Description	SalesGroup
102	R-56966	VEG|Oats|Steel Cut|Maple Apple	OK - VEGETARIAN KITCHEN

Products

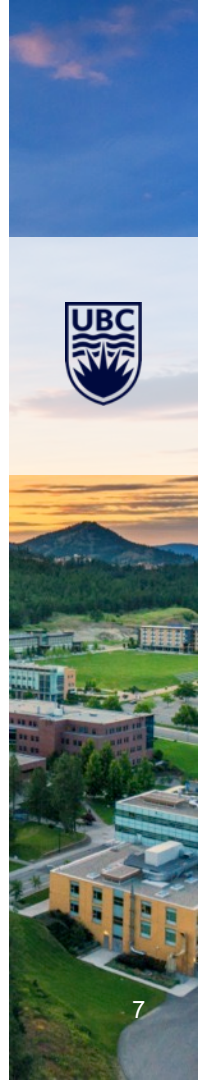
Methodology (Importing external data)

- All emission factor data are derived from **Cool Food Calculator**.
  - Greenhouse gas emission, nitrogen generation, water usage.

ItemId	CategoryID	Description	CaseQty	CaseUOM	PakQty	PakUOM	InventoryGroup
I-64877	3	TMRW SAUSAGE BREAKFAST PATTY	100	each	1.00	ea	MEAT
I-55331	4	CHICK BREAST BL/SO HAL TENDOUT	1	Kg	1.00	Kg	POULTRY
I-3999	4	CHICK DRUMSTICK HALAL	1	Kg	1.00	Kg	POULTRY
I-4465	36	ASPARAGUS (LARGE) MX	11	lb	1.00	lb	PRODUCE
I-22443	40	BAMBOO SHOOTS STRIP	6	LG CAN	2.84	L	PRODUCE
I-10616	17	BEANS ROMANO	1	lb	1.00	lb	PRODUCE
I-4582	38	CARROTS BABY BUNCHED BC	1	each	1.00	CT	PRODUCE

Category ID	Food Category	Active Total Supply Chain Emissions (kg CO2 / kg food)
1	beef & buffalo meat	41.3463
2	lamb/mutton & goat meat	41.6211
3	pork (pig meat)	9.8315
4	poultry (chicken, turkey)	4.3996
5	butter	11.4316

GHG Emission Factors



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							PRODUCE
							PRODUCE

Conversions

ConversionId	Multiplier	ConvertFromQty	ConvertFromUom	ConvertToQty	ConvertToUom
I-64877	0.004762	1.0	each	210.0	g

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3	pork (pig meat)	9.8315
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Calculation

$$9.8315\ \frac{kg}{kg} = 9.8315\ \frac{g}{g}$$

$$210\ g\ x\ 9.8315\frac{g}{g}$$

$$= \mathbf{2064.615\ g}$$

Methodology (Labelling)

Divide each factor by thrice of its baseline, and add all three emission factors to calculate an impact factor for 100g of each menu item.

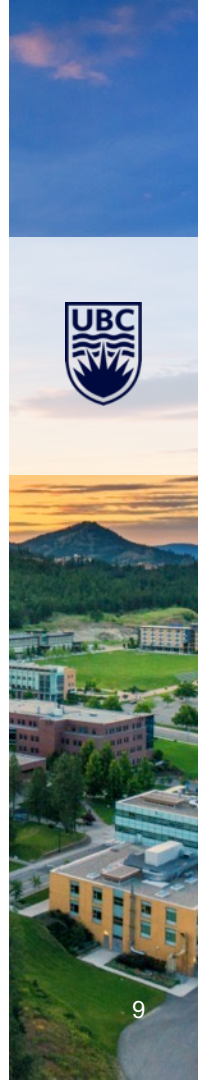
ProdId	Weight (g)	Description	GHG Emission (g) / 100g	N lost (g) / 100g	Freshwater Withdrawals (L) / 100g	Restaurant
R-22896	6.000000	ADD|Crackers	152.25	1.48	42.00	Feast
R-56809	60.000000	ADD|Guacamole	57.64	0.41	1.87	Feast
R-36043	201.000000	CC|AlooGobi|SIDE	77.81	0.81	3.79	Feast
R-67834	267.999996	CC|Biryani|Chicken	351.96	6.77	52.44	Feast
R-68237	267.999996	CC|Biryani|Vegetable	217.36	1.13	33.93	Feast
R-62422	396.999996	CC|Butter Chicken + 1	284.96	5.03	42.35	Feast
R-62424	396.999996	CC|Chana Masala + 1	152.46	0.91	28.65	Feast
R-68226	317.999996	CC|Chicken Tikka Masala|Plate	389.30	5.84	51.61	Feast

GHG Baseline	Nitrogen Baseline	Water Baseline
381.13	4.21	1501.2

Emission Baselines

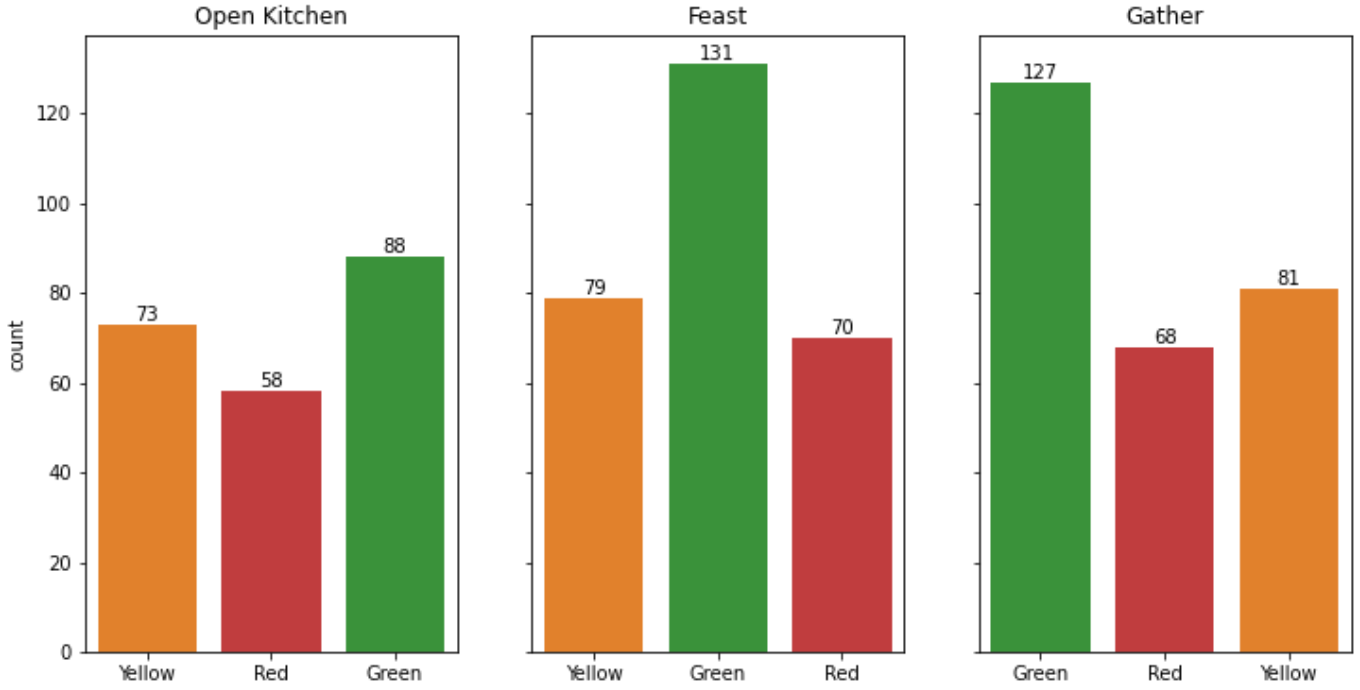
Calculation

- If *combined and normalized* impact factor <= 0.5, item is **GREEN**.
- If *combined and normalized* impact factor >= 1, item is **RED**.
- Between RED and GREEN, item is **YELLOW**.



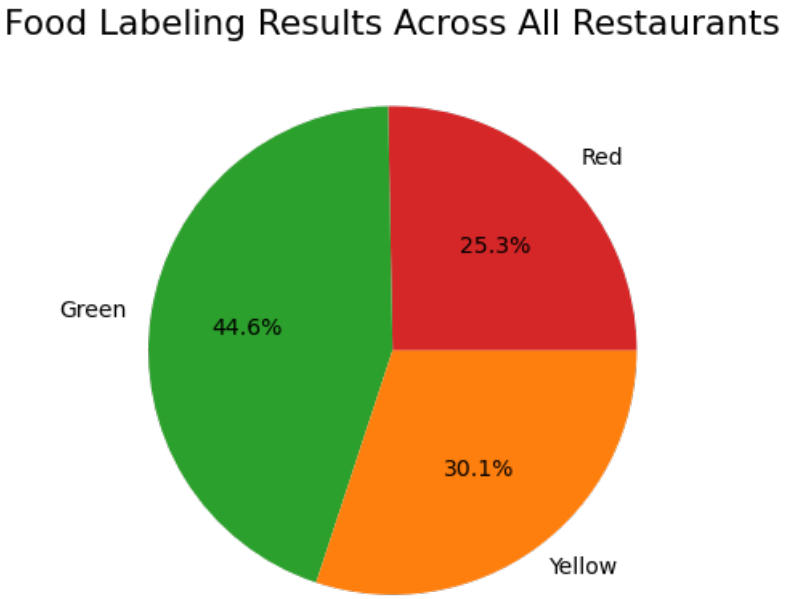
Results (by Restaurants)

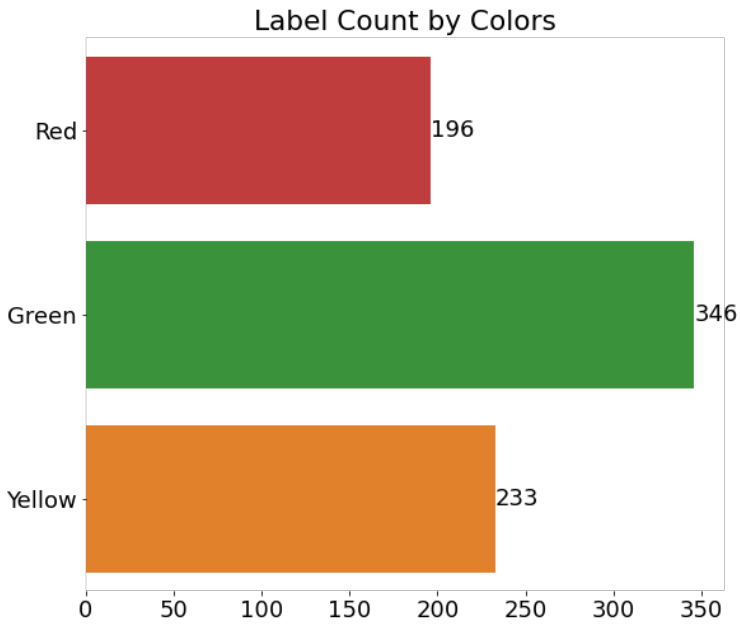
- In total, **775 menu items** have been labelled.
  - **219** items from Open Kitchen, **280** items from Feast, and **276** items from Gather.



Results (by Label Counts)

- In total, **775 menu items** have been labelled.
  - **196** items are classified as **RED**, **346** items are classified as **GREEN**, and **233** items are classified as **YELLOW**.

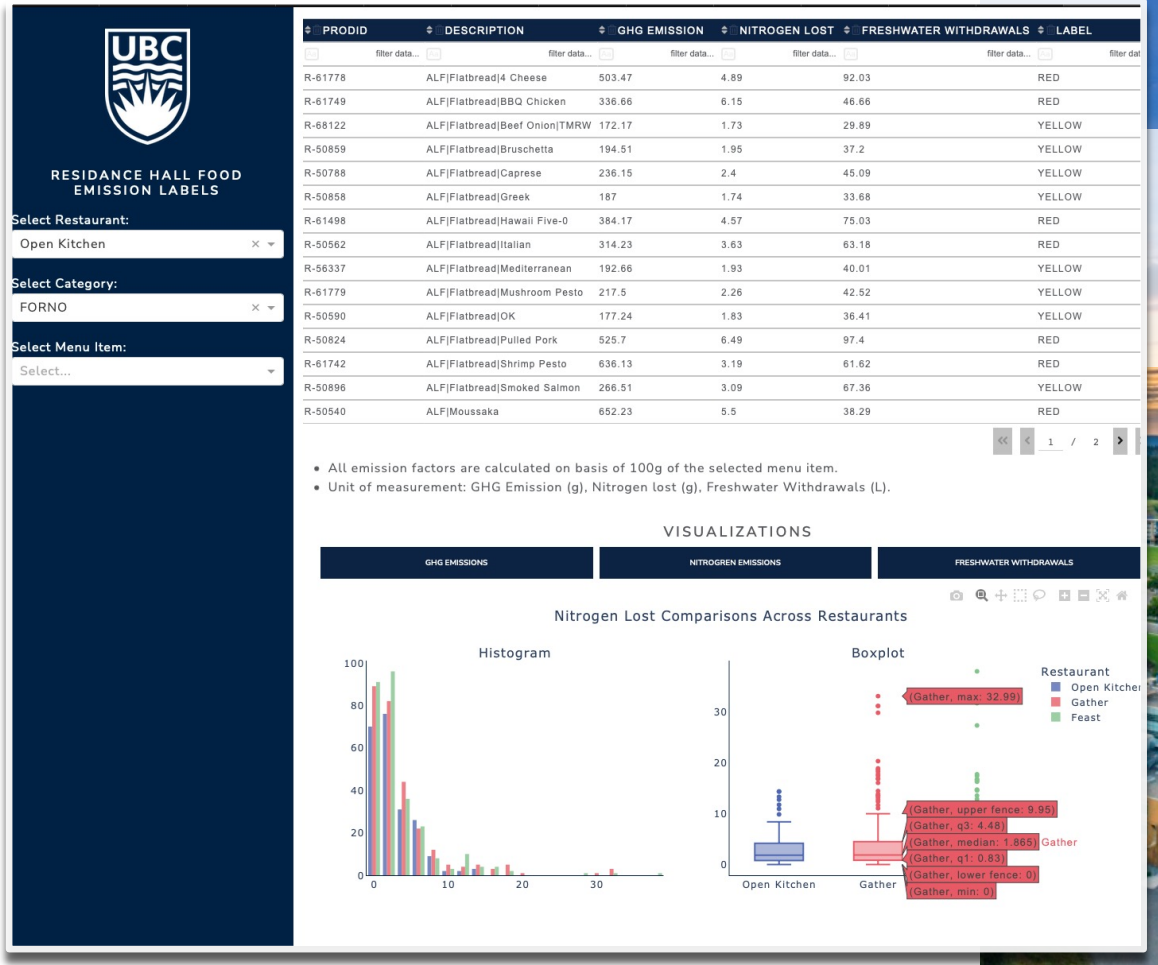




Results (Search with CFFS App)

- Features of the **CFFS App**:
  - Search for *single items*
  - Search by *restaurant*
  - *Advanced, conditional* search
  - *Visualize* GHG, nitrogen, and water withdrawal emission factors.

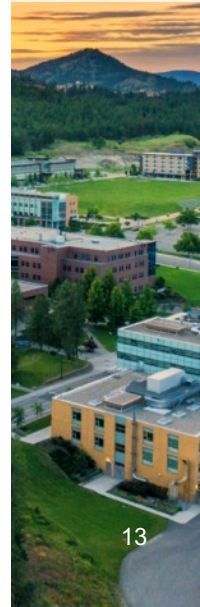
🔗 [CFFS App (Accessible to All)]



Discussion

- **Points of Improvement:**
  - Food category of the emission factors (external dataset from Cool Food Calculator) is too general.
    - E.g., “herbs” such as thyme are all classified under “other vegetables.”
      “garlics” are classfied under “onions”.

Category ID	Food Category	Category ID	Food Category
1	beef & buffalo meat	32	apples
2	lamb/mutton & goat meat	33	bananas
3	pork (pig meat)	34	berries
4	poultry (chicken, turkey)	35	citrus fruit
5	butter	36	cabbages and other brassicas (broccoli)
6	cheese	37	tomatoes
7	ice cream	38	root vegetables
8	cream	39	onions and leeks
9	milk (cow's milk)	40	other vegetables
10	yogurt	41	potatoes
11	eggs	42	cassava and other roots
12	fish (finfish)	43	sugars and sweeteners
13	crustaceans (shrimp/prawns)	44	other vegetable oils



Discussion

- **Points of Improvement:**
  - Automation of assigning **category IDs**.
    - E.g., Right now, category IDs are assigned based on the name of the ingredient– thus it is done *manually*. Instead, we can better automate the process by including some keywords that would link to a specific category ID.
      - E.g., if “Milk” is in the name of an ingredient, assign it to category 9.

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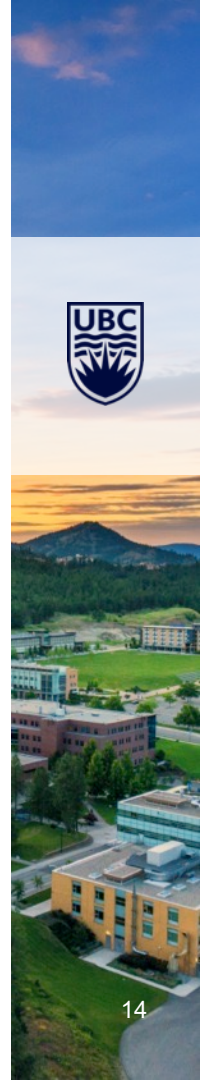
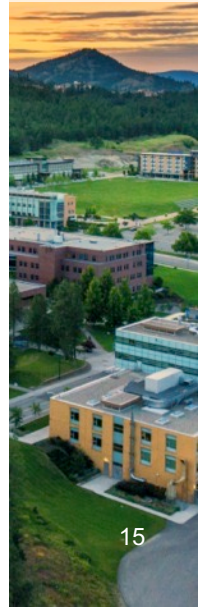
6	cheese	37	tomatoes
7	ice cream	38	root vegetables
8	cream	39	onions and leeks
9	milk (cow's milk)	40	other vegetables
10	yogurt	41	potatoes
11	eggs	42	cassava and other roots
12	fish (finfish)	43	sugars and sweeteners
13	crustaceans (shrimp/prawns)	44	other vegetable oils



Future Actions

- For a long-term process, it is recommended that **another student** would take over the Data Analyst position for the CFFS project.
    - Since this workflow is not 100% automated, each time a new label needs to be created someone with *basic programming knowledge* needs to edit parts of the code.

- Consult with **Cool Food Calculator** for their label assignment service.

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