COM480
Data Visualization

Milestone 2

By:
Siffert Jean - 366682
Rein Gundersen Bentdal- 366666
Faucher Laurent - 366681
Insight Infusion

May 5th 2023

Introduction

The development of food engineering techniques coupled with ever-increasing globalization has made it possible to offer a greater variety of products around the world, all at low cost.

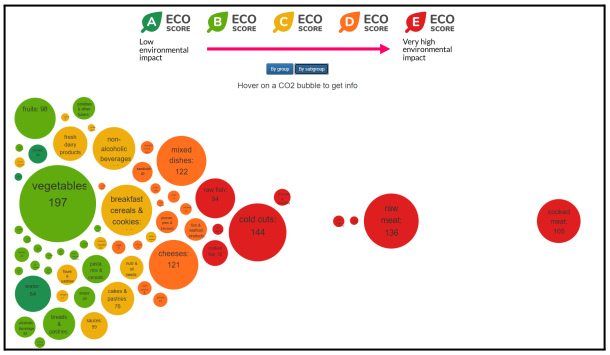
Nevertheless, these advances have many negative impacts on our health (diseases, obesity) and our environment (greenhouse gases, deforestation, pollution, destruction of biodiversity) .

The objective of our project is to inform consumers about the impacts of their food through vulgarized and high impact visualizations and explanations. All of the following visualisations are implemented in our website and we strongly recommend taking a look at them.

Environmental

CO2 Emissions

The first goal of this section is to represent the CO2 emissions produced by products and their food-group in particular. A bubble visualization is used to represent the CO2 particles released in the atmosphere.



On the left the groups producing the least emissions are placed. The bubbles on the right represent the groups with the most emissions. The size of the bubble group is linearly proportional to the number of products it contains. This visualization is highly interactive with bubble clicks and hovers.

By clicking on any product on the page, this bar chart will appear under to give more information on which sector produces the most CO2 .

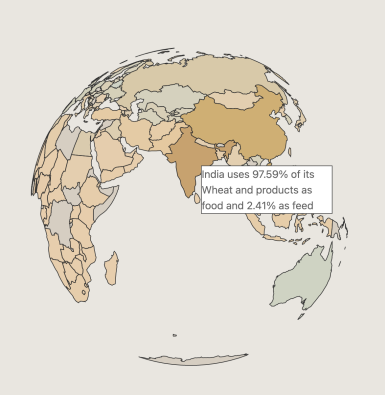
To realise these visualisations we used D3. The force layout was useful to place the bubbles and make sure they had the right spacing between themselves. A color pallet from green to red is used to show if the emissions are low or high. This is linked to the week 6 lecture on color perception to help the human eye to distinct similarities and differences between food products and groups. Also at first, instead of a pie chart, a bar chart was used to represent the specific information of a product. We switched the visualisation because certain areas of the pie chart were too small to perceive. This echoes to the lecture on do's and don'ts of week 7.

World map environmental impact

Geography is central to the environmental footprint of food. The beans you eat might come from India, salmon might be packaged in China. We would like to give a geographic visualisation of such information through a 3D Choropleth map. We think the visual representation of the data might make it both fun to explore while being more intuitive to understand than just reading the data. The visualisation should help the users in better understanding the environmental impact of the food they consume related to geography. For example, through the visual feedback of the map, they might better appreciate the impact of choosing locally vs globally. It's easy to forget this in daily life, when shopping for groceries.

We have developed an initial prototype demonstrating the use of a 3 choropleth map. The current visualisation uses the FOA dataset (Food and Agriculture Organisation of the United Nations) to visualise how much of the selected type of food is consumed by humans and animals. The color gradient is the ratio between human and animal consumption.

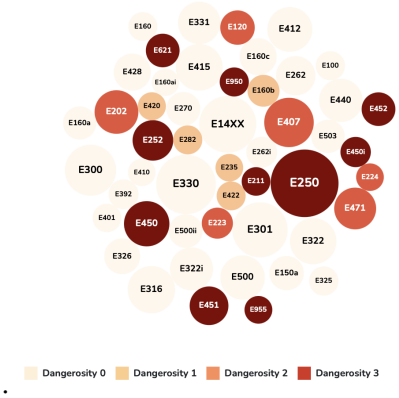
We used the lessons from the map lecture to help us build this visualization.



Health

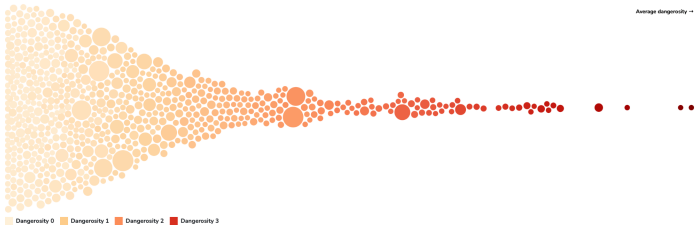
The second part of the project presents the impacts of our food on our health. The focus is on the presence and the danger of additives and allergens in products.

The website presents first of all an overview of additives with a graph representing the most present additives (radius) according to their danger (color)



It has been realized with D3.js inspired by the "Circle Packing" example which uses the force layout system of the library.

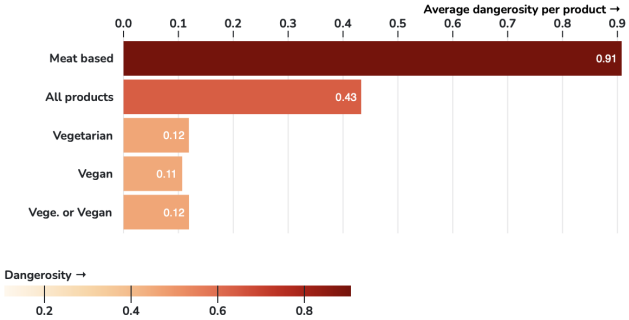
Afterwards, a similar visualization presents the average danger of additives by product categories (meat, yoghurt, sweetened drinks, ...).



This graph is an adaptation of the previous one where the strength on the X-axis depends on the dangerousness.

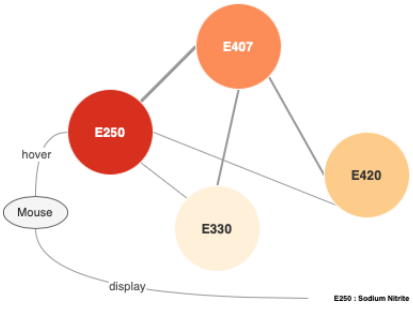
To retrieve the dangerousness of the products, we used the techniques we learned in the "Data" lecture to scrape the Yuka application site which is based on many scientific studies.

Finally we intend to represent the impacts of additives according to different categories of products (processed, vegan, vegetarian, organic, fat, ...)



We were thinking of doing a pie chart but after the "Do's and Don'ts" lecture, we switched to a bar chart that better shows the different things we want to highlight and is more readable.

Then we want to implement graphs to represent the most present additives and allergens together using the techniques presented in the lecture on graphs.



To make this graph, we will take inspiration from the "Force-Directed Graph" example of D3.js documentation and modify it according to our need.