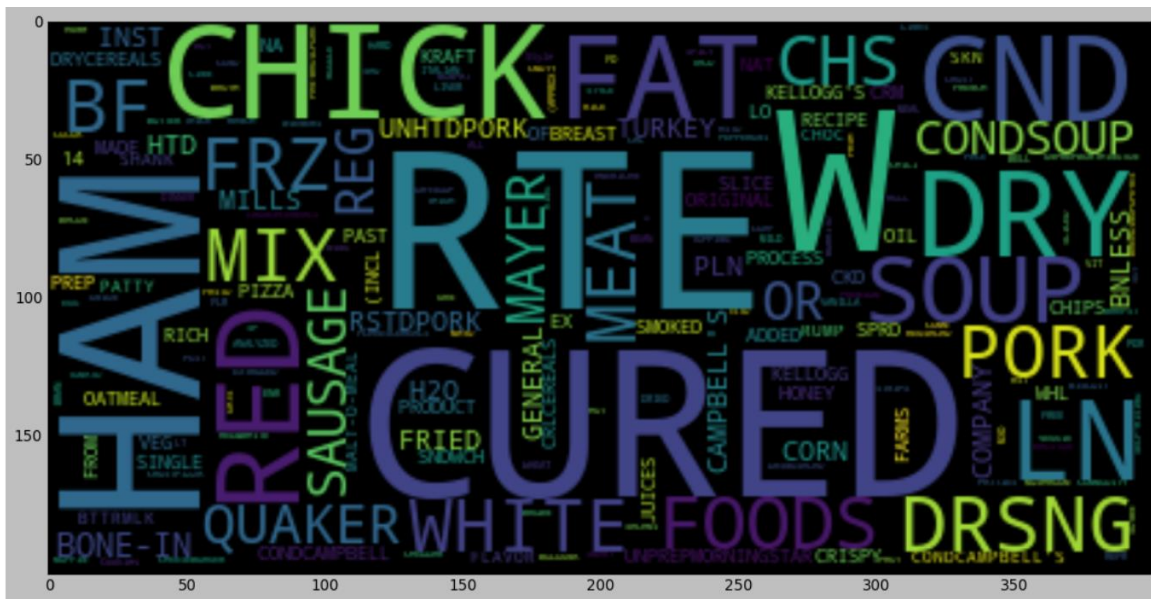


# Too Much Chicken Makes You Salty

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Filed under Science & Health  
Published Apr. 26, 2020

**Who would have thought? According to one of the Department of Agriculture's databases, chicken meats can be just as salty as ham, cured meats, and all kinds of Ready-To-Eat foods.**



When queries were made in a word cloud<sup>1</sup> built on USDA's Food Composition Database<sup>2</sup> (polished and published by Ryan Whitcomb) to find foods containing more than 500 units of Major Mineral Sodium, foods that have the "CHICK" labels as part of their descriptions were surprisingly present next to those with "HAM", "RTE (Ready-To-Eat)", and "CURED". The latter three categories are generally recognized as salty foods that should be eaten with moderation.

It is generally understood that, while sodium is a necessary mineral for the human body, modern foods often have an overage in their sodium compositions. The fact that keyword “CHICK” appears alongside “CURED”, “HAM” and “Ready-To-Eat (RTE)” types as foods containing above-average amounts of sodium in the food data published by United States Department of Agriculture (USDA), and surpasses both “PORK” and “SAUSAGE” in its sodium composition says something about the chicken products in the nation.

<sup>1</sup> The word cloud is considered a central visualization and can be found in Part 3 of the linked Jupyter Notebook: [https://mybinder.org/v2/gh/velwu/data\\_viz\\_USDA\\_food/master?filepath=wu-vel-final-report-cumulative.ipynb](https://mybinder.org/v2/gh/velwu/data_viz_USDA_food/master?filepath=wu-vel-final-report-cumulative.ipynb)

<sup>2</sup> The dataset is available as Food Python Library, the CORGIS Dataset Project by Ryan Whitcomb; Version 2.0.0, created 6/21/2016: <https://think.cs.vt.edu/corgis/python/food/>

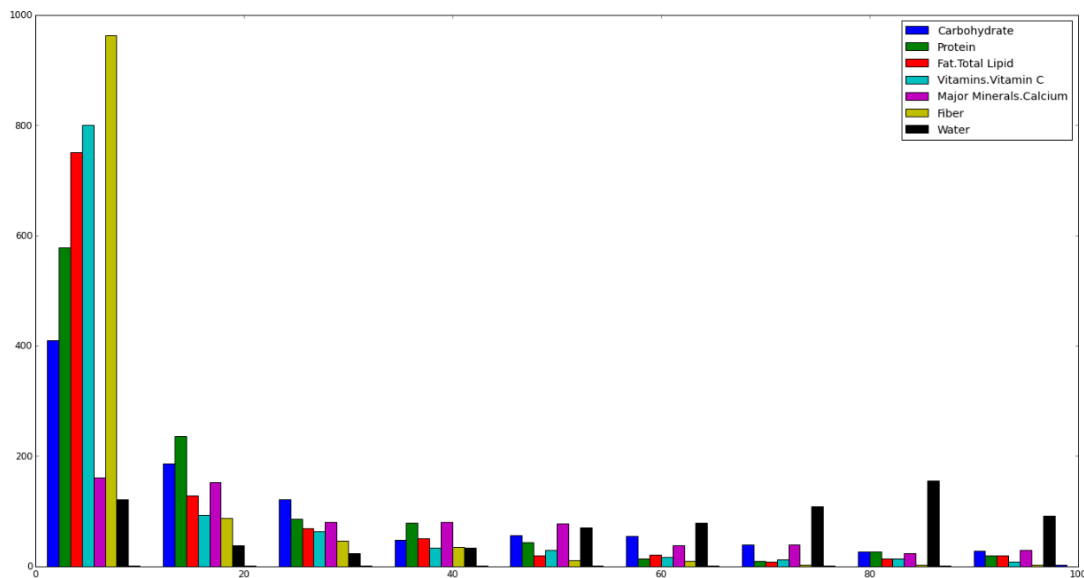
## Which foods are we talking about, anyway?

Briefly looking at the USDA's dataset<sup>3</sup>, nothing particularly stands out. However, each food is conveniently anonymized, with only the 1-word "Category" and comma-separated "Description" columns to provide any hint of what it is. The other columns simply record the unit composition of each of the 45 nutrients within that food.

	Category	Description	Alpha Carotene	Ash	Beta Carotene	Beta Cryptoxanthin	Carbohydrate	Cholesterol	Choline	Fiber	...	Major Minerals.Potassium	Miner
0	BUTTER	BUTTER,WITH SALT	0	2.11	158	0	0.06	215	19	0.0	...	24	
1	BUTTER	BUTTER,WHIPPED,WITH SALT	0	2.11	158	0	0.06	219	19	0.0	...	26	
2	BUTTER OIL	BUTTER OIL,ANHYDROUS	0	0.00	193	0	0.00	256	22	0.0	...	5	
3	CHEESE	CHEESE,BLUE	0	5.11	74	0	2.34	75	15	0.0	...	256	
4	CHEESE	CHEESE,BRICK	0	3.18	76	0	2.79	94	15	0.0	...	136	
...													
7408	FROG LEGS	FROG LEGS,RAW	0	1.40	0	0	0.00	50	65	0.0	...	285	
7409	MACKEREL	MACKEREL,SALTED	0	13.40	0	0	0.00	95	95	0.0	...	520	
7410	SCALLOP	SCALLOP, (BAY&SEA),CKD,STMD	0	3.06	0	0	0.00	53	81	0.0	...	476	
7411	SNAIL	SNAIL,RAW	0	1.30	0	0	2.00	50	65	0.0	...	382	
7412	TURTLE	TURTLE,GREEN,RAW	0	1.20	0	0	0.00	50	65	0.0	...	230	

7413 rows x 47 columns

In order to help users of our visualizations explore which food contains what (by just surfing in the couch, without all the hassle of counseling a nutritionist during this surreal time), we have undertaken the task of creating an interactive word cloud. In the process of creating it, however, an exploration of the dataset yielded the following distribution<sup>4</sup> of several essential nutrients within all foods recorded by the Department of Agriculture:



<sup>3</sup> Part 1 of the linked Jupyter Notebook contains the dataset parsed in the same form as the screenshot herein: [https://mybinder.org/v2/gh/velwu/data\\_viz\\_USDA\\_food/master?filepath=wu-vel-final-report-cumulative.ipynb](https://mybinder.org/v2/gh/velwu/data_viz_USDA_food/master?filepath=wu-vel-final-report-cumulative.ipynb)

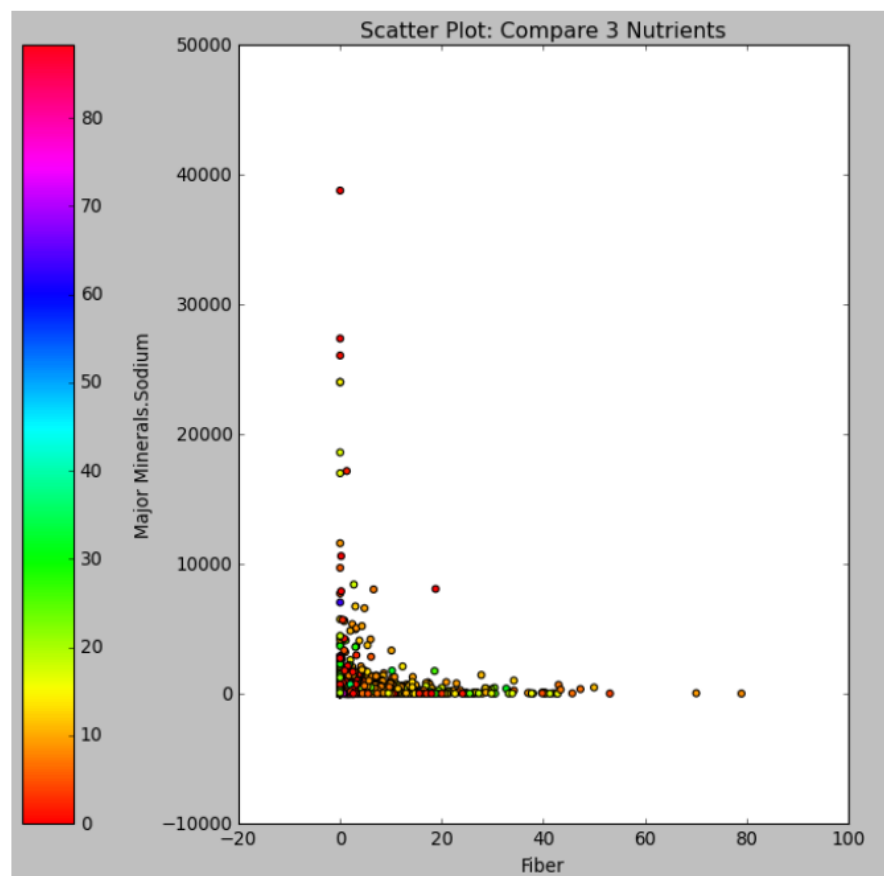
<sup>4</sup> This is considered the 1<sup>st</sup> contextual visualization. It can be found near the end of Part 1. It is also embedded as an interactive component in Part 2.

As the histogram shows, the majority have less than 10 units of each nutrient type, and most do not contain over 20 units of any. The distributions of water and calcium are quite even, so a modern consumer with access to these foods should not have much shortage in either nutrients long as s/he keeps a diverse diet, mixing in all kinds of foods.

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**Our world has too much salt, but barely enough fibers.**

Fiber remains rather low in most foods, however, and with more and more of us assuming office occupations and dealing with the lack of bowel movements caused by not taking enough fibers, this distribution stands out as a 2<sup>nd</sup> concern we would like you the reader to know ---- next to the fact that some foods are dangerously high in sodium.



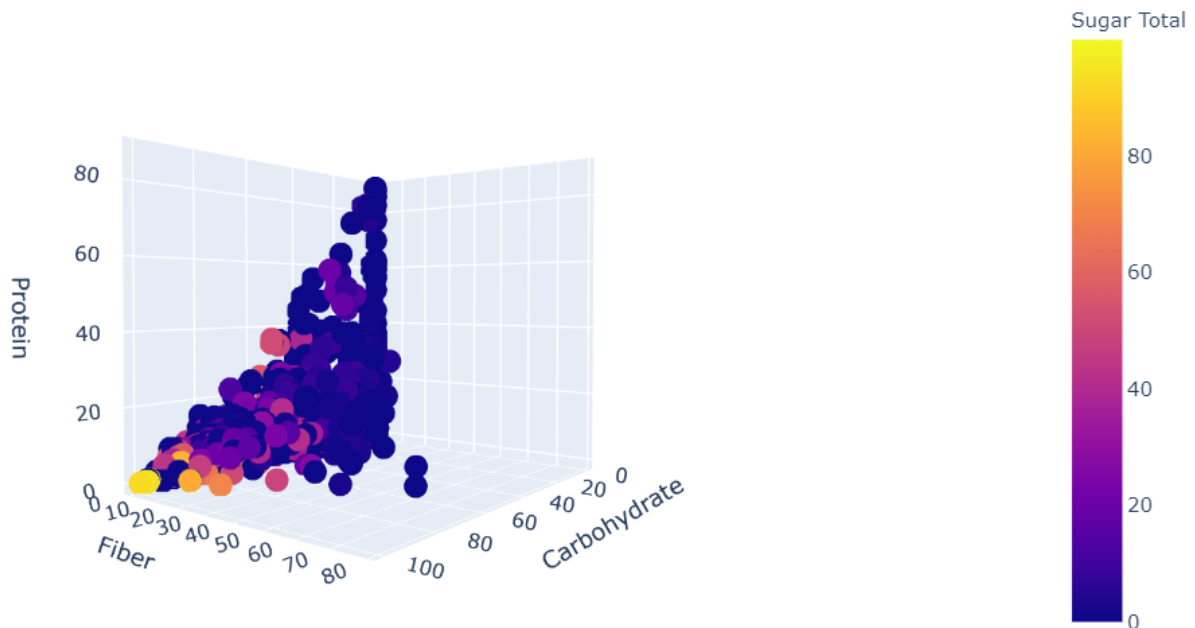
With this scatterplot<sup>5</sup>, we see that the distribution of fibers is rather even but very few foods have fiber units remotely close to a hundred. Meanwhile, there are several foods with almost no fiber, but their sodium contents are measured in tens of thousands! Suffice to say, such foods are to be avoided for any soul looking to stay healthy.

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<sup>5</sup> Considered the 2<sup>nd</sup> contextual visualization. Found in Part 2 of the linked Jupyter Notebook as an interactive component of Version 1.

### Carbohydrate is good for you. But mind the sugar.

There is no shortage of foods with high carbohydrate, which is also an essential fuel for our health. The following 3D scatterplot<sup>6</sup> does show that many foods rich in carbohydrate also contain a lot of sugars, however, so consumers should still be mindful.



There does exist carbohydrate-rich foods with low sugar, though most with such traits are also found with extremely low protein. Trying to plot multiple essentials in this 3-dimensional graph, we found that no food exists in the center of the box.

### Eat Diversely, Be Healthy.

The moral lesson of the day is, as easily as anyone could have said it: there is no perfect food. When something is rich in both carb and fiber, it comes with almost no protein. And vice versa. An ideal diet for human health is not about finding those perfect medicinal meals and take them religiously, but about trying out a bit a everything from day to day. The world is big and open, with many hidden treasures that are our foods. Never settle for just one recipe, but instead keep exploring and finding new horizons. In the end, your body might just thank you for being a curious soul.

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<sup>6</sup> Considered the 3<sup>rd</sup> contextual visualization. Found in Part 2 of the linked Jupyter Notebook as an interactive component of Version 1.

### Closing Notes

We would like to leave you the reader with the links to the datasets which this article and the codes behind visualizations herein are based on.

The main dataset is on <https://think.cs.vt.edu/corgis/python/food/>.

A supporting material can be found as “fndds\_ingredient\_nutrient\_value.xls”, extracted from “FoodData\_Central\_Supporting\_Data\_csv\_2020-03-31.zip” downloaded from the “Supporting Data” section on <https://fdc.nal.usda.gov/>

Source codes can be found at:

[https://github.com/velwu/data\\_viz\\_USDA\\_food](https://github.com/velwu/data_viz_USDA_food)

Also, you are very welcome to try out the visualizations interactively on your own devices through the link down below:

[https://mybinder.org/v2/gh/velwu/data\\_viz\\_USDA\\_food/master?filepath=wu-vel-final-report-cumulative.ipynb](https://mybinder.org/v2/gh/velwu/data_viz_USDA_food/master?filepath=wu-vel-final-report-cumulative.ipynb)

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