Nutriscore evaluation study on poultry sold in France

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Introduction

The nutriscore is a logo that provides information on the nutritional quality of products, in a simplified form that complements the mandatory nutritional declaration. It is based on a 5-color scale: from dark green to red. It's also associated with letters from A to E to optimize accessibility and comprehension by the consumers.

In the first part of this SAE, we cleaned a database in order to have it contain only what could of use to us in order to answer to the following question : What link can be established between the nutriscore (A,B,C,D,E) and the nutritional variables for products in the 'en:poultry' family in France?

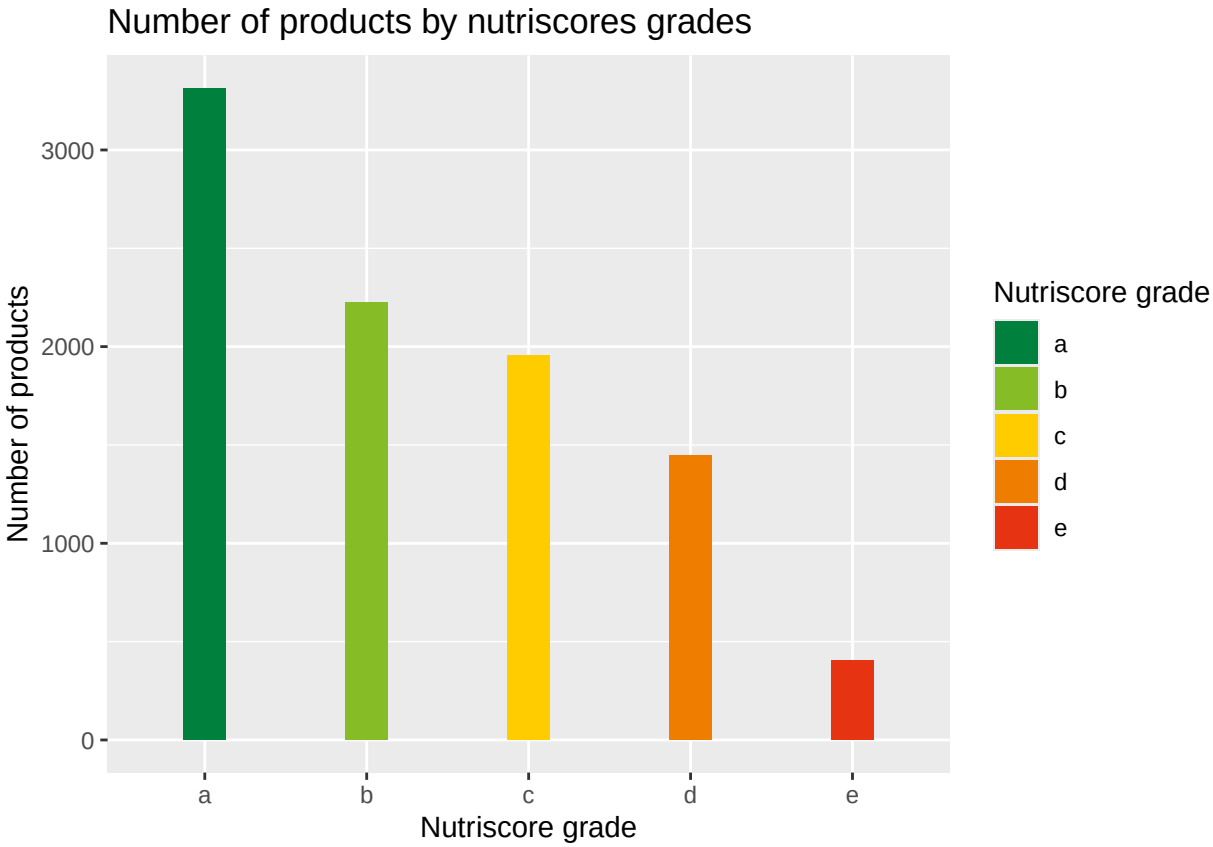
We will study the problem with 9,345 different products and several graphs based on poultry sold in different French stores and interpret these results to establish the link between the nutriscore and the nutritional variables of poultry according to French standards.

In this study, we will first take a look at graphes comparing their poultries quantity compared to their nutriscore grade, then we will review the proportion of main ingredients in products and their impact on nutriscore grades. Finnally, we will talk about the impact of energy intake on nutriscore and its correlation with main ingredients in products of our database.

Poultries quantity

Quantity of poultries compared to their nutriscore

This bar chart shows the number of poultry sold in France on the y-axis, and the nutriscore grade on the x-axis. This allows us to compare the number of poultry products in relation to their nutriscore grade.



As we can see, poultries are well rated on nutricores grades. The data set is mostly composed of products rated 'a' or 'b' with a peak at around 3300 poultries products rated 'a' and 2200 rated 'b'. The ones rated from 'c' to 'e' amount to around 3700 in total. We can define that the majority of poultry sold in France are of good quality / nutritional value. However, what are the ingredients in these products that modify their nutritional evaluation in France?

Quantity of organic and non-organic poultries compared to their nutriscore garde

This bar chart allows us to compare organic, non-organic and unknown-label poultry by quantity on the y-axis and nutriscore grade on the x-axis. This allows us to determine the impact of this label on their nutriscore grade.

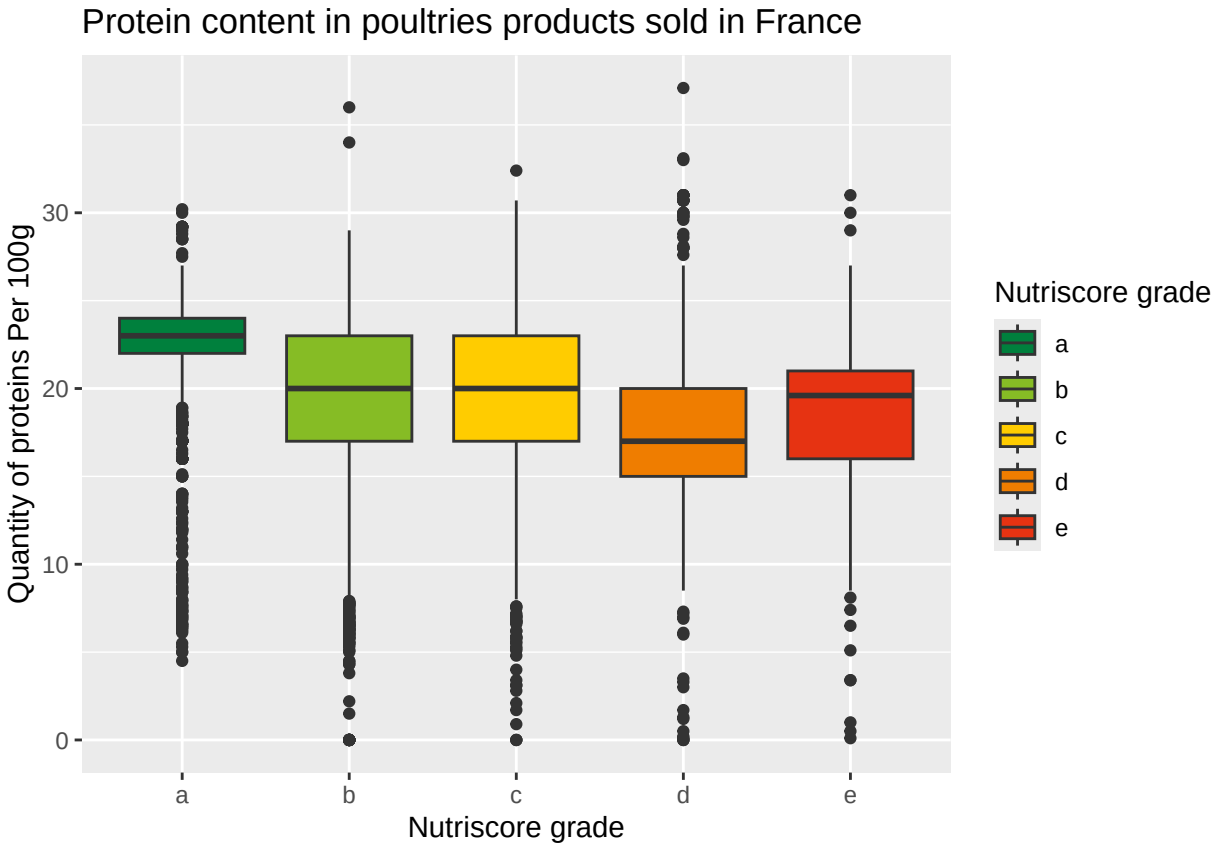
This graph shows that non-organics poultries have a nutriscore of 'a' with a peak at more than 2300 products in total. The amount of non-organics poultries decrease gradually until the 'e' grade, which has 230 products. Unlike the organic poultries products, this graph is composed of a rather large part of the total dataset. This shows that in general poultries are noted to be non-organic.

This graph also shows that organics products mostly have a nutriscore of 'a' and 'c' with 210 poulries in total. As we can see, the total number of organic poultries is trivial in comparison to the total number of entries in our dataset (9,345 entries). This shows that in general poultries aren't noted to be organic.

Quantity of main ingredients

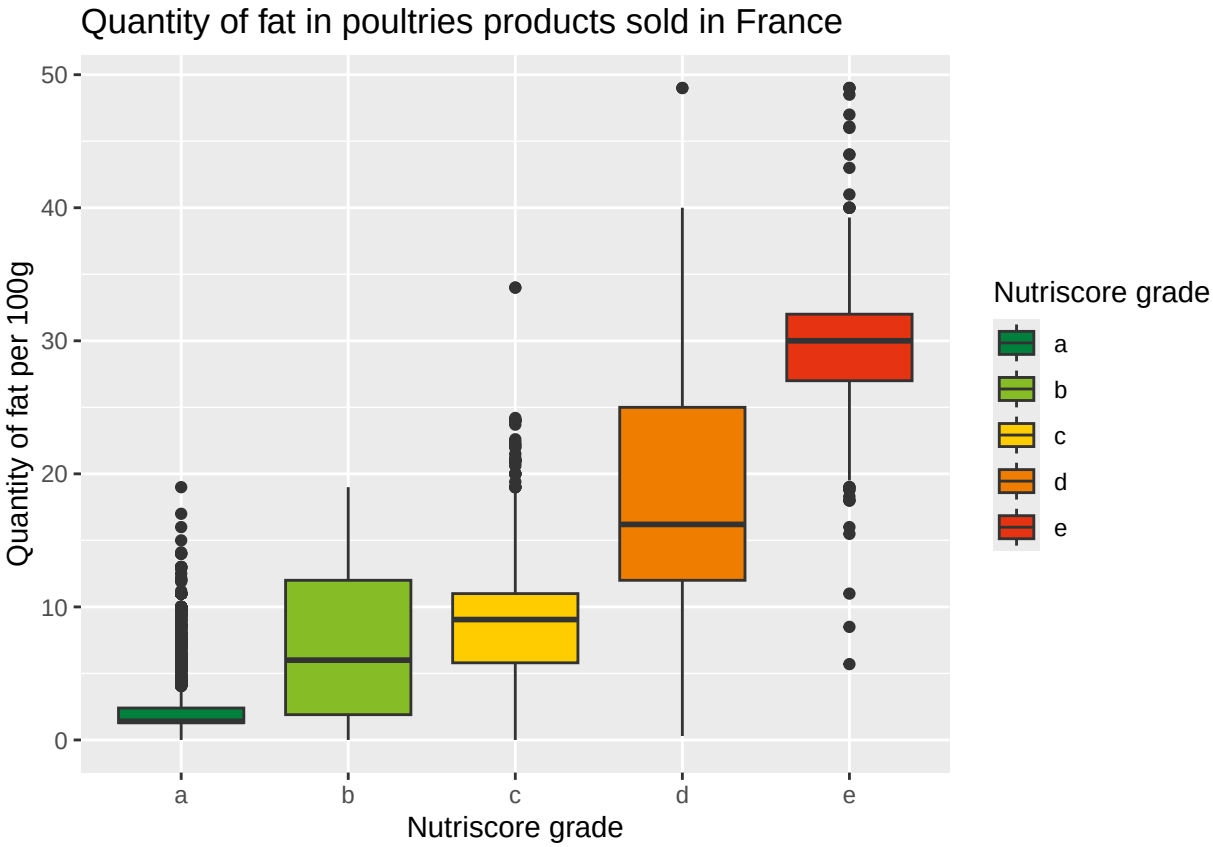
Protein quantity

This boxplot shows the protein content in our database's poultry products sold in France on the y-axis, and the nutriscore grade on the x-axis. This allows us to compare the protein content of a product in relation to their nutriscore grade.

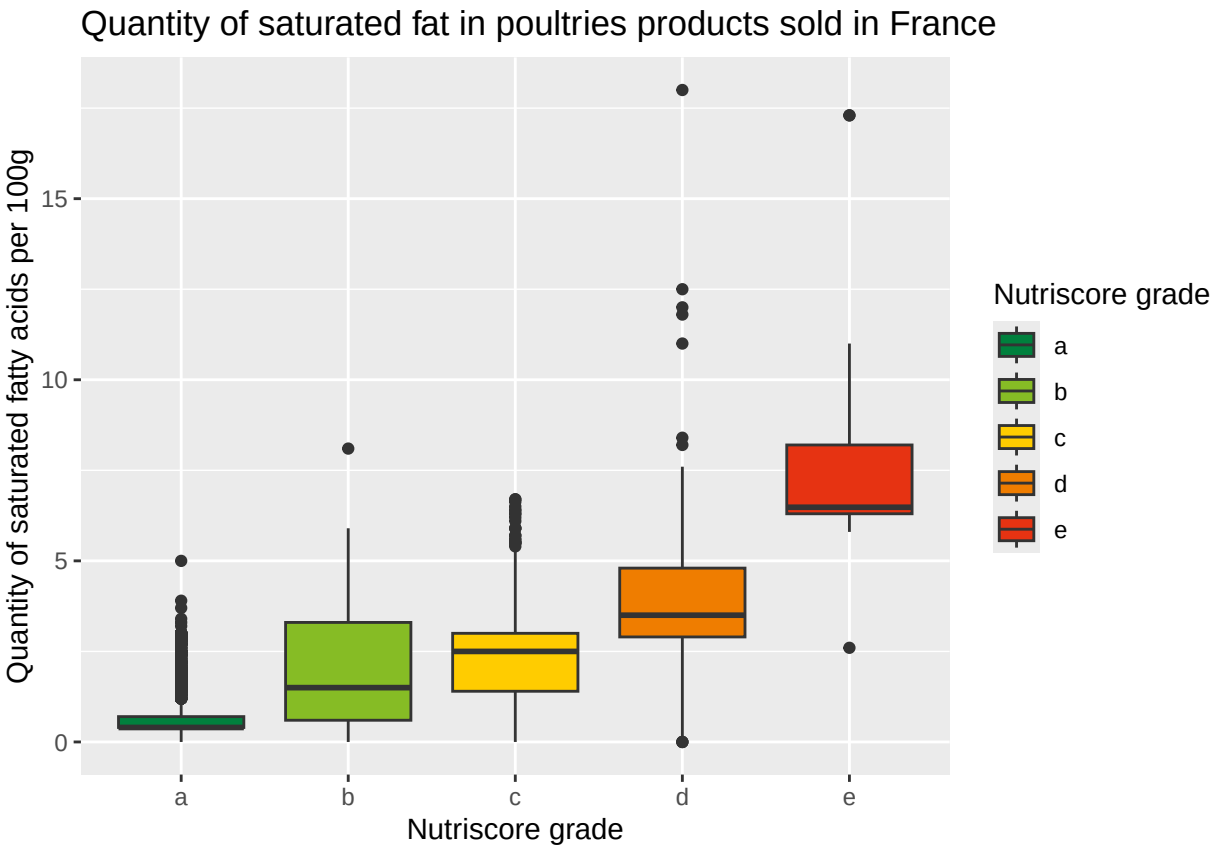


Fat quantity

This boxplot shows the quantity of fat in poulties products sold in France on the y-axis, and the nutriscore grade on the x-axis. This allows us to compare the quantity of fat of a product in relation to their nutriscore grade.

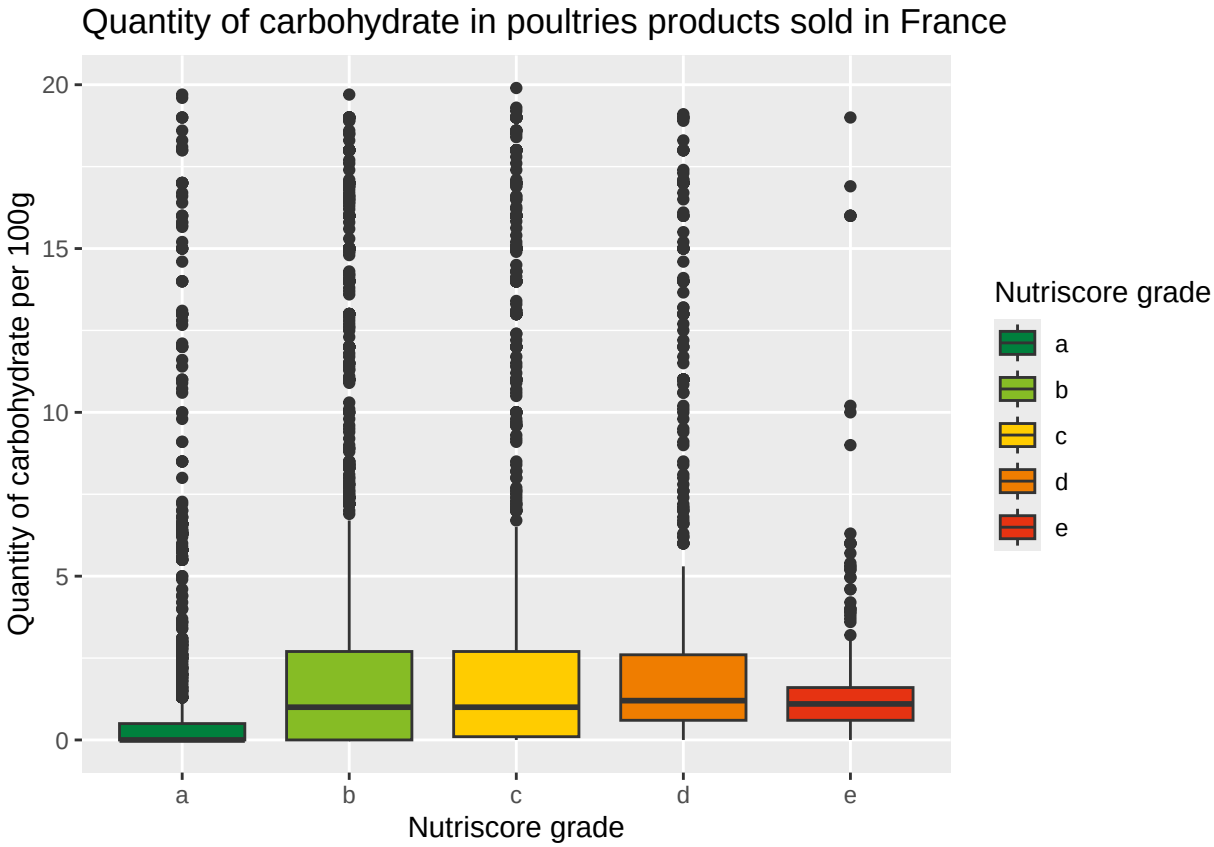


This boxplot shows the quantity of saturated fat in poulties products sold in France on the y-axis, and the nutriscore grade on the x-axis. This allows us to compare the quantity of saturated fat of a product in relation to their nutriscore grade.



Carbohydrates quantity

This boxplot shows the quantity of carbohydrate in poulties products sold in France on the y-axis, and the nutriscore grade on the x-axis. This allows us to compare the quantity of carbohydrate of a product in relation to their nutriscore grade.

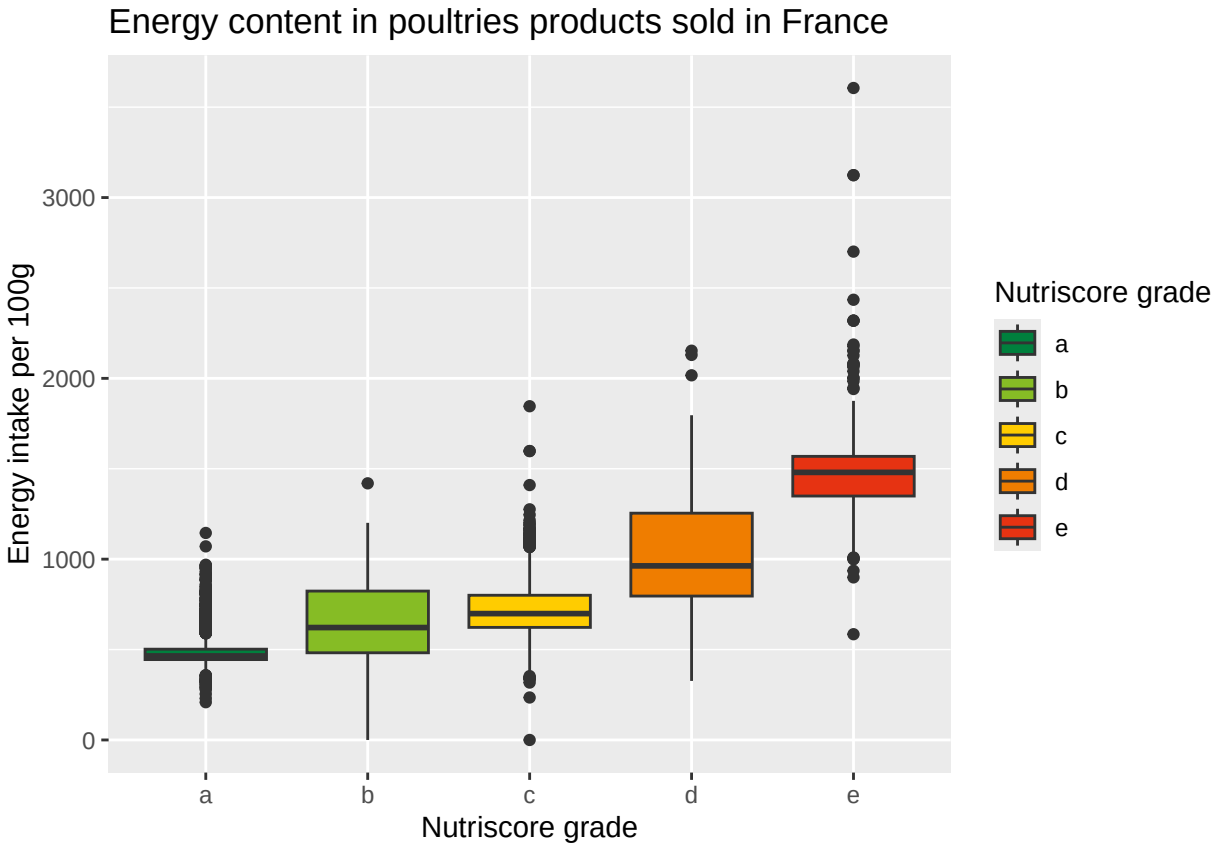


On these graphs, we can see the protein amount decrease slightly along with the grade of the products. It's the reverse with the fat and saturated fat quantities, where the quantity of it in poultry increases as its grade worsens. This increase is gradual but tends to be rather sharp. As for the carbohydrates amount in the products, the median tend to stay stagnant along the nutriscores grades but we can see the for the 'a' rated products, the median is near 0 instead of the constant amount of around 1 that the other products have.

As we can see on these graphs, we can see that most of these poultries are rather healthy products and it is correlated to their nutriscore. Usually, the better their grade, the better their quantity of proteins, and with a lesser amount of fat, saturated fat and carbohydrates in these poultries

Product energy contribution

This boxplot shows the energy content in poulties products sold in France on the y-axis, and the nutriscore grade on the x-axis. This allows us to compare the energy content in products in relation to their nutriscore grade.



On average, the lower the product's energy contribution, the higher its score. For products with an "A" score, the contribution is around 500 Kj (Kilojoule), compared with products with an "E" score, which have a contribution of around 1500 Kj. Energy intake is calculated on the basis of lipid, carbohydrate and protein content. The energy difference can easily be explained by what we've seen above, the large amount of lipids in products of lesser nutritional quality, which cause energy intake to explode by a factor of 3.

Conclusion

Finally, for good-quality French poultry, it's very important that lipid and carbohydrate content is low, drastically reducing energy intake by up to a factor of 3. On the other hand, the protein content must be high, even if there are several extremes tending towards the lower end of the scale, as most recipes have a high protein content for an "a" grade. Finally, good French poultry is high in protein, and low in fat and carbohydrates.