

## **PRESS RELEASE**

### **COMPREHENSIVE ANALYSIS OF THE NUTRITIONAL PROFILE OF GLUTEN-FREE PRODUCTS AS COMPARED TO THEIR GLUTEN-CONTAINING COUNTERPARTS**

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#### **Objectives and study**

Gluten free-diet is the life-long therapy for patients with Coeliac Disease (CD). This supposes the exclusion of staple foods coming from gluten containing cereals from the daily dietary intake. The intake of these products, like bread, pasta and other bakery products, represent an important role in the daily diet, thus contribute significantly to the nutritional daily intake. In order to tackle this gap, a wide range of gluten-free products (GFP) are available across the food industry, which mimic the physical and organoleptical characteristics of their gluten-containing counterparts (GCC) with the only difference that the raw materials for their elaboration have replaced the forbidden cereals, mainly by corn or rice flour and potato starch. The elimination of the gluten, however, supposes a great technological challenge since this protein is the responsible for the tridimensional structure conferred to the food matrices. This cannot be achieved by any other ingredient, but a similar palatability and texture in the GFP can be obtained by the addition of other ingredients. Thus, the different elaboration process may lead to a different nutritional profile between these two groups of products.

Therefore, the aim of the present study was to assess the nutritional composition of the GFP as compared to their GCC.

#### **Methods**

- A total number of 654 GFP from 25 brands and 655 GCC from 29 brands were selected.
- Nutritional facts information was obtained from the labeling of the products, which according to the Spanish legislation, include Energy (kcal), protein (g), carbohydrates (g), sugar (g), lipids (g), saturated fatty acids (g) and fibre, for the vast majority of the food products.
- Ingredients used in the manufacturing of products was also registered for the analyses. They were classified into two groups “starchy ingredients” and “added fats”
- According to the role in the diet, each food item was assigned with a food group: bread, roll bread, bread toast, bread bun, pasta, flour, breakfast cereal, biscuits, pastries, pizza, snacks, ready meals, battered and ice-cream.
- A linear regression model was used to explain differences in nutritional composition between GFP and GCC for each food group.
- The whole range of products was compared between Gluten-free and Gluten-containing.
- Additionally, three groups were assessed separately (gluten-free vs. gluten-containing) because of their relevance in the diet: breads, pasta and biscuits.

#### **Results**

Whole range of products:

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- the GFP had a higher energy content than their GCC.
- the protein content of GCC in some of the food groups was two to three times higher than the content in the GFP, especially in the case of flours, breads, pasta and pizza ( $p < 0.0001$ )
- Similar carbohydrates and sugar content between the two categories
- Heterogeneous lipids and saturated fatty acids patterns found among the assessed products, but for any of the nutrients statistically significant differences were found (gluten-free vs. gluten containing).

Breads, pasta and biscuits.

- Breads (bread, bread roll, bread bun, toasted bread): all GF-breads had significantly higher content of lipids and saturated fatty acids (this last except the bread bun group)
- Pasta: GF-pasta had significantly lower content of sugar and protein, and there were no differences in lipids or saturated fatty acids with respect to the GC-counterparts.
- Biscuits: GF-biscuits had significantly lower content of protein and significantly higher content of lipids, but not saturated fatty acids.

Analysis of the formulation (ingredients)

- “Added fats”. Bread: sunflower oil has a high contribution in the composition of GCP, in contrast to the GFP, in which palm oil was the principal fat used. Pasta: sunflower oil was the main fat used in the GCP, whilst in some GFP also butter and palm oil were used. Biscuits (these are processed products with a high fat composition) in GCP fats are provided by cocoa oil, palm oil and sunflower oil in a similar proportion, whilst in GFP the biggest clustering was seen in palm oil, although other products such as butter, cocoa, coconut and sunflower oil were also present. → all this explains the differences in saturated fatty acids: palm oil is rich in saturated fatty acids, whilst sunflower oil has a more unsaturated profile.
- “Starchy ingredients”. Bread: wheat flour was the main cereal used for the elaboration of GC breads, whilst GF breads were made up, in order of frequency: corn starch, rice flour and corn flour. Pasta: semolina was the main cereal used as flour in GCP, whilst corn flour, rice flour and cornstarch were the main cereals used in GF pasta. Biscuits: GC biscuits were principally made of wheat flour and GF biscuits mainly of corn starch, rice flour and corn flour. → all this explains the differences in protein content: wheat flour is rich in protein whilst rice or corn flour, as well as starches and semolina, are poor in protein content.

## Conclusions

- GFP cannot be considered as substitutes for their GCC.
- We highlight the lack of nutritional facts information in the labeling of products
- The assessed food products that may have a greater impact in the diet of a CD patient, like bread and pasta, differ from their GCC in terms of protein, lipids and saturated fatty acids
- need for a reformulation of the GFP with healthier raw materials and ingredients and encourage the food industry to innovate the recent advances in research in this field.