

# NUTRIENT COMPOSITION OF GLUTEN - FREE COOKIES

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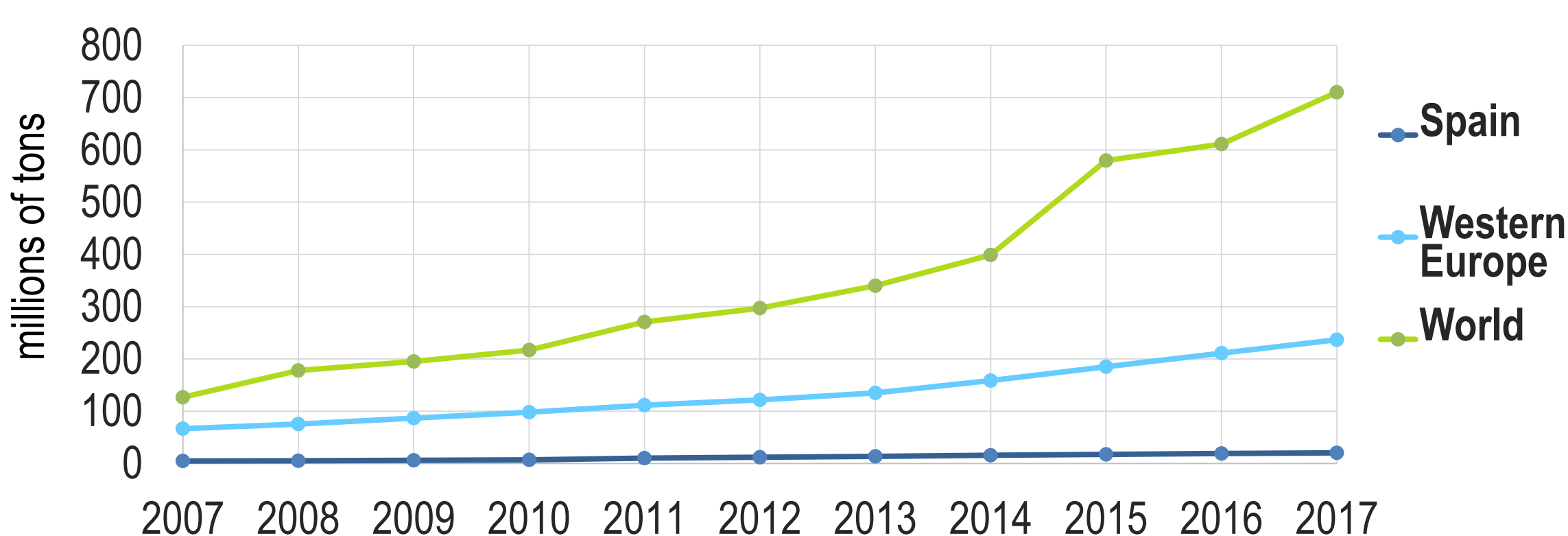


Figure 1. Worldwide production of gluten-free products<sup>1</sup>

## BACKGROUND

At present, there is a widespread offer of gluten-free products in the Spanish market due to an increasing demand. Spain has the largest positive growth in the production of this food category in the last 10 years (18.8%), compared to Western Europe and the rest of the world (13.6 and 15.4%, respectively)<sup>1</sup>. However, composition data is limited and it is questioned whether they are similar to their gluten containing counterparts, especially for target nutrients in health promotion<sup>2</sup>.

## OBJECTIVES

To develop a food composition database on gluten-free products and to compare nutritional content with similar products that contain gluten. Data is given for cookies and pastries.

## METHODS



A market study (September 2016 - March 2018) based on supermarket visits (highest market share) and product web page scanning was conducted

Nutritional composition declared on product's labels from packaged cereal-based gluten-free foods marked with the European gluten-free label, The Spanish Federation of Coeliac Associations (FACE) symbol and the nutritional claim "SIN GLUTEN" were collected

Development a food database according LanguaL<sup>TM</sup> Thesaurus EuroFIR

Data were compared with that available in Food Composition Tables<sup>3</sup>  
Unpaired *t*-test was used to compare means of nutritional content between gluten-free products and similar to their gluten containing counterparts (SPSS v.24.0 program)

## RESULTS

Developed database comprises a total of 230 gluten-free foods from eleven different food subgroups adopting the LanguaL<sup>TM</sup> Thesaurus EuroFIR (Fig. 2). Fine bakery were represents the 37% (Fig. 2a). Six varieties of cookies were defined: digestive type, with fillings, butter, etc.;

being chocolate biscuits the largest variety (Fig. 2b). Nutritional composition from 62 gluten-free cookies was studied (Fig. 3). Only protein and salt contents were significantly lower in gluten-free products (Fig. 3a).

- Alcoholic beverages
- Imitation milk prod.
- Frozen dairy desserts
- Breads and similar prod.
- Breakfast cereals
- Cereal or cereal-like milling prod. and deriv.
- Fine bakery ware
- Pasta and similar prod.
- Savoury cereal dishes
- Prepared food prod.
- Spices, condiments or other ingredients

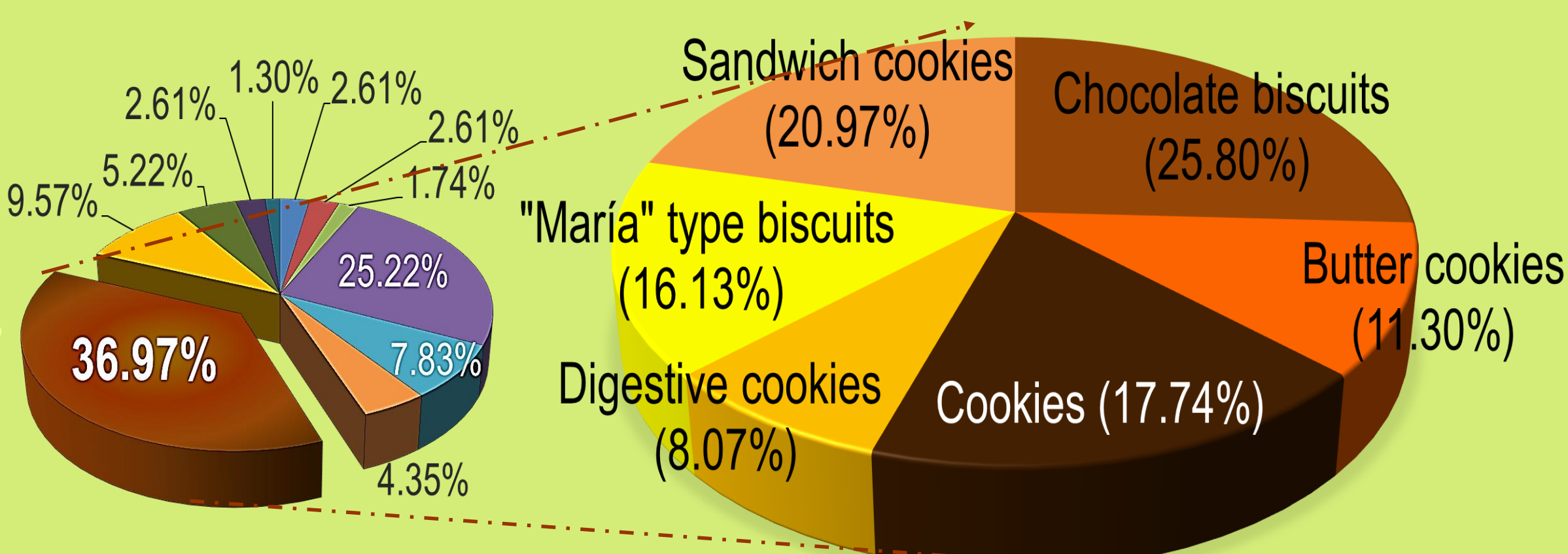


Fig. 2a. GF food subgroups Fig. 2b. GF cookie varieties

Figure 2. Percentages of different gluten-free food subgroups (2a); Percentages of the cookies gluten-free category in the developed database (2b). \*deriv: derivatives; prod: products; GF: gluten-free.

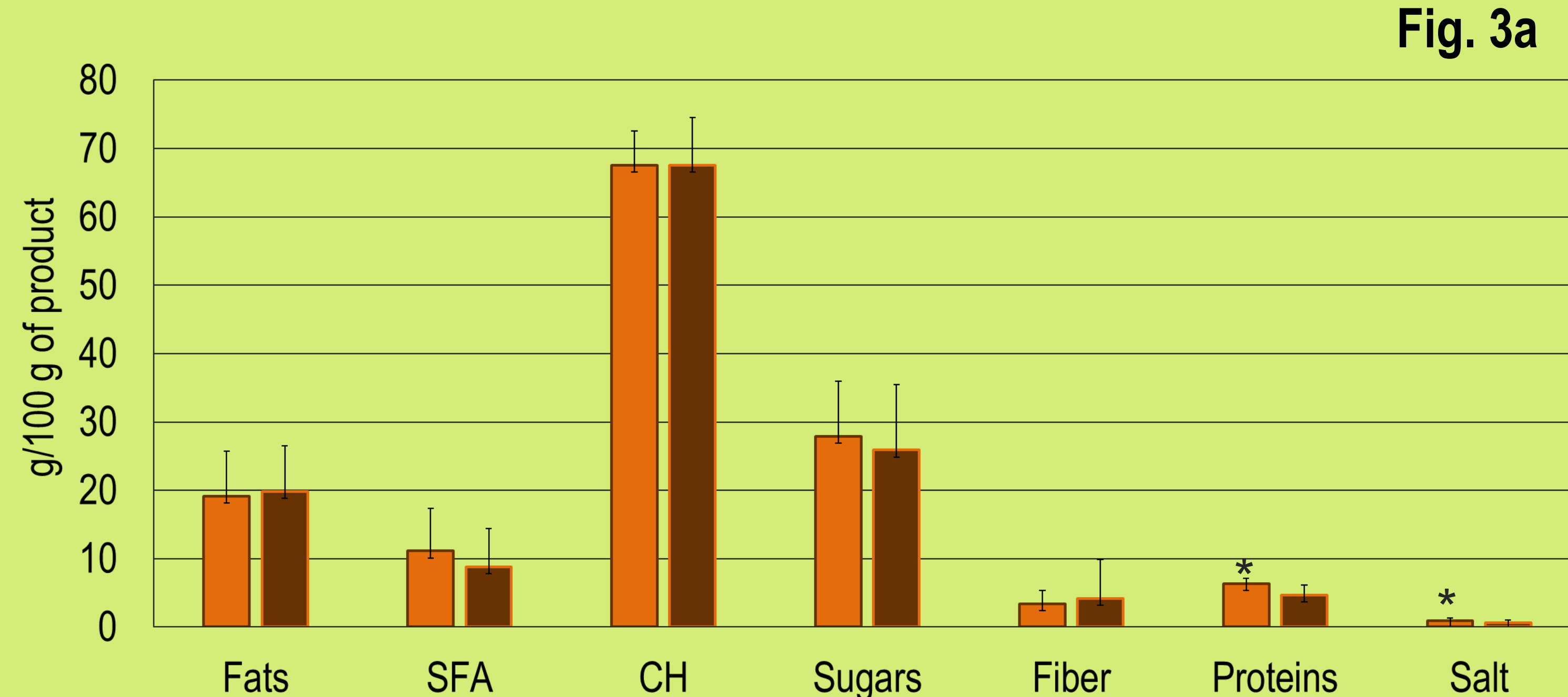


Fig. 3a

Table 1. Example of the developed gluten-free products database

Image	Name of product	LIST OF INGREDIENTS FROM LABEL/PACKAGE (IMAGE)	E (kcal)	Fats (total) (g)	AGS (g)	AGM (g)	AGP (g)	Cholesterol (mg)	HC (g)	Sugars (g)	Starch (g)	Fibre (g)	Protein (g)	SALT (g)
	Galletas de desayuno	Fécula de patata, harina de maíz, azúcar de caña, aceite de girasol, fécula de maíz, maltodextrina, semillas de amapola 2,2%, semillas de sésamo decortadas 2,2%, semillas de lino 2,2% emulgente: lecitinas de nabina, dextrosa, salvado de quinoa, espesante: goma xantana, fibra de bambú, gasificantes: difosfatos, carbonatos de sodio, carbonatos de amonio, sal, aroma natural.	455,0	16	1,6	ND	ND	ND	72	16	ND	4	3,8	0,56
	Galleta maria	Harina de maíz, aceite vegetal 18 % (girasol alto oleico), azúcar, almidón de maíz, jarabe de glucosa y fructosa de maíz, harina de arroz, harina de soja, fibra de maíz, fibra de guisante, sal, gasificantes: bicarbonato sódico y amónico, emulgente: lecitina de soja.	471	19	1,7	15	2,3	ND	67	20	ND	4,8	5,6	0,88
	Galleta sharkies	Almidón de maíz, azúcar, aceite vegetal (girasol alto oleico) 15%, harina de maíz, almidón de patata, almidón de arroz, cacao en polvo, jarabe de glucosa y fructosa de maíz, harina de arroz, salvado de arroz, gasificantes (bicarbonatos sódico y amónico), sal, emulgente (lecitina de soja), aroma de vainilla. Sin frutos secos, lactosa, proteínas de la leche y huevos. Con girasol alto oleico.	459	16	1,5	13	1,5	ND	75	21	54	3,8	1,9	0,17

\*ND: non defined

Fig. 3b

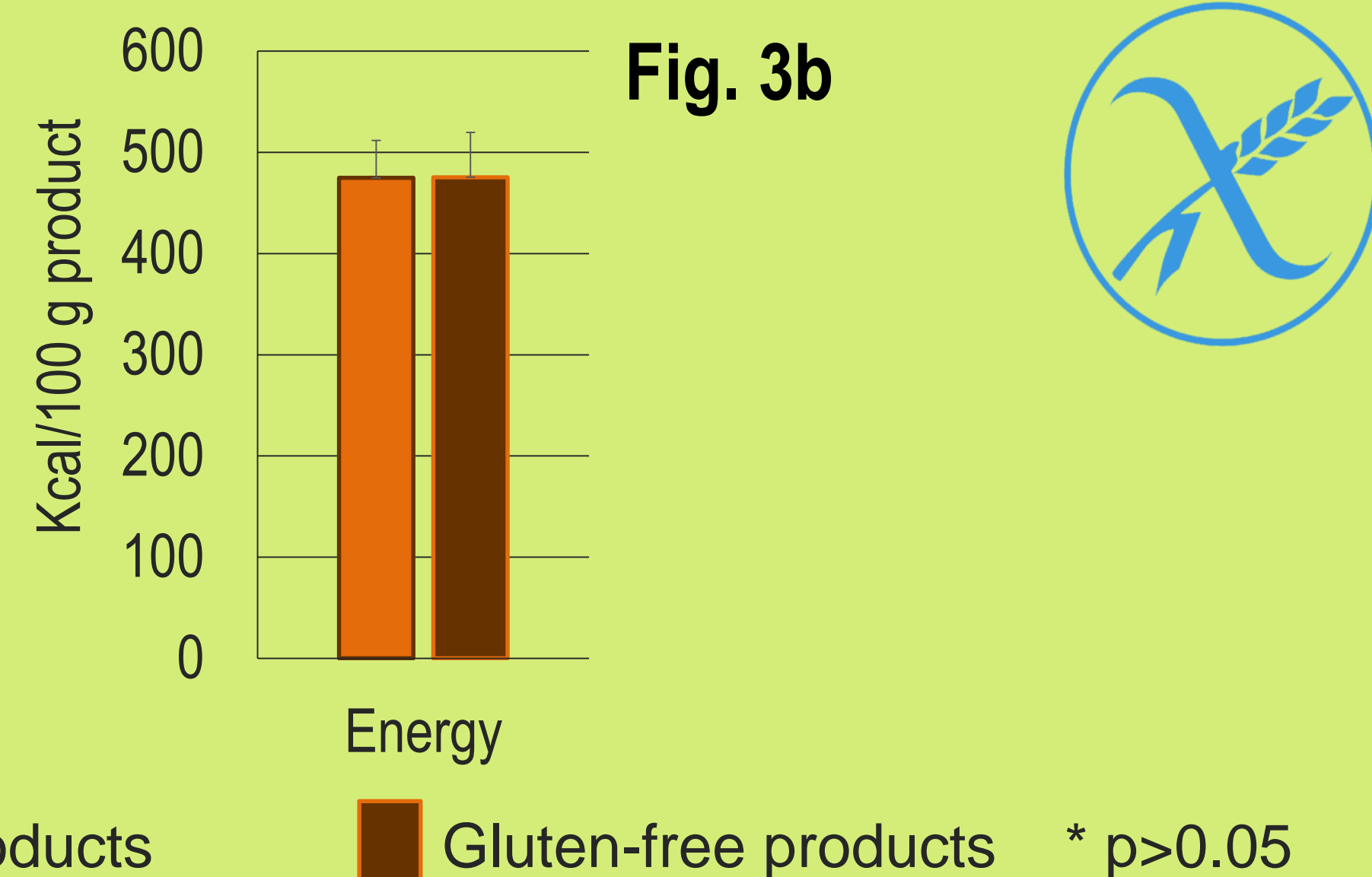


Figure 3. Macronutrients, fiber, salt (3a) and energy (3b) contents between gluten-free vs. regular (gluten containing) products (average  $\pm$  SD). \*SFA: saturated fatty acids; CH: carbohydrates.

## CONCLUSIONS

Nutritional composition of gluten-free cookies was found to be similar to gluten containing products with the only exceptions of a lower protein and salt content. The results are in contradiction to other studies where gluten-free products have been described as higher in fat, energy and sodium content; but could be the result of food reformulation by manufacturers.

## REFERENCES

- [1] Worldwide production of gluten-free products. Euromonitor International. Available online: <http://panypizza.com/sin-gluten-categoria/la-calidad-organoleptica-una-prioridad-las-marcas-sin-gluten/>.
- [2] Missbach B, Schwingshackl L, Billmann A, Mystek A, Hickelsberger M, Bauer G, König J. 2015. Gluten-free food database: the nutritional quality and cost of packaged gluten-free foods. *PeerJ* 3:e1337; DOI10.7717/peerj.1337. [3] Moreiras O, Carbajal A, Cabrera L, Cuadrado C. 2018. Tablas de composición de alimentos. Guía de prácticas, 19th edition. Pirámide: Madrid, Spain.

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