

CIRCULAR GASTRONOMY APPLIED TO GREEN ASPARAGUS BY-PRODUCTS

DEVELOPMENT, CHARACTERIZATION AND EVALUATION BY CONSUMERS OF DERIVED PASTA FORMULATIONS

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INTRODUCTION & AIM

The environmental impact of food production represents a relevant challenge today. Many by-products generated by the agrifood sector, under a circular economy approach, represent an opportunity for sustainability with sensory and nutritional benefits.



Green asparagus (*Asparagus officinalis*), a significant crop in the Community of Madrid, releases large amounts of by-products, with few food applications described.

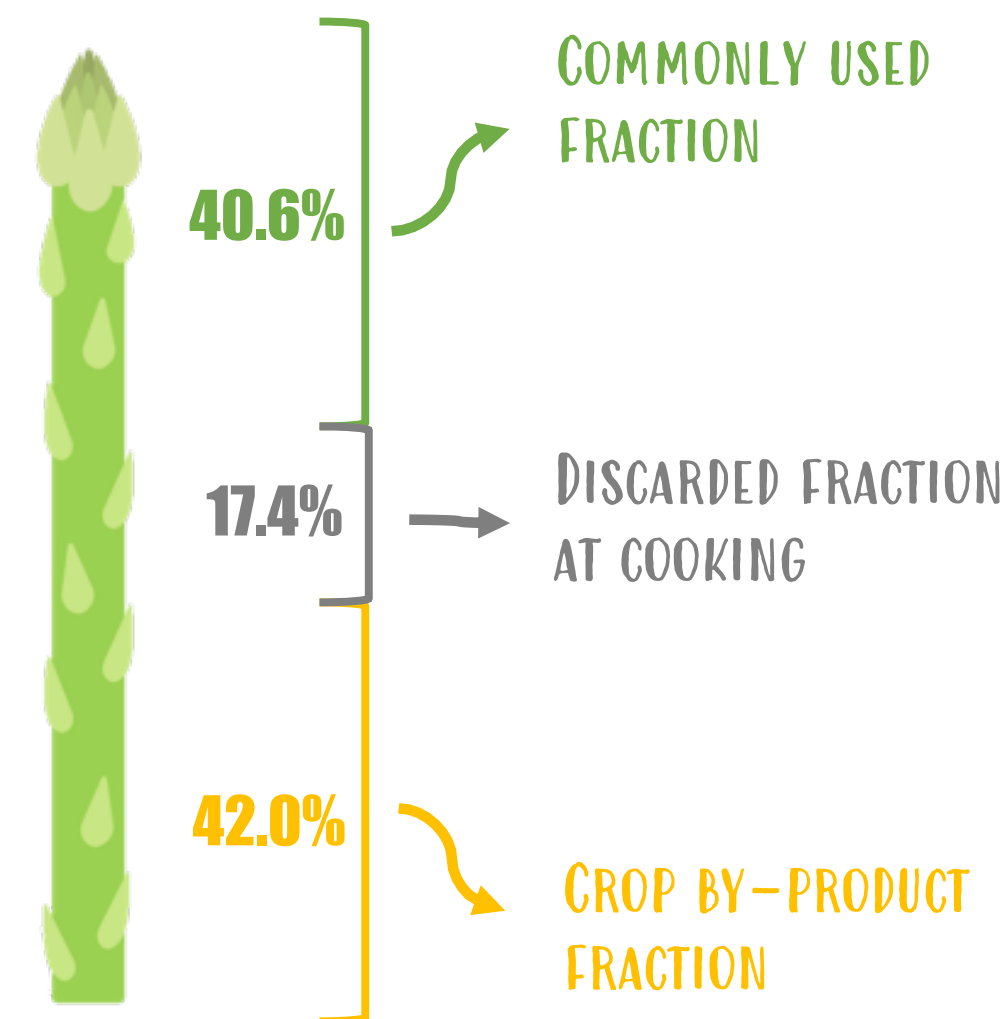


The **AIM OF THIS WORK** is the effective incorporation of green asparagus by-products in pasta products.

METHOD

- 1 **ASPARAGUS BY-PRODUCTS FROM FUENLABRADA AGRARIAN PARK**
- 2 **PROXIMAL COMPOSITION AND TOTAL CONTENT OF POLYPHENOLS (Folin-Ciocalteu method)**
- 3 **DIFFERENT CULINARY TECHNIQUES:**
blending, dehydration, enzymatic hydrolysis...
- 4 **SENSORY EVALUATION OF PRELIMINARY FORMULATIONS BY 43 GASTRONOMY STUDENTS**
- 5 **OPTIMIZATION OF PASTA PROPOSALS:**
By-product processing, mixing technique, formulations...
- 6 **TEXTURE ANALYSIS OF PASTA WITH THE 5-BLADE KRAMÉ SHEAR CELL (TEXTUROMETER)**
- 7 **COLOR ANALYSIS OF PASTA USING A COLORIMETER**
- 8 **CONSUMER ACCEPTANCE EVALUATION BY 107 PARTICIPANTS IN A TASTING ROOM**
(4 developments and a spinach commercial reference)

RESULTS & DISCUSSION



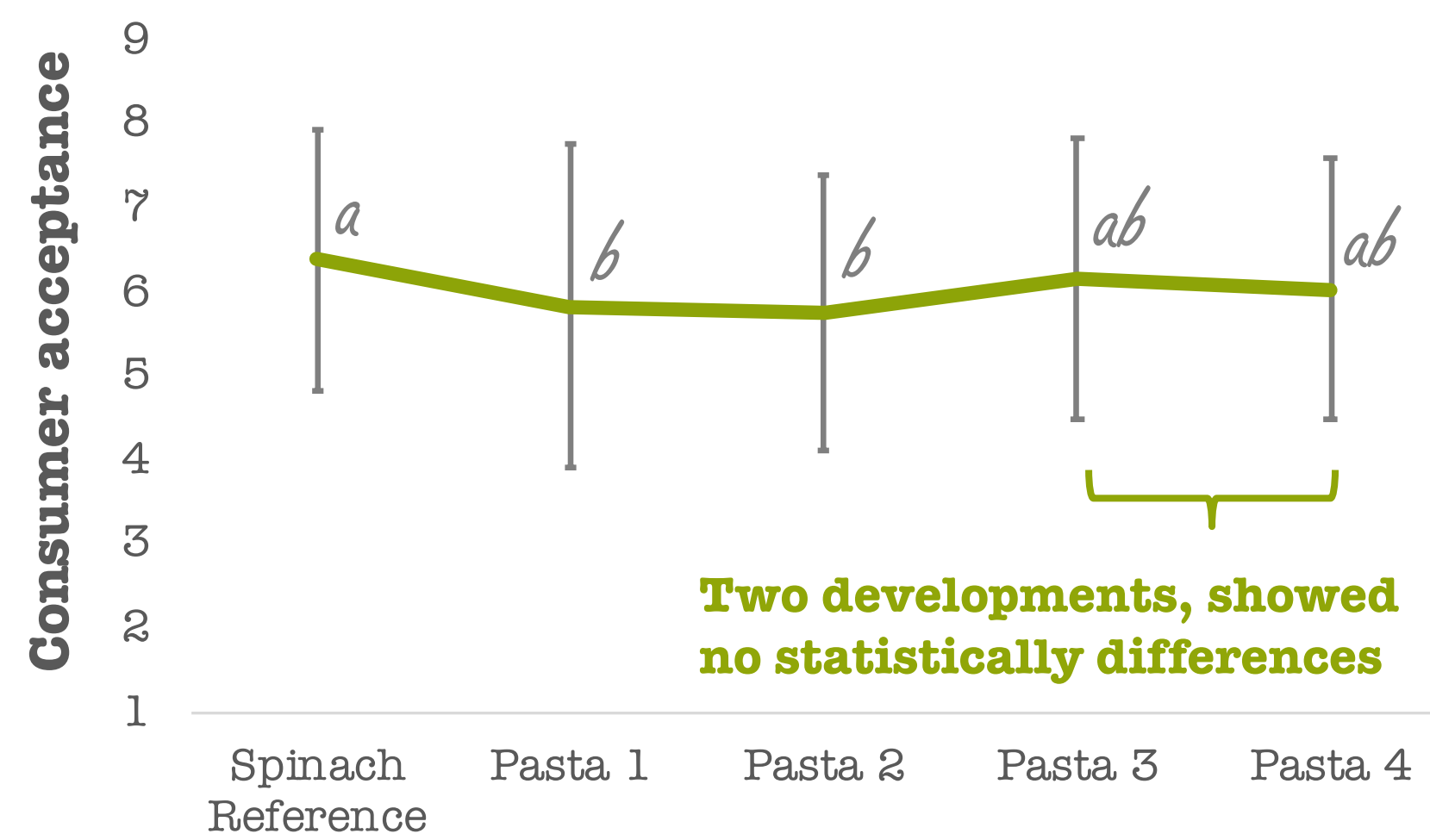
Asparagus fractions based on consumption.
Asparagus template designed by raupixel.com (Freepik).

The abundant asparagus byproduct showed remarkable contents of fiber ($31.7 \pm 1.13/100$ g of dry by-product) and protein (15.95 ± 0.07), with a polyphenol content of 3.55 ± 0.30 mgGAE/g.

	value	SD
ENERGY (Kcal)	263.00	2.83
PROTEIN (g)	15.95	0.07
CARBOHYDRATES (g)	32.25	0.07
SUGARS (g)	20,65	1.20
TOTAL FAT (g)	0.75	0.07
SFA (g)	0.20	0.00
MUFA (g)	0.10	0.00
PUFA (g)	0.45	0.07
DIETARY FIBER (g)	31.70	1.13
SODIUM (g)	0.03	0.00

Proximal composition of asparagus by-product (% dry product; n=2).

SFA, MUFA and PUFA: saturated, monounsaturated and polyunsaturated fatty acids.



Consumer acceptance of pasta developments based on asparagus by-product and a commercial spinach reference (9-point hedonic; n=107).

Different letters corresponding to statistical differences by ANOVA and Tukey test ($p < 0,05$).

After reports of the characteristics, 85% of consumers re-evaluated samples positively, associating it mostly with pleasant feeling.

CONCLUSION



The viability of using green asparagus by-products in pasta was demonstrated; it showed acceptable mechanical properties, good acceptance and nutritional benefits. It contributes to sustainability, also presenting an important gastronomic opportunity.