

Modulation of antinutritional factors in lentil flours after different physical pretreatment techniques

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Introduction

One of the most ancient cultivars



Leguminous family

Spain is the main European producer



Part of the Mediterranean diet

Source of vegetal proteins, fiber, and minerals



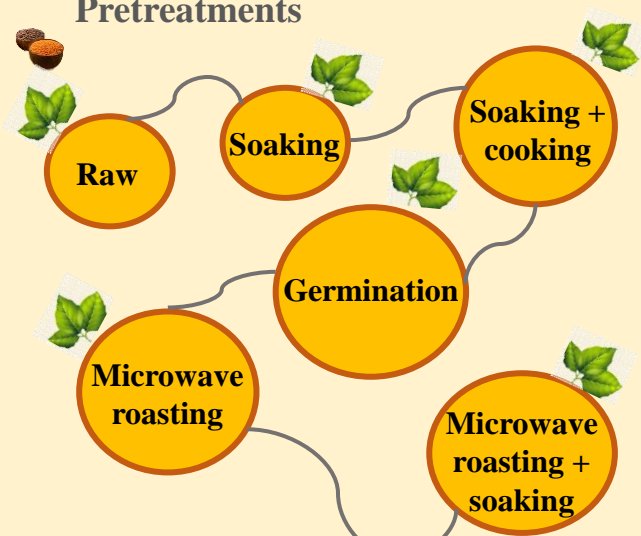
Consumed in soups, bakery products, and as meat substitutes/extenders

Presence of antinutrients which decreases the bioavailability of compounds of interest



May be suppressed/eliminated using different pre-treatments

Pretreatments



Antinutritional factors

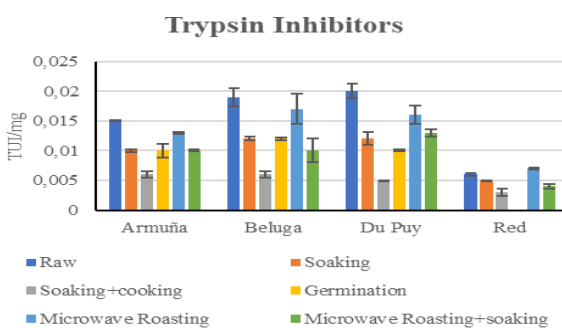
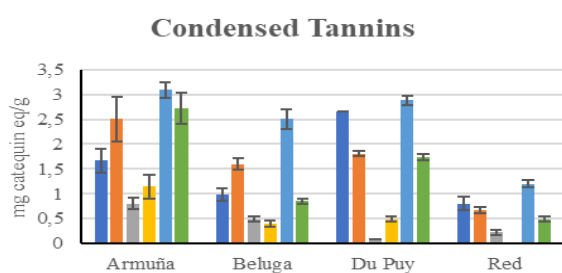
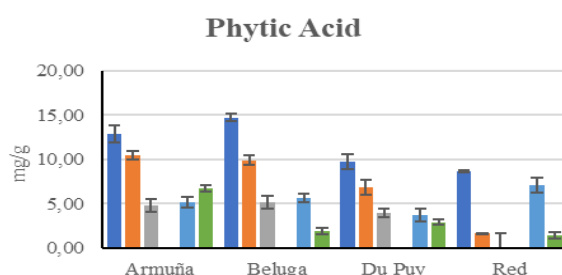


Figure 1. Pretreatment methods applied to Armuña, Beluga, Du Puy, and Roja lentils flours.

Discussion

Regarding phytic acid, all processing methods significantly ($p < 0.05$) decreased its concentration in all lentil varieties analyzed, mainly after germination, when phytic acid was eliminated. This decrease has been attributed to its degradation by the phytase enzyme that is activated during this process.

Not all processing methods were efficient in reducing condensed tannin content, with substantial increases observed after soaking and microwave roasting, with or without pre-soaking, of the vast majority of samples. During germination, in turn, condensed tannins can be reduced by activation of polyphenol oxidase and other catalytic enzymes, this process being responsible for the greatest tannin reductions in several other studies.

Regarding trypsin inhibitors, cooking with pre-soaking was the most efficient processing method to reduce their concentration, which was attributed to their denaturation resulting from their thermolabile nature.

Conclusion

All the investigated processing methods exerted some influence on the analysed parameters of the lentils, with greater influence and beneficial results emerging from germination and cooking treatments to varying degrees.

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