The quality of pasta added with cardoon inulin: 1) evaluation of the part of the plant used for the extraction of the polymer

Carla Sillitti, PhD student, CNR-ISAFOM, Catania, Italy; University of Foggia – D3A, Foggia, Italy.
Lucia Padalino, PhD reseacher, University of Foggia – D3A, Foggia, Italy.
Piero Calderaro, Technician, CNR-ISAFOM, Catania, Italy.
Antonella Pagliaro, PhD student, CNR-ISAFOM, Catania, Italy; University of Foggia – D3A, Foggia, Italy.
Amalia Conte, PhD researcher, University of Foggia – D3A, Foggia, Italy.
Matteo A Del Nobile, PhD professor, University of Foggia – D3A, Foggia, Italy.
Salvatore A Raccuia, PhD researcher, CNR-ISAFOM, Catania, Italy.
Maria Grazia Melilli, PhD researcher, CNR-ISAFOM, Catania, Italy.

Abstract

Statement of the Problem: the plants of cardoon (*Cynara cardunculus* L.) accumulate inulin both in the roots and in the receptacles. The yields of inulin in the heads is quite high, the lower costs and greater ease of collection than the roots, led to an initial evaluation of this polymer as ingredient to functionalize pastas. Methodology & Theoretical Orientation: roots and heads were obtained from cardoon plants at the flowering stage. The crop was two years old. The inulin has been extracted, purified and characterized from both sources. Purified inulins were added to durum wheat semolina at 4% (w/w), to produce spaghetti. Pasta without inulin was used as control. On the pastas were evaluated: color (Minolta colorimeter CR, 400), cooking time (minutes), cooking quality, loss of inulin (HPAEC-PAD, Thermofisher) in cooking and sensorial qualities (panel test). Findings: the inulin content of roots and capitula were 780 and 300 g kg^{-1} d.m. respectively. In the pastas with the addition of inulin from heads it has been noticed an increase in the L* value, and an increase in overall quality (7.0) vs the control (5.95) and the spaghetti containing roots inulin (6.76). On the contrary there was a greater cooking loss of the polymer (-31%) than that recorded in the pasta with roots inulin (-27%). Conclusion & Significance: Despite the overall quality (panel analysis) of the pastas obtained with head inulin was good, the highest loss of the polymer during cooking, the lowest content in the receptacle in terms of yields, imply an increase of the concentration at the initial phase, making the use of roots more sustainable for inulin extraction than heads.

Recent Publications

1. Madrigal L and Sangronis E (2007) Inulin and derivates as key ingredients in functional foods. Archivos Latinoamericanos de Nutrición, 57(4):387–396.
2. Nikoleta S Stamataki, Eirini K Nikolidaki, Amalia E Yanni, Maria Stoupaki, Panagiotis Konstantopoulos, Alexandros-Pantelis Tsigkas, Despoina Perrea, Nikolaos Tentolouris, Vaios T Karathanos (2016) Evaluation of a high nutritional quality snack based on oat flakes and inulin: effects on postprandial glucose, insulin and ghrelin responses of healthy subjects. Food & Function 7 (7): 3295-3303.
3. Padalino L, Mastromatteo M, Lecce L, Spinelli S, Conte A, Del Nobile MA (2015) Effect of raw material on cooking quality and nutritional composition of durum wheat spaghetti. International Journal Food Science Nutrition, Early Online: 1–9.
4. Raccuia SA, Genovese C, Leonardi C, Bognanni R, Platania C, Calderaro P, Melilli MG (2016) Fructose production by *Cynara cardunculus* inulin hydrolysis Acta Hortic. 1147: 309-314.
5. Sillitti C, Melilli MG, Padalino L, Bognanni R, Tringali S, Conte A, Raccuia SA and Del Nobile MA (2016) Healthy pasta production using inulin from cardoon: first results of sensory evaluation. Acta Horticulturae 1147: 407-412.



Biography

Carla Sillitti is a PhD student of the University of Foggia. She is carrying out her PhD work in collaboration with CNR-ISAFOM in Catania. Her studies have been Biological Science with the master in Health Biology. She is developing a project for the production of new nutraceutical food, a type of pasta, based on the use of ancient Sicilian whole meal and the added of inulin. Many studies were carried out to define the best type of semolina and inulin to added. She is interested in nutraceutical food and food quality, as well as nutrition and human health.

Email: carla.sillitti@unifg.it ;
Carla.sillitti@isafom.cnr.it

Notes/Comments: