

How *Cynara cardunculus* ecotypes affect the production of Castelo Branco PDO cheese - a case study.

M. Cristóvão^{1*}, A. Camelo¹, A. Martins¹, A. Resende¹, A. Riscado¹, A. Silveira, C. Baptista¹, G. Lopes¹, H. Beato¹, L. Paulo¹, L. Pinto de Andrade², C. Pinheiro³, Paulo Barracosa⁴ and C. Espírito Santo^{1,5}

¹CATAA- Associação Centro de Apoio Tecnológico Agro-Alimentar de Castelo Branco, Zona Industrial de Castelo Branco, Rua A 6000-459 Castelo Branco, Portugal, geral@cataa.pt;

²Escola Superior Agrária do Instituto Politécnico de Castelo Branco, Qt.ª da Sr.ª de Mércules, 6001-909 Castelo Branco, PORTUGAL;

³Departamento de Zootecnia, Escola de Ciências e Tecnologia, Universidade de Évora, Pólo da Mitra, Ap. 94, 7006-554 Évora, Portugal;

⁴Escola Superior Agrária de Viseu, Quinta da Alagoa Estrada de Nelas, 3500-606 Viseu, Portugal, esavesav.ipv.pt;

⁵Universidade de Coimbra, Centro de Ecologia Funcional, Departamento de Ciências da Vida, Calçada Martim de Freitas, 3000-456 Coimbra, Portugal, cfe@uc.pt

Cheese manufacture is a way of preserving a very perishable food, milk. This product is a versatile food that offers various flavours and textures, making it a convenient food and a source of nutrients¹. Last available data from *Instituto Nacional de Estatística* (INE) indicates that the annual dairy consumption reaches 1218 thousand tons in Portugal and the third more consumed dairy product is cheese, with 137 thousand tons per year². In 2021, the world cheese trade was forecast to rise 4 % to hit the record of 3.6 million tonnes³.

There are eleven Protected Designation of Origin (PDO) cheeses in Portugal, and for the designation PDO Beira Baixa there are three types Amarelo, Castelo Branco and Picante. The Castelo Branco sub-category is the only one that uses *Cynara cardunculus* for coagulation. These flowers contain an enzyme (cardosins) that allows milk to clot and has unique proteolytic properties. The Beira Baixa PDO cheese results from the slow depletion of the raw milk curd of the sheep breeds adapted to the delimited region of the Beira Baixa PDO Cheeses.

To understand the differences between the ecotypes (with unique cardosin profiles) of *Cynara cardunculus*, cheese manufacture test trial was made. Only sheep's milk, salt and thistle were used in the production.

The cheeses were maintained for ten days with a temperature of 7±1 °C and 90±5% of humidity, followed by thirty-two days with 12±1 °C and slowly reduction of the humidity to 70±5 %.

The evolution of colour and weight was recorded on a weekly basis. At the end of the maturation, the different cheeses were evaluated for pH, fat, protein, salt, texture and sensory analyses.

Acknowledgements: Sabores da Soalheira

Funding: Programa de Desenvolvimento Rural 2014-2020, PDR2020-101-031009

References:

1. Farkye, N. Y. (2004). Cheese technology. *International Journal of Dairy Technology*, 57(2).
2. Instituto Nacional de Estatística. (2020). Instituto Nacional de Estatística. https://www.ine.pt/xportal/xmain?xpid=INE&xpgid=ine_indicadores&contecto=pi&indOcorrCod=0000213&selTab=tab0&xlang=pt
3. FAO. (2021). Dairy Market Review: Emerging trends and outlook, December 2021, Rome.