INFLUENCE OF TEMPERATURE AND PACKAGING MATERIALS IN EWE'S CHEESES STORAGE

Paula M. R. Correia[1*], Raquel P. F. Guiné[1], Melania C. Rodrigues[2], Rita Mendes[3]

[1]CERNAS-IPV Research Centre, Polytechnic Institute of Viseu, Campus Politécnico - Repeses, 3504-510 Viseu, Portugal
[2]Food Industry Department, ESAV/ IPV, Quinta da Alagoa, Estrada de Nelas, 3500-606 Viseu, Portugal
[3]Lacticinios Correia e Barreiros Lda, Avenida do Outeiro, 6270-192 Santa Eulália, Seia, Portugal

[*]e-mail: paulacorreia@esav.ipv.pt

Abstract

One of the major concerns in cheese production is the shelf life extension, and the use of different conservation methods is extremely important. During commercialization period several problems often appear, like molds or packages that change the characteristics of cheese, which concerns the producers because they can lead to significant economic losses. The objective of this work was to evaluate the quality of the effect of temperature and packaging material in ewe's cheeses during 120 days of storage.

Cheeses were produced by industrial manufacture from raw ewe's milk produced by animals of breeds Bordaleira Serra da Estrela and Churra Mondegueira, in Seia district, belonging to the PDO (Protected Designation of Origin) of Serra da Estrela cheese region of Portugal. Cheeses were subject to two different storage conditions: control chamber (CC) [16 ± 1 ^{0}C and RH (relative humidity) of 75 ± 2%], packaging in vacuum with a high barrier blade film and polyolefin shrink film; and refrigeration with a mean temperature of 7 ^{0}C and HR 47%, simulating the usual commercial storage. The ewe's cheeses were analysed in three different moments: at 1, 60 and 120 days. Several physicochemical parameters were evaluated: moisture, water activity, colour, and texture. A hygrometer, at 25 ^{0}C, was used to determine the water activity of cheeses. The colour parameters were measured using a colorimeter, and the Cartesian Coordinates were measured: L*, a* and b* (CIELab colour space). A texturometer TA-XT2 was used for analysis of the textural parameters. A spreadability test was performed. The test consisted in measurement of force under compression with a probe P/1S (1 inch stainless ball). Sensory analysis was also performed, involving a descriptive sensory profile performed by 25 persons which evaluated the appearance, aroma, taste, texture and global appreciation.

The cheeses packed in polyolefin film presented molds after 20 days of storage. The moisture content and water activity were high in the initial stage of storage, but they decrease with storage time, and this effect was more evident in the unpacked cheeses. Vacuum packed cheeses stored in CC (CCP) presented similar colour parameters along storage time, with high L* and low b* values. The harder cheeses were the CC cheeses after 120 days (CC120) of storage, and the stickier ones were the CCP120. The refrigerated cheeses were the most appreciated by the panellists, followed by cheeses stored at the CC with vacuum package, and the buttery attribute showed high differences.

After 120 days of storage, the biggest differences between the two conservation processes were in the moisture content, stickiness and adhesiveness. Moreover, cheeses packaged with a high barrier blade film Polyethylene Terephthalate/Polyamide/Ethylene Vinyl alcohol/Polyethylene (PET/PA/EVOH/PE) preserved their moisture content and the water activity when compared with unpackaged cheeses. During storage cheeses changed their colour in all processes, being the cheeses in the control chamber were less dark and less yellow. In general, cheeses were less hard than the control, independently of storage process and time. The refrigeration process was the one that preserved the best characteristics of stored cheese. In conclusion, the conservation process, the storage time and the packaging material influenced the physical and sensorial properties of the cheeses.

Key words: *Ewe cheese, Packaging, Storage temperature, Physical properties, Sensorial analysis.*