Effect of vegetal fibre on texture and colour of fat reduced dry cured Spanish sausages

Irene Peñaranda, Daniel Álvarez, Celia María Iniesta[1], Macarena Egea[1], M. Belén Lopez, Elvira Zapata, M. Dolores Garrido, M. Belén Linares

UMU, Food Science and Technology, Faculty of Veterinary,University of Murcia,Campus Universitario Espinardo,30100 Murcia, Spain

Introduction: Fresh meat and meat products play a very important role in the human diet, as they are a rich source of high-quality protein, also provide a large amount of micro and macronutrients, making them valuable foodstuffs (Latham, 2002). This has made the production of meat evolve and adapt to new lifestyles. Among the new food trends, the interest in low-fat meat products is highlighted due to the association they have with the development of certain diseases (Vargas, 2018). This makes the demand for low-fat meat products increase by making food industries look for fat substitutes that maintain the same properties (García-Reyes, 2015). Previous studies have shown that use of prebiotics as vegetable fibres are a good way to substitute fat, obtaining products with good physicochemical characteristics (Vásquez et al., 2010; Álvarez & Barbut, 2013). So the objective was to evaluate texture and colour of dry-cured sausage fat reduced elaborated with vegetable fibre ingredients such as inulin, β-glucan and grape extract.

Material and method: The experimental design consisted of four dry-cured sausages (two replicates each): control (C1) (65% lean, 25% fat), reduced control (C2) (65% lean, 16% fat), reduced 1 (R1) (65% lean 16% fat, 6% inulin, 0.5% β-glucan) and reduced 2 (R2) (65% lean, 16% fat, 3% inulin, 0.5% grape extract, 1% β-glucan). For the technological assessment, colour space CIELab (CIE, 1978) and texture parameters (Bourne, 2002) were determined. Anova and Tukey tests were performed using SPSS 21.

Results: The Adhesiveness, cohesiveness and elasticity were not affected by reduction or fibre addition. Hardness was higher in reduced fat groups. It is possible that fat content influenced on the water loss during ripening process, being higher in those products with fat reduction (Reina, 2011). Gumminess and chewiness were higher in R1 group than C1. It could be related with inulin addition. Other authors affirm that the addition of inulin affects the texture since it is incorporated into the food matrix, strengthening and promoting the connections between the different components (Cruz et al., 2010).

In CIElab colour were no differences between controls and fat-reduced sausages for a* and L*. The R2 group obtained a lower value, being bluer and less yellow (3.54) than both controls (6.36 and 6.46 respectively). Riazi et al. (2006) also found a reduction of this parameter in a study where grape pomace was added on nitrite-reduced meat emulsion systems. Mainente et al. (2018) suggested that flavonoids are the molecules that are primarily involved in the colour of grape pomace. In addition, the colour of anthocyanins could vary from red to blue depending on the pH value, being lower in these fermented products.

Conclusions: In general, texture parameters were not affected by fat reduction, except hardness. Addition of vegetal fibre was not enough to avoid hardness increment. Inulin and β-glucan do not change colour, while grape pomace produce a reduction of b*. Although more studies are needed to improve formulations, vegetable fibre seems could be used for dry-cured sausages.

Acknowledgements and Financial support statement: This work was financed by the MCI (Ministerio de Ciencias e innovación: RTA 2017-00039-02-02), AEI (Agencia estatalde investigación) and INIA (Instituto Nacional de Investigación Agraria) of Spain by their financial support.

Literature:

* Álvarez, D., & Barbut, S. (2013). Effect of inulin, β-glucan and their mixtures on emulsion stability, color and textural parameters of cooked meat batters. Meat Science, 94(3), 320-327.
* Cruz, A. G., Cadena, R. S., Walter, E. H. M., Mortazavian, A. M., Granato, D., Faria, J. A. F., et al. (2010). Sensory análisis: relevance for prebiotic, probiotic and symbiotic producto development. Food Science and Food Safety, 9(4), 358 - 373.
* International Commission on Illumination. (1978). Lighting of Traffic Signs (No. 35). Bureau Central de la CIE.
* García-Reyes, M. (2015). Elaboración de salchichas de pollo, bajas en grasa y ricas en fibra y Omega-3.
* Latham, M. C. (2002). Nutrición humana en el mundo en desarrollo (Vol. 29). Roma: Fao.
* Mainente, F.; Menin, A.; Alberton, A.; Zoccatelli, G.; Rizzi, C. (2018). Evaluation of the sensory and physical properties of meat and fish derivatives containing grape pomace powders. Int. J. Food Scicence Technol., 54, 952–958
* Reina, R. (2011). Estudio descriptivo-comparativo de productos cárnicos asociados a la denominación de origen "Jamón de Teruel".
* Riazi, F.; Zeynali, F.; Hoseini, E.; Behmadi, H.; Savadkoohi, S. (2016). Oxidation phenomena and color properties of grape pomace on nitrite-reduced meat emulsion systems. Meat Science, 121, 350–358.
* Vargas, R. J. (2018) "Elaboración de salchicha de ternera utilizando inulina como sustituto de la grasa de cerdo".
* Vásquez, C. E., Soto, S., Villalobos, L. H. (2010). Efecto de la fibra dietética sobre la textura de salchichas tipo Viena. Dialnet, 4(2), 37 - 43.