

Research & Development

Water holding properties in pork *longissimus dorsi* muscle due to two different injection techniques

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References

1. ANONYMUS (2001): Nitrite-free curing methods. Replacement of the traditional process. (in Polish). *Mięso i Wędliny* (7), 46–52.
2. BARANOWSKA, H.M., W. DOLATA, E. PIOTROWSKA and M. PIATEK (2003): Evaluation of the substitution of fat for pea cellulose on the water binding state in sausage forcemeat. *Acta Agrophysica* 2 (2), 293–300.
3. BERTRAM, H.C., S. DONSTRUP, A.H. KARLSSON and H.J. ANDERSEN (2002): Continuous distribution analysis of T2 relaxation in meat an approach in the determination of water-holding capacity. *Meat Sci.* 60, 279–285.
4. CARR, H.Y. and E.M. PURCELL (1954): Effects of diffusion on free precession in nuclear magnetic resonance experiments. *Phys. Rev.* 94, 630–638.
5. DZUDIE, T. and A. OKUBANJO (1999): Effects of rigor state and tumbling time on quality of goat hams. *J. Food Engineering* 42, 103–107.
6. FUKUSHIMA, E. and S.B.W. ROEDER (1981): *Experimental Pulse NMR. A Nuts and Bolts Approach.* Addison-Wesley Publishing Company, London.
7. GAJEWSKA-SZCZERBAL, H., H.M. BARANOWSKA and T. OSTROWSKI (2004): Analysis of water properties in selected porcine muscles subjected to the process of injection curing. *Acta Agrophysica* 4 (2), 301–312.
8. GAJEWSKA-SZCZERBAL, H., H.M. BARANOWSKA and W. MUSIOL (2007): Effect of brine constituents on the content and properties of water in the *longissimus dorsi* muscle of swine. *Acta Agrophysica* 9 (1), 49–60.
9. GAJEWSKA-SZCZERBAL, H. (2001): An attempt to apply water activity (a_w) measurement to evaluate the technological process of smoked meats production. *Properties of Water in Foods*, Warsaw Agric. Univ. Press, 168–177.
10. GRAU, R. and R. HAMM (1957): Die Bestimmung der Wasserbindung des Fleisches mittels der Konstantdruckmethode. *Fleischwirtsch.* (9), 193–195.
11. HAMM, R. (1994): The influence of pH on protein net charge of the myofibrillar system. *Rec. Meat Conf. Proc.* 47, 5–9.
12. MCGEE, M.R., K.L. HENRY, J.C. BROOKS, F.K. RAY and J.B. MORGAN (2003): Injection of sodium chloride, sodium tripolyphosphate and sodium lactate improves Warner-Bratzler shear and sensory characteristics of pre-cooked inside round roasts. *Meat Science* 64, 273–277.
13. MEIBOOM, S. and D. GILL (1958): Modified spin-echo method for measuring nuclear relaxation times. *Rev.Sci.Instrum.* 29, 688–691.
14. OFFER, G. and P. KNIGHT (1988): The structural basis of water-holding in meat. Part 1: General principles and water uptake in meat processing. *Developments in Meat Science* 26, 5–18.

15. PN ISO-2917 (2001): Meat and meat products. Determination of water content. (in Polish).
16. PN-73/A 82119 (2000): Determination of nitrogen by Kjeldahl method and conversion into protein (in Polish).
17. POSPIECH, E., B. GRZES, A. ŁYCYŃSKI, K. BORZUTA, M. SZALATA, B. MIKOŁAJCZAK and E. IWANSKA (2003): Muscle proteins, their transformations and meat tenderness (in Polish). *Mięso i Wędliny* (1), 26–33.
18. UCHMAN, W. (1998): Functional additives in meat industry (in Polish). ProDruk, Poznań.
19. WÊGLARZ, W.P. and H. HARANCZYK (2000): Two-dimensional analysis of the nuclear relaxation function in the time domain: The CracSpin program. *J. Phys. D. Appl. Phys.* 33, 1909–1920.

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