F.19. COMPARATIVE STUDY OF THE TECHNOLOGICAL QUALITY OF PASTA OBTAINED USING TRITICALE FLOUR, BLONDE AND DARK FERMENTED BREWER'S SPENT GRAIN

IURIE RUMEUS[1*], ALIONA GHENDOV-MOSANU[2], MIRCEA-ADRIAN OROIAN[3], OLESEA ȘAITAN[1], SORINA ROPCIUC[3], GEORGIANA GABRIELA CODINĂ[3]

[1]Cahul University Center "Bogdan Petriceicu Hasdeu" of the Technical University of Moldova, 1 Independence Square, Cahul, Republic of Moldova
[2]Technical University of Moldova, 168, Stefan cel Mare Bd, Chisinau, Republic of Moldova
[3]"Stefan cel Mare" University of Suceava, 13 Universitatii St., Suceava, Romania
email: rumeus.iurie@usch.md

Abstract. The aim of this study was to analyze the influence of two types of brewer's spent grain (BSG) in a fermented form on pasta quality obtained from different triticale varieties cultivated in the Republic of Moldova. Triticale grains provided by the Institute of Genetics, Physiology and Plant Protection, Moldova (harvest 2023) were Ingen 35, Ingen 33, Ingen 93, Ingen 54, Ingen 40, Costel and Fanica. According to their chemical characteristics (moisture, ash, protein, wet gluten, fat content) all of them may be used for pasta-making. BSG obtained from dark (BSGD) and blonde (BSGB) lager beer brewing process, received from the Efes Moldova Brewery S.A., Chisinau, Moldova was dried up to a 6.3±0.1% humidity value, milled and mixed with triticale flour in a 3:1 (*w/w*) ratio. A dough with a fluid consistency was obtained by adding water to this mixture, which was fermented at 30±1 °C and refreshed with new portions of mixture until a final acidity of 8–10 degrees was reached. The fermented liquid doughs from dark and blonde brewer's spent grain were incorporated in 10% addition in triticale flour to prepare dough for pasta. The 14 rigatoni pasta samples obtained were analyzed. Water absorption (WA), optimal cooking time (OCT), swelling index (SI) and cooking loss (CL) were determined according to AACC 66–50 International Approved Method. The fracturability test was determined using the TVT-6700 texture analyzer (Perten Instruments, Hagersten, Sweden), whereas the sensory analysis was made using a nine-point hedonic scale (1 = "dislike extremely" to 9 = "like extremely") to evaluate color, smell, taste, aroma, texture, and overall acceptability of each pasta sample. According to the data obtained OCT and SI values decreased by BSG addition whereas the values of WA and CL increased. Generally, the lowest values for OCT and SI were obtained for pasta with BSGD addition (ranged between 11.25-13 min and 1.57-1.83 respectively) whereas the highest values for WA and CL (ranged between 112.72-144.51% and 0.19-0.23% respectively) for pasta with BSGB incorporated in triticale flour. It may be concluded that the incorporation of BSG into triticale pasta significantly affected its cooking behavior probably due to the fact that fibers from BSG disrupted the gluten-starch matrix, resulting in faster cooking, reduced swelling, higher water absorption, and higher cooking loss values. The extent of these effects depended on the type of BSG used, with BSGD having the highest influence on cooking time and swelling, and BSGB on water absorption and cooking loss. Also, the pasta fracturability depended on the type of BSG. Generally, the BSGB decreased fracturability, whereas the BSGD increased pasta fracturability, probably due to insoluble fibers and roasted particles which may reinforce it structure. However, for some triticale varieties such as Ingen 33, Ingen 40 pasta fracturability decreased even when BSGD were incorporated in pasta-making. From the sensory point of view, pasta samples obtained with the addition of BSGD were appreciated with a higher score than pasta prepared with BSGB, which can be explained by the higher content of melanoidins from BSGD, that had a positive influence on the color, aroma and global acceptability of the pasta.

Keywords: triticale varieties, brewer's spent grain, pasta quality.

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