

Supporting Information

BW products elaboration

BW-enriched wheat breads. Dark wheat flour (BIO type 2000) was provided from a healthy food store (Poland). According to the producer's information flour was obtained as product consistent with the organic agriculture requirements. The commercial white wheat flour (BIO type 500) was purchased from a local food ingredient company while roasted common buckwheat groats (BWg) (variety Kora) were obtained from a local company located in the northeast of Poland. The roasted groats were milled into flour using a laboratory mill type WZ-1 (Factory of Machines and Mechanisms for the Food Industry, Żnin, Poland). Percentage of dry matter (DM) in flour from roasted BWg, wheat flour BIO type 2000 and white wheat flour type 500 was 89.7, 87.0, and 87.5%, respectively, while their corresponding protein contents were 14.3, 8.1, and 11.6 %. The flour obtained from roasted groats was used to substitute dark wheat flour or white wheat flour at levels of 50% w/w on total flour basis. BW-enriched dark wheat bread ($_b$ BW) and BW-enriched white wheat bread ($_{b500}$ BW) were prepared in a pilot-scale bread maker. Salt and baker's yeast used in the formulation of bread dough were purchased from a local food manufacturer and were added at 1 and 3 % w/w on the total flour basis. The dough was prepared using the single phase method with the dough allowed to stand before baking. The BW-enhanced wheat breads and reference dark and white wheat breads formulation and baking conditions are shown in Supplementary Table 1. At least 3 loaves of each type of bread were baked in duplicate. The breads were sliced (1 cm thick), frozen and subsequently freeze-dried while the dried material was ground and sieved through a 60-mesh screen to obtain the bread powder. The bread powder was kept at -20 °C until analysis.

Fermented roasted BW groats elaboration. 50 g of roasted BWg was steamed at 100 °C for 5 min in 200 mL deionized water. After boiling, the samples were drained and tempered until reaching room temperature. Then, a fermentation process was carried out at 37 °C for 24 h by inoculation of 10⁴ spores/g of *Rhizopus oligosporus* NRRL 2710 to the samples. The fermented product was freeze-dried and kept at -20 °C.

Buckwheat sprouts. Whole BW seeds (25 g) were soaked in 125 mL of distilled water at a room temperature and shaken every 30 min. After 12 h, water was drained off and the seeds were transferred to an incubator (Cliambic Cabinet, model Economic Deluxe EC00-065, Snijders Scientific b.v, Netherlands). Sprouting was carried out at 25°C and 95% humidity in dark. BWs were harvested 12 days after seeding and then lyophilized and kept at -20 °C.

Roasted BW groats. Roasted BWg were obtained from a Polish local company (Olsztyn, Poland) and the material was freeze-dried, ground and kept at -20 °C.