EFFECT OF MICROWAVE RADIATION ON STARCH DIGESTIBILITY AND PHYSICO-CHEMICAL PROPERTIES OF THREE BARLEY TYPES

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ABSTRACT Samples of normal barley (NB), high-amylose barley (HAB) and waxy barley (WB) were tempered to 42-45% moisture and treated with microwave radiation (2450 MHz) at three power levels. Samples were microwaved immediately after tempering or after 14 days of storage at 4°C. The effect of microwave power level on in vitro starch digestibility was not significant. Levels of resistant starch (RS) in microwaved samples were lower than those in corresponding unprocessed samples. The highest and lowest RS contents in microwaved samples were observed in NB (15.7%) and WB (0.0%), respectively. Unprocessed samples of NB, HAB and WB contained 17, 24 and 9% RS, respectively. The enthalpies of gelatinization (ΔH) of unprocessed barleys, as determined by differential scanning calorimetry, were in the order of WB>NB>HAB. Microwaved HAB did not exhibit a phase transition. Microwave treatment increased the pasting temperature of NB and the peak viscosity of WB, as determined by rapid viscoanalysis.

Keywords: Barley, microwave processing, resistant starch, starch digestibility, starch gelatinization.