High pressure homogenization of a commercial amylglucosidase: effects on activity at different temperatures

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High pressure homogenization (HPH) was recently highlighted as process able to improve enzyme activity, therefore this work aimed to evaluate the effect of HPH on amylglucosidase (AMG) activity at different temperatures. A 0.01% of commercial AMG solution was prepared at pH 2.9, 4.3 and 6.5 and homogenized at pressures up to 2000 bar. A native sample was used as a control. The enzyme activities at 35, 65 and 80ºC were evaluated and the released glucose was measured though glucose-oxidase method. ANOVA and Tukey tests were used to evaluate the data (p<0.05). Results at 35ºC showed no changes on AMG activity after HPH up to 2000 bar for the three evaluated pH (p>0.05). Similarly, at 65ºC (optimum temperature), native and homogenized enzyme at pH 2.9 and 6.5 showed no significant changes on AMG activity (p>0.05). On contrary, when enzyme was homogenized at pH 4.3 and its activity measured at optimum temperature, a significant activity increase (5-8%) was observed after homogenization up to 1000 bar (p<0.05). At 80ºC. It was observed an AMG activity increase after HPH for the three evaluated pH. Sample homogenized at pH 2.9 showed a gradual and significant activity increase, reaching a maximum increment of 100% after homogenization at 2000bar. At pH 4.3 and 6.5, homogenization up to 1000 bar resulted on significant AMG activity increase (p<0.05) of around 20 and 30%, respectively. Therefore, the results highlighted that HPH can improve AMG activity, especially at non optimum temperature.