Purple sweet potato (Ipomoea batatas L. Poir) is potential for functional food, especially as antioxidant source due to its purple color and other nutrient content. The objective of this research was to produce plain bread containing antioxidant by partial substitution of wheat flour with purple sweet potato flour. The result showed that the best plain bread was produced by a maximum substitution of 20% purple sweet potato flour to wheat flour. The hedonic characteristics of the resulting bread include aroma, taste, and texture were not significantly different from bread without substitution. Nevertheless, the crust was harder and darker. Addition of 1.0% GMS emulsifier and reduction of purple potato flour to 15% increased the score of softness, hedonic texture, acceptance level, as well as the volume of the bread. The substituted bread had antioxidant activity of 55833.78 ppm DPPH as shown by the IC$_{50}$ value and contained 4.30% of dietary fiber.

Key words: antioxidant activity, purple sweet potato, plain bread, substitute