The folate poly-gamma-glutamate profile, their concentrations, and hydrolysis by endogenous gamma-glutamyl hydrolase (GGH) were evaluated in broccoli, carrot and tomato. Further studies on the effect of time and temperature on folate poly-gamma-glutamate hydrolysis and stability were carried out in broccoli since this vegetable showed the highest long-chain and total folate poly-gamma-glutamate concentration. The evolution of l-ascorbic acid, total phenols and Trolox equivalent antioxidant capacity (TEAC) values was evaluated in parallel. Upon thermal inactivation of GGH prior to crushing, it was observed that broccoli, carrot and tomato contained poly-gamma-glutamates with one to seven glutamate residues but differed in the predominant poly-gamma-glutamates. Crushing of raw broccoli, carrot and tomato resulted in significant poly-gamma-glutamate profile changes in broccoli and carrot (indicating GGH-catalyzed hydrolysis) but not in tomato. In this study, the actual crushing of raw broccoli matrix had a greater effect on folate poly-gamma-glutamate hydrolysis than incubation conditions (0-30 min at 25-55 degrees C). During treatments at 25-140 degrees C, folate retention was higher at 80 and 100 degrees C than at the other temperatures. A similar trend in thermal stability was observed for folates, vitamin C, total phenols and TEAC value, an indication that conditions that result in endogenous antioxidants degradation might also result in folate degradation.