

The enzymatic digestibility and phosphate content in potato starches

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Abstract

Tuber and root starches contain small amount of covalently-bound phosphate. Potato starch has a higher concentration of phosphate than the other tuber and root starches, such as sweet potato, cassava, and yam starches. The level of phosphate in potato starch alters considerably, according to the cultivars and environmental factors. Starch bound phosphate is a critical factor that affects pasting properties of the starch. Amylolytic enzymes are incapable of bypassing the phosphorylated glucosyl residue. It is likely that higher level of starch phosphate might decrease enzymatic digestibility of starch. In this investigation, starch digestion was performed using minimum concentration of enzymes, such as two α -amylases and glucoamylase, in potato starches containing high and middle phosphorus as well as sweet potato, cassava and yam starches with containing low phosphorus. Among the potato starches, the high-phosphorus starches showed comparatively higher starch resistant capacity than the medium-phosphorus starches. Furthermore, high-phosphorus starches were more resistant to enzyme hydrolysis than sweet potato, cassava and yam starches. The hydrolysis rate of tuber and root starches was not largely influenced by their amylose content and median granule size. Information regarding the enzymatic digestibility of gelatinized potato starches might be important to the food industry, especially, for those divisions that make use of potato starches as raw materials for producing starch syrup.

Reference: N. Absar et al. (2009) Enzymatic hydrolysis of potato starches containing different amounts of bound phosphorus, *Food Chem.*, 112(1), 57-62.