

***In vitro* antioxidant activity of digestates of commercial casein phosphopeptide preparations after intestinal metabolization followed by administration to human osteoblasts**

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The Reactive Oxygen Species (ROS)-induced cellular damage is correlated with the onset of chronic diseases, especially at bone level. Based on this, we studied *in vitro* the antioxidant properties in human osteoblasts (SaOS-2 cells) of three commercial preparations after gastrointestinal digestion (SGID) and metabolization at intestinal epithelium. The samples consisted of enriched calcium-free casein phosphopeptides (CPP), enriched calcium-bound casein phosphopeptides (Ca-CPP) and an enzymatically hydrolyzed casein (CP). Their casein phosphopeptide content was 90%, 95% and 26%, respectively. Upon SGID, 240–260 casein phosphopeptides were detected by UPLC/ESI-HR-MS/MS. Most of them derived from α_{s1} casein. Casein phosphopeptides containing the acidic motif sssEE were more abundant in CPP digestate than in all other digested samples. The antioxidant activity at three different doses of each digestate was firstly evaluated at the intestinal level using a Caco2/HT-29 70/30 cell co-culture. All the digestates *per se* did not modify the basal oxidative state of the cells. In presence of 2,2'-azobis(2-methylpropionamide) dihydro-chloride (AAPH), a generator of peroxyl radicals, only CP and CPP displayed a dose-dependent antioxidant activity equal or even greater than Vitamin C. In presence of FeCl₂ (Fe), all the digestates exerted an antioxidant activity only when administered to the co-culture at the highest dose. After metabolization of digestates by the co-culture grown on transwells, the basolateral contents were administered to SaOS-2 cells. They exerted an antioxidant activity in presence of AAPH and were ineffective in presence of Fe. These results suggest the capability of casein phosphopeptides to act as antioxidants with different effectiveness in intestinal or bone cell models. SGID and metabolization at intestinal epithelium can modulate this activity.

BOOK OF ABSTRACTS

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