



Intestinal alkaline phosphatase (IAP) is a brush border phosphomonoesterase that produces the hydrolysis of non-specific phosphate ester bonds. Its location suggests an involvement in the uptake of nutrients but its role has not been defined yet. IAP expression parallels those of other intestinal proteins involved in calcium (Ca) absorption under vitamin D stimulation. Experiments carried out *in vitro* with purified IAP have demonstrated interaction between Ca and IAP. The gut is prepared to face different levels of Ca intake along the time, but high Ca intake in a situation of low Ca in the diet would produce high entrance of Ca to the enterocyte. It is predictable the presence of a mechanism that block Ca entrance with possible adverse effects. Thus, Sprague Dawley rats were fed with different Ca content in the diet (0.2 g%, 1 g% and 2 g%, n=6 per group) and percentage of Ca absorption (%Ca) with or without L-phenylalanine (Phe) was calculated. The presence of Phe produced a significant increase in %Ca (without Phe=31.1%±8.9 vs with Phe=52.3±6.5, regardless Ca intake; Paired t test, p=0.02). When data were analyzed in function of Ca intake a significant difference was only found in the group with low Ca intake (0.2%) (Paired t test, p=0.03). Additionally, IAP activity increased significantly (ANOVA, p<0.05) as Ca concentrations increased in the duodenal lumen. This paper provides *in vivo* evidence that luminal Ca concentration increases the activity of IAP and simultaneously decreases %Ca, acting as a minute-to-minute regulation mechanism of Ca entrance.