

COCOA – AN ALTERNATIVE VITAMIN D SOURCE?

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Only a few natural foods, such as oily fish, dairy products, egg yolk, mushrooms and yeast, contain relevant amounts of vitamin D. Surprisingly, we found substantially high vitamin D₂ contents in cocoa which represents, so far, an unknown source of vitamin D. To evaluate the amount of vitamin D₂ consumed by cocoa-based foods, we analyzed the vitamin D content of different cocoa products by liquid chromatography-tandem mass spectrometry. Among the analyzed chocolates, the vitamin D₂ content was highest in dark chocolate (min. 60% cocoa) ($3.95 \pm 1.58 \mu\text{g}/100 \text{ g}$) and lowest in white chocolate ($1.35 \pm 0.68 \mu\text{g}/100 \text{ g}$). Comparatively, low contents of vitamin D₂ were found in chocolate spreads ($0.15 \pm 0.07 \mu\text{g}/100 \text{ g}$) and sweetened instant cocoa drinks ($0.31 \pm 0.09 \mu\text{g}/100 \text{ g}$). The effect of cocoa intake on vitamin D status was assessed in an *in vivo* experiment. Two groups of mice were fed vitamin D-adequate diets (supplied as vitamin D₃) which consisted of either 25% cocoa mass with a vitamin D₂ concentration of $14.1 \mu\text{g}/\text{kg}$ or an energy and macronutrient equivalent control mass without vitamin D₂. Analyses reveal that the cocoa group had no detectable 25-hydroxyvitamin D₂ in serum but significantly lower circulating 25-hydroxyvitamin D₃ concentrations than the controls ($P < 0.01$). To conclude, cocoa and cacao-based foods represent a novel source of vitamin D. The ability of cocoa to increase the serum concentration of 25-hydroxyvitamin D remains elusive and needs further investigations.