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Nutritional quality and degree of processing of children's foods assessment on the French market

Celine Richonnet, Françoise Mosser, Elisabeth Favre, Martine Robert, Françoise Martin and Isabelle Thiebaut
l'Enfance (CEDE), Belgium

Back ground: Food packaging marketing techniques which appeal to children (such as cartoon characters and brand mascots) affect children's choices, preferences, and eating habits. Several studies have assessed the nutritional quality of food intended to children in various countries and concluded that most were high in fat, salt, and sugar (HFSS) and ultra-processed foods.

Methodology: The marketing strategies most often used on children's products are cartoons (97.22%; n = 1120) and mascots (77.78%; n = 896). A total of 1155 products were included in the study, most of which were sugary foods: almost a quarter of the products in the sample (23.81%; n = 275) list a sweetener as the first ingredient, and most of them (89.52%; n = 1034) contain free sugars according to the WHO definition. All the products included in our study feature marketing elements targeting on the packaging, yet 94.88% do not meet the criteria of the WHO Europe Nutrient Profile Model. Most (58.68%; n = 676) belong to Nutri-Score groups D and E, with the highest proportion in group D (39.32%; n = 453) and are ultra-processed (87.97%; n = 1016), especially through the use of flavourings and ultra-processed sugars.

Result: The maximum Entrapment efficiency of E1formulation as determined by ultracentrifugation was 96%.Methanolic extract of ethosomal formulation of Tinospora cordifolia has shown drug release of 96.84%, Zeta potential of -32.7mV. Hence E1formulation was considered to be the best formulation among all the formulations. The best formulation was further developed into ethosomal gel. The pH value for ethosomal gel of Tinospora cordifolia was found to be 6.4.Ethosomal gel was showing better In vitro diffusion of 45.2% and the drug content of 95.3%. Anti-inflammatory activity was tested for the ethosomal gel of Tinospora cordifolia and was compared with the diclofenac gel. Anti- inflammatory activity after 3hrs was found to be 45.80% for the ethosomal gel.

Conclusion: Using the Nutri-Score, the WHO Europe Nutrient Profile Model, and the NOVA classification, this study suggests that a significant share of pre-packaged foods marketed to children do not have an adequate nutritional profile. As such, measures are needed to regulate what marketing elements aimed at children can be included on packaging, based on these criteria.