

Supplemental Data

Details of the challenges

Over the study period the children received the challenge/washout-Placebo drinks on a weekly basis and the 3 year olds consumed at home 300mls per day of mixed fruit juices (Placebo or Active) provided in identical sealed bottles (8/9 year olds 625 mls per day). In challenge weeks children were randomly assigned by the study administrator to receive Placebo, Active Mix A or Active Mix B. Mix A was similar to the Active challenge employed in the Isle of Wight study¹² and for 3 year olds included 20mg in total of artificial food colourings (5mg sunset yellow(E110), 2.5mg carmoisine (E122), 7.5mg tartrazine (E102), 5mg ponceau 4R (E124)[Forrester Wood & Co. Ltd.] and 45mg of sodium benzoate(E211) (Sigma Aldridge Co. Ltd.) For 3 year olds Active Mix B included 30mg in total of artificial food colourings (7.5mg sunset yellow, 7.5mg carmoisine, 7.5mg quinoline yellow(E104), 7.5mg allura red AC(E129)) and 45mg of sodium benzoate. Mix B was selected to reflect the current average daily consumption of food additives by 3 year old UK children (1).

The 8/9 year olds' Mix A used additives in the same proportions as the Active challenge employed in the Isle of Wight study (2) but with amounts multiplied by 1.25 to take account of the increased body weight in 8 year olds. Mix A included 24.98mg in total of artificial food colourings (6.25mg sunset yellow, 3.12mg carmoisine, 9.36mg tartrazine, 6.25mg ponceau 4R [Forrester Wood & Co. Ltd.]) and 45mg of sodium benzoate (Sigma Aldridge Co. Ltd.). Active Mix B included 62.4mg in total of artificial food colourings (15.6mg sunset yellow , 15.6mg carmoisine, 15.6mg quinoline yellow, 15.6mg allura red AC) and 45mg of sodium benzoate. The only difference in the composition of the Placebo and Active mixes was the presence of the artificial food colours and preservative in the Active mix. The child's family and the research team were blind to the challenge allocation.

References

1. Gregory JR, Collins EDI, Davies PSW, Hughes JM, Clarke PC. *National Diet and Nutrition Survey: Children Aged 1.5 to 4.5 years. Vol. 1: Report of the Diet and Nutrition Survey*. London: HMSO;1995.
2. Bateman B, Warner JO, Hutchinson E, Dean T, Rowlandson P, Gant C, Grundy J, Fitzgerald C, Stevenson J. The effects of a double blind, placebo controlled, artificial food colourings and benzoate preservative challenge on hyperactivity in a general population sample of preschool children. *Arch Dis Child*. 2004; 89 (6): 506–511.