

NZ CHILDREN'S IQ STUDY: REVIEW AND POTENTIAL RESPONSE

Dietary Patterns and Intelligence in Early and Middle Childhood. Theodore RF et al (2009) *Intelligence* in press

This study was recently published in the scientific journal, *Intelligence*. The investigators in the study are from the University of Auckland. The study suggests that children who eat margarine daily have a lower IQ at ages 3.5 and 7. It reports that those that eat fish have a higher IQ.

Does this study prove that eating margarine will lower IQ?

- § No, this type of study (cross-sectional epidemiological) only investigates relationships between variables and does not prove causation.
- § In addition, as it is the only publication investigating the relationship between margarine consumption and IQ in children, the authors agree that the results should be interpreted with caution.
- § Furthermore, much larger studies in children have shown positive associations between polyunsaturated fats (found in margarine spreads) and mental performance^{1,2}. In this publication the relationship between children's IQ and polyunsaturated fats was not analysed.
- § Whilst the findings are statistically significant for a relationship between margarine consumption and IQ, it is not clear if the findings have any clinical significance. In other words, is an IQ score difference of 3 points relevant in practice?

- § Margarine is a source of essential nutrients such as omega 6 and vitamin D that are important for children's growth and development.
- § In addition, independent health organisations such as the National Heart Foundation (in Australia and New Zealand) recommend that people use margarine instead of butter to lower their intake of saturated fat and thereby reduce the risk of heart disease.

The authors propose that trans fats may be responsible for the association seen. Do margarines contain trans fats?

No, since 1996, all Flora margarine spreads sold in Australia and New Zealand have been virtually free of trans fat. By far the majority of all other margarine spreads in the Australian and New Zealand market today are also low in trans. Margarine spreads with the Heart Foundation Tick are guaranteed to be low in trans.

How much margarine did the children eat who had a lower IQ?

This was not quantified so no dose-response relationship can be taken from the findings. This is another reason why any relationship between margarine and IQ cannot be proven.

Additional Information on the study:

- § This study is a cross-sectional analysis which is the weakest type of epidemiological study. Only a few hundred subjects were involved in the study, not enough to draw conclusions when many dietary variables are examined.
- § While the authors do adjust for potential confounders, it is not known if their list of confounders is exhaustive. For example, other factors (like parent's income level) may also be driving this relationship
- § The effect was seen in all children in the study aged 3 ½ years but for 7 year old children, the relationship was only seen for those that were small for gestational age. In other words, the reported relationship between margarine intake and lower IQ was different in children across the two age brackets. For this reason, it is not possible to conclude from this study that there was a negative effect of margarine on IQ in children over time

¹ Zhang J et al (2005) Dietary Fat intake is associated with psychosocial and cognitive functioning of school aged children in the United States *Journal of Nutrition* 135 (8): 1967-1973

² Rask-Nissila L et al (2002) Effects of diet on the neurologic development of children at 5 years of age. The STRIP project. *Journal of Paediatrics* 140 (3), 328-333.