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RESTORATION OF BRAIN DHA LEVELS IN YOUNG-DEFICIENT RAT IS BETTER WITH 1.5%ALA DAIRY FAT BLEND COMPARED TO 1.5% ALA VEGETABLE BLEND

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Background and objectives: Achieving an appropriate docosahexaenoic-acid (DHA) status in the neonatal brain is an important goal of neonatal nutrition. Infant formulas have been gradually replacing mother’s milk and are usually prepared with vegetable oils. The essential fatty acids (EFA) composition of these formulas are controlled (ALA, LA) and DHA supplementation has been more recently proposed to mimic mother-milk. In an attempt to validate the potential replacement of vegetable fat with dairy fat in infant formulas, we used the brain DHA level of rats as a nutritional model to compare the effects of blends based on dairy fat instead of palm oil providing the same EFA quantities (commonly recommended values for commercial vegetable fat formulas: 1.5% and 16%, respectively).

Methods: Three groups of rats (10 males and 10 females), born from dams fed over gestation/lactation with a low ALA-diet (0.4% FA), were fed, for 6 weeks after weaning, diets providing similar levels of ALA (1.5%, from rapeseed source), blended with (i) anhydrous dairy fat, (ii) palm oil or (iii) palm oil supplemented with DHA (0.12%). Brain FA were determined by gas chromatography at weaning and after the post-weaning diets

Results: Restoration of brain DHA levels was superior with the 1.5% ALA-dairy-fat compared to both 1.5% ALA-palm-blends (without/with DHA supplementation) for increasing brain DHA (+80%, +65% and +60%, respectively p<0.001). A gender/diet interaction showed lower levels of brain DHA of males with the 1.5% ALA-palm diet, while brain DHA was similarly restored in males and females by the 1.5% ALA-dairy-fat diet or by DHA supplementation of palm diet

Conclusions: Restoration of brain DHA levels of young deficient rats is more efficient with a 1.5% ALA dairy fat blend compared to vegetable blends despite similar dietary ALA levels supplemented or not with DHA. Human application for infant formulas should be considered. Granted by Lactalis

Key words: dairy-fat, brain, DHA, ALA