CEREBRAL BLOOD FLOW AND COGNITION IN AGED ALZHEIMER APP/PS1 MICE ON A MULTI-
NUTRIENT DIET CONTAINING DOCOSAHEXAENOIC ACID (DHA)

M. Wiesmann\textsuperscript{1,2}, V. Zerbi\textsuperscript{1,3}, D. Jansen\textsuperscript{1,2}, C. Janssen\textsuperscript{1,2}, I. Arnoldussen\textsuperscript{1,2}, X. Fang\textsuperscript{1,2}, A. Rijpma\textsuperscript{1,2}, L. Broersen\textsuperscript{4}, A. Heerschap\textsuperscript{3}, A. Kiliaan\textsuperscript{1,2}

\textsuperscript{1}Dept. Anatomy, \textsuperscript{2}Dept. Cognitive Neuroscience, Donders Centre for Neuroscience, \textsuperscript{3}Dept. Radiology, Radboud University Nijmegen Medical Centre, Nijmegen, \textsuperscript{4}Danone Research, Wageningen, The Netherlands

Introduction: Alzheimer’s Disease (AD), a progressive neurodegenerative disorder, is the most common cause of dementia. Lifestyle, vascular health and genetic factors influence the onset and progression of AD. Intake of a combined diet existing of docosahexaenoic acid (DHA), uridine-monophosphate (UMP) and components like antioxidants and B-vitamins may have an impact on the brain circulation, neuronal membranes and β-amyloid production affecting the course of AD.

Aims: In the current study, we will therefore investigate the effects of DHA combination diets on spatial learning and memory, and cerebral hemodynamics in 10-12 month old male APPswe/PS1dE9 mice and C57BL6/J mice.

Methods: From 2 months of age, mice were fed a standard diet, a DHA+UMP diet, and a multi-nutrient diet containing precursors and cofactors in membrane synthesis, such as DHA, phospholipids, UMP, choline, B-vitamins and antioxidants (Fortasyn). Cognitive assessments were performed using the (reverse) Morris Water Maze (MWM). A pulsed ASL technique with flow sensitive alternating Inversion Recovery (FAIR) was assessed with MRI at ultra-high field (11.7T) to evaluate changes in the cerebral blood flow in different brain regions.

Results: We expect an impairment in spatial learning and memory acquisition and also a decreased CBF and an improvement of these parameters in the APP/PS1 mice on Fortasyn diet. The experiments are still ongoing and the data will be presented.

Conclusions: DHA combination diets influence cognition. This may via cerebral circulation and neural membrane composition and may therefore play an important role in the onset and progression of AD.