



# Maternal diet effects during the perinatal period on cognitive and hedonic brain processes and metabolism of adult Yucatan minipigs Tests on obese adults Test on lean adults

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# Maternal diet effects during the perinatal period on cognitive and hedonic brain processes and metabolism of adult Yucatan minipigs

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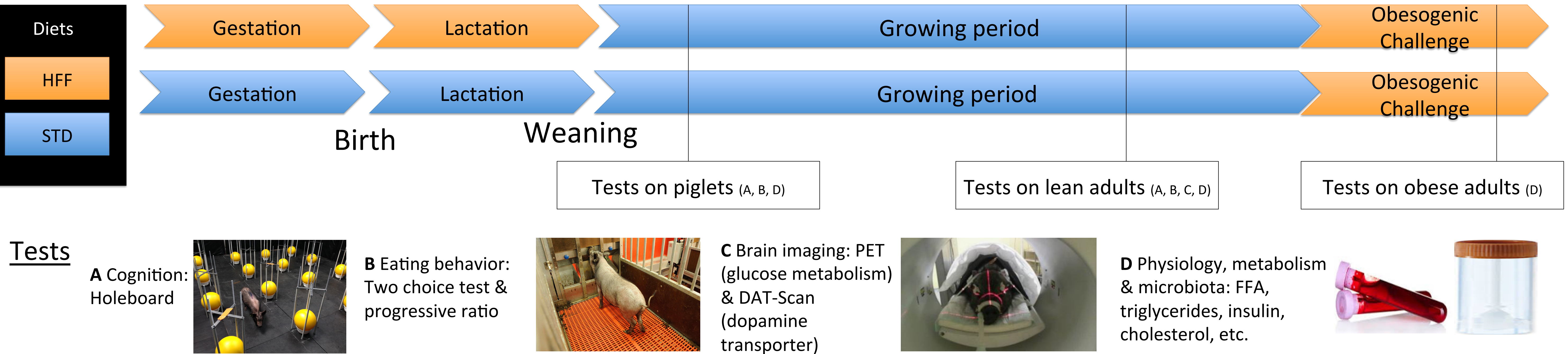


Key word: fetal programing, reward system, food challenge , physiology, longitudinal study

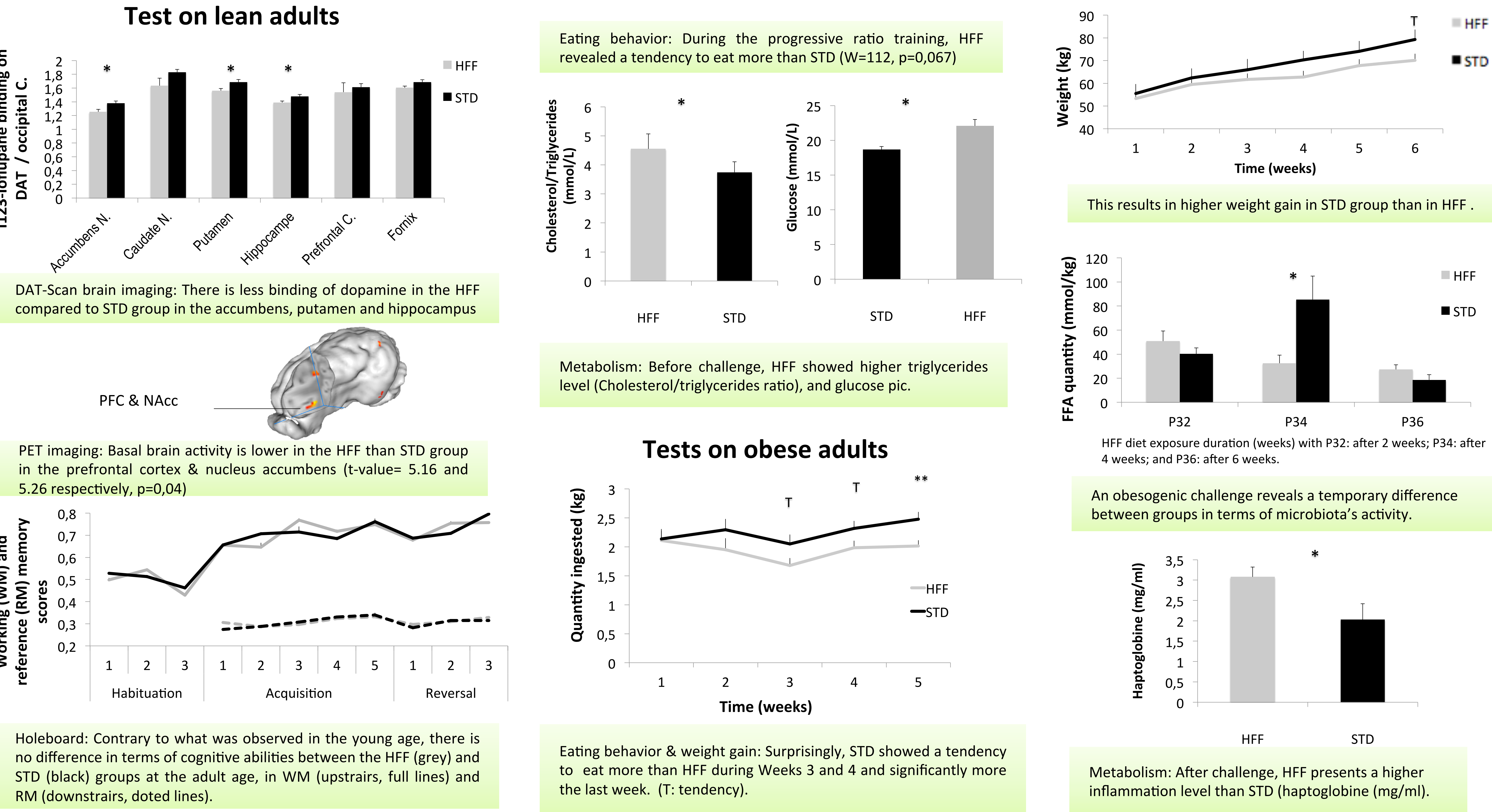
## Introduction

The concept of DOHaD suggests that perinatal nutrition have long term consequences, due to fetal programing. This study was designed to compare cognitive abilities, eating behavior, brain and metabolic processes of Yucatan minipigs exposed to a High Fat Fructose diet (HFF) with minipigs exposed to a standard diet (STD) during the perinatal period. This experiment started with eating behavior and cognitive tests on piglets after weaning. It showed that the offspring exposed early to HFF had better working and reference memories during the holeboard test, likely due to an increased motivation for the food rewards (Val-Laillet et al., 2016 in prep.), compared to piglets exposed to a standard diet (STD). HFF piglets had less microbiota activity (FFA) than STD. HFF also showed higher FFA and triglycerides levels than STD at weaning. The aims of the present work was to investigate some physiological and neurobehavioral responses of the same individuals at the adult age, before and/or after the induction of obesity.

## Materials & Methods



## Results



## Discussion & prospects

A perinatal exposure to a maternal high-fat high-sugar diet modulates neuronal processes in the reward and cognitive systems, as well as metabolic impairments. Though, these effects at the brain level were not accompanied by behavioral modifications in the context of a balanced nutritional environment. However, our results suggest that the HFF group better coped with an unbalanced nutritional environment than the STD group regarding weight gain. Nevertheless, HFF showed more inflammation marker than STD. It could be interesting to perform microbiota analysis (16S) to precise FFA results, and assess behavioral and neuronal responses to the nutritional challenge.