

# Does Dietary Choline Supplementation Mitigate the Effects of Adolescent Stress on Working Memory in Rats?

Abby Owens<sup>1</sup> and Kalynn M. Schulz<sup>2</sup>

Department of Psychology<sup>2</sup>, Department of Nutrition<sup>1</sup> and NeuroNET

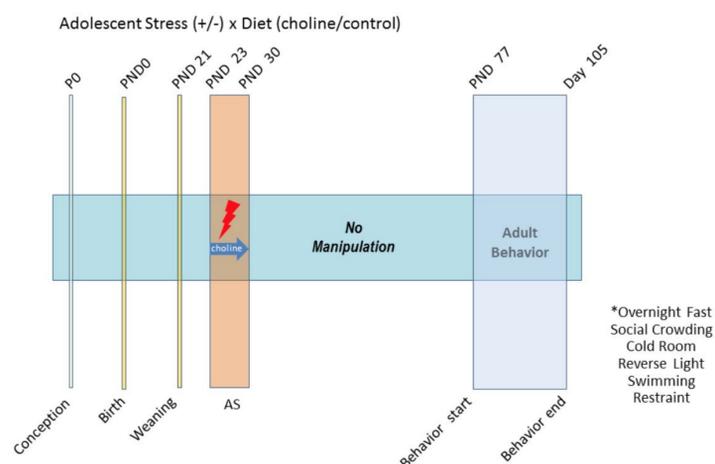
## Background

- Adolescent stress is associated with decreased memory function in adulthood.
- Stress exposure during development increases risk of mental illnesses such as depression, anxiety, and schizophrenia.
- Choline is a dietary nutrient important for brain function, and rodent models demonstrate that supplementing the diet of pregnant dams with choline buffers the negative effects of prenatal stress on offspring anxiety and memory function in adulthood.
- We hypothesize that adolescent choline supplementation mitigates the effects of adolescent stress on working memory using the radial arm maze.

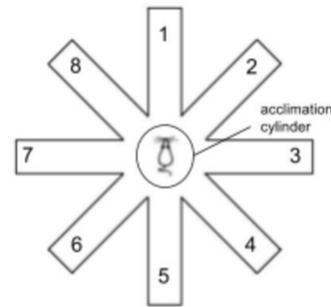
## Experimental Objective

- To determine whether dietary choline supplementation counteracts the negative effects of adolescent stress on adult working memory in the radial arm maze.

## Experimental Design



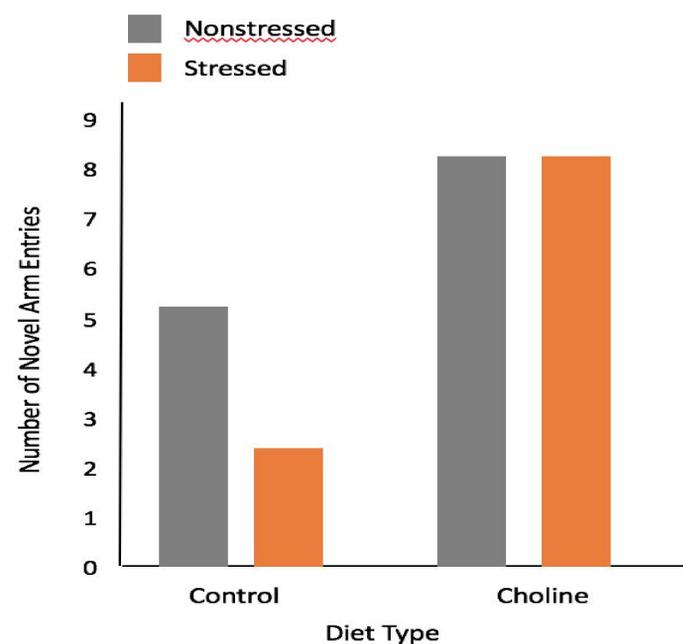
## Radial Arm Maze



Rats were placed in an acclimation cylinder for 1 minute before being allowed to explore the arms.

## Hypothesized Data

Diet and Stressors vs. Number of Novel Arm Entries



## Methods

- Behavior testing in the radial arm maze began in adulthood.
- Rats were given 1 minute to acclimate to their environment before being released from the acclimatization cylinder.
- The first 8 arm entrances were then recorded as well as distance traveled.
- The tracking software TopScan was used to record distances traveled as well as sniffing.

## Hypothesized Results

- If adolescent choline mitigates the effects of adolescent stress and improves working memory, stressed animals fed a choline diet will make more novel arm entries in the radial arm maze than stressed animals fed a standard diet.

## Conclusions/Future Directions

- In rodent models, choline has been shown to buffer the negative effects of prenatal and adolescent stress on offspring anxiety and memory function in adulthood.
- Choline may be used as a supplement in adolescence to decrease the risk of mental illnesses such as depression, anxiety, and schizophrenia in adulthood.