International Conference on Food Safety & Regulatory

3rd International Conference on **&** Water Microbiology, Water Sustainability and Reuse Technologies

December 03-04, 2018 | Chicago, USA

Impact of a high fructose diet in Wistar rat, its metabolic and behavioral disorders and the effect of supplementation of flaxseed

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Background: The deregulation of the energy balance by the malnutrition leads to the dysfunction of the neuro and the metabolic mechanisms but these homeostatic problems can be corrected by nutritional supplements. In this study, we investigated the effects of flaxseed on metabolism and anxiety-depressive-like disorders in high fructose-fed (23%) Wistar rat.

Methods: One-month-old female Wistar rats were divided into four groups of six rats: (1) Control: (30g of standard food + 30ml of tap water), (2) Control supplemented with flaxseed (27g standard food + 7g flaxseed + 30ml tap water) (3) Fructose (30 g standard food + 23% fructose) (4) Fructose supplemented with flaxseed (23g standard food + 7gflaxseed + 23% fructose), after two months of diet, the rats underwent a battery of tests to evaluate the effective behavior (Open Field, Elevated Plus Maze and Forced Swimming Test) and biochemical analyses of glucose, cholesterol, and triglycerides.

Results: High fructose diet induces adverse metabolic effects (increases blood sugar, cholesterol, triglycerides) and behavioral ones (depression). For flaxseed, it does not correct anxiety but decreases depression-like and metabolic disorders.

Conclusion: Our results suggest that a high fructose diet induces metabolic and behavioral dysfunctions. Flaxseeds have improved these conditions.

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