LIMITATIONS OF THE ULTRA-PROCESSED FOOD CATEGORY AS APPLIED TO FOOD ADDICTION

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INTRODUCTION

There is a need for a system to help people distinguish harmful foods from helpful foods. The NOVA Food Classification System created the Ultra-Processed Food category which has been associated with disease. However, the NOVA system also includes two categories for Culinary Ingredients and Processed Foods that provide that sugars and flour are safe when used at home as part of a healthy meal to make bread, preserves, drinks, and desserts (Monteiro et al., 2018). This provision does not take into consideration evidence that these refined carbohydrates are high glycemic index foods which have been shown to trigger addictive neuro-mechanisms. These addictive responses can lead to intense cravings, loss of control over food, and disease consequences. The NOVA system was not designed to address food addiction and so it does not reflect addictive mechanisms that could cause people to lose control over food and worsen obesity and other diet-related diseases.

Creating a food category system for specific addictive foods would be valuable because it could help people stop loss of control over food and widen use of addiction recovery protocols. Addiction recovery approaches could turn the tide of the epidemic of diet-related diseases. Food addiction recovery protocols would take the focus off of 'eat less, move more' approaches which have been ineffective. It would put the focus on the addictive properties of specific processed foods, focus on cravings cessation, and encourage elimination of those addictive foods. This brief paper describes why it is not appropriate to apply NOVA to issues related to processed food addiction and why a system focused on addictive foods would be useful.

LITERATURE REVIEW

A review of key studies illustrates the problems that arise when the NOVA Ultra Processed Food Classification System is applied to processed food addiction.

The NOVA Group 4 Ultra-processed food category excludes two other categories of processed foods, Group 2 Culinary Ingredients and Group 3 Processed Foods. Culinary Ingredients and Processed Foods explicitly include sugar and flour and combinations used at home or in restaurants to make bread, preserves, drinks, and desserts (Monteiro et al., 2018). However, sugars have been shown to be addictive (D. A. Wiss, Avena, & Rada, 2018). Flour is a high glycemic food which has been associated with addictive eating (Lennerz & Lennerz, 2018; Schulte, Avena, & Gearhardt, 2015).

Regarding cooking with sugar and flour at home, evidence shows that exposure to food cues precedes more active eating behavior (Colagiuri & Lovibond, 2015).There is evidence that the smell of food hyperactivates reward systems especially in obese children (Agarwal et al., 2021;

Soussignan, Schaal, Boulanger, Gaillet, & Jiang, 2012). The smell of bread is associated with heightened food-seeking (de Wijk et al., 2018). Conditioned place preferences are associated with processed food especially sucrose, and have been shown to trigger relapse (Hetherington, 2007; White & Carr, 1985). Isolation and eating at home curing Covid may have increased the salience of the home in as a place trigger in overeating (D et al., 2023). Cravings have been shown to be more intense in the dining room, kitchen, and bedroom than other places (Ferrer-Garcia, Gutierrez-Maldonado, & Pla, 2013). Storing ingredients at home could be a craving and use stimulus due to accessibility and proximity (Hollands et al., 2019; Schuz, Bower, & Ferguson, 2015).

NOVA suggests that cooking at home with Category 2 and 3 ingredients and without industrialized ingredients is an answer to the epidemic of diet-related disease. This overlooks another possibility, i.e. that disability from disease and obesity progression could explain the trend in reduced home cooking (Heo, Pietrobelli, Wang, Heymsfield, & Faith, 2010). Under the disability hypothesis, returning to cooking sugars and flours at home would not be helpful in reducing disease. It's not the lack of home cooking that causes disease. It's the sugars and flours themselves (Ciok & Dolna, 2006; Lavi et al., 2009). Disabilities could explain the shift to consuming more convenient ultra-processed foods away from home .

The hypothesis is that first came the diseases and disabilities which decreased the ability to cook. This in turn increased demand for convenient ultra-processed foods which increased disease and disabilities. The cycle could be construed as reenforcing in a downward spiral. But the idea that the solution is to turn away from ultra-processed foods in favor of making bread and desserts at home is inconsistent with the evidence that sugar and flour are intrinsically addictive and harmful regardless of how they are combined with other processed ingredients and additives. The situation is similar to the idea that alcohol is intrinsically addictive regardless of the number, quality, or toxicity of other ingredients in the drink and whether or not it is part of a nutritious meal at home.

NOVA proposes that using sugars and flours in homemade bread, preserves, drinks, and desserts is less harmful than store-bought versions of those foods. However, in a Substance Use Disorder (SUD) model, using sugar and flour at home is not harm reduction compared to using sugar and flour in an ultra-processed product.

The NOVA system does not claim to be applicable to issues related to food addiction.

> *The NOVA classification has now been applied worldwide. Uses so far include description of population dietary patterns, assessments of changes over time in the dietary share of ultra-processed products, and analyses of the association of this share with the nutrient profile of diets and with health outcomes* (Monteiro et al., 2018).

DISCUSSION

The evidence suggests that using sugar and flour to make bread, preserves, drinks, and desserts at home is contraindicated for food-addicted people. The practice could make food-addicted people lose control even more due to the smell of cooking and baking, as well as ready accessibility at home to the addictive substances of sugar and flour. Further, the consumption of bread and desserts in the home could turn the home into a place trigger for relapse into loss of control over food. The home has already been shown to be a place that triggers relatively intense cravings so the idea of making those cravings worse by cooking and baking sugar and flour items at home might could be an impediment to recovery.

The attempt to focus attention on ultra-processed foods is laudable but misguided when it comes to the idea that people would be better off cooking and baking sugar and flour items at home even as part of a healthy meal. It brings to mind the attempt of the tobacco industry to claim that low-tar cigarettes were safer than regular cigarettes (Pauwels et al., 2020). Homemade sugar and flour products are just as addictive as store-bought products and perhaps more so due to aggravation of craving resulting from smells, accessibility, and development of place triggers in the home.

It is perhaps tempting to just focus on the ultra-processed food category and ignore the advice to make sugar and flour items at home. However, food-addicted people are susceptible to irrational beliefs which can lead to uncontrolled eating (Nolan & Jenkins, 2019). Telling a food-addicted person that the problem is just ultra-processed foods opens them up to feeling safe consuming homemade sugar and flour items. Trying and failing to accomplish control over homemade addictive foods prolongs the misery of food addiction and worsens diet-related diseases. It can be very difficult to regain control over food. The consequences can be severe. In the US, in 2020, 1.7 million people died from diet-related diseases (Murphy, Kochanek, Xu, & Arias, 2021).

It would also be tempting to disassociate the term ‘ultra-processed’ from the NOVA system but the NOVA system is consistently cited in research on ultra-processed food addiction (Gearhardt et al., 2023; LaFata & Gearhardt, 2022; Silva Júnior, Gearhardt, & Bueno, 2023; Whatnall, Clarke, Collins, Pursey, & Burrows, 2022; D. Wiss, 2022). In none of these studies did the researchers add sugars and flours used at home into their reports of the prevalence of ultra processed food consumption in the US.

A preferable method of food categorization for use in gaining recognition for food addiction could be focused on the addictive substances themselves. This is the approach used in the DSM 5 SUD Criteria for alcohol, caffeine, cannabis, cocaine, hallucinogens, inhalants, opioids, sedatives, stimulants, and tobacco. (American.Psychiatric.Association, 2013). Addictive properties for each substance have been established using a variety of research approaches.

Similarly, a broad range of evidence also exists for addictive use of specific food substances including sugar, flour, gluten, excessive salt, dairy, excessive fat, and caffeine (Ifland et al., 2018). Following the DSM 5 SUD precedent by developing the evidence for each substance is the scientifically credible way of gaining recognition for food addiction. In light of the goal to gain recognition and standardize treatment for processed food addiction, consistently applying well-

established and accepted addictive substance categorization procedures could ease acceptance among educators, regulators and practitioners.

Such a system of categorization could be subjected to the Delphi method to develop expert consensus on which substances should be the focus of concern (Jorm et al., 2003). An expert consensus using the Delphi method which incorporates research at every stage, would lend credibility to three efforts: a. recognition for the disease of addiction to processed food, b, standardization of treatment, and c. protection for consumers through public policy.

CONCLUSION

The attempt to apply the NOVA Food Categorization System to food addiction is inappropriate and possibly dangerous as it could lead food-addicted people to feel safe using sugar and flour at home which could increase cravings triggers and consumption. This could lead to loss of control over eating and disease consequences. An approach with precedents would be to focus directly on the addictive foods for which there is evidence of addictive properties, develop expert consensus using the Delphi method including existing research. This is the established approach to demonstrating addictive properties in substances and creates scientifically credible evidence to support treatment and public policy.

BIBLIOGRAPHY

Agarwal, K., Manza, P., Leggio, L., Livinski, A. A., Volkow, N. D., & Joseph, P. V. (2021). Sensory cue reactivity: Sensitization in alcohol use disorder and obesity. *Neurosci Biobehav Rev, 124*, 326-357. doi:10.1016/j.neubiorev.2021.02.014

American.Psychiatric.Association. (2013). *The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* (Vol. 5). Arlington, VA: American Psychiatric Publishing.

Ciok, J., & Dolna, A. (2006). [The role of glycemic index concept in carbohydrate metabolism]. *Przegl Lek, 63*(5), 287-291.

Colagiuri, B., & Lovibond, P. F. (2015). How food cues can enhance and inhibit motivation to obtain and consume food. *Appetite, 84*, 79-87. doi:10.1016/j.appet.2014.09.023

D, J. D., Han, A., Anderson, A., Katzman, D. K., Patten, S. B., Soumbasis, A., . . . Dimitropoulos, G. (2023). The impact of the COVID-19 pandemic on eating disorders: A systematic review. *Int J Eat Disord, 56*(1), 5-25. doi:10.1002/eat.23704

de Wijk, R. A., Smeets, P. A. M., Polet, I. A., Holthuysen, N. T. E., Zoon, J., & Vingerhoeds, M. H. (2018). Aroma effects on food choice task behavior and brain responses to bakery food product cues. *Food Quality and Preference, 68*, 304-314. doi:https://doi.org/10.1016/j.foodqual.2018.03.015

Ferrer-Garcia, M., Gutierrez-Maldonado, J., & Pla, J. (2013). Cue-elicited anxiety and craving for food using virtual reality scenarios. *Stud Health Technol Inform, 191*, 105-109.

Gearhardt, A. N., Bueno, N. B., DiFeliceantonio, A. G., Roberto, C. A., Jiménez-Murcia, S., & Fernandez-Aranda, F. (2023). Social, clinical, and policy implications of ultra-processed food addiction. *Bmj, 383*, e075354. doi:10.1136/bmj-2023-075354

Heo, M., Pietrobelli, A., Wang, D., Heymsfield, S. B., & Faith, M. S. (2010). Obesity and functional impairment: influence of comorbidity, joint pain, and mental health. *Obesity (Silver Spring), 18*(10), 2030-2038. doi:10.1038/oby.2009.400

Hetherington, M. M. (2007). Cues to overeat: psychological factors influencing overconsumption. *Proc Nutr Soc, 66*(1), 113-123. Retrieved from

http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Citation&list_uids=17343777
Hollands, G. J., Carter, P., Anwer, S., King, S. E., Jebb, S. A., Ogilvie, D., . . . Marteau, T. M. (2019). Altering the availability or proximity of food, alcohol, and tobacco products to change their selection and consumption. *Cochrane Database Syst Rev, 8*(8), Cd012573. doi:10.1002/14651858.CD012573.pub2
Ifland, J., Preuss, H. G., Marcus, M. T., Wright, H. T., Taylor, W. C., Sheppard, K., & Rourke, K. M. (2018). Abstinent Food Plans for Processed Food Addiction. In J. Ifland, M. T. Marcus, & H. G. Preuss (Eds.), *Processed Food Addiction: Foundations, Assessment, and Recovery* (1st ed., pp. 462). Boca Ratan, FL: CRC Press.
LaFata, E. M., & Gearhardt, A. N. (2022). Ultra-Processed Food Addiction: An Epidemic? *Psychother Psychosom, 91*(6), 363-372. doi:10.1159/000527322
Lavi, T., Karasik, A., Koren-Morag, N., Kanety, H., Feinberg, M. S., & Shechter, M. (2009). The acute effect of various glycemic index dietary carbohydrates on endothelial function in nondiabetic overweight and obese subjects. *J Am Coll Cardiol, 53*(24), 2283-2287. doi:10.1016/j.jacc.2009.03.025
Lennerz, B., & Lennerz, J. K. (2018). Food Addiction, High-Glycemic-Index Carbohydrates, and Obesity. *Clin Chem, 64*(1), 64-71. doi:10.1373/clinchem.2017.273532
Monteiro, C. A., Cannon, G., Moubarac, J. C., Levy, R. B., Louzada, M. L. C., & Jaime, P. C. (2018). The UN Decade of Nutrition, the NOVA food classification and the trouble with ultra-processing. *Public Health Nutr, 21*(1), 5-17. doi:10.1017/s1368980017000234
Murphy, S. L., Kochanek, K. D., Xu, J. Q., & Arias, E. (2021). *Mortality in the United States 2020*. Hyattsville, MD: National Center for Health Statistics
Nolan, L. J., & Jenkins, S. M. (2019). Food Addiction Is Associated with Irrational Beliefs via Trait Anxiety and Emotional Eating. *Nutrients, 11*(8). doi:10.3390/nu11081711
Schulte, E. M., Avena, N. M., & Gearhardt, A. N. (2015). Which foods may be addictive? The roles of processing, fat content, and glycemic load. *PLoS One, 10*(2), e0117959. doi:10.1371/journal.pone.0117959
Schuz, B., Bower, J., & Ferguson, S. G. (2015). Stimulus control and affect in dietary behaviours. An intensive longitudinal study. *Appetite, 87C*, 310-317. doi:10.1016/j.appet.2015.01.002
Silva Júnior, A. E. D., Gearhardt, A. N., & Bueno, N. B. (2023). Association between food addiction with ultra-processed food consumption and eating patterns in a Brazilian sample. *Appetite, 186*, 106572. doi:10.1016/j.appet.2023.106572
Soussignan, R., Schaal, B., Boulanger, V., Gaillet, M., & Jiang, T. (2012). Orofacial reactivity to the sight and smell of food stimuli. Evidence for anticipatory liking related to food reward cues in overweight children. *Appetite, 58*(2), 508-516. doi:10.1016/j.appet.2011.12.018
Whatnall, M., Clarke, E., Collins, C. E., Pursey, K., & Burrows, T. (2022). Ultra-processed food intakes associated with 'food addiction' in young adults. *Appetite, 178*, 106260. doi:10.1016/j.appet.2022.106260
White, N. M., & Carr, G. D. (1985). The conditioned place preference is affected by two independent reinforcement processes. *Pharmacol Biochem Behav, 23*(1), 37-42. doi:10.1016/0091-3057(85)90127-3
Wiss, D. (2022). Clinical Considerations of Ultra-processed Food Addiction Across Weight Classes: an Eating Disorder Treatment and Care Perspective. *Curr Addict Rep, 9*(4), 255-267. doi:10.1007/s40429-022-00411-0
Wiss, D. A., Avena, N., & Rada, P. (2018). Sugar Addiction: From Evolution to Revolution. *Front Psychiatry, 9*, 545. doi:10.3389/fpsyt.2018.00545