Ultra-Processed Food, Culinary Medicine & An Ordinary Meal
NOVA
NOVA Group 1: raw and unprocessed foods like raw milk
NOVA Group 2: minimally processed foods like butter
NOVA Group 3: processed foods like a classic from-scratch sandwich

NOVA Group 3: Hand-crafted sandwich, no UPFs
NOVA Group 4: ultra-processed foods (UPFs)

NOVA Group 4: Commercial sandwich & condiments
NOVA Group 4 Foods: Ultra-Processed Foods

Defining Characteristics:
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NOVA Group 4 Foods: Ultra-Processed Foods

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• Natural food matrix substantially degraded or destroyed
• Added compounds not found in Nature (Markers of Ultra-Processing or MUPs)
• Excessive added amounts of sugars, fats, and salt; “Bliss Point”
• Constructed compounds made to be addictive and profitable with a long shelf-life
Carboxymethyl Cellulose (Cellulose gum or CMC)

Sodium carboxymethylcellulose is **not natural** as it is synthesized by alkalinization and etherification of the raw material cellulose.
CMC ingestion leads to gut bacteria changes associated with inflammation, IBS & Crohn’s.

CMC consumption induces strong alterations in fecal microbiota

CMC consumption induces strong depletion of fecal metabolome
The Gut Microbiome and Markers of Ultra-Processing
Consumption of ultra-processed foods and risk of developing chronic disabilities and diseases (partial list)

Overweight/Obesity, Adiposity, Neurocognitive disorders, Dyslipidemia, Type 2 Diabetes, Metabolic Syndrome, Hypertension, Total Cancers and Breast Cancer, Cardiovascular Diseases, Irritable Bowel Syndrome, IBD, Functional Dyspepsia, other GI disorders, Depressive Symptoms, Mental Health issues, Cognitive Function Autoimmune diseases, Arthritis, Early Mortality
UPFs: Detrimental Effects Beyond Composition Effect & Nutrients

Ultra-processed Diet

Unprocessed Diet

Diets were presented in random order and matched for provided calories, sugar, fat, fiber, and macronutrients

“Whatever food company chemists are doing to create ultra-processed food; it makes people fatter and sicker and causes a vast proportion of Americans and others around the world harm.”

Dr. Kevin Hall, National Institutes of Health
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(2) cause psychoactive (i.e., mood-altering) effects via their effect on the brain,
(3) reinforce behavior.
(4) the ability to trigger strong urges or cravings.
UPFs parallel tobacco products, as both are:

- Legal,
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- Legal,
- **Easily accessible,**
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- Legal,
- Easily accessible,
- **Inexpensive,**
UPFs parallel tobacco products, as both are:

- Legal,
- Easily accessible,
- Inexpensive,
- **Lack an intoxication syndrome and,**
UPFs parallel tobacco products, as both are:

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- Easily accessible,
- Inexpensive,
- Lack an intoxication syndrome and,

**Are a major cause of preventable death.**
Ultra-processed foods (UPFs) “meet the criteria to be labeled as addictive substances using the standards set for tobacco products.”
Early life dietary emulsifier exposure predisposes the offspring to obesity through gut microbiota-FXR axis.

A Murine study examining the effect of commonly used emulsifier Polysorbate 80 (P80).
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Maternal P80 exposure significantly impaired intestinal development and barrier function and increased intestinal low-grade inflammation in offspring mice.
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After consuming a high-fat diet, Maternal P80-exposed offspring showed more severe gut dysbiosis and obesity, accompanied by alternation in bile acid profile and up-regulation of the FXR-FGF15 axis.
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“Conclusively, early-life emulsifier exposure predisposes the offspring to obesity through the gut microbiota-FXR axis.”
Ultra-processed foods and type-2 diabetes risk in the SUN project: A prospective cohort study

Participants in the highest tertile (high consumption) of UPF consumption had a 53% higher risk of T2D than those in the lowest tertile.
Ultra-processed food and risk of type 2 diabetes: a systematic review and meta-analysis of longitudinal studies

<table>
<thead>
<tr>
<th>Study</th>
<th>Risk Ratio</th>
<th>RR</th>
<th>95%-CI</th>
<th>Weight</th>
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<tbody>
<tr>
<td><strong>High intake</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Schulze et al., 2003</td>
<td>1.86</td>
<td>(1.35 - 2.57)</td>
<td>4.1%</td>
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<tr>
<td>Song et al., 2004</td>
<td>1.19</td>
<td>(1.00 - 1.42)</td>
<td>7.5%</td>
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<tr>
<td>Montonen et al., 2005</td>
<td>1.22</td>
<td>(0.89 - 1.68)</td>
<td>4.1%</td>
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<tr>
<td>Villegas et al., 2006</td>
<td>1.18</td>
<td>(1.00 - 1.39)</td>
<td>7.9%</td>
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<tr>
<td>McNaughton et al., 2008</td>
<td>1.51</td>
<td>(1.10 - 2.08)</td>
<td>4.1%</td>
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<tr>
<td>Mannisto et al., 2010</td>
<td>1.37</td>
<td>(1.10 - 1.70)</td>
<td>6.3%</td>
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<tr>
<td>Steinbrecher et al., 2011</td>
<td>1.51</td>
<td>(1.40 - 1.63)</td>
<td>10.6%</td>
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<tr>
<td>Fretts et al., 2012</td>
<td>1.31</td>
<td>(0.83 - 2.07)</td>
<td>2.4%</td>
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<tr>
<td>Lajous et al., 2012</td>
<td>1.30</td>
<td>(1.07 - 1.58)</td>
<td>6.8%</td>
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<tr>
<td>van Woudenbergh, 2012</td>
<td>1.73</td>
<td>(1.16 - 2.58)</td>
<td>3.0%</td>
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<tr>
<td>Bauer et al., 2013</td>
<td>1.56</td>
<td>(1.20 - 2.02)</td>
<td>5.2%</td>
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<tr>
<td>Bendinelli et al., 2013</td>
<td>1.16</td>
<td>(1.03 - 1.30)</td>
<td>9.5%</td>
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<tr>
<td>Ericson et al., 2013</td>
<td>1.12</td>
<td>(0.95 - 1.32)</td>
<td>7.9%</td>
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<tr>
<td>Kurziani, 2013</td>
<td>1.11</td>
<td>(0.92 - 1.33)</td>
<td>7.3%</td>
<td></td>
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<tr>
<td>Son et al., 2019</td>
<td>1.07</td>
<td>(0.85 - 1.35)</td>
<td>5.9%</td>
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<tr>
<td>Levy et al., 2021</td>
<td>1.44</td>
<td>(1.03 - 2.01)</td>
<td>3.9%</td>
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<tr>
<td>Llaverio-Valero et al., 2021</td>
<td>1.53</td>
<td>(1.06 - 2.21)</td>
<td>3.4%</td>
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**Random-effects model**

Heterogeneity: $i^2 = 60\%$, $p < 0.01$
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Each additional daily serving of ultra-processed foods was associated with a 7% increase in the risk of incident CVD
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French prospective NutriNet-Sante cohort study ($n = 105,159$):
Each 10% increment in the consumption of ultra-processed foods was associated with an 11–13% increased risk of CVD, CHD, and cerebrovascular disease
Ultra-processed Foods and Cardiometabolic Health Outcomes: from Evidence to Practice

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The Italian Moli-sani study \((n = 22,275)\):
Individuals consuming the most ultra-processed foods had a 58% increased risk of CVD mortality
"Greater consumption of ultra-processed foods was associated with higher all-cause mortality in this health-conscious Adventist population with many vegetarians. Animal-based food consumption (meat, dairy, eggs) was not associated with mortality…. These findings suggest that high consumption of ultra-processed foods may be an important indicator of mortality."
“A significant proportion of the higher mortality risk associated with an elevated intake of nutrient-poor foods was explained by a high degree of food processing. In contrast, the relation between a high ultra-processed food intake and mortality was not explained by the poor [nutritional] quality of these foods.”
The Rise of Ultra-Processed Foods

From age 5 onwards, almost 70% of the U.S. diet is comprised of Ultra-Processed Foods (UPFs)

Culinary Medicine:

“The multidisciplinary application of evidence-based decision making in the selection of ingredients and techniques used in preparing foodstuffs with a goal of achieving and maintaining health and wellness through an optimized food experience.”
The 85% Rule for Better Health:

“Keep it to 5 to stay alive!”

If more than five ingredients are in the ingredient list, then about 85% of the time, it is ultra-processed!
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Roughly 85% or more of the foods found in these 6 grocery store categories are UPFs:
Salted meats
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And Beyond belief and Impossible to digest Vegetarian dishes!

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**Strive to make your diet at least 85% minimally processed.**