WEBINAR

Ultra-Processed Foods: State of the Science and Implications for Policy

Healthy Eating Research

Thursday, September 26

1:30-3:00 PM ET

Lauren O'Connor
Texas A&M

Ashley Gearhardt
University of Michigan

Aviva Musicus
CSPI

Moderated By:

Jim Krieger
Healthy Food America
University of Washington

Logistics

Participants will be automatically muted when joining

Ask any tech or logistics questions for the host in the chat bar

30 minutes of audience Q&A at the end of the session – ask questions for the presenters in the Q&A bar

Today's webinar

Presentations (45 minutes)

- **Lauren O'Connor, PhD, MPH**
  Texas A&M Agriculture
  Considerations for research about ultra-processed foods

- **Ashley Gearhardt, PhD**
  University of Michigan
  Science on the addictive nature of UPFs

- **Aviva Musicus, ScD**
  Center for Science in the Public Interest
  Harvard T.H. Chan School of Public Health
  Motivations and Mechanisms for Ultra-Processed Food Policy in the U.S.

Panel discussion and Q&A (30 minutes)

- *Facilitated by* **Jim Krieger, MD, MPH**
  Healthy Food America
  University of Washington School of Public Health

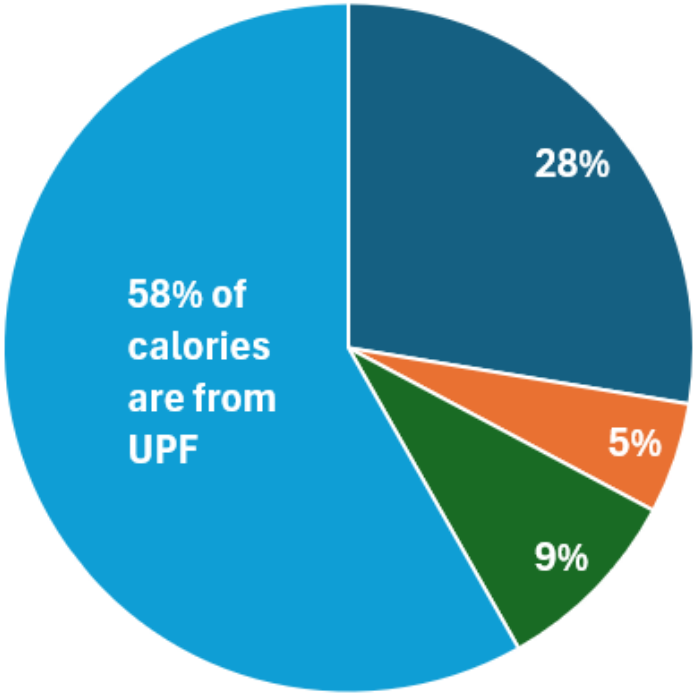
Reference list will be posted on HER website

Energy contributed by UPF to US diet

Increasing over past 25 years

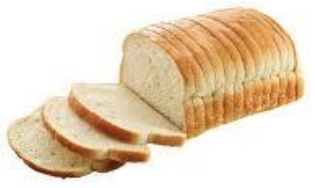
Higher among lower income or education groups

Higher among children and adolescents



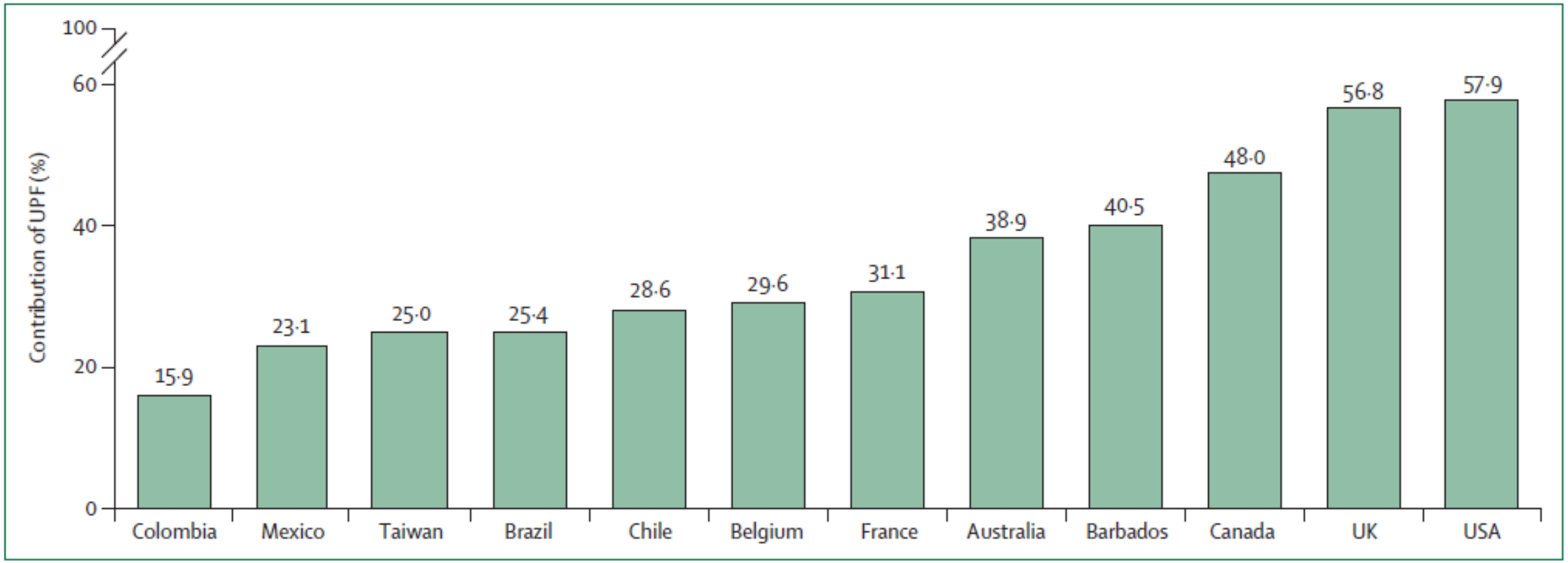
Most common UPF (% energy):

- Breads (10%)
- Soft drinks, fruit drinks, and milk-based drinks (7.3%)
- Cakes, cookies, and pies (5.8%)
- Reconstituted meat or fish products (5.6%)
- Salty snacks (4.8%).



Steele, et al. J Nutr. 2023; Dicken, et al Nutr Res Rev 2023

The US is a global leader in UPF intake



Srour 2022

UPF and adverse health outcomes

Risk Ratios

- **All cause mortality: 1.21**
- **CVD mortality: 1.50**
- **Type 2 DM: 1.40**
- **Obesity: 1.55**
- **Anxiety: 1.48**
- **Depression 1.22**
- **Combined mental disorders: 1.53**
- **Poor sleep: 1.41**

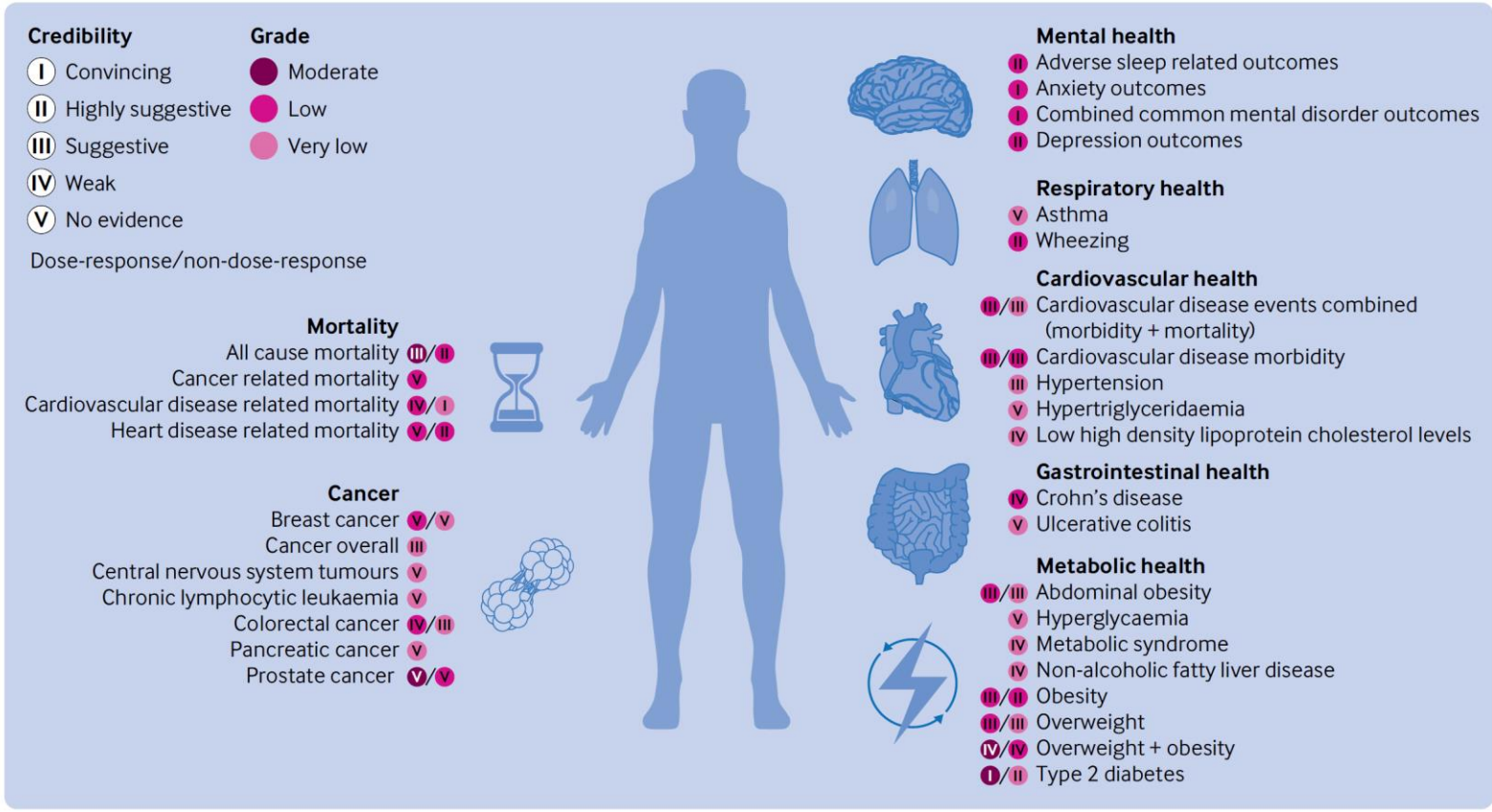


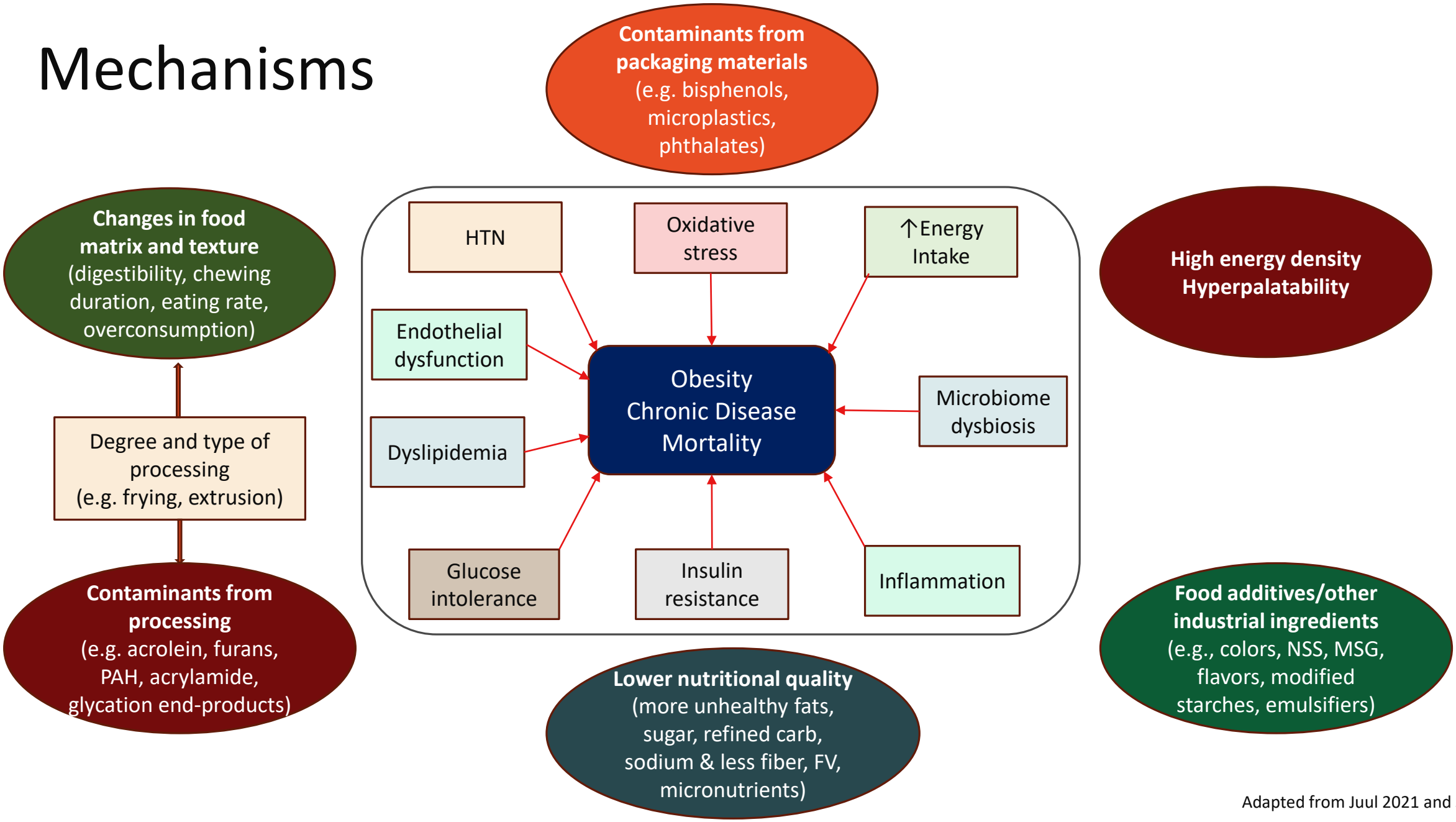
Fig 4 | Credibility and GRADE (Grading of Recommendations, Assessment, Development, and Evaluation) ratings for associations between greater exposure to ultra-processed foods and risks of each adverse health outcome

Lane BMJ 2024

Potential benefits of UPF

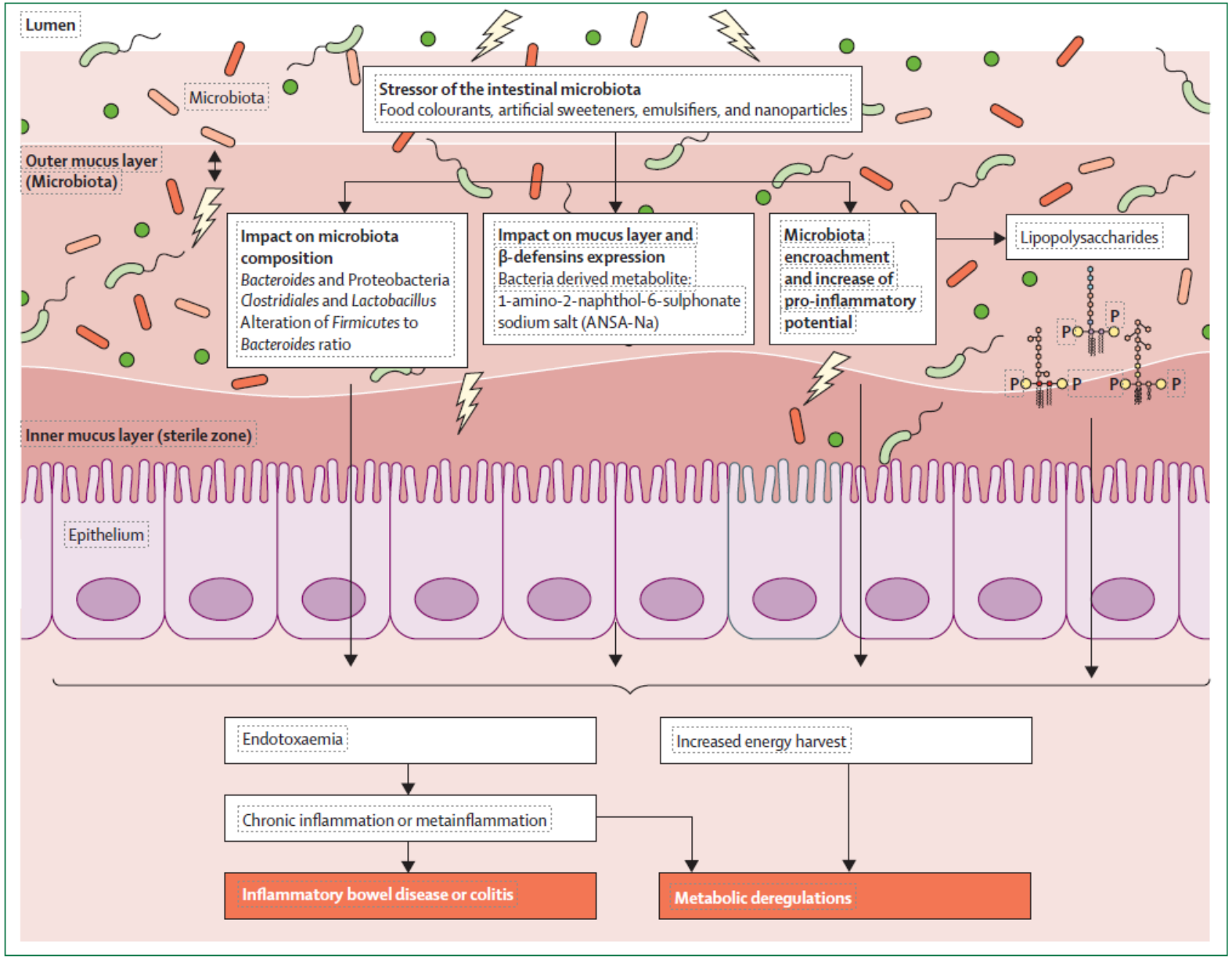
- Convenience
- Shelf-life
- Low cost (some products)
- Food safety
- Increase in availability and digestibility for some nutrients (but also decrease for others)
- Waste reduction

Mechanisms



Adapted from Juul 2021 and Srour 2022

Gut microbiome

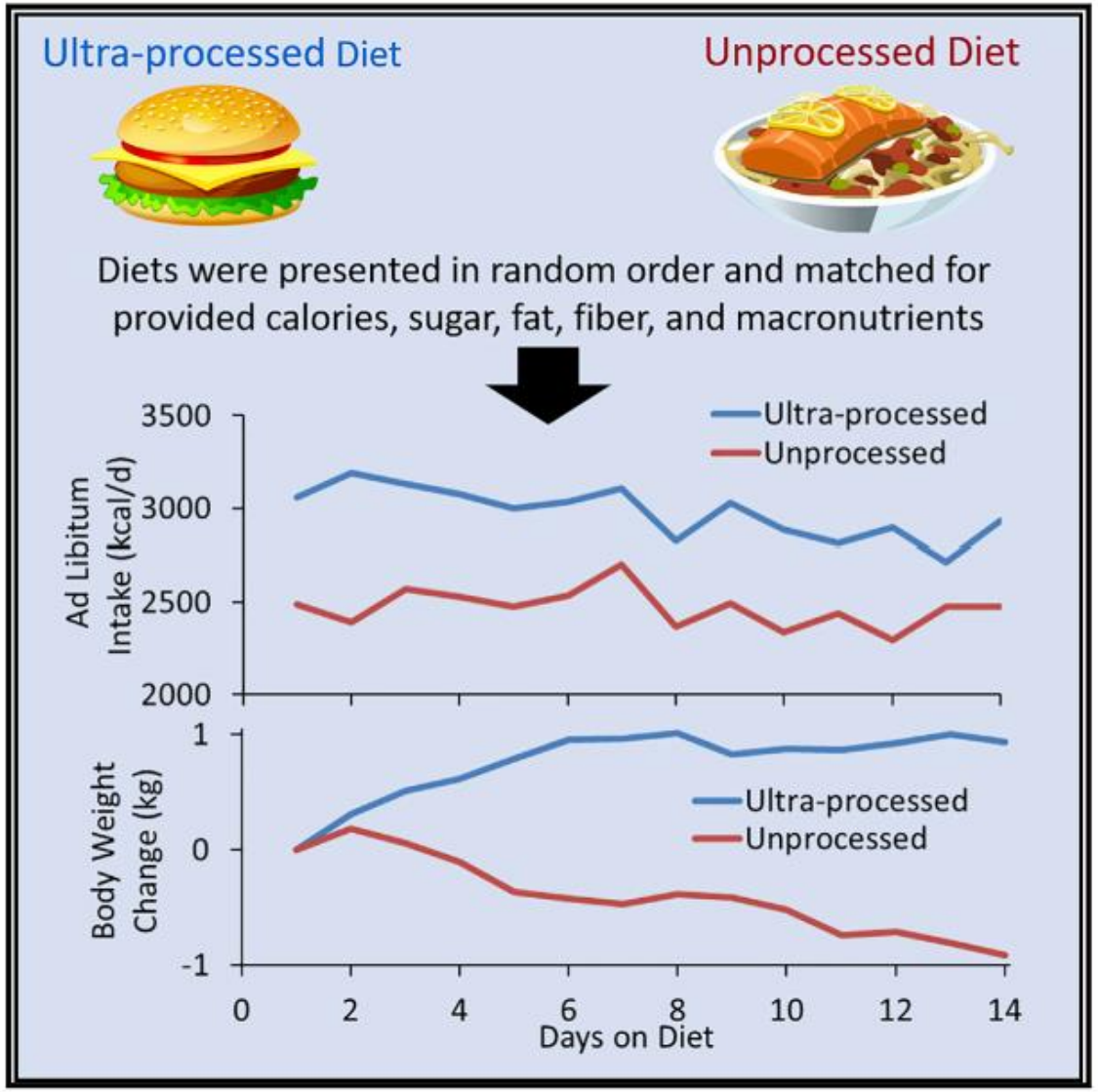


Srour 2022

Energy density and Hyperpalatability

Ultra-Processed Diets Cause Excess Calorie Intake and Weight Gain: An Inpatient RCT

- 20 inpatient adults received ultra-processed and unprocessed diets for 14 days each
- Diets were matched for presented calories, energy density, sugar, fat, sodium, and fiber



Hall 2019

Current debate:
Nutritional quality vs. processing

INGREDIENTS: ***CROISSANT:*** ENRICHED BLEACHED FLOUR (WHEAT FLOUR, MALTED BARLEY FLOUR, NIACIN, IRON, THIAMINE MONONITRATE, RIBOFLAVIN, FOLIC ACID), VEGETABLE SHORTENING (PARTIALLY HYDROGENATED SOYBEAN AND/OR COTTONSEED OILS, WATER, SALT, MONO- AND DIGLYCERIDES, ANNATTO EXTRACT, [COLOR]), SKIM MILK, HIGH FRUCTOSE CORN SYRUP, YEAST, WATER, CONTAINS 2% OR LESS OF: SALT, EGGS, WHEAT GLUTEN, ENZYMES, SUGAR, NATURAL AND ARTIFICIAL FLAVORS, MONO- AND DIGLYCERIDES, CALCIUM PROPIONATE AND POTASSIUM SORBATE (PRESERVATIVES), SOY FLOUR. ***COOKED SAUSAGE PATTY:*** *PORK, WATER, CONTAINS 2% OR LESS OF: SALT, DEXTROSE, SPICES, SODIUM LACTATE, SODIUM PHOSPHATE, MONOSODIUM GLUTAMATE, SODIUM DIACETATE, BHT, CITRIC ACID, CARAMEL COLOR.* ***PRECOOKED EGG PATTY:*** *WHOLE EGGS, WATER, SOYBEAN OIL, NONFAT DRY MILK, MODIFIED CORN STARCH, SALT, XANTHAN GUM, NATURAL AND ARTIFICIAL BUTTER FLAVOR (BUTTER [CREAM, MILK], PARTIALLY HYDROGENATED SOYBEAN AND COTTONSEED OIL, SOYBEAN OIL, LIPOLYZED BUTTER OIL, NATURAL AND ARTIFICIAL FLAVORS), CITRIC ACID.* ***PASTEURIZED PROCESS CHEDDAR CHEESE:*** CULTURED MILK, WATER, CREAM, SODIUM PHOSPHATES, SALT, SORBIC ACID (A PRESERVATIVE), VEGETABLE COLOR (ANNATTO AND PAPRIKA EXTRACT), ENZYMES. **CONTAINS EGG, MILK, SOY AND WHEAT**

Nutrition Facts

Serving Size 1 Sandwich (139g)
Servings Per Container 1

Amount Per Serving	
Calories 500	Calories from Fat 330
	% Daily Value*
Total Fat 36g	**55%**
Saturated Fat 12g	**60%**
Trans Fat 3g	
Cholesterol 130mg	**43%**
Sodium 910mg	**38%**
Total Carbohydrate 30g	**10%**
Dietary Fiber 1g	**4%**
Sugars 6g	
Protein 14g	
Vitamin A 6% • Vitamin C 0%	
Calcium 15% • Iron 10%	

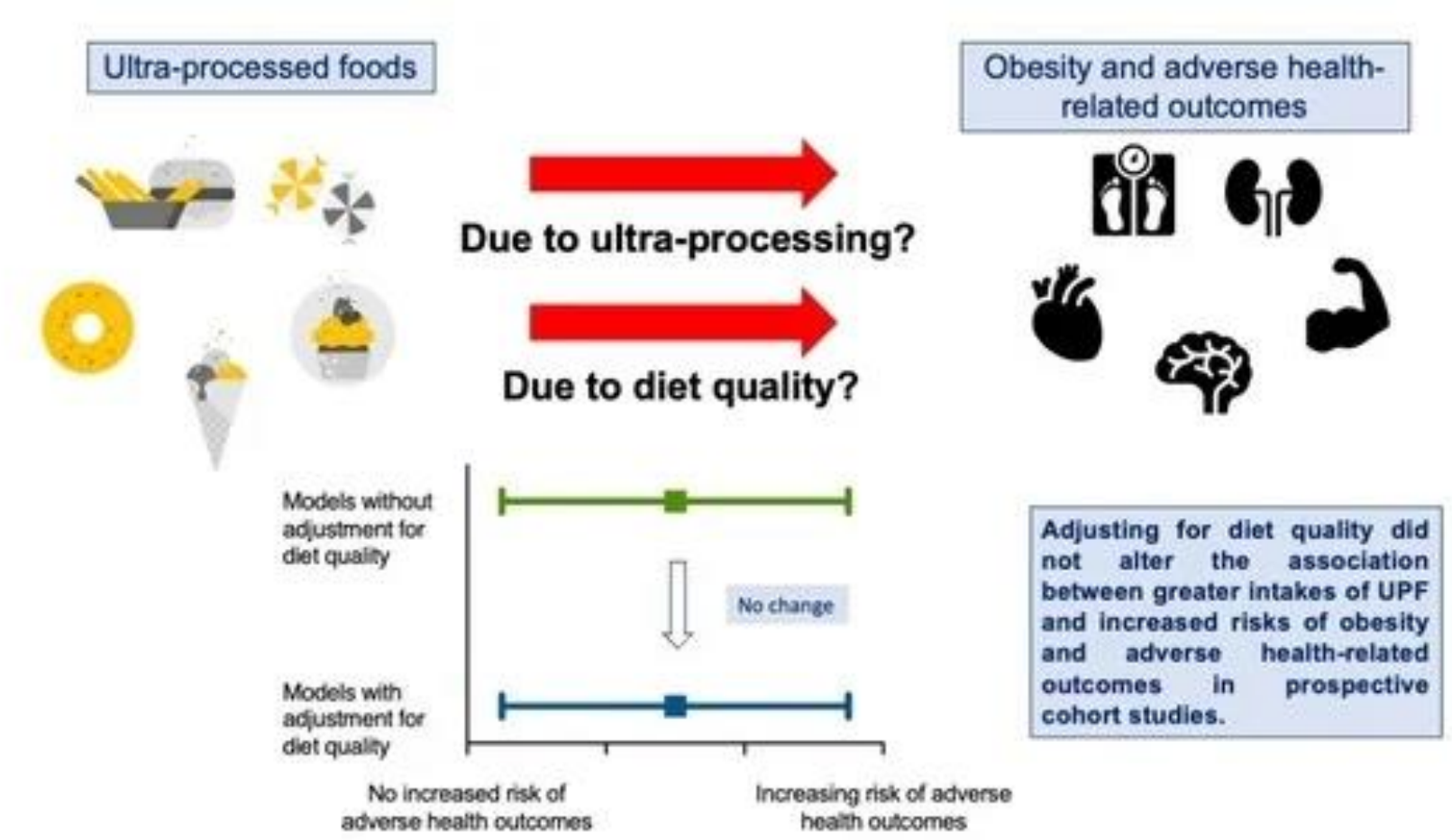
*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:

	Calories	2,000	2,500
Total Fat	Less Than	65g	80g
Saturated Fat	Less Than	20g	25g
Cholesterol	Less Than	300mg	300 mg
Sodium	Less Than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

Calories per gram:
Fat 9 • Carbohydrate 4 • Protein 4

Adjustment for diet quality does not affect association of UPF with health outcomes

- 37 cohort studies
- 66 models show association
- 64 remain significant after adjustment



Dicken 2022

Joint association of food nutritional profile by Nutri-Score front-of-pack label and ultra-processed food intake with mortality: Moli-sani prospective cohort study

Marialaura Bonaccio,[1] Augusto Di Castelnuovo,[2] Emilia Ruggiero,[1] Simona Costanzo,[1] Giuseppe Grosso,[3] Amalia De Curtis,[1] Chiara Cerletti,[1] Maria Benedetta Donati,[1] Giovanni de Gaetano,[1] Licia Iacoviello,[1,4] on behalf of the Moli-sani Study Investigators*

All cause mortality:
22% of risk due to processing

CVD mortality:
15% of risk

WHAT THIS STUDY ADDS

In a large Italian population cohort, the Nutri-Score and the NOVA classification were independently associated with all cause and cardiovascular mortality

Part of the excess mortality risk associated with a nutrient poor diet, as reflected by increased values of the Nutri-Score, was significantly explained by a higher degree of food processing

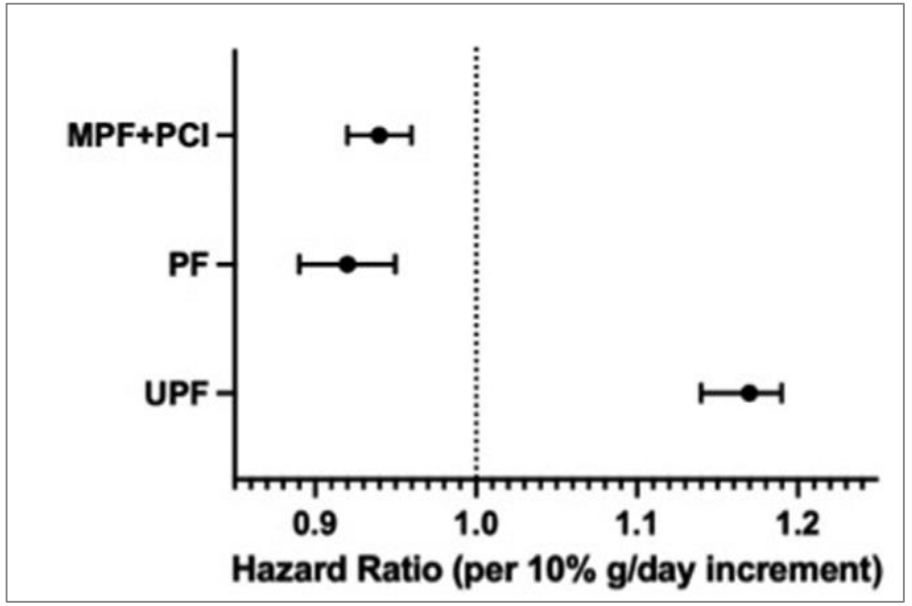
Ultra-processed food intake, by contrast, remained associated with mortality even after the poor nutritional quality of the diet was accounted for

Bonaccio 2022

Degree of processing and food groups may matter

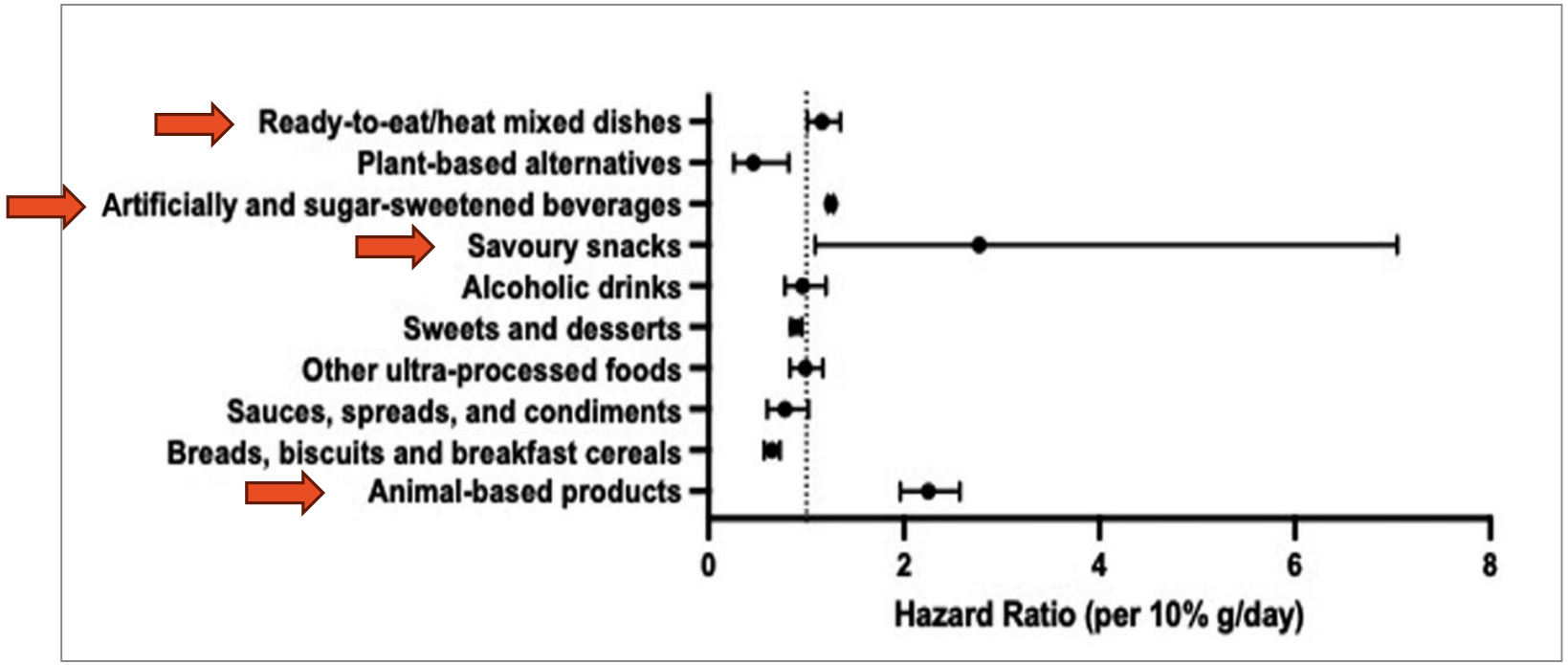
UPF and incident type 2 diabetes

Adjusting for diet quality or fat intake did not explain away the association between UPF diabetes.



European Prospective Investigation into Cancer and Nutrition cohort

- 10.9 yr follow-up
- 311,892 people



Dicken 2024

Summary

- Intake of UPF clearly associated with wide range of adverse health outcomes

- A portion of the effects of UPF appear to be independent of nutritional content or quality and mediated through processing itself

- Some types of UPF may be more strongly associated with harm

Questions to think about during this session

- Is the current dominant definition of UPF – the NOVA classification system – adequate?
- Should UPFs be viewed as a single entity or is it useful to examine subgroups?
- What are the mechanisms through which UPFs act to influence health?
- How much and what types of additional evidence are needed to guide actions to reduce exposure to UPFs?
- Is current evidence sufficient to act on policies to reduce exposure?
- If UPFs are addictive, how should this shape policy decisions?

Considerations for research about ultra-processed foods

LAUREN E. O'CONNOR, PHD, MPH

HEALTHY EATING RESEARCH

SEPTEMBER 26, 2024

Considerations for research about ultra-processed foods (UPFs)

Lauren O'Connor, PhD, MPH

Healthy Eating Research 2024

Everything presented today reflects my own personal experiences and opinions, and not of any institution.

AGENDA

- Food processing primer
- Challenges in identifying UPFs
- Heterogeneity among UPFs
- Research gaps and future directions

Food processing primer in 30 seconds from a non-food scientist

Why do we process foods?

Preservation

Safety

Quality

Increase product shelf-life

Improve sensory qualities

Inactive pathogenic microorganisms

Convenience

New products and new functionality for added value

Increase food availability and access

What do we gain with processed foods?

Autonomy (particularly for women and guardians)

Food fortification

Medical foods

Foods that are more environmentally conscious

Reduction in post-harvest losses

Reduction in food waste due to longer shelf-life

Innovative ways of reducing food waste

Innovative ways of increasing whole grains

Unfortunately, more added sugars and sodium

Mario Ferruzzi, PhD
Arkansas Children's Research Institute | Nutrition Center

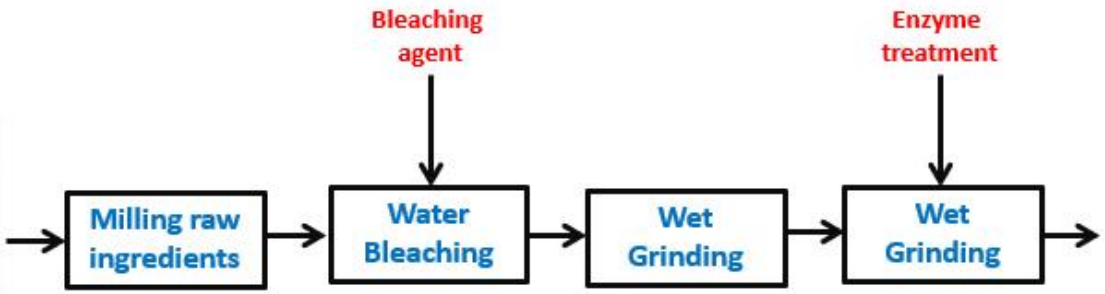
Food processing & formulation

FOOD PROCESSING (UNIT OPERATION)

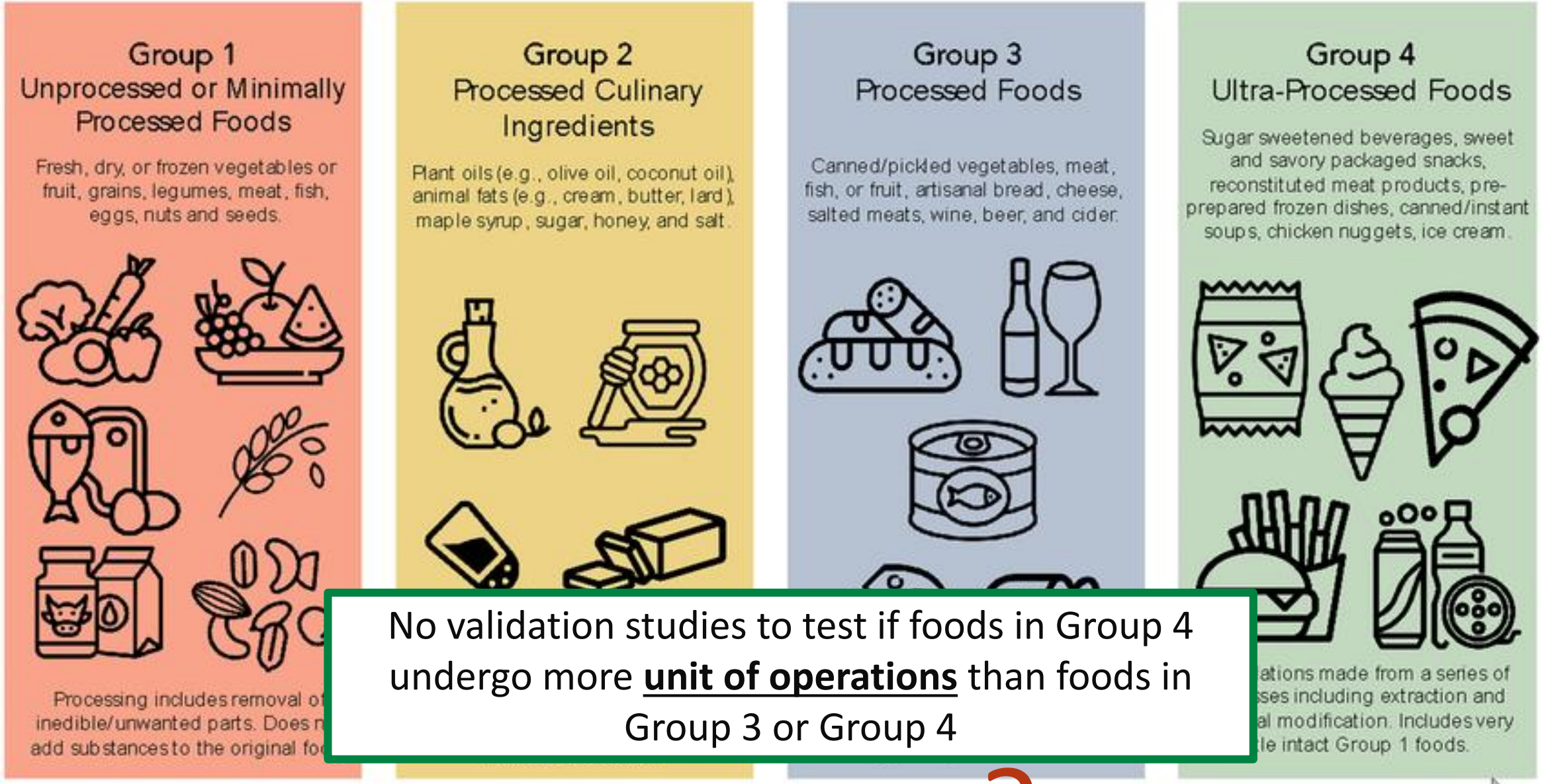
The use of methods and techniques involving equipment, energy, and tools to transform agricultural products such as grains, meats, vegetables, fruits, and milk into food ingredients or finished food products.

FORMULATION (RECIPE)

The combination of ingredients and additives added and prepared according to prescribed methods to produce a product intended for further processing or ready for consumption.



The Nova food processing classification system



No validation studies to test if foods in Group 4 undergo more **unit of operations** than foods in Group 3 or Group 4

?

Mario Ferruzzi, PhD
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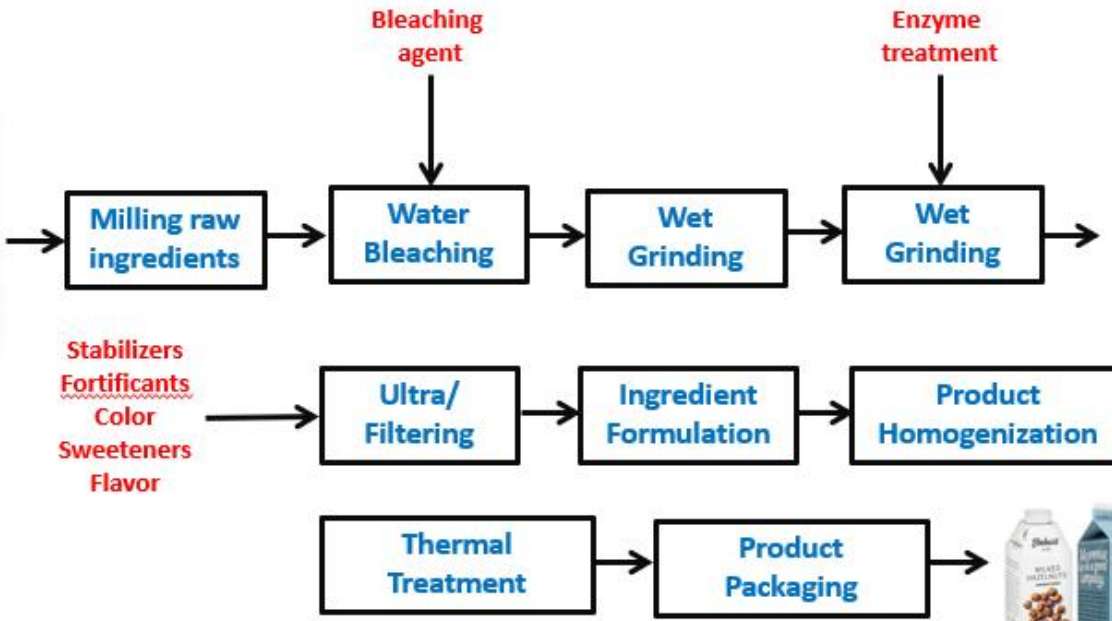

Group 4: Ultra-processed

Mario Ferruzzi, PhD
Arkansas Children's Research Institute | Nutrition Center

Food processing & formulation

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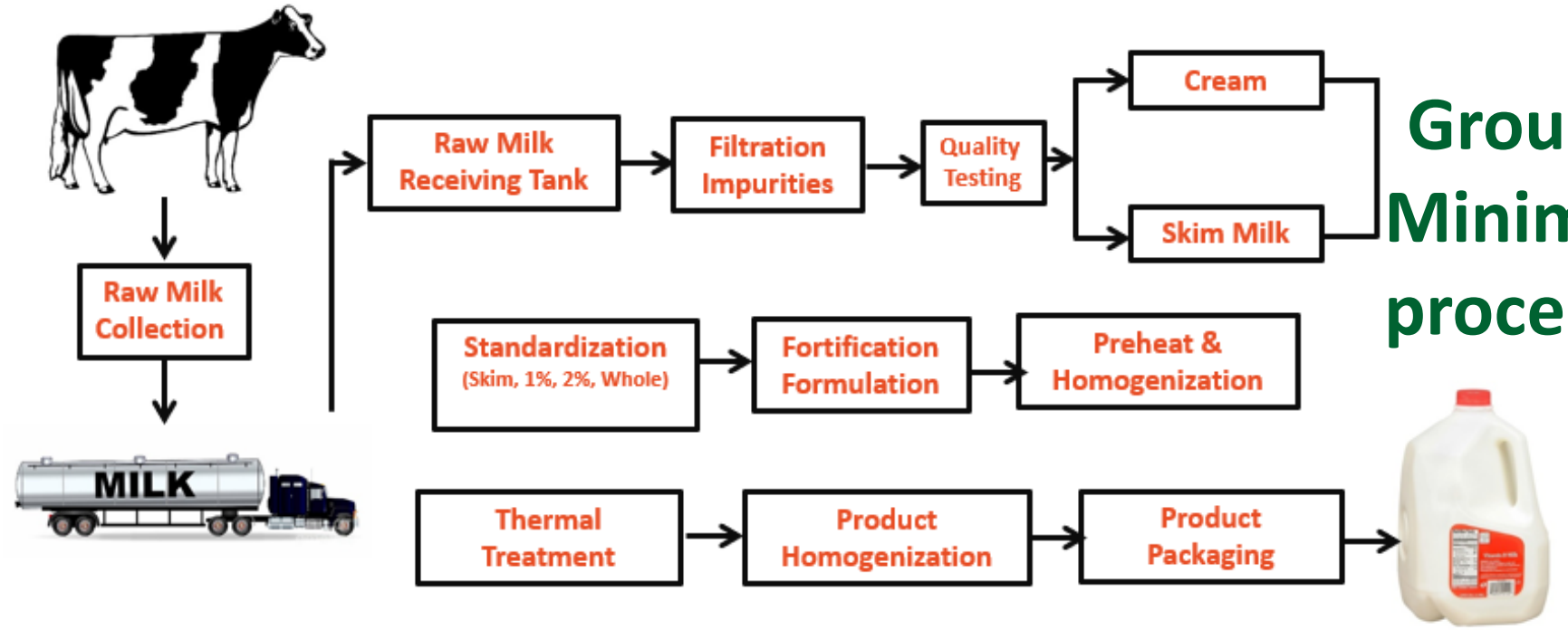
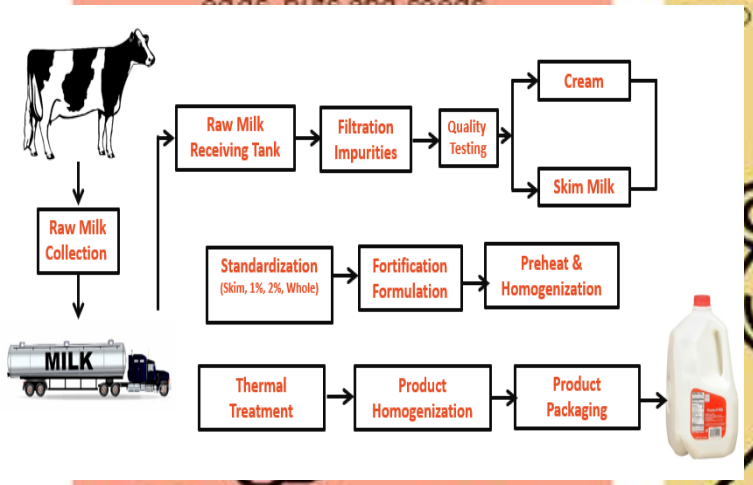


Group 1: Minimally processed

The Nova food processing classification system

Group 1
Unprocessed or Minimally Processed Foods

Fresh, dry, or frozen vegetables or fruit, grains, legumes, meat, fish,



Processing includes removal of inedible/unwanted parts. Does n add substances to the original fo

Group 2
Processed Culinary Ingredients

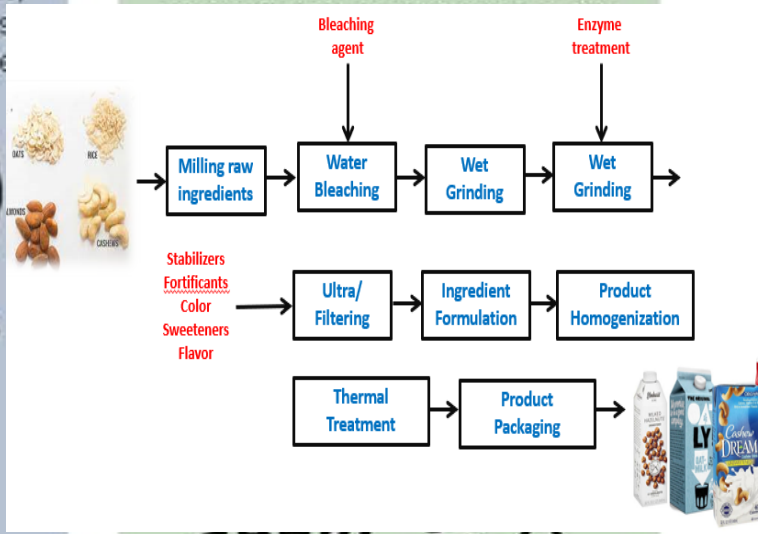
Plant oils (e.g., olive oil, coconut oil), animal fats (e.g., cream, butter, lard), ple syrup, sugar, honey, and salt.

Group 3
Processed Foods

Canned/pickled vegetables, meat, fish, or fruit, artisanal bread, chees salted meats, wine, beer, and cid

Group 4
Ultra-Processed Foods

Sugar sweetened beverages, sweet and savory packaged snacks,



ations made from a series of sses including extraction and al modification. Includes very le intact Group 1 foods.

No validation studies to test if foods in Group 4 undergo more **unit of operations** than foods in Group 3 or Group 4

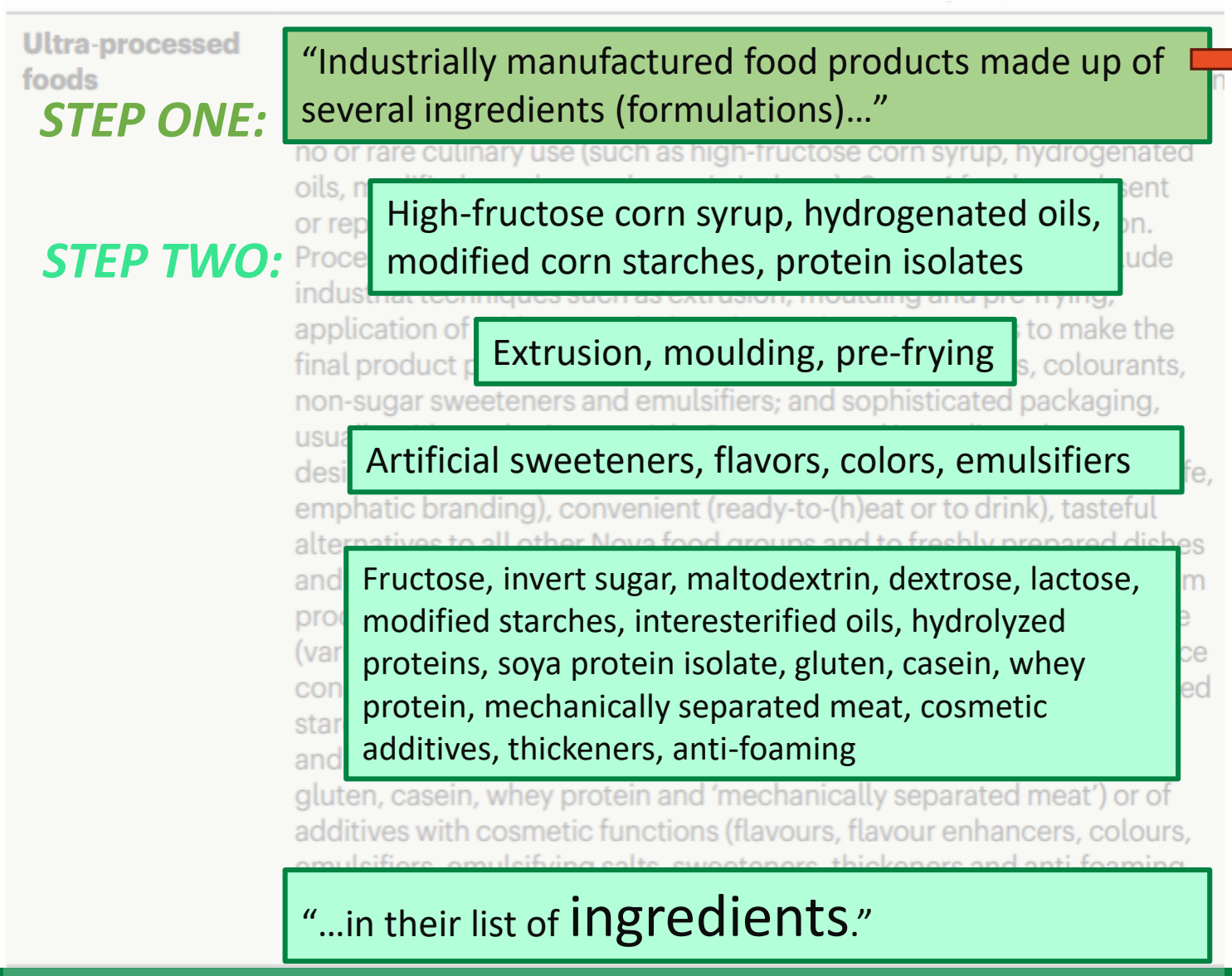
Increasing Level of Processing ?

Challenges in identifying ultra-processed foods

Ultra-processed foods	Industrially manufactured food products made up of several ingredients (formulations) including sugar, oils, fats and salt (generally in combination and in higher amounts than in processed foods) and food substances of no or rare culinary use (such as high-fructose corn syrup, hydrogenated oils, modified starches and protein isolates). Group 1 foods are absent or represent a small proportion of the ingredients in the formulation. Processes enabling the manufacture of ultra-processed foods include industrial techniques such as extrusion, moulding and pre-frying; application of additives including those whose function is to make the final product palatable or hyper-palatable such as flavours, colourants, non-sugar sweeteners and emulsifiers; and sophisticated packaging, usually with synthetic materials. Processes and ingredients here are designed to create highly profitable (low-cost ingredients, long shelf-life, emphatic branding), convenient (ready-to-(h)eat or to drink), tasteful alternatives to all other Nova food groups and to freshly prepared dishes and meals. Ultra-processed foods are operationally distinguishable from processed foods by the presence of food substances of no culinary use (varieties of sugars such as fructose, high-fructose corn syrup, 'fruit juice concentrates', invert sugar, maltodextrin, dextrose and lactose; modified starches; modified oils such as hydrogenated or interesterified oils; and protein sources such as hydrolysed proteins, soya protein isolate, gluten, casein, whey protein and 'mechanically separated meat') or of additives with cosmetic functions (flavours, flavour enhancers, colours, emulsifiers, emulsifying salts, sweeteners, thickeners and anti-foaming, bulking, carbonating, foaming, gelling and glazing agents) in their list of ingredients.

Martinez-Steele E., et al. Best practices for applying the Nova food classification system. Nature Food, 2023.

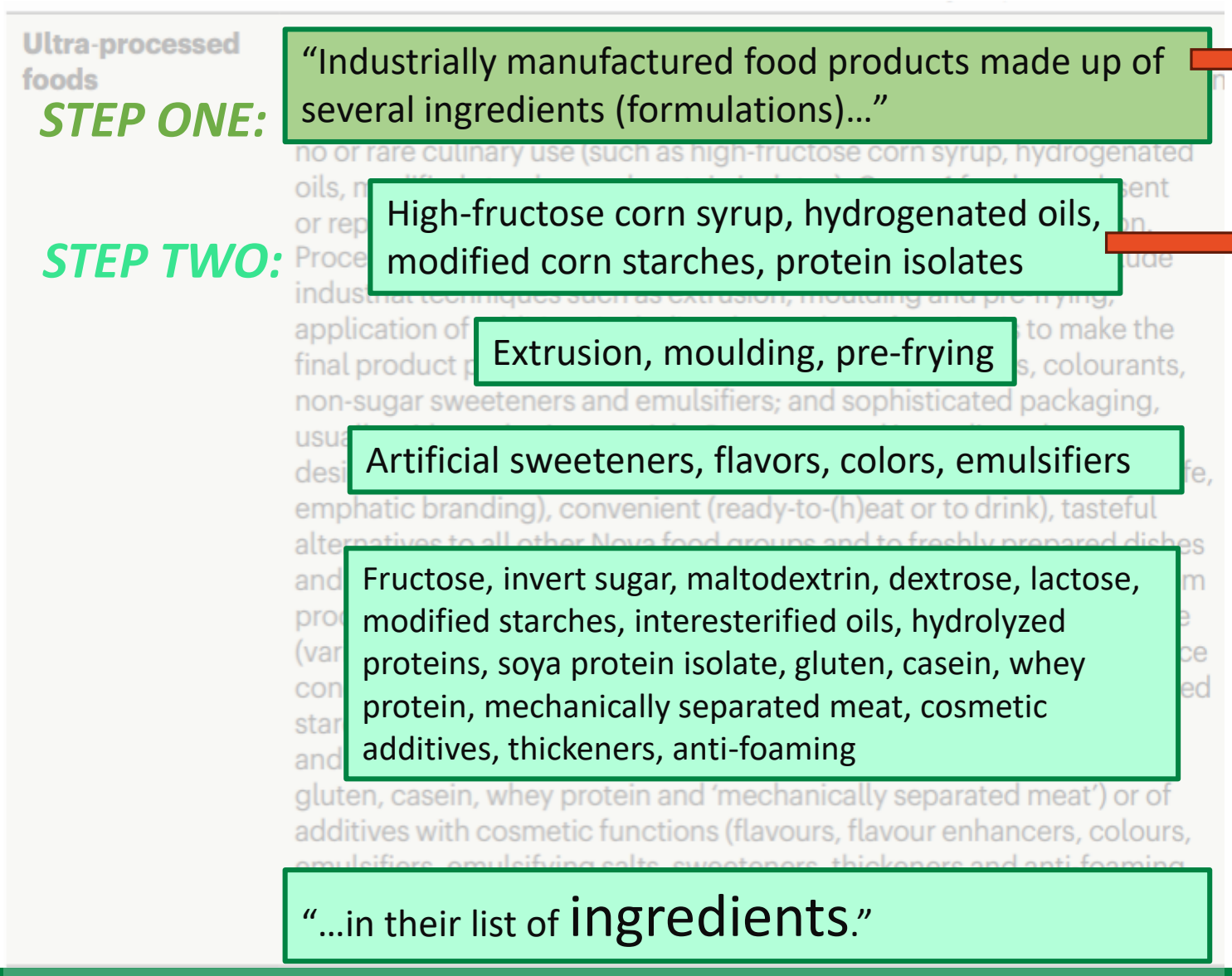
Challenges in identifying ultra-processed foods



→ Industrially manufactured

Martinez-Steele E., et al. Best practices for applying the Nova food classification system. Nature Food, 2023.

Challenges in identifying ultra-processed foods



Industrially manufactured or ***homemade***?

Availability of ingredients?

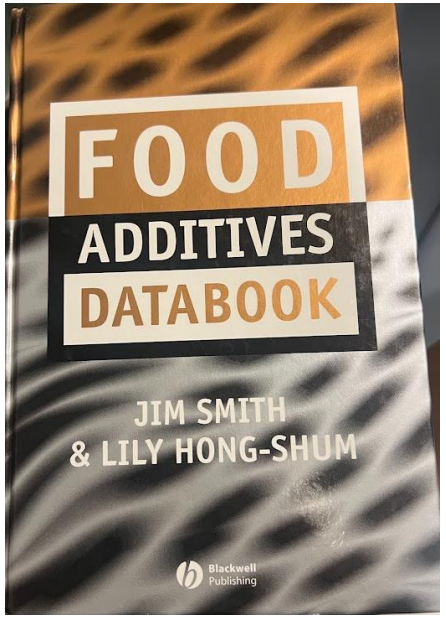
FFQs	Recalls/ records	Food labels
✖	?	√

Martinez-Steele E., et al. Best practices for applying the Nova food classification system. Nature Food, 2023.

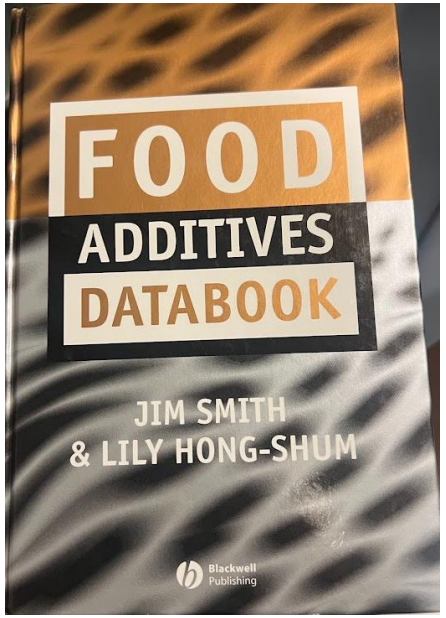
Classification depends on the ***function*** of the additives

Nova Group	Additive explanation
Group 1: Minimally processed foods	Additives are usually **not necessary and only exceptionally found** in minimally processed foods, and foods with vitamins and minerals added generally to replace nutrients lost during processing, such as wheat or corn flour fortified with iron and folic acid.
Group 2: Processed culinary ingredients	Additives are usually **not necessary and only exceptionally** found in processed culinary ingredients; **with added vitamins or minerals, such as iodized salt**.
Group 3: Processed foods	…additives that **prolong product duration, protect original properties or prevent proliferation of microorganisms** (such as preservatives and antioxidants), **WITHOUT additives with cosmetic functions**.
Group 4: Ultra-processed foods	…application of additives **WITH cosmetic functions** including those whose function is to make the final product **palatable or hyper-palatable** such as flavours, colourants, non-sugar sweeteners, and emulsifiers…

Martinez-Steele E., et al. Best practices for applying the Nova food classification system. Nature Food, 2023.



NAME:	**Propionic acid**
CATEGORY:	Antimicrobial preservative
FOOD USE:	Baked products/ Cheese products
SYNONYMS:	Methylacetic acid/ Propanoic acid/ Ethylformic acid/ E280/ CAS 79-09-4/ EINECS 201-176-3
FORMULA:	C_2H_5COOH
MOLECULAR MASS:	74.09
PROPERTIES AND APPEARANCE:	Oily liquid, pungent, rancid odour
BOILING POINT IN °C AT VARIOUS PRESSURES (INCLUDING 760 mm Hg):	760 mmHg: 141.1. 400 mmHg: 122.0. 100 mmHg: 85.8. 10 mmHg: 41.6. 1 mmHg: 4.6
IELTING RANGE IN °C:	–21.5
ASH POINT IN °C:	58
NSITY AT 20°C (AND OTHER MPERATURES) IN g/l:	0.993
RITY %:	99.5
ER CONTENT MAXIMUM IN %:	0.15
VY METAL CONTENT MAXIMUM IN	10
MAXIMUM IN %:	0.01
CTION IN FOODS:	Antimicrobial preservative; antimycotic; flavouring agent; preservative additive; mould inhibito
ERNATIVES:	Other antimicrobial preservatives depending on the application



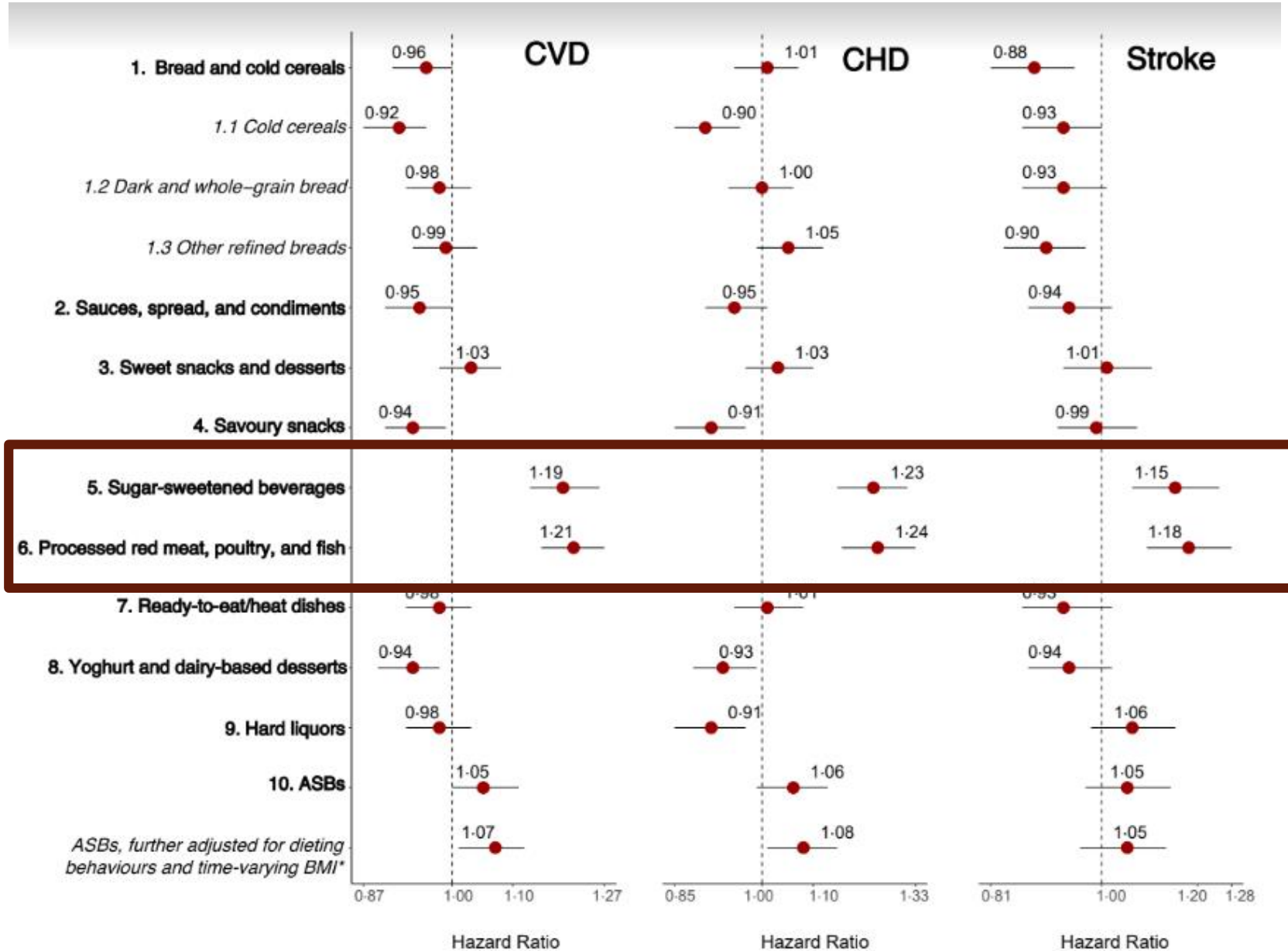
NAME:	**Sodium nitrate**
ATEGORY:	Antimicrobial preservative
NONYMS:	CAS 7631-99-4/ EINECS 231-554-3/ E251/ Soda niter/ Cubic niter/ Chile saltpeter
RMULA:	$NaNO_3$
LECULAR MASS:	84.99
PERTIES AND APPEARANCE:	Colourless transparent crystals, odourless
ING POINT IN °C AT VARIOUS SURES (INCLUDING 760 mm Hg):	decomposes at 380
ING RANGE IN °C:	308
TY AT 20°C (AND OTHER RATURES) IN g/l:	2.267
%:	99
METAL CONTENT MAXIMUM IN	10 as Pb

ITY % AT VARIOUS TEMPERATURE/pH COMBINATIONS:

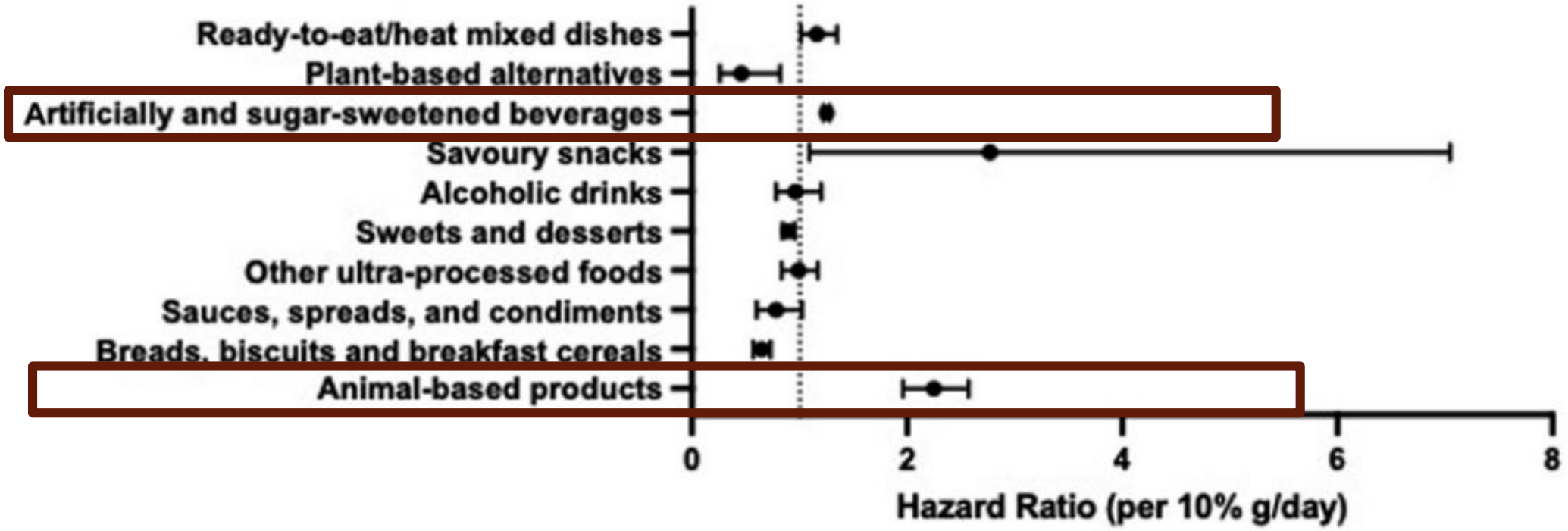
	@ 25°C	92.1	@ 100°C	180			
l solution:	@ 5%	Soluble	@ 20%	Soluble	@ 95%	Soluble	@ 100% Soluble

N IN FOODS:	Antimicrobial agent, preservative. Source of nitrite, colour fixative in cured meats, fish, poultry water additive; curing salt
OGY OF USE IN FOODS:	Used in cured meats and fish as an antibotulinum agent as well as an antimicrobial preservative fixative, flavour enhancer

Heterogeneity of ultra-processed foods

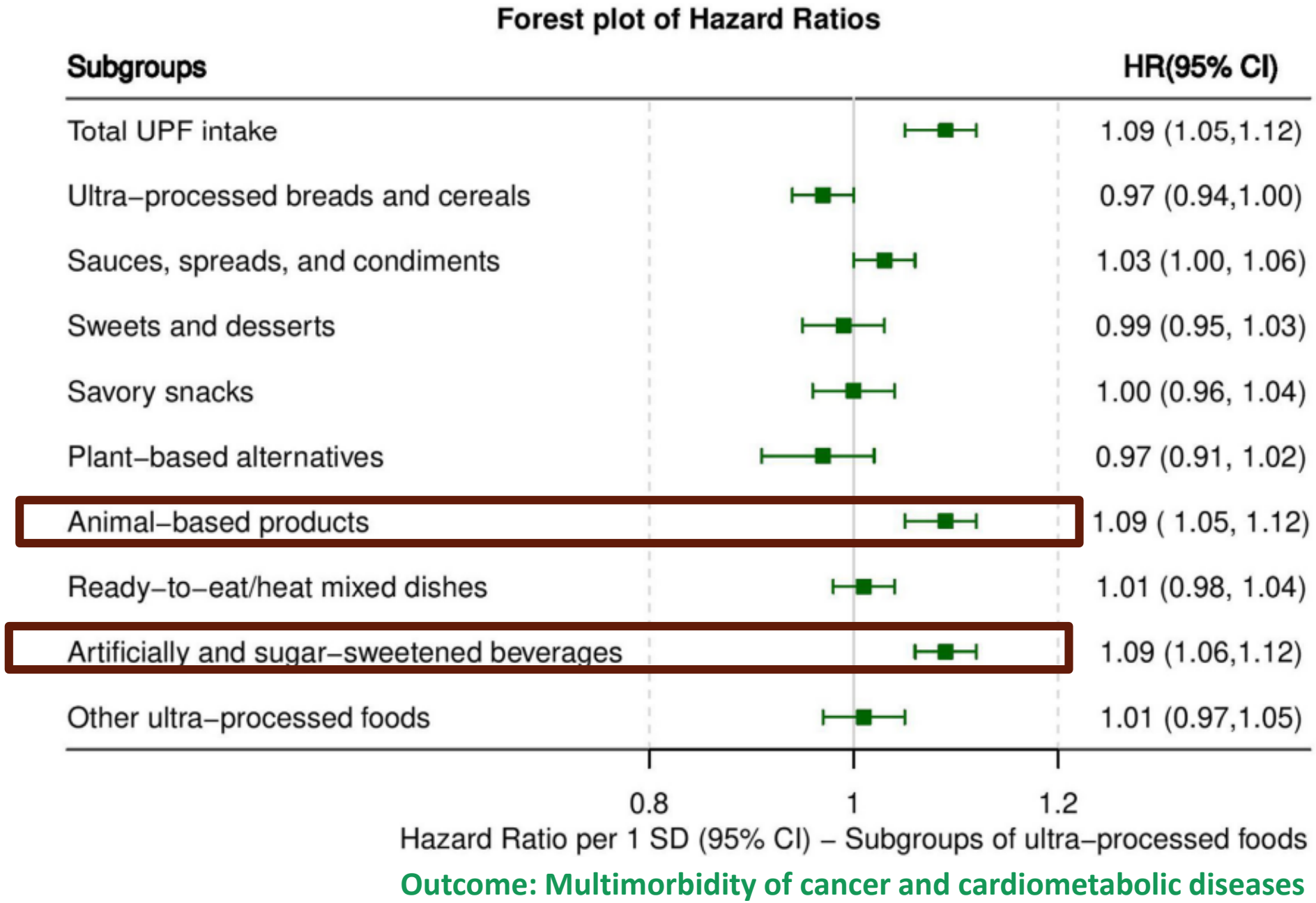


Mendoza et al, The Lancet, 2024. Data from the Nurses Health Study.



Outcome: type 2 diabetes risk

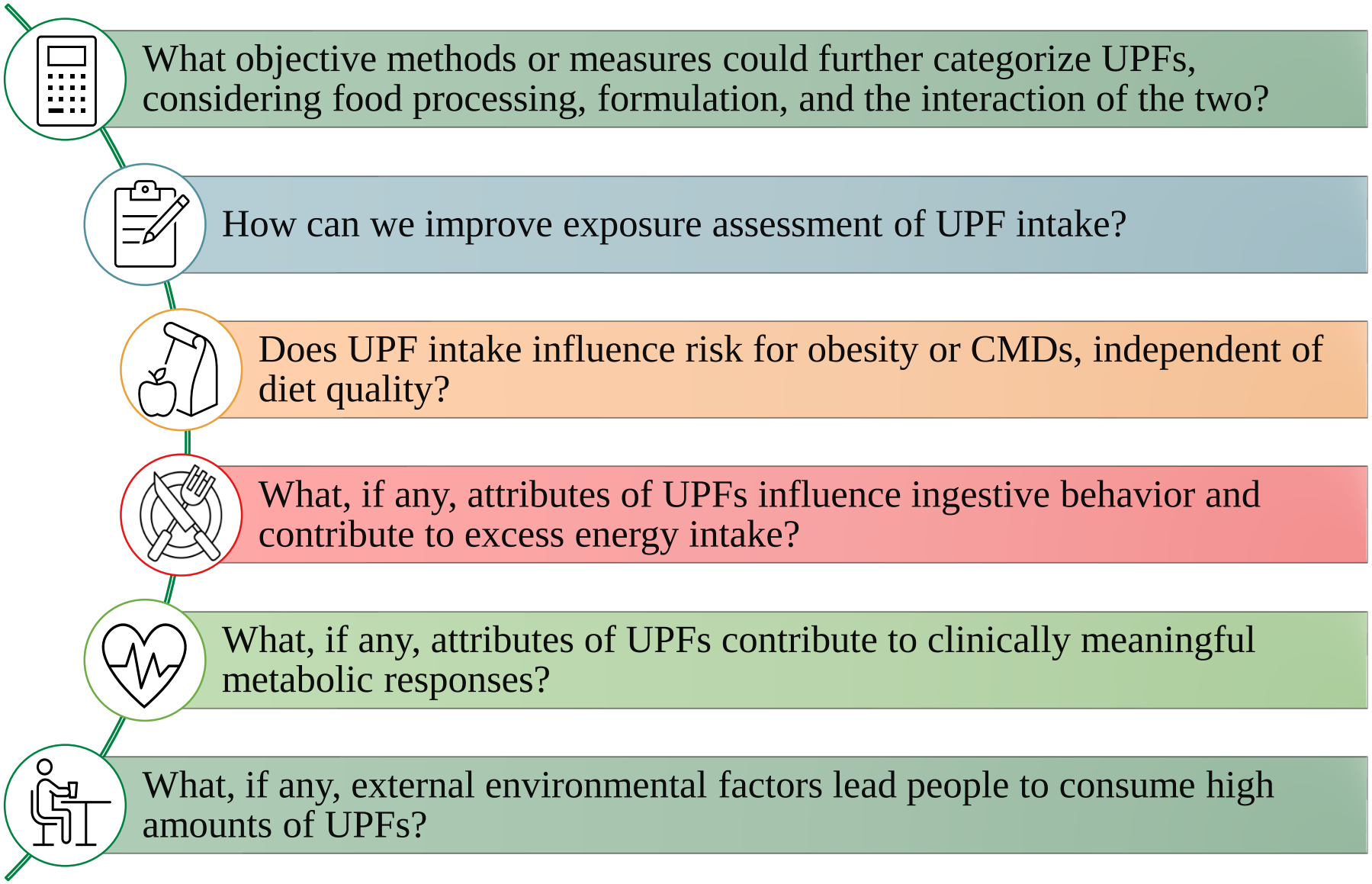
Dicken et al, The Lancet, 2024. European Prospective Investigation into Cancer and Nutrition



Outcome: Multimorbidity of cancer and cardiometabolic diseases

Cordova et al, The Lancet, 2023. European Prospective Investigation into Cancer and Nutrition

Ultra-processed Foods Research Roadmap



NIFA grant #2022-07671

O'Connor LE and Higgins KA. Advances in Nutrition, 2023.

Conclusions

There is no bright line between foods on the Nova scale

Need to get back to food science basics to improve quality and validity of future research

Be critical: understand limitations, **befriend a food scientist**, and be aware of misclassification

Not all UPFs are created equal, need to be cautious of stigmatizing foods

Need *new* UPF-focused dietary assessment methods and randomized clinical trials

Resources for applying Nova classification to your own dietary data:

- **Martinez-Steele E., et al. Best practices for applying the Nova food classification system. Nature Food, 2023.**
- **Martinez-Steele E and O'Connor LE et al., Identifying and estimating ultra-processed food intake in the US NHANES according to the Nova classification system of food processing J Nutr, 2023.**
- **O'Connor et al. Handle with care: challenges associated with ultra-processed foods research. Int J Epi, 2024.**

nhanes
The Nation's Mobile Health Survey

ASA24
Automated Self-Administered 24-Hour Dietary Assessment Tool

Science on the Addictive Nature of UPFs

ASHLEY GEARHARDT, PH.D
PROFESSOR OF PSYCHOLOGY
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AJPH HISTORY

Transferring Racial/Ethnic Marketing Strategies From Tobacco to Food Corporations: Philip Morris and Kraft General Foods

Kim H. Nguyen, ScD, MPH, Stanton A. Glantz, PhD, Casey N. Palmer, RN, MS, and Laura A. Schmidt, PhD, MSW, MPH

Objectives. To investigate the transfer of marketing knowledge and infrastructure for targeting racial/ethnic minorities from the tobacco to the food and beverage industry in the United States.

BMJ 2

ANALYSIS

Check for updates

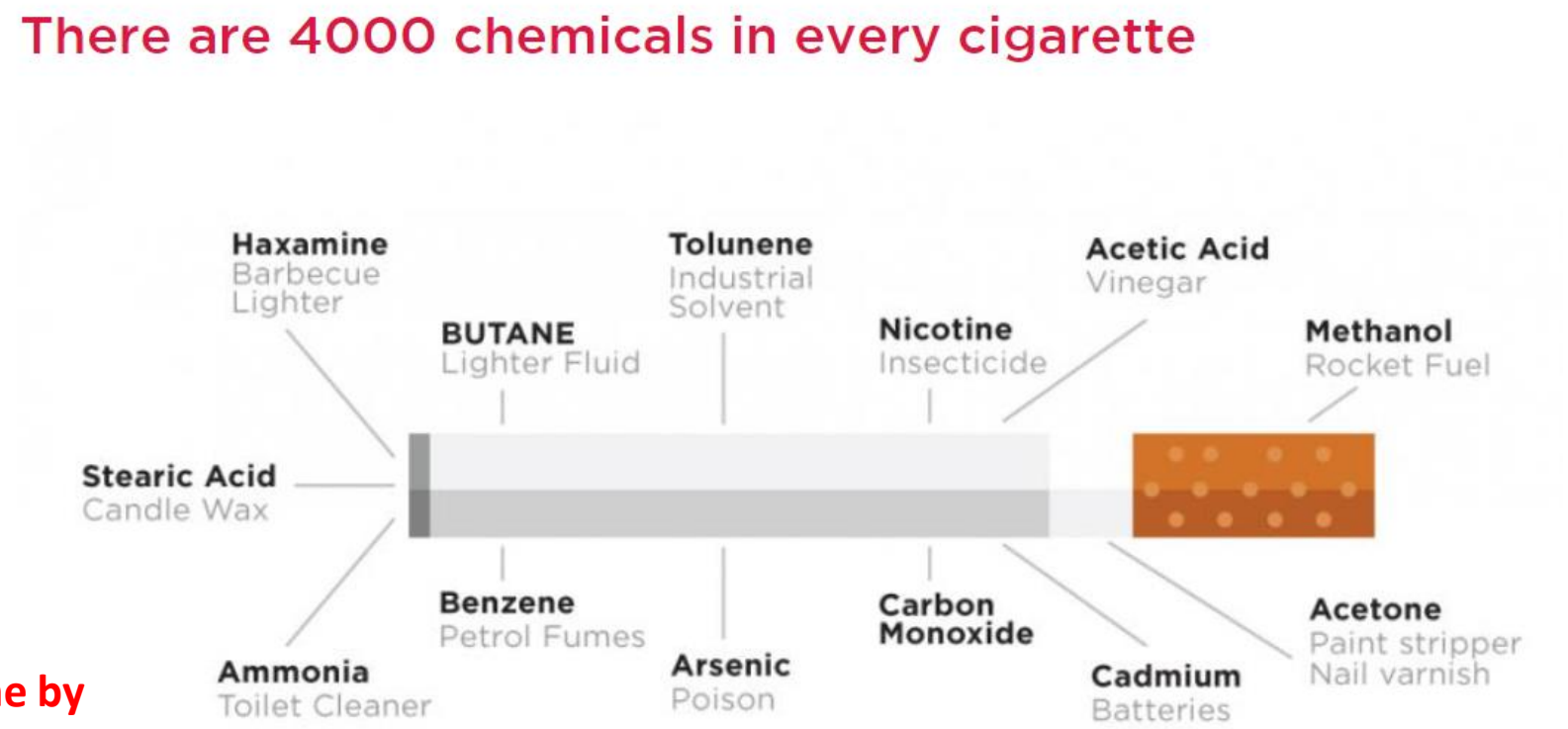
Tobacco industry involvement in children's sugary drinks market

Kim H Nguyen and colleagues examine how tobacco companies applied their knowledge of flavours, colours, and child focused marketing to develop leading children's sugar sweetened drink brands. These techniques continue to be used by drinks companies despite industry agreement not to promote unhealthy products in this way

Kim H Nguyen *research scientist*[1], Stanton A Glantz *professor*[2 3 4], Casey N Palmer *research analyst*[1], Laura A Schmidt *professor*[1 5 6 7]

[1]Philip R Lee Institute for Health Policy Studies, University of California, San Francisco, CA 94148, USA; [2]Department of Medicine, University of

How Do You Create an Addictive Substance?



Cigarettes are only 1% nicotine by weight.

Ultra-Processed Foods?

How Do We Tell if Something is Addictive?

- Tobacco as a benchmark
  - No objective biological response
  - Psychological and behavioral responses

Primary Criteria: Compulsive Use

Inability to stop despite a desire to do so and/or negative consequences

- Weight gain
- Diet-related disease
- Distress

NCHS Data Brief, 2020; Ayton et al., 2021; Ge et al., 2020

Yale Food Addiction Scale

- Loss of control
- Cravings
- Inability to Cut Down
- Negative consequences
- Tolerance
- Withdrawal
- Diagnostic Threshold
  - 2 or more symptoms plus impairment/distress

Gearhardt et al., 2009; Gearhardt et al., 2012; Meule et al., 2012: Gearhardt & Schulte, 2021

Which Foods?

Rank	Food	Frequency
1	Chocolate	27.60
2	Ice Cream	27.02
3	French Fries	26.94
4	Pizza	26.73
5	Cookie	26.72
6	Chips	25.38
7	Cake	24.84
8	Popcorn (Buttered)	23.39
9	Cheeseburger	21.26
10	Muffin	20.81

Schulte, Avena, & Gearhardt, 2015

Which Foods?

Rank	Food	Frequency
26	Apple	10.21
27	Corn (No Butter or Salt)	9.92
28	Salmon	9.44
29	Banana	9.34
30	Carrots (Plain)	9.08
31	Brown Rice (Plain, No Sauce)	8.79
32	Water	6.91
33	Cucumber (No Dip)	6.83
34	Broccoli	6.48
35	Beans	6.47

Schulte, Avena, & Gearhardt, 2015

The Lived Experience

“I can't even be in the same vicinity as Krispy Kreme or any type of donuts, 'cause I will finish a dozen all by myself and I'm type 2 diabetic. So, that could kill me, and I know that and I know that I shouldn't be eating all those. I shouldn't be eating one, let alone a whole dozen. But for some reason I just can't stop eating them.”

(participant with severe food addiction)

Parnarouskis et al., Under Review

Prevalence: UPF Addiction

31% in clinical samples of adults

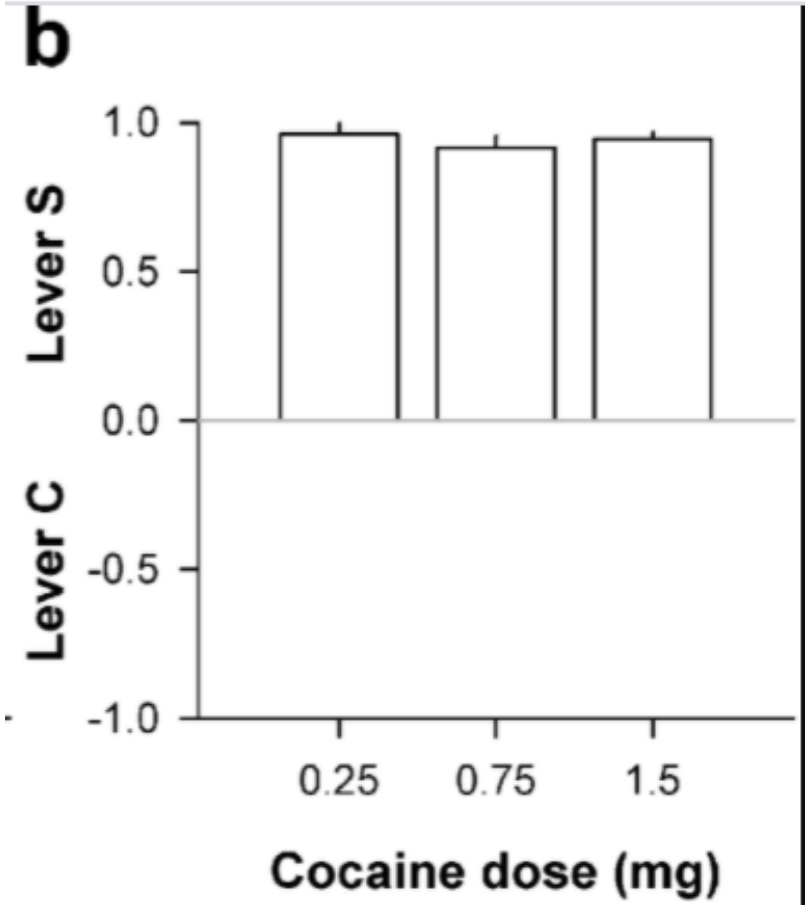
14% non-clinical samples of adults

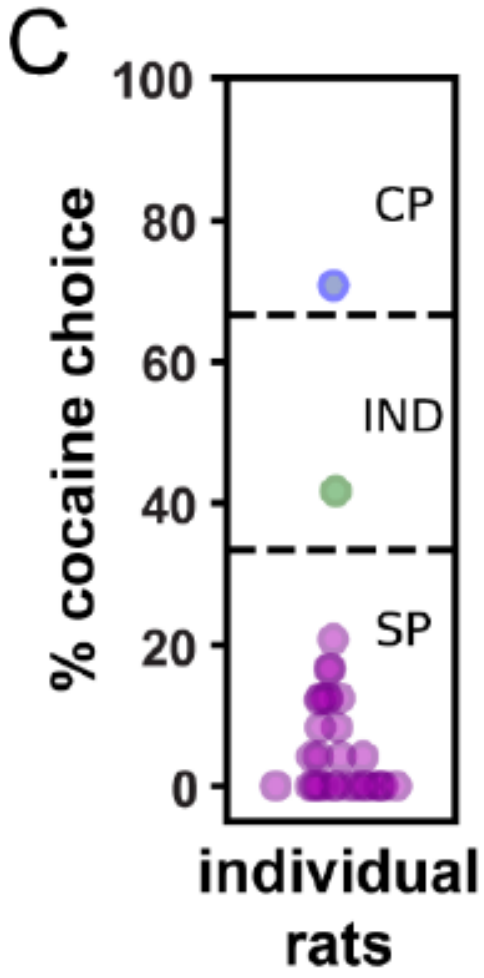
19% in samples of children with overweight

12% in non-clinical samples of children

Praxedes et al., 2021; Yekaninejad et al., 2021

Primary Criteria: Highly Reinforcing

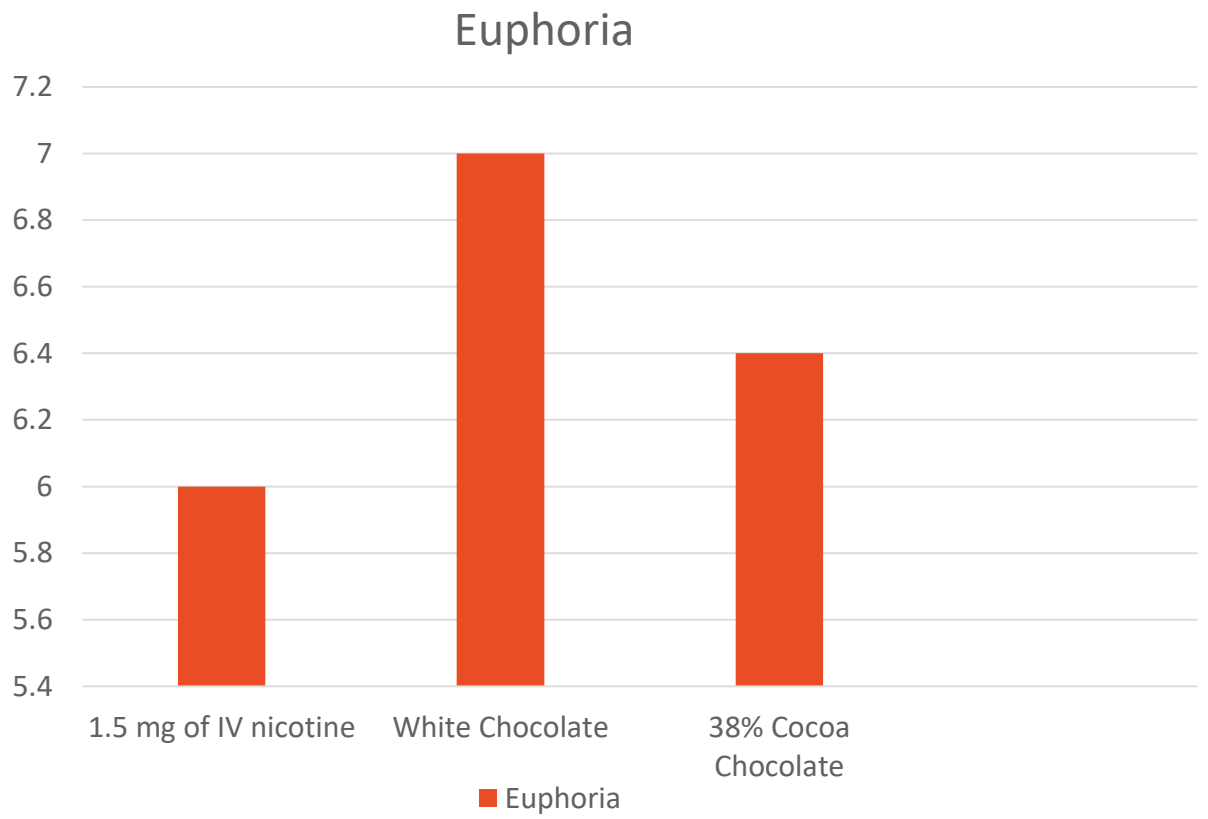




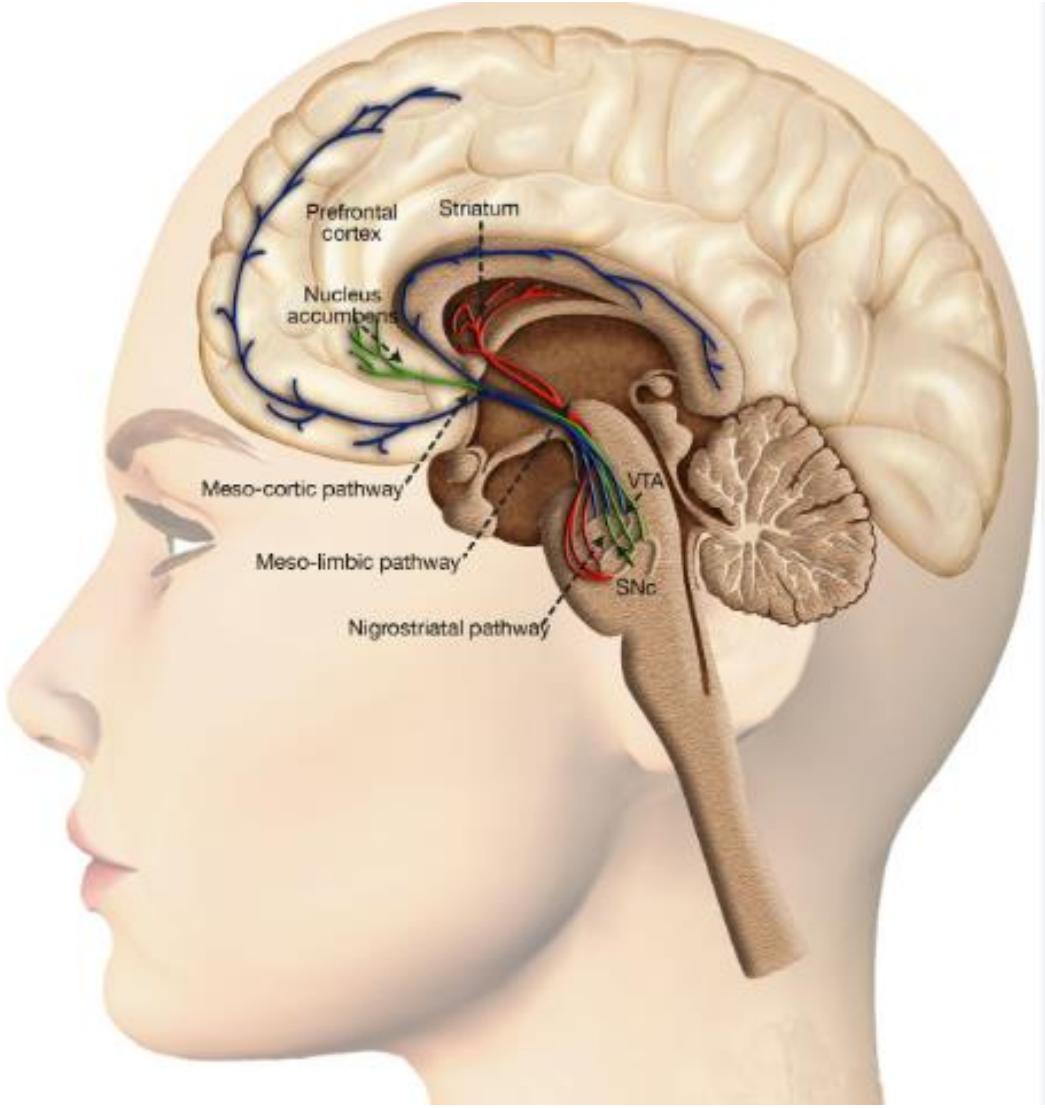
Ahmed et al., 2013, Ahmed et al., 2021

Primary Criteria: Psychoactive

Transient Effects on Mood as Mediated by the Brain



Gearhardt & DiFeliceantonio, 2022; Soria et al., 1996; Casperson et al., 2019



How about the Brain?

<u>Mesolimbic dopamine system – animal models</u>

>1000% for dopamine agonists stimulants

~150 to 200% for nicotine and ethanol

~150 to 200% for sucrose and UPFs

-PET studies in humans are less sensitive

- Mixed ability to detect dopamine release for opioids, alcohol, nicotine
- Individual differences
  - Pleasure, craving, history of use, sex, mood disorders

Di Chiara and Imperato 1988; Spitta et al., 2023; Chukwueke & Le Foll 2019; Wail & amartinex, 2019

Proposed Primary Criteria: Strong Urges and Craving

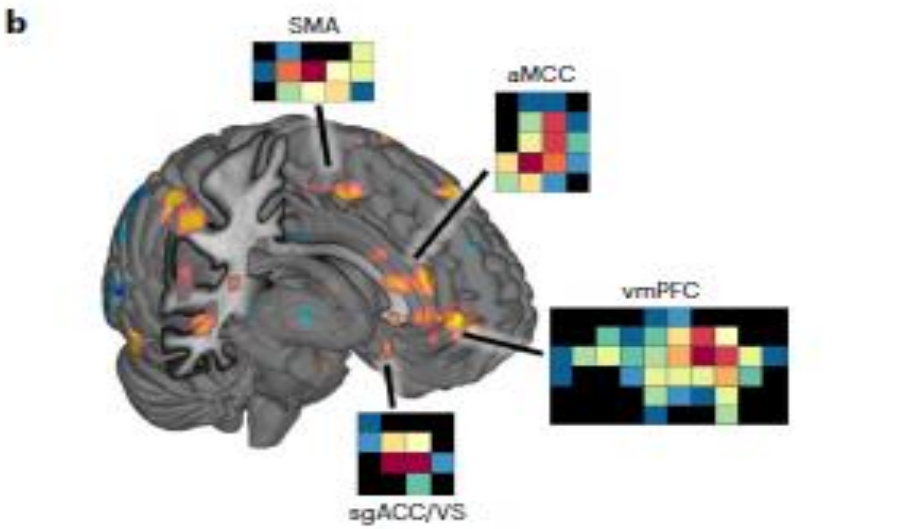


Fig. 2 | Thresholded display of the NCS. Note that unthresholded patterns are used for prediction; this thresholded pattern is shown for illustration at $P < 0.005$ uncorrected. **a**, Medial, lateral and insula displays of the most consistent pattern weights. **b**, Pop-out rectangles show the multivariate pattern for selected clusters of interest. Warm (yellow-red) color indicates positive weights; cold (cyan-purple) color indicates negative weights in predicting drug and food craving. *P* values are based on bootstrapping and indicate the areas that contribute most consistently with positive or negative weights. See Table 1 for a list of FDR-corrected weights. The NCS weight map and code to apply it to new data are available for download at https://github.com/canlab/Neuroimaging_Pattern_Masks/tree/master/Multivariate_signature_patterns/2022_Koban_NCS_Craving. aMCC, anterior midcingulate cortex; sgACC, subgenual anterior cingulate cortex; SMA, supplementary motor area.

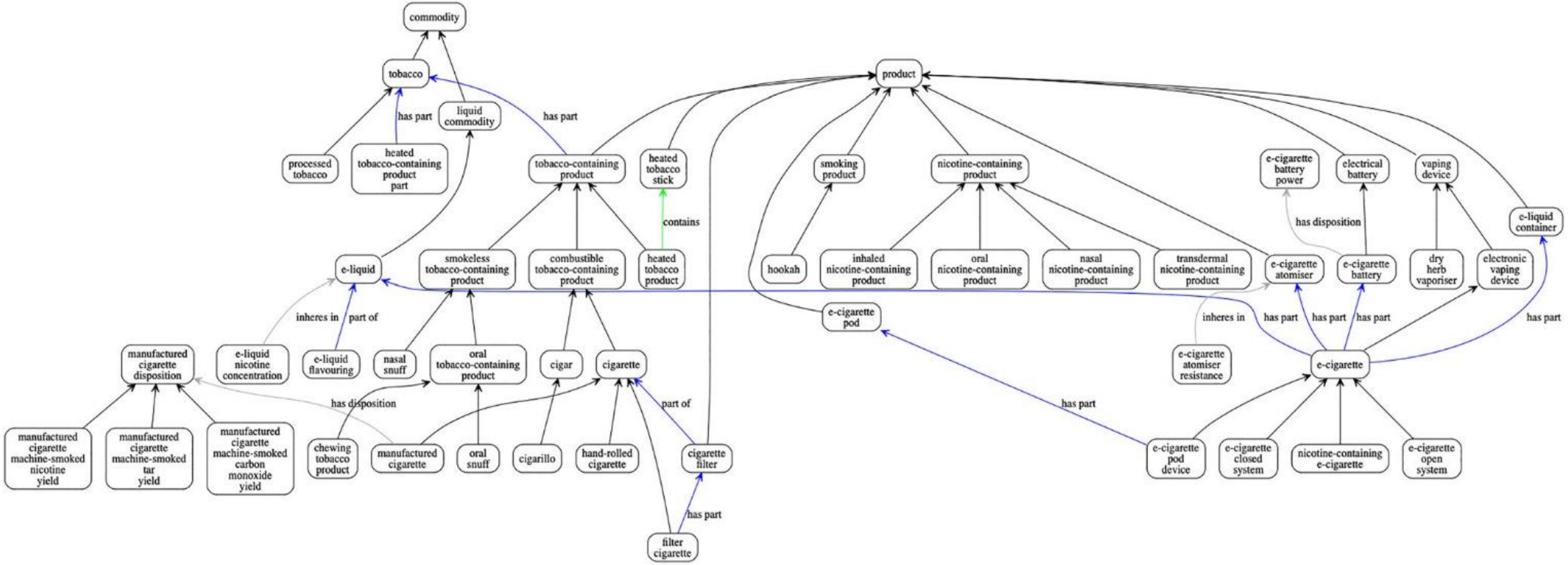
Koban, Wager, & Kober, 2023

Addiction Benchmarks

	YES	NO
COMPULSIVE		
PSYCHOACTIVE		
REINFORCING		
URGES/CRAVING		

Gearhardt & DiFeliceantonio, 2022

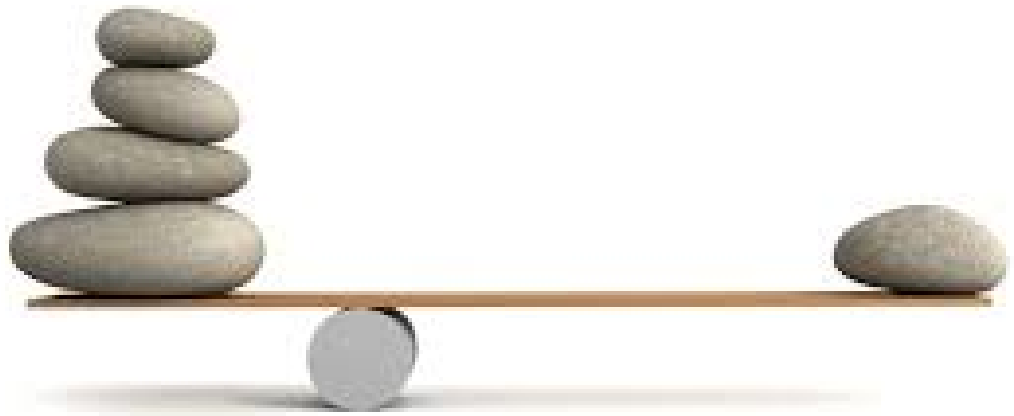
Future Directions –UPF Definition



Cox et al., 2023

Benchmark of Proof

- Addiction science
  - Processed products optimized for profits and hedonics
  - Epi and animal models
- Industry emphasizes the need for more science to delay
  - Costs of inaction
    - Ex. Pregnant women and smoking



Brandt, 2007; The Cigarette Century

Thank You!

Food Addiction Science & Treatment Lab at the University of Michigan

- Erica Schulte – Drexel
- Emma Schiestl - Indiana
- Lindsey Parnarouskis – Drexel

Rudd Center for Food Policy and Obesity at the University of Connecticut

- National Institute of Diabetes and Digestive and Kidney Diseases (R01DK098983)
- National Institute of Drug Abuse (R01DA055027)

Motivations and Mechanisms for Ultra-Processed Food Policy in the U.S.

Aviva Musicus, ScD
Science Director, Center for Science in the Public Interest
Adjunct Assistant Professor of Nutrition, Harvard Chan School of Public Health

CENTER FOR Science IN THE Public Interest

Healthy Eating Research Webinar
September 26, 2024

HARVARD T.H. CHAN SCHOOL OF PUBLIC HEALTH

Outline

- **Motivations** for limiting UPFs via policy
- **Mechanisms** for limiting UPFs via policy
- **Challenges & considerations**
- **Conclusions**

Motivations for limiting Ultra-Processed Foods (UPFs)

Our current food system is failing to keep us healthy

Hypothesized causes:

- UPFs (NOVA 4) are harmful as a category
- We don't have enough minimally processed foods in our diet

We should have structures in place to **limit consumption of UPFs** and **increase consumption of minimally processed foods**

Those structures are currently lacking

U.S. food policies are separately structured around nutrients, food groups, and food additives

NUTRIENTS

Example: Sugar-Sweetened Beverage Excise Taxes (local)

- Tax on industry to reduce added sugars in beverages

FOOD GROUPS

Example: National School Lunch Program Standards (federal)

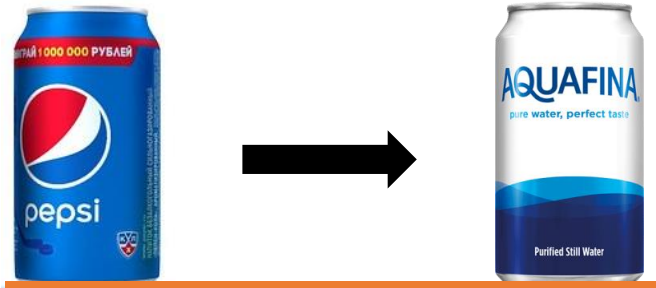
- Fruits, vegetables, whole grains, meat, milk required
- *Nutrient requirements as well (separate)*

FOOD ADDITIVES

Example: Ban of Red Dye No. 3 in foods (state)

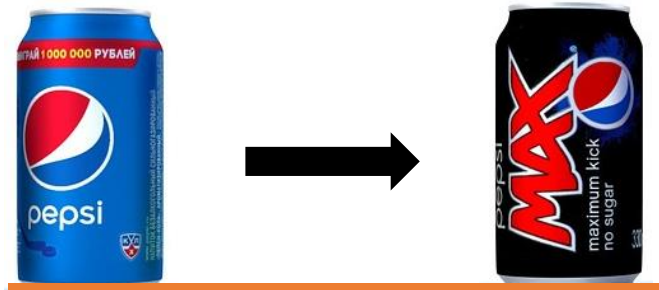
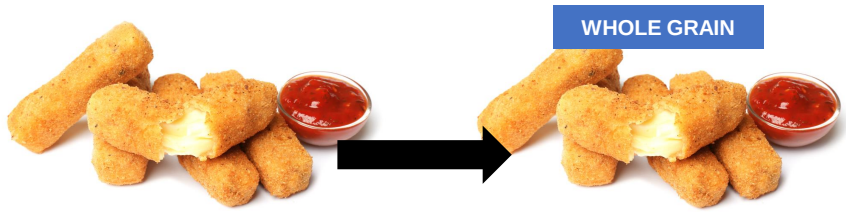
- Bans the use of Red 3 in foods and beverages sold in California due to cancer concerns

These policies are well-intentioned…

POLICY TYPE	IDEAL OUTCOME
NUTRIENTS **Sugar-Sweetened Beverage Excise Taxes**	 ✓ **Reduce added sugar** ✓ Increase water consumption
FOOD GROUPS **National School Lunch Program Standards**	 ✓ Sub. refined grains for **whole grains** ✓ Increase **fresh vegetable consumption**
FOOD ADDITIVES **Ban of Red Dye No. 3**	**INGREDIENTS:** RED 3 → **INGREDIENTS:** [NO FOOD DYES] ✓ **Eliminate harmful additive** (no replacement necessary)

Pepsi image: Alexander Antropov from Pixabay; Aquafina: https://www.aquafina.com/en-US/our-products.html#aquafina-can; Mozzarella sticks, burrito bowl: New Africa, JJAVA-stock.adobe.com

These policies are well-intentioned…but insufficient for maximal health

POLICY TYPE	UNINTENDED CONSEQUENCES
NUTRIENTS **Sugar-Sweetened Beverage Excise Taxes**	 ✓ **Reduce added sugar** ✖ Addition of **potentially harmful additives**
FOOD GROUPS **National School Lunch Program Standards**	 ✓ Sub. refined grains for **whole grains** ✖ No **fresh veggies** ✖ Addition of **potentially harmful additives**
FOOD ADDITIVES **Ban of Red Dye No. 3**	**INGREDIENTS:** RED 3 → **INGREDIENTS:** RED 40 ✓ **Eliminate harmful additive** ✖ Addition of **potentially harmful additive**

Pepsi images: Alexander Antropov from Pixabay; Aquafina: https://www.aquafina.com/en-US/our-products.html#aquafina-can; Mozzarella sticks: New Africa-stock.adobe.com

jonbilous - stock.adobe.com

Solution: Target Ultra-Processed Foods

A more holistic approach to fixing our food supply

Ultra-Processed Foods

NOVA Category 4

COSMETIC ADDITIVES
Colors, flavors, sweeteners, emulsifiers, thickeners, etc.

NON-ADDITIVE INGREDIENTS
Sugars & sugar alcohols, modified oils, protein additives (e.g., whey, gluten)

additives, processing (breakdown of food matrix)
[nutrients of concern, nutrient density, food chemicals in packaging]

- considers all together as opposed to in isolation (current system)
- accounts for interactions

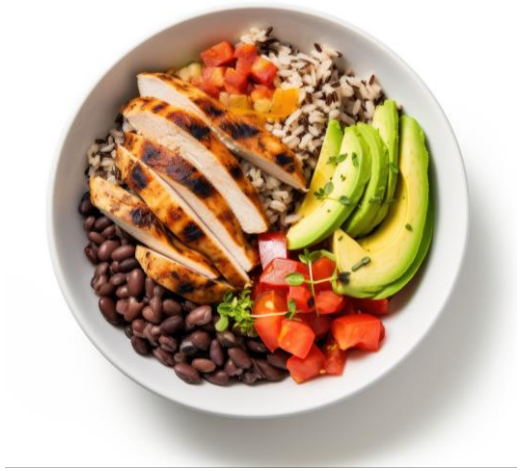
At their best:

UPF policies could avoid the unintended consequences of our current system

- ✓ Reduce added sugar and other nutrients of concern
- ✓ Increase consumption of minimally processed foods and scratch-cooked meals
- ✓ Minimize exposure to potentially harmful chemicals

WHOLE GRAIN

INGREDIENTS:
RED 3, RED 40



INGREDIENTS:
[NO FOOD DYES]

Pepsi images: Alexander Antropov from Pixabay; Aquafina: https://www.aquafina.com/en-US/our-products.html#aquafina-can; Mozzarella sticks, burrito bowl: New Africa, JJAVA-stock.adobe.com

How would this work in the U.S.?

Mechanisms for limiting UPF consumption in the U.S.

Government

- Federal
- State
- Local

Potential for impacting largest number of people

Institutions

- Schools
- Hospitals

Communities

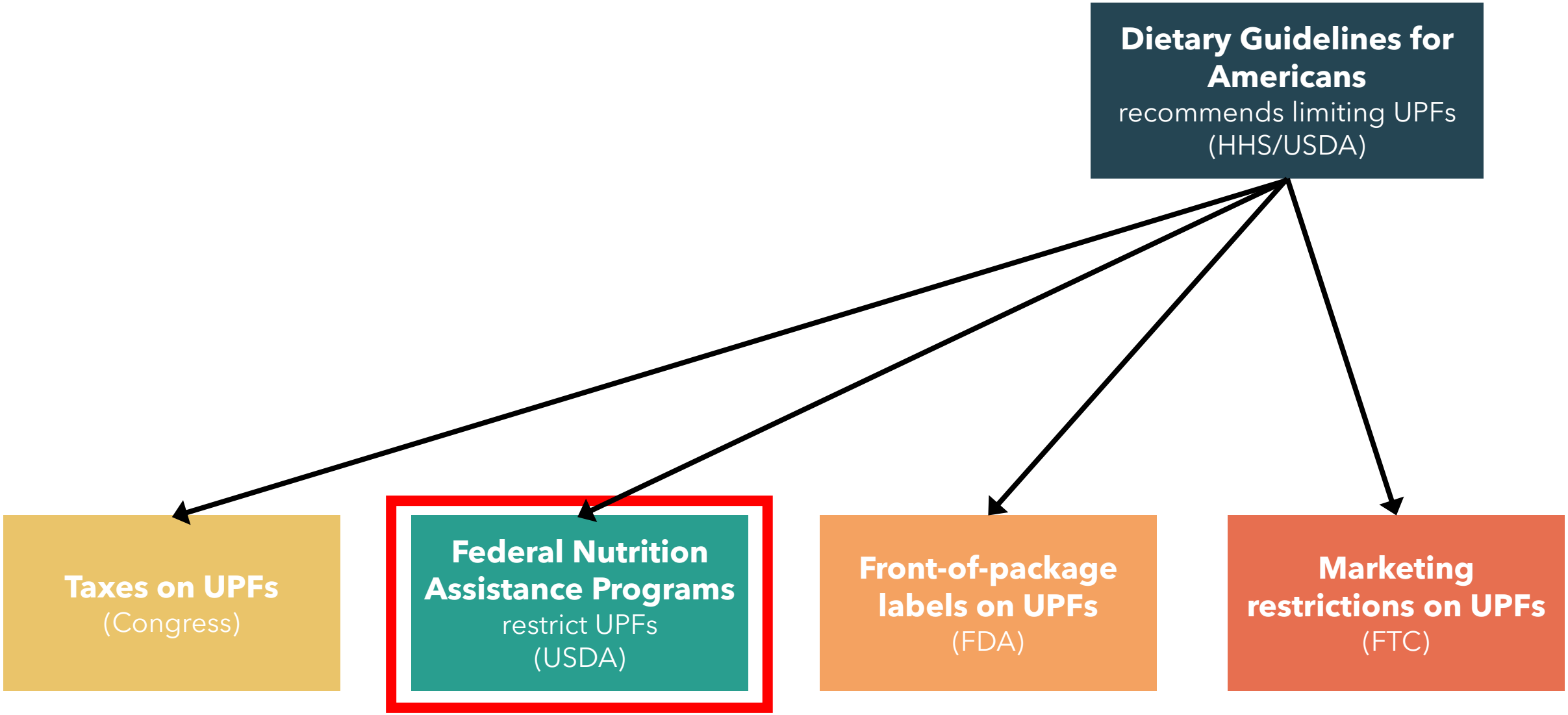
Federal policy starts with the Dietary Guidelines

Other countries have incorporated recommendations to limit UPFs in their Dietary Guidelines

- **Brazil, Peru:** "Avoid ultra-processed foods"
- **Ecuador:** "Avoid the consumption of ultra-processed products, fast food, and sweetened drinks"
- **Uruguay:** "Base your diet on natural foods, and avoid the regular consumption of ultra-processed products with excessive contents of fat, sugar and salt"

Image: https://www.fao.org/nutrition/education/food-dietary-guidelines/regions/uruguay/en/

Incorporation of UPFs into Dietary Guidelines would open up federal policy options



National School Lunch Program (USDA) & UPFs

U.S. National School Lunch Program Standards

- **Food Groups, Nutrients**
- **Processing Level:**
  - Brazil's category-specific restriction approach?
  - Required proportions for minimally processed/scratch-cooked foods?

Brazil's School Meal Program Standards:

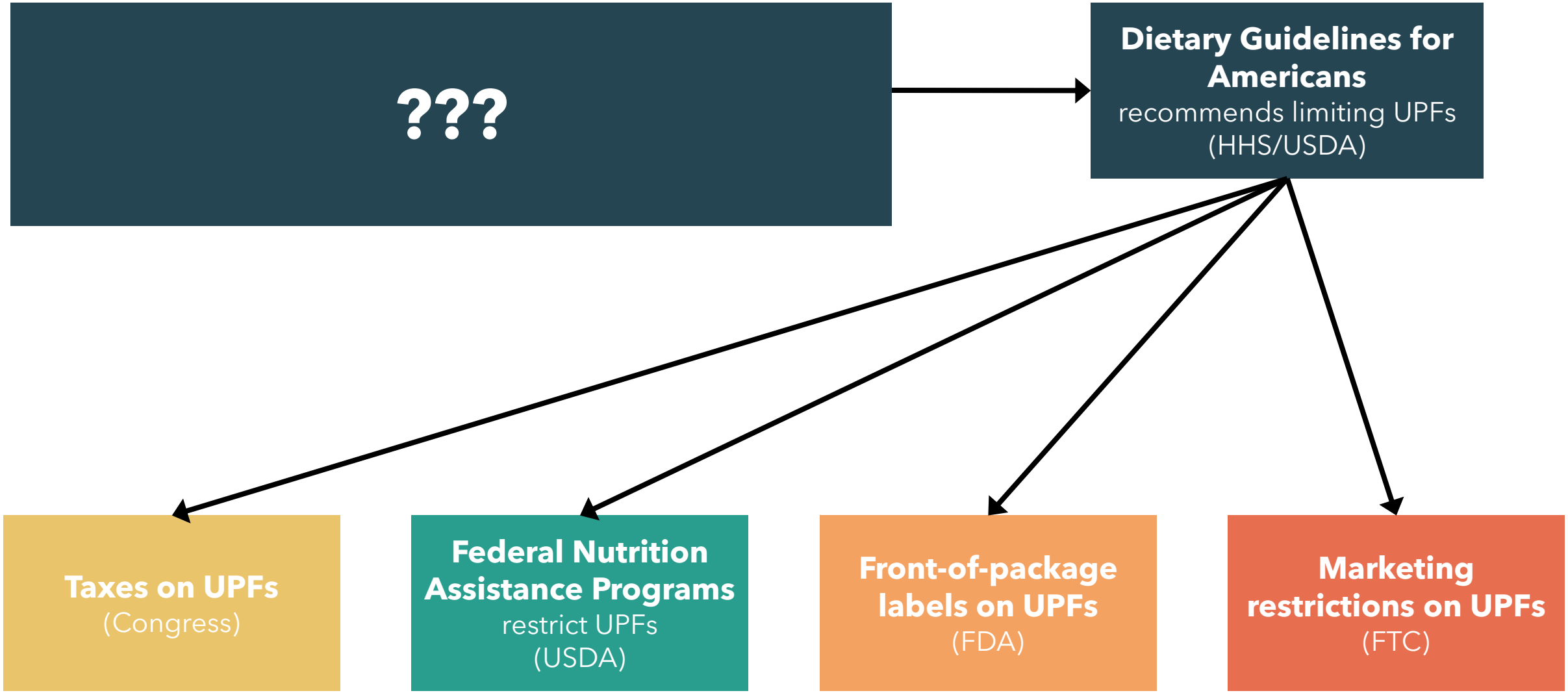
- **Prohibited:** Beverages with low nutritional value (e.g. sodas, artificial beverages, energy drinks)
- **Restricted:** Canned foods, cured meats, pastries, semi-prepared or ready-to-eat products, dehydrated soups and dried powders

FAO. Nutrition Guidelines and Standards for School Meals. 2019.

New Africa-stock.adobe.com

JJAVA-stock.adobe.com

What would we need to make federal UPF policy possible?



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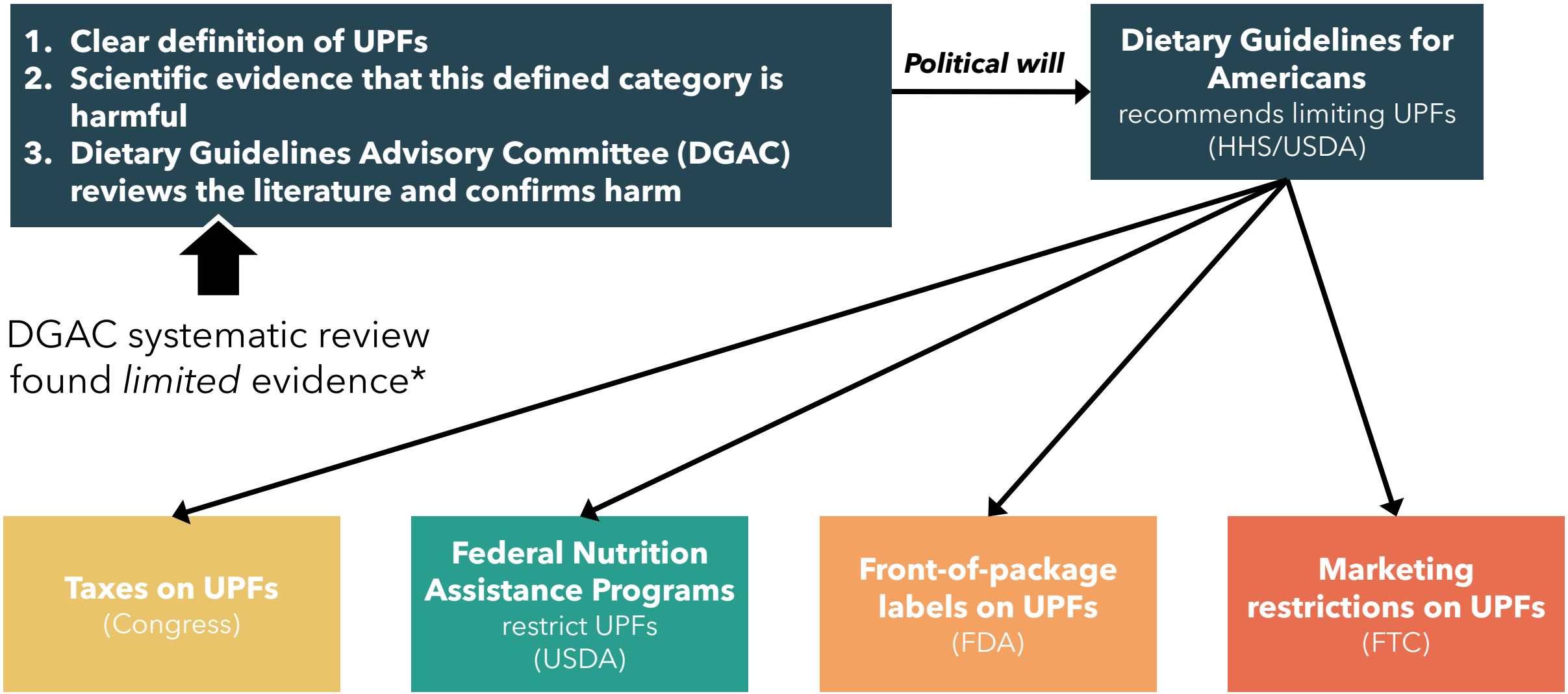


*https://www.dietaryguidelines.gov/sites/default/files/2024-09/DGAC-Meeting-5-Day-2-Slides.pdf see slides 164-179

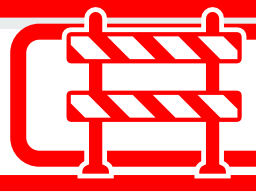
Dietary Guidelines recommendations aren't enough for lasting policy change

1. Clear definition of UPFs
2. Scientific evidence that this defined category is harmful

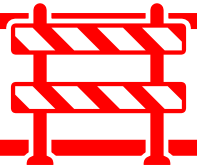
Political will →

Dietary Guidelines for Americans
recommends limiting UPFs

Definition + scientific evidence also crucial for policies to succeed



Extensive data requirements for federal agencies



Industry lawsuits

hurdles for state & local policies too →

First amendment challenges

Taxes on UPFs
(Congress)

Federal Nutrition Assistance Programs
restrict UPFs
(USDA)

Front-of-package labels on UPFs
(FDA)

Marketing restrictions on UPFs
(FTC)

Enormous research gap for passing federal (and many state and local) UPF policies

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2. Scientific evidence that this defined category is harmful

Political will →

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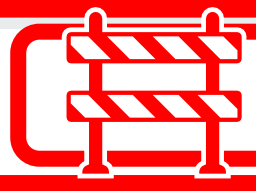

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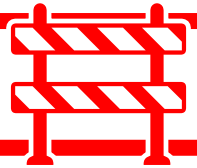

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Possible right now to limit UPFs: Procurement policies

Most promising path forward for state and local governments, institutions

NYC Good Food Purchasing

Citywide Goals & Strategy for the Implementation of Good Food Purchasing

Mayor's Office of Food Policy (MOFP)
September 2021

No consumer behavior change required

Citywide Goals

Percent food spend:	Actual - FY 2019	Goal - FY 2022	Goal - FY 2025
Total Food Spend Captured	74%	90%	100%
Full Sourcing Details	7%	20%	60%
Percent qualified city spent on:	**Actual - FY 2019**	**Goal - FY 2022**	**Goal - FY 2025**
Local Economies	15%	15%	22%
M/WBE	0%	3%	5%
Environmental Sustainability	1%	5%	15%
Raise Without Routine Antibiotic Use	27%	25%	30%
Valued Workforce	8%	9%	15%
Animal Welfare	3%	5%	15%
Nutrition	77%	90%	90%
Whole/Minimally Processed	25%	33%	46%

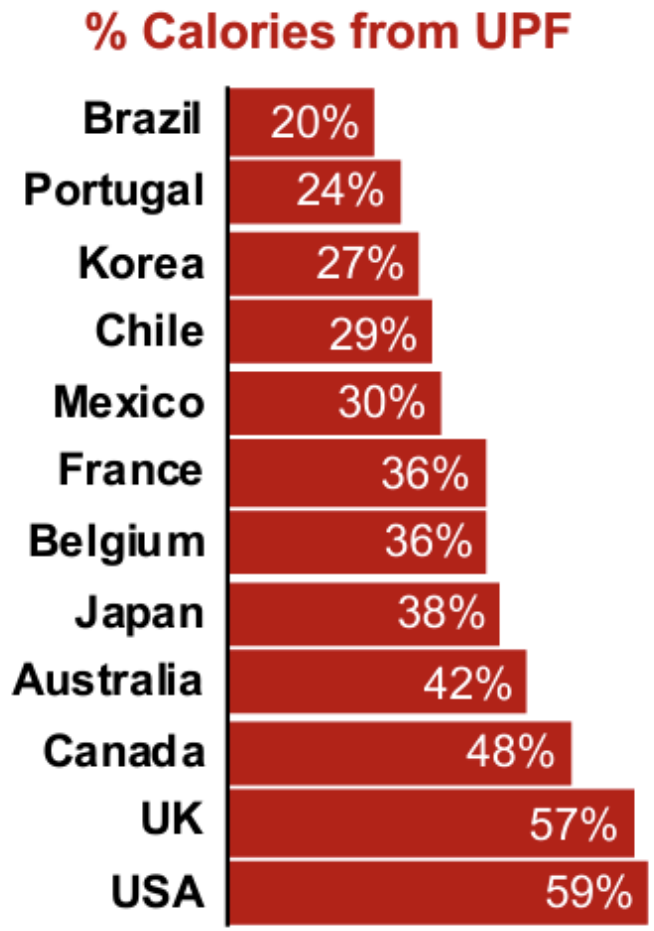
https://www.nyc.gov/assets/foodpolicy/downloads/pdf/GFP-Citywide-Goals-Strategy.pdf

Overarching concerns/considerations for efforts to limit UPF consumption in the U.S.

- **Procurement policies/institutional foodservice:**
  - $$$ (infrastructure, training, food)
  - Ensuring food quality and taste
  - Cultural preferences
  - Take care with framing as UPF science continues to evolve

Overarching concerns/considerations for efforts to limit UPF consumption in the U.S.

- **Majority of U.S. diet is UPFs**
- **For policies aiming to reduce consumption of UPFs via behavior change, what are people likely to replace them with?**
  - Raw/minimally processed; homecooked; restaurant foods?
- **Equity concerns for policies solely limiting UPFs without increasing minimally processed foods (e.g., taxes)**
  - Limit ability for people with lower incomes to get the nutrients and calories they need to survive
  - Stigma against those who can't afford to shift away from UPFs
- **Climate considerations**
  - Plant-based meat and milk are UPFs; red meat and milk are minimally processed



UNC Global Food Research Program, May 2021

Main Takeaways and Next Steps

1. **Efforts to improve our food supply via nutrients, food groups, and food additives separately can improve population health**

2. **UPF policies can holistically avoid unintended consequences of that approach (endless reformulation)**
   - Concerns remain about feasibility, equity, and climate

3. **Federal policies to limit UPFs are not currently feasible**
   - Lacking clear definition
   - Lacking scientific evidence of harm (especially mechanistic) based on this definition

4. **Procurement policies (state, local, institutions) are most promising option**
   - Especially effective if combined with other food standards (e.g., nutrients, sustainability)
   - Frame carefully: UPF science continues to evolve, need to prevent erosion of public trust in science/policy

Special thanks
Alyssa Moran
Neha Khandpur
Peter Lurie
Joshua Petimar
Anna Grummon

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HARVARD T.H. CHAN SCHOOL OF PUBLIC HEALTH

Q&A

Learn more about Healthy Eating Research and our work at:
https://healthyeatingresearch.org/

Thank you for attending!

THE RECORDING WILL BE MADE AVAILABLE IN THE COMING DAYS.