Sustainability Lecture Series

Sustainable Diets -Why and how?

Brent Loken and Daniel Vennard

Opening address: Connie Hedegaard Moderator: Katherine Richardson Respondents: Marie Trydeman Knudsen, Arne Astrup, Jakob Jønck, Signe Frese, Jan Johannesen and Michael Minter Host: CONCITO and Sustainability Science Centre

8 May 2019 14:00-17:00 Ceremonial Hall, Frue Plads 4, 1168 Copenhagen K





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Sustainability Lecture Series

Sustainable Diets - Why and how?

Brent Loken EAT









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e e A T

The EAT-Lancet Commission on Healthy Diets From Sustainable Food Systems

> Food Planet Health

The New York Times

Opinion Time to Panic

The planet is getting warmer in catastrophic ways. And fear may be the only thing that saves us.



Sustainable Development Goals by 2030



Paris Climate Change Agreement by 2050



The Problem

A Great Acceleration in the Global Food System



We are not yet bending the curves on unhealthy and unsustainable food



The scale of the challenge



2 billion people lack key micronutrients like iron and vitamin A

155 million children are stunted

52 million children are wasted

2 billion adults are overweight or obese

41 million children are overweight

88% of countries face a serious burden of either two or three forms of malnutrition

And the world is off track to meet all global nutrition targets

Goal - 2 Targets - 5 Strategies

To Achieve Planetary Health Diets for Nearly 10 Billion People By 2050

EAT-Lancet Commission Approach

Define a healthy reference diet using the best available evidence (controlled feeding studies, long-term cohort studies, randomized trials).

Define planetary boundaries for 6 key environmental systems and processes (GHG, cropland use, water use, nitrogen and phosphorus application, extinction rate).

Apply a global food systems modeling framework to analyze what combinations of readily implementable measures are needed to stay within food production boundaries while still delivering healthy diets by 2050.

Outline Strategies to achieve the changes needed to meet the goal of healthy diets from sustainable food systems for all by 2050.

1 Goal – 2 Targets – 5 Strategies

Scientific Targets for Healthy Diets from Sustainable Food Production

Target 1 – Healthy Diets 2500 kcal/day



		grams per day (possible range)	Caloric intake kcal per day
	Whole grains Rice, wheat, corn and other	232	811
	Tubers or starchy vegetables Potatoes and cassava	50 (0–100)	39
Î	Vegetables All vegetables	300 (200–600)	78
6	Fruits All fruits	200 (100–300)	126
•	Dairy foods Whole milk or equivalents	250 (0–500)	153
B	Protein sources Beef, lamb and pork Chicken and other poultry Eggs Fish Legumes Nuts	14 (0–28) 29 (0–58) 13 (0–25) 28 (0–100) 75 (0–100) 50 (0–75)	30 62 19 40 284 291
6	Added fats Unsaturated oils Saturated oils	40 (20–80) 11.8 (0-11.8)	354 96
	Added sugars <mark>All sugars</mark>	31 (0–31)	120



Samples of Planetary Health Plates



Have plenty of vegetables and fruits

Eat protein foods

The Canadian Food Guide

Make water your drink of choice

Choose whole grain ____foods



Current Intakes vs Reference Diet





Current Intakes vs Reference Diet

Whole

grains

Nuts

Fish

Vegetables

Fruit

Legumes



Substantial Health Benefits

Approach 1 Comparative Risk	19%	or	11.1 million adult deaths per year
Approach 2 Global Burden of Disease	22.4%	or	10.8 million adult deaths per year
Approach 3 Empirical Disease Risk	23.6%	or	11.6 million adult deaths per year

Target 2 – Sustainable Food Production

Earth system process	Control variable	Boundary (Uncertainty range)
Climate change	GHG emissions	5 Gt CO₂-eq yr ⁻¹ (4.7 – 5.4 Gt CO ₂ -eq yr ⁻¹)
Land-system change	Cropland use	13 M km² (11–15 M km²)
Freshwater use	Water use	2,500 km³ yr⁻¹ (1000–4000 km³ yr ⁻¹)
Nitrogen cycling	N application	90 Tg N yr⁻¹ (65–90 Tg N yr ⁻¹) * (90–130 Tg N yr ⁻¹)**
Phosphorus cycling	P application	8 Tg P yr⁻¹ (6–12 Tg P yr ⁻¹) * (8–16 Tg P yr ⁻¹)**
Biodiversity loss	Extinction rate	10 E/MSY (1-80 E/MSY)

Food Production with Safe Operating Space for Climate



Achieving Planetary Health Diets

Actions	Description
Dietary shift Planetary health diet	Planetary health diet – as outlined in Table 1.
Halve waste Reduced food loss and waste	Food losses and waste reduced by half, in line with SDG target 12.3.
PROD Improved production practices Standard level of ambition	Closing yield gaps to about 75%; rebalancing N and P application; improving water management; implementation of agricultural mitigation options; and land is expanded first into secondary habitat and then to intact forests to minimize impacts on biodiversity.
PROD+ Improved production practices High level of ambition	Closing yield gaps to 90%; a 30% increase in N use efficiency and 50% recycling rates of P; phase-out of first-generation biofuels; implementation of available bottom-up options for mitigating GHG emissions; and optimizing land-use across regions to minimize impacts on biodiversity.

Sc	cenarios		GHG emissions	Cropland use	V ater use	Nitrogen application	Phosphorus application	Biodiversity loss	
	Food produc	Food production boundary			13 (11.0–15.0)	2.5 (1.0–4.0)	90 (65.0–140.0)	8 (6.0–16.0)	10 (1–80)
	Baseline in 2010		5.2	12.6	1.8	131.8	17.9	100-1000	
	Production (2050)	Waste (2050)	Diet (2050)						
	BAU	Full waste	BAU	9.8	21.1	3.0	199.5	27.5	1,043
	BAU	Full waste	Dietary shift	5.0	21.1	3.0	191.4	25.5	1,270
	BAU	Halve waste	BAU	9.2	18.2	2.6	171.0	23.2	684
	BAU	Halve waste	Dietary shift	4.5	18.1	2.6	162.6	21.2	885
	PROD	Full waste	BAU	8.9	14.8	2.2	187.3	25.5	206
	PROD	Full waste	Dietary shift	4.5	14.8	2.2	179.5	24.1	351
	PROD	Halve waste	BAU	8.3	12.7	1.9	160.1	21.5	50
	PROD	Halve waste	Dietary shift	4.1	12.7	1.9	151.7	20.0	102
	PROD+	Full waste	BAU	8.7	13.1	2.2	147.6	16.5	37
	PROD+	Full waste	Dietary shift	4.4	12.8	2.1	140.8	15.4	34
	PROD+	Halve waste	BAU	8.1	11.3	1.9	128.2	14.2	21
	PROD+	Halve waste	Dietary shift	4.0	11.0	1.9	121.3	13.1	19



Uncertainty range Baseline projections of environmental pressures in 2050 **Dietary Shift** Planetary Health Diet Halve waste Reduced food loss and waste PROD Improved production practices Standard level of ambition PROD+ Improved production practices High level of ambition





COMB+

Combination of actions High level of ambition











Combination of actions High level of ambition





High level of ambition





1 Goal – 2 Targets – 5 Strategies

Five Strategies for a Great Food Transformation

Strategy 1

Seek international and national commitment to shift towards healthy diets



Strategy 2

Reorient agricultural priorities from producing high quantities of food to producing healthy food



Change in Food Production

2050 BAU + full waste

2050 planetary health diet + halve waste


Strategy 3

Sustainably intensify food production to increase high-quality output



Yield gap – difference between actual and attainable yields



More sustainability

Sustainable Intensification

Global redistribution of fertilizers (N & P)

Figure 5

Existing crop yield gaps. Shown is the ratio of current yields to potential yields, as estimated by 92 (see also http://www.yieldgap.org/ water-productivity). A ratio of 0.2 indicates that a nation, on average, has crop yields 20% of what that nation is capable of yielding. Low ratios indicate large yield gaps, or the difference between current yields and potential yields. Countries in gray are missing data on either current yields or potential yields. Clark et al. 2018 Annual Review of Env. Resour Strategy 4

Strong and coordinated governance of land and oceans



Strategy 5

At least halve food losses and waste, in line with UN Sustainable Development Goals



Conclusion

Without a transformation of the global food system, the world risks failing to meet the UN Sustainable Development Goals (SDGs) and the Paris Agreement and the data are both sufficient and strong enough to warrant immediate action.

Widespread multi-sector, multi-level action is needed including: a substantial global shift toward healthy dietary patterns; large reductions in food loss and waste; and major improvements in food production practices.



Dietary changes from current diets to healthy diets are likely to substantially benefit human health, averting about 11.0 million premature deaths per year, a reduction of about 20%.

Feeding 10 billion people a healthy diet within safe planetary boundaries is possible and will improve the health and well being of millions of people and allow us to pass onto our children a viable planet.



eatforum.org **#foodcanfixit**



Sustainability Lecture Series

Sustainable Diets - Why and how?

Daniel Vennard World Resources

Institute







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FROM WHY TO HOW: MOVING CONSUMERS TOWARDS A SUSTAINABLE DIET

Daniel Vennard, Director, Better Buying Lab, World Resources Institute

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PREVIOUS EFFORTS TO SHIFT DIETS





1/3 of a pie (oven cooked) SUGARS ENERGY FAT ATURATES 2218kJ 533kcal 34.5q 16.1a 2.3q 1.25q 27% 49% 81% 3% 21% % of the Reference Intakes Typical values per 100g: Energy 1210kJ/291kcal

The eatwell plate

Fruit and vegetables Potatoes, bread, rice, pasta etc Potatoes, pasta etc Potatoes, bread, rice, pasta etc Potatoes, pasta





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BETTER BUYING LAB



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LANGUAGE RESEARCH: LEARNING JOURNEY



LITERATURE REVIEW



Lassi: Raghunathan, et.al, 2006 Cookie: Suher, Raghunathan, and Hoyer, 2016



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LSE ONLINE STUDY: VEGETARIAN LANGUAGE

"CONTROL" MENU

Risotto primavera (v) Peas, mushrooms, lemon 14.00

Lobster & crab roll Avocado, lettuce, lemon mayonnaise 17.00

Sautéed king prawns Chill, garlic & parsley, basmati rice 22.50

Deep fried haddock Minted peas, hand cut chips, sauce tartar 15.50

Chicken cacciatora Roasted chicken breast, mushrooms, tomato, olives 14.50

Steak frites Rump pavé, hand cut chips, béarnaise sauce 19.50

> Hamburger Relish, hand cut chips 13.50

Ricotta & spinach ravioli (v) Asparagus, butter & sage sauce 13.50

v - suitable for vegetarians

"VEGETARIAN" MENU

Lobster & crab roll Avocado, lettuce, lemon mayonnaise 17.00

Sautéed king prawns Chill, garlic & parsley, basmati rice 22.50

Deep fried haddock Minted peas, hand cut chips, sauce tartar 15.50

Chicken cacciatora Roasted chicken breast, mushrooms, tomato, olives 14.50

Steak frites Rump pavé, hand cut chips, béarnaise sauce 19.50

> Hamburger Relish, hand cut chips 13.50

VEGETARIAN DISHES

Risotto primavera (v) Peas, mushrooms, lemon 14.00

Ricotta & spinach ravioli (v) Asparagus, butter & sage sauce 13.50





ONLINE RESEARCH: UK

BEEF LASAGNE	£5.00	
With garlic bread and side salad		
CHICKEN & HAM PIE	£5.25	
With mashed potato, peas and gravy		
CHICKEN TIKKA MASALA	£5.35	
With rice and naan bread		
	65.00	
MEAT FREE SAUSAGE AND MASH Meat free sausage and mash with peas or carrots and gravy	£5.00	
MEAT FREE SAUSAGE AND MASH Meat free sausage and mash with peas or carrots and gravy YORKSHIRE HAM, EGGS AND CHIPS	£5.00 £5.00	
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https://www.wri.org/publication/encouraging-sustainable-food-consumptionusing-more-appetizing-language



https://www.wri.org/publication/encouraging-sustainable-food-consumptionusing-more-appetizing-language

ONLINE RESEARCH: UK





N = 1160 ** p<0.01, * p<0.05, + p<0.1 Note: Primary Analysis Menu 6 (Curry)

ALTERNATIVE DISH NAMES



FIELD STUDY: SAINSBURYS

Methodology

- Tested 8 different names across 3 different dishes
- 10 random assigned café's across the UK
- Compared sales data: 4 weeks with control names, 4 weeks with alternative names: August 11th – October 11th 2017





FIELD STUDY: SAINSBURYS

THE % UPLIFT IN SALES OF THE TARGET VEGETARIAN BREAKFAST DISH "MEAT-FREE BREAKFAST" BETWEEN INTERVENTION VERSUS CONTROL GROUPS



THE % UPLIFT IN SALES OF THE TARGET VEGETARIAN LUNCH DISH "SAUSAGE AND MASH" BETWEEN INTERVENTION VERSUS CONTROL GROUPS



https://www.wri.org/publication/language-sustainable-diets

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PANERA: FIELD TRAIL



Methodology

- Tested 2 different names for the "Low Fat Vegetarian Black Bean Soup"
- "Slow Simmered Black Bean Soup" in 22 locations in Nashville and Lexington areas, "Cuban Black Bean Soup" in 18 cafes in Los Angeles
- Test from January 17 to February 20, 2018
- Compared sales against set of control cafes with similar soup sales data from year before.

<u>Results</u>

• "Slow Simmered Black Bean Soup" saw no uplift

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• "Cuban Black Bean Soup" uplift of +13%

SOCIAL MEDIA ANALYSIS: UK & US

Vegan food is...





Basic	Indulgent	Healthy Restrictive	Healthy Positive
Beets	Dynamite chili and tangy lime-seasoned beets	Lighter-choice beets with no added sugar	High-antioxidant beets
Corn	Rich buttery roasted sweet corn	Reduced-sodium corn	Vitamin-rich corn
Green beans	Sweet sizzlin' green beans and crispy shallots	Light 'n' low-carb green beans and shallots	Healthy energy-boosting green beans and shallots
Sweet potatoes	Zesty ginger-turmeric sweet potatoes	Cholesterol-free sweet potatoes	Wholesome sweet potato superfood
Butternut squash	Twisted garlic-ginger butternut squash wedges	Butternut squash with no added sugar	Antioxidant-rich butternut squash
Zucchini	Slow-roasted caramelized zucchini bites	Lighter-choice zucchini	Nutritious green zucchini
Bok choy and mushrooms	Tangy ginger bok choy and banzai shiitake mushrooms	Low-sodium bok choy and mushrooms	Wholesome bok choy and mushrooms
Carrots	Twisted citrus-glazed carrots	Carrots with sugar-free citrus dressing	Smart-choice vitamin C citrus carrots

https://mbl.stanford.edu/sites/g/files/sbiybj9941/f/turnwaldbolescrum_ indulgentdescriptionsandvegetableconsumption.pdf



STANFORD: FIELD STUDY



TYPE OF NAMING DESCRIPTOR FOR IDENTICAL VEGETABLE SIDE

https://mbl.stanford.edu/sites/g/files/sbiybj9941/f/turnwaldbolescrum_ indulgentdescriptionsandvegetableconsumption.pdf



DON'T USE

- 1. Meat-free
- 2. Vegan
- 3. Vegetarian
- 4. Healthy Restrictive

DO USE

- 5. Provenance
- 6. Flavor
- 7. Look and Feel



GOOGLE ROLL OUT

Bay Area (incl. Mountain View, Sunnyvale, Palo Alto and San Bruno) 1.

15.

20.

- New York 2.
- London 3.
- San Francisco 4.
- Dublin 5.
- Zurich 6.
- Taiwan 7.
- Kirkland 8.
- Seattle 9.
- Singapore 10.
- Tokyo 11.
- Cambridge 12.
- Sydney 13.
- Los Angeles 14.
- Boulder 15.
- Hyderabad 16.
- Chicago 17.
- Tel Aviv 18.
- Austin 19.
- São Paulo 20.
- Paris 21. 22. Pittsburgh Munich 23. 24. 25.
 - Gurgaon Irvine



GOOGLE: NAMES AND RESULTS

Cafe - BAY AREA (Compass) Mountain View					
Before	After	Results			
Lentil Stew	Moroccan Spiced Lentil Stew and Tempeh Tagine	70% uplift Less overproduction going to scales			
Sauteed Mixed Radish	Caramelized Radish Trifecta with Citrus Gremolata	30% uplift			
Orzo with Feta	Greek Goddess Pasta with Creamy Feta	25% uplift			
Falafel	Spiced Panko Crusted Fritter with Ventura Parsley	No uplift			



6 Google Proprietary and Confidential



GOOGLE: NAMES AND RESULTS

Data Centre - AMERICAS (Guckenheimer) Pryor Creek					
Before	After	Results			
Coconut Curried Veggie	Sweet and Spicy Coconut Stew	30% uplift in production of dishes 53% reduction in food waste across the board			
Vegetable Mac with Almonds	Farmer's Al-Mac				
Maple Balsamic Tempeh	Sweet and Sour Take Out Tempah				
Eggplant Parmesan with Spicy Marinara	Mangia! Fried Eggplant Parm				





BRINGING INTERVENTIONS TOGETHER









The Cool Food Pledge

A new platform to help corporate canteens, restaurants, universities, hospitals, and city facilities provide delicious food while slashing food-related greenhouse gas emissions



HOW IT WORKS



FOOD PURCHASES

GHG EMISSIONS

Initial cohort serve more than 60 million meals per annum. Aim for 40 by end 2019 serving 1bn.







Premium Burgers



A Member of the Roche Group

RESOURCES: BetterBuyingLab.org wri.org.language-of-food wri.org/our-work/project/cool-food-pledge

daniel.vennard@wri.org



Sustainability Lecture Series

Sustainable Diets - Why and how?

Marie Trydeman Knudsen Aarhus University









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MARIE TRYDEMAN KNUDSEN:

How do you see livestock's role in the ideal future agriculture and food systems around the world?

'Enhancing biodiversity within agricultural systems' – how do you envision that and the transformation towards it?

What should land be used for – food, energy, materials?

Chemical pollution was not included – why not?

With the climate agreements we are normally regulating the national production and not the consumption – how do you see this?





Sustainability Lecture Series

Sustainable Diets - Why and how?

Arne Astrup University of Copenhagen

CONCITO

DENMARK'S GREEN THINK TANK

UNIVERSITY OF COPENHAGEN

SUSTAINABILITY

SCIENCE CENTRE

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Videnskabsmænd i denne disciplin forudser, at i 2013 vil Verdens befolkning nå de syv milliarder, i 2028 vil vi være otte milliarder, i 2054 ni milliarder, og i år 2200 forventes vi at nå de ti milliarder mennesker på denne planet. 7,6

Det fremgår af grafen, at langt den største befolkningstilvækst vil finde sted i udviklingslandene.



Sustainable Diets - Why and how?

Jakob Jønck Simple Feast









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Sustainable Diets - Why and how?

Signe Frese COOP Denmark









Coop and Sustainable Diets

Biggest change in diets in peace-time!





Madpyramiden er klimavenlig

Spiser du efter Madpyramidens anbefalinger, kan du reducere din belastning på klimaet med op til 30 procent i forhold til en danskers gennemsnitlige kost. Blandt andet fordi der er skruet ned for kødet og op for det grønne



Need for innovation and change in the value chain

COOP



Bæredygtig Superfood-protei...

Skal en lokalproduceret, bæredygtig og velsmagende Superfood med imponerende ernæringsprofil forblive en hemmelighed –

26.050 kr. af 30.000 kr.

87 backers 53 dage tilbage

🛍 Rewardprojekt



Får i vinmarken

Hjælp os med at udskifte traktoren med får

56.800 kr.

97 backers 8 dage tilbage

🛍 Rewardprojekt



Sustainable Diets - Why and how?

Jan Johannesen Arla Foods







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Sustainable Diets

As defined by FAO and Biodiversity International in 2012

Sustainable Diets are those diets with low environmental impacts which contribute to food and nutrition security and to healthy life for present and future generations. Sustainable diets are protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible



economically fair and affordable; nutritionally adequate, safe and healthy; while optimizing natural and human resources.



Arla Foods' new Green Ambition

is long term and ambitious, based on science and focus on the most important environmental impacts.

Watch our video >> https://youtu.be/mzk7o9fGV0c



Sustainable Diets - Why and how?

Michael Minter CONCITO









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EAT-Lancet vs Danish diets and recommendations

	EAT-Lancet Grams per day	DK-consumption Grams per day	DK-recommendation Grams per day
Vegetables			
Whole grain (rice, corn etc)	232	63	Min 75
Starchy veg. (potatoes)	50	94	
Vegetables	300	236	Min 6oo
Fruit	200	193	
Legumes (beans)	50	2	
Nuts	25	4	
Meat and dairy			
Dairy products	250	329	250-500
Cheese		47	25
Beef and lamb	7	38	Max 70
Pig	7	77	
Poultry	29	29	
Eggs	13	27	
Fish	28	40	28



www.concito.dk/klimavenligemadvaner



Source: CONCITO (2019) based on DTU National Food Institute (2019)