

SALUD INDIVIDUAL, SALUD POBLACIONAL o SALUD PLANETARIA

¿Cuál debe ser la prioridad?

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CIBER OBN, Instituto de Salud Carlos III



CAMBIANDO NUESTRA DIETA PODEMOS CAMBIAR NUESTRA SALUD

Risk Factors

Dietary risks

Tobacco smoking

High blood pressure

High body mass index

Physical inactivity and low physical activity

High fasting plasma glucose

High total cholesterol

Ambient particulate matter pollution

Alcohol use

Drug use

Lead exposure

Occupational risks

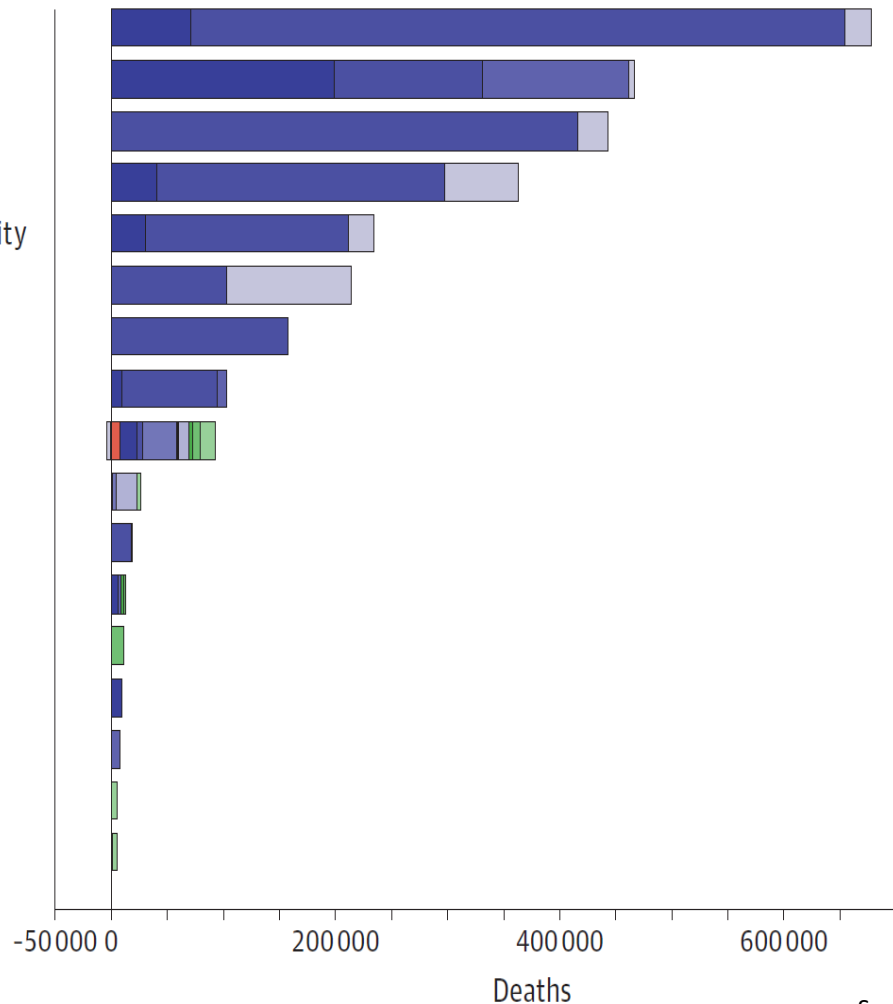
Low bone mineral density

Residential radon

Ambient ozone pollution

Intimate partner violence

Childhood sexual abuse



U.S. Burden of Disease Collaborators, JAMA 2013

Source: Dr. Ramon Estruch, presented at Tomorrow Tastes Mediterranean 2019

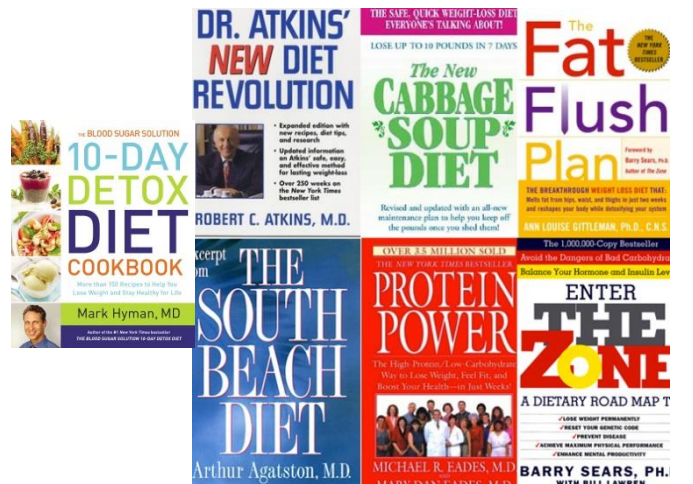
NUTRICIÓN: PASIÓN Y CONFUSIÓN



lose weight casual image obesity diets books scales energy measure lunch success taste gym meal ideal
 eat fruit good culture medical dieting healthy ingestion traditional taboos eating changing girl change body luscious beautiful dietary living female doctor
Diet food energy measure lunch success taste gym meal ideal
nutrition flat proteins stomach mortality wellness disorders measurement big enjoying habits concept sugar
 carbs carbohydrates measurement big enjoying habits concept sugar
 slim fats calorie water
 dress chest slim fats calorie water

FOOD BABE THE DR. **OZ** SHOW

WHAT is **GOOD Nutrition?**



Source: Google images

INTERVENCIÓN NUTRICIONAL

NUTRICIÓN PERSONALIZADA

NUTRICIÓN POBLACIONAL

NUTRICIÓN PLANETARIA

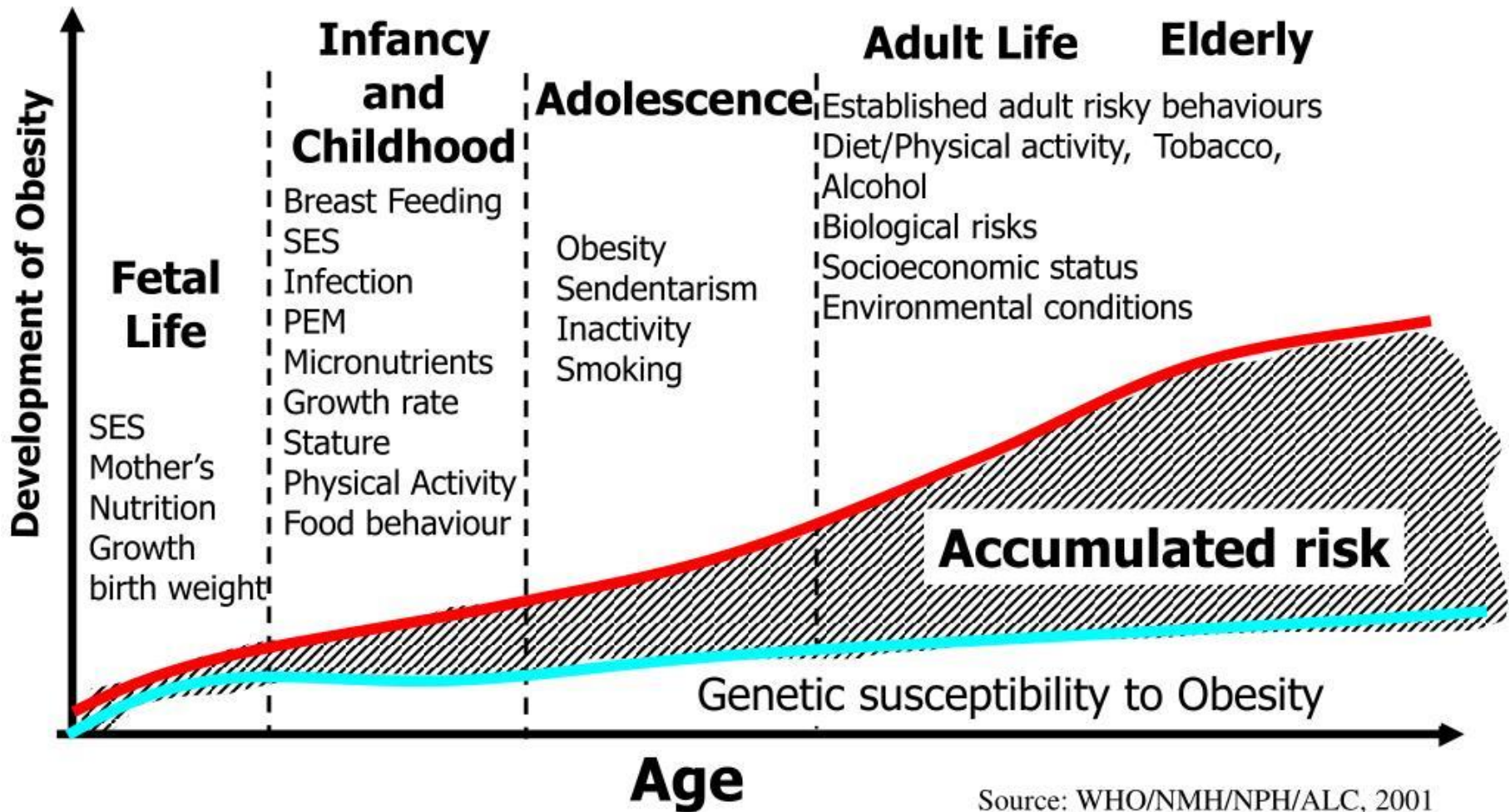
NUTRICIÓN PERSONALIZADA

TRATAMIENTO DIETÉTICO DE PERSONAS CON ENFERMEDADES ESPECÍFICAS Y AQUÉLLAS QUE NECESITAN UNA ATENCIÓN NUTRICIONAL ESPECIAL

- Errores congénitos del metabolismo
- Alergias e intolerancias alimentarias
- Enfermedades metabólicas
- Etapas de la vida: Edad, Embarazo, Lactancia, ...
- Factores étnicos, culturales y religiosos

DESARROLLO DE INTERVENCIONES PERSONALIZADAS EFECTIVAS PARA MEJORAR LA SALUD PÚBLICA

Obesity prevention : a Life Course Approach

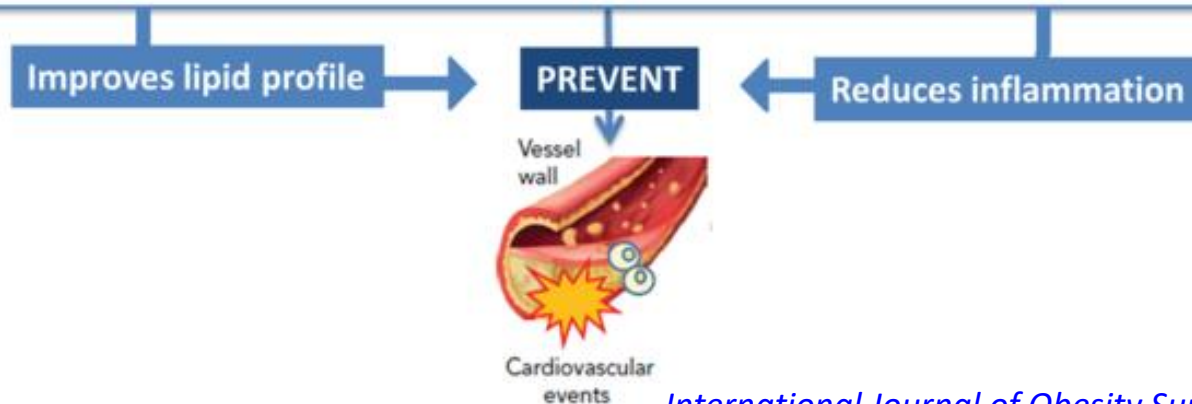


NUTRIGENETICS—PERSONALIZED NUTRITION IN OBESITY AND CARDIOVASCULAR DISEASES

PERSONALIZED INTAKE OF



ACCORDING WITH INDIVIDUAL GENETICS:



Recomendaciones Personalizadas basadas en la Historia Clínica, Preferencias e Información Genética

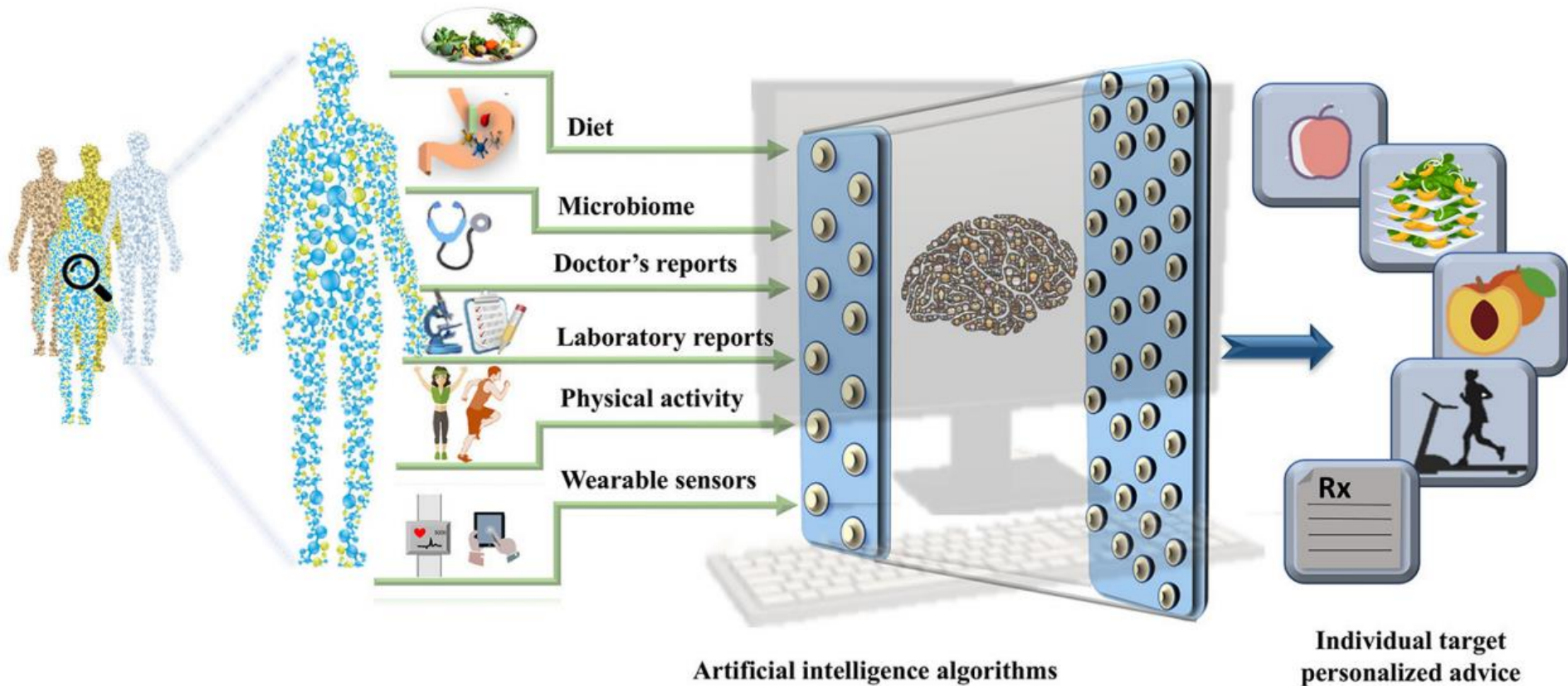
- SLC30A8: Portadoras del Alelo A en el rs 1158471SLC308
- TCF7L2: Portadoras del Alelo T en el rs TCF7L2-rs7903146
- MTHFR: Portadoras del genotipo TT en el MTHRC677T
- Suplementos de Zn para mantener la homeostasis de la glucosa (8 mg/d)
- La Dieta Mediterránea reduce el riesgo de AVC
- Suplementos de Vitamina B2 (riboflavina) reduce el riesgo de HTA

ENSAYO CLÍNICO ALEATORIZADO PARA INVESTIGAR LA EFICACIA DE LA NUTRICIÓN PERSONALIZADA



- Inclusión de 1607 participantes procedentes de 7 países europeos.
- División aleatoria en 4 grupos (0,1,2 y 3) – L0 (control), L1 (Datos Dietéticos-DD), L2 (DD + Datos Fenotípicos-DF) y L3 (DD + DF + Datos Genotípicos)
- Intervención por Internet. Seguimiento 6 meses
- Medida del “*Healthy Eating Index*”, datos clínicos – nutricionales y muestras biológicas
- Conclusión: La nutrición personalizada es más eficaz que una intervención convencional “*one-size-fits-all*” (talla única para todos)

CHALLENGES IN PERSONALIZED NUTRITION AND HEALTH



INTERVENCIÓN NUTRICIONAL

NUTRICIÓN PERSONALIZADA

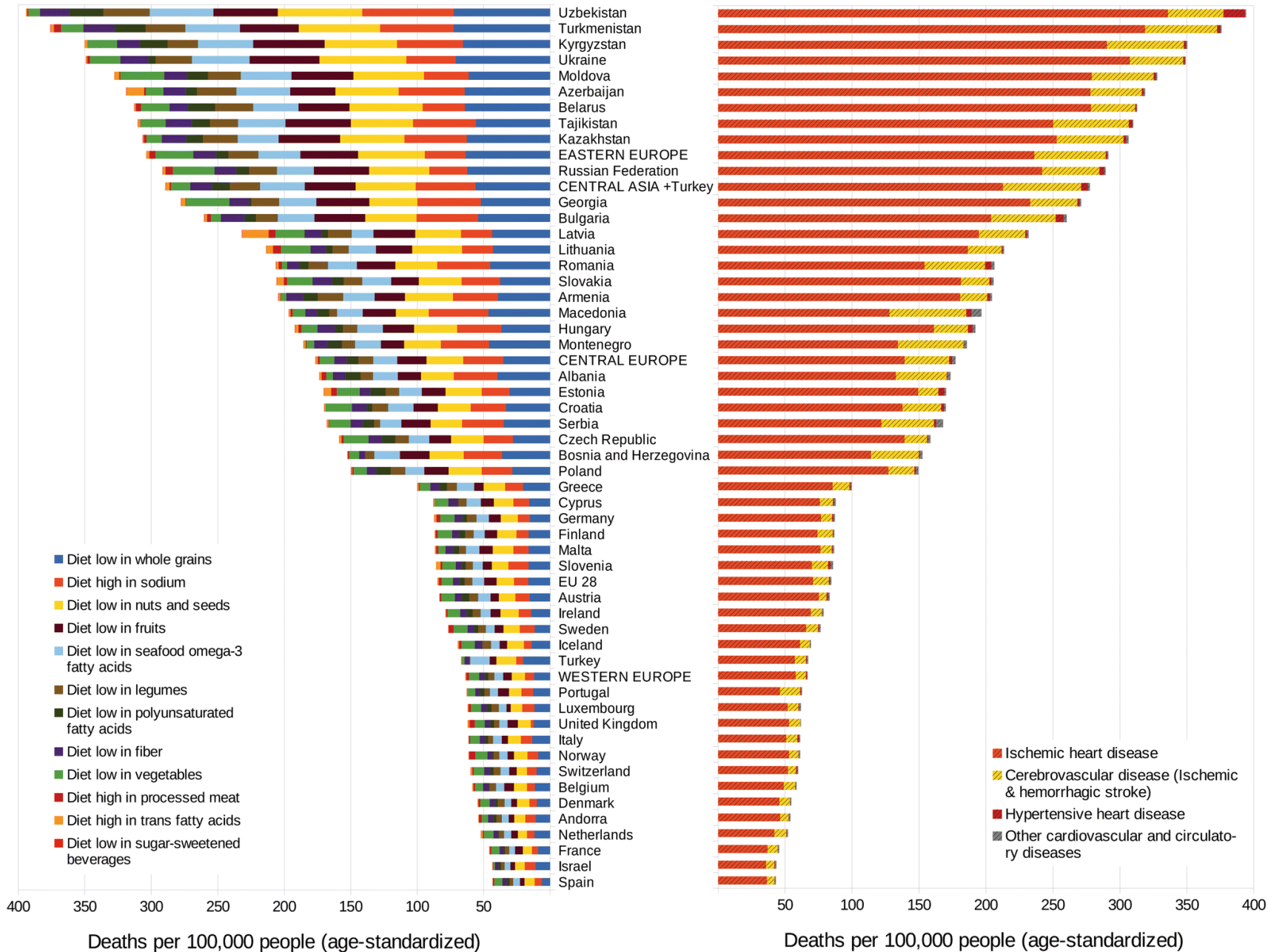
NUTRICIÓN POBLACIONAL

NUTRICIÓN PLANETARIA

JERARQUÍA DE LA MEDICINA BASADA EN LA EVIDENCIA CIENTÍFICA



DIET-RELATED DEATHS FROM CVD DUE TO DISEASE GROUPS



ESTILO DE VIDA: HÁBITOS DIETÉTICOS





United States Department of Agriculture

■

**DIETA SALUDABLE AMERICANA
DIETA VEGETERIANA
DIETA MEDITERRANEA**

LA DIETA MEDITERRÁNEA

THE BEST DIETARY PATTERN IN 2020



MEDITERRANEAN DIET

DASH DIET

FLEXITARIAN DIET

2

1

3

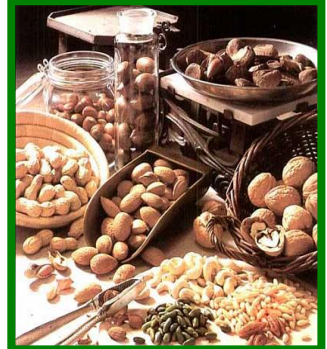
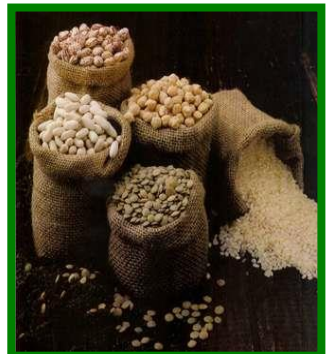
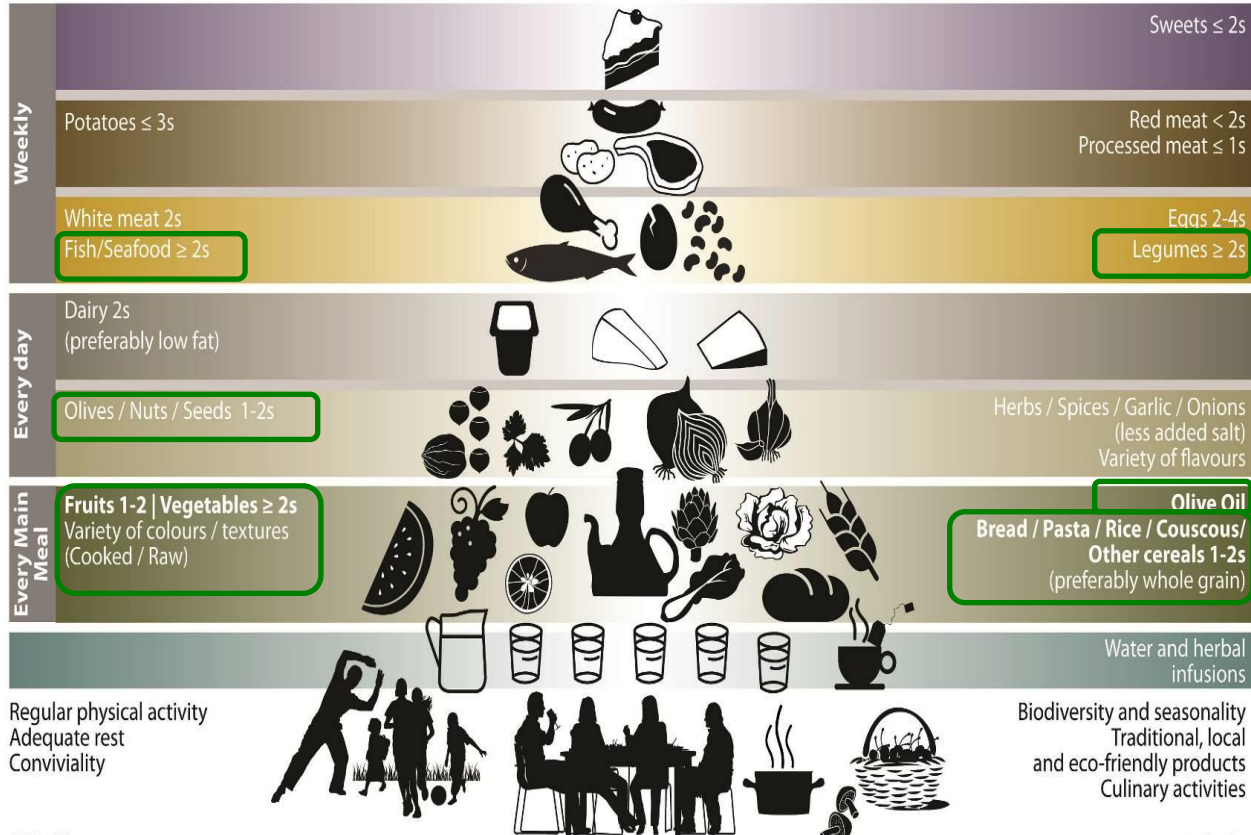
Dieta Mediterránea

ALTO CONSUMO

Mediterranean Diet Pyramid: a lifestyle for today
Guidelines for Adult population

Serving size based on frugality and local habits

 Wine in moderation and respecting social beliefs



s = Serving

Dieta Mediterránea

CONSUMO MODERADO-BAJO

Mediterranean Diet Pyramid: a lifestyle for today
Guidelines for Adult population

Serving size based on frugality and local habits



Wine in moderation and respecting social beliefs

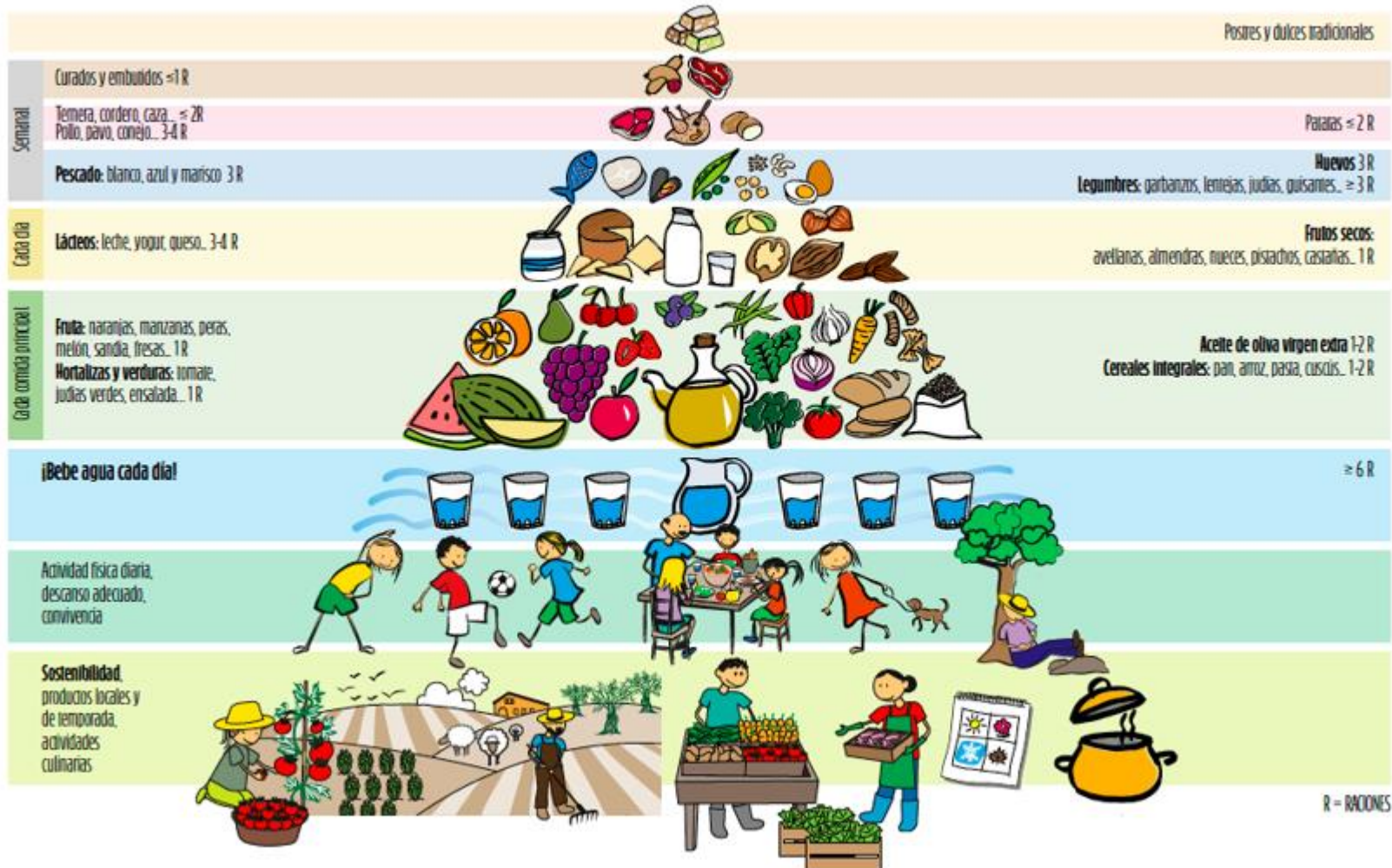


Regular physical activity
Adequate rest
Conviviality

Biodiversity and seasonality
Traditional, local and eco-friendly products
Culinary activities

Pirámide Infantil y Juvenil de la Dieta Mediterránea

Pirámide infantil y juvenil Dieta Mediterránea



R = RACIONES

Patrimonio cultural intangible de la Humanidad (UNESCO)



Dieta Mediterránea



Efectos de la Dieta
Mediterránea en la Prevención
Primaria de la Enfermedad
Cardiovascular
(Estudio PREDIMED)

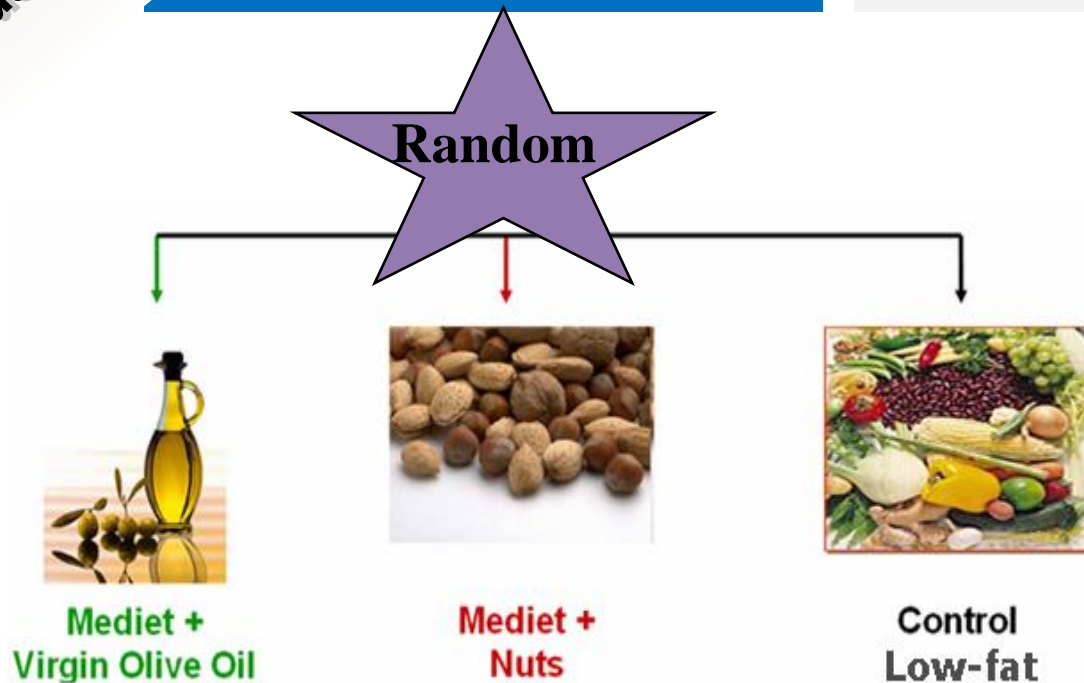


PREDIMED TRIAL: DESIGN

- ☐ Men: 55-80 yr
- ☐ Women: 60-80 yr
- ☐ High CV risk without CVD
type 2 diabetics
3+ risk factors

1. Smoking
2. Hypertension
3. ↑ LDL
4. ↓ HDL
5. Overweight/obese
6. Family history

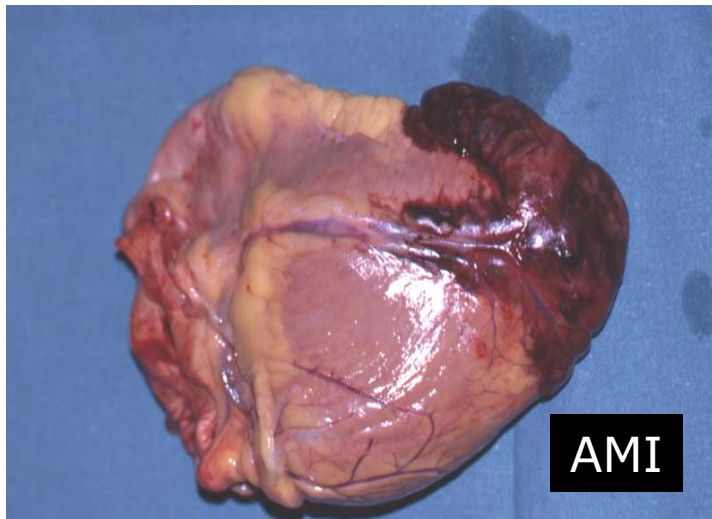
All free of CVD at baseline

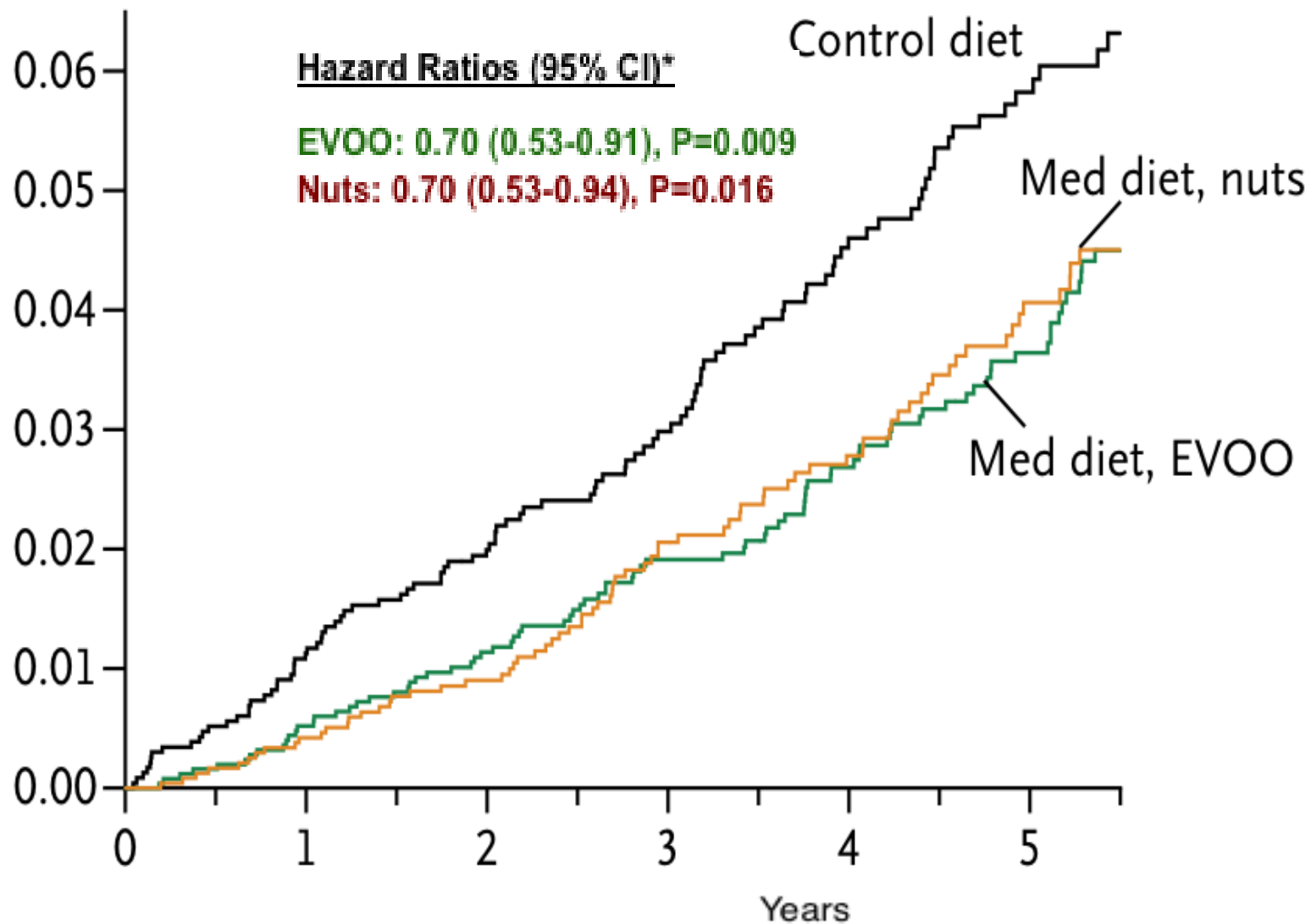


End-points

PRIMARY END-POINTS

Cardiovascular Death
No-fatal Acute Myocardial Infarction
No-fatal Stroke

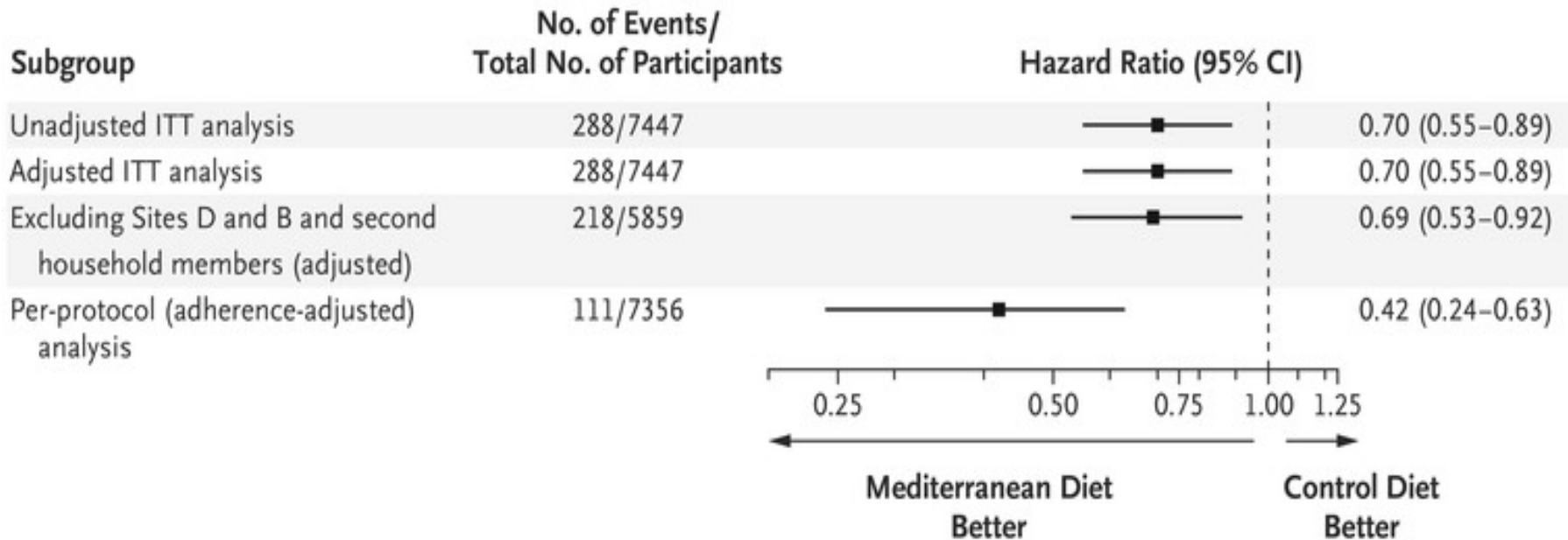




Number at risk

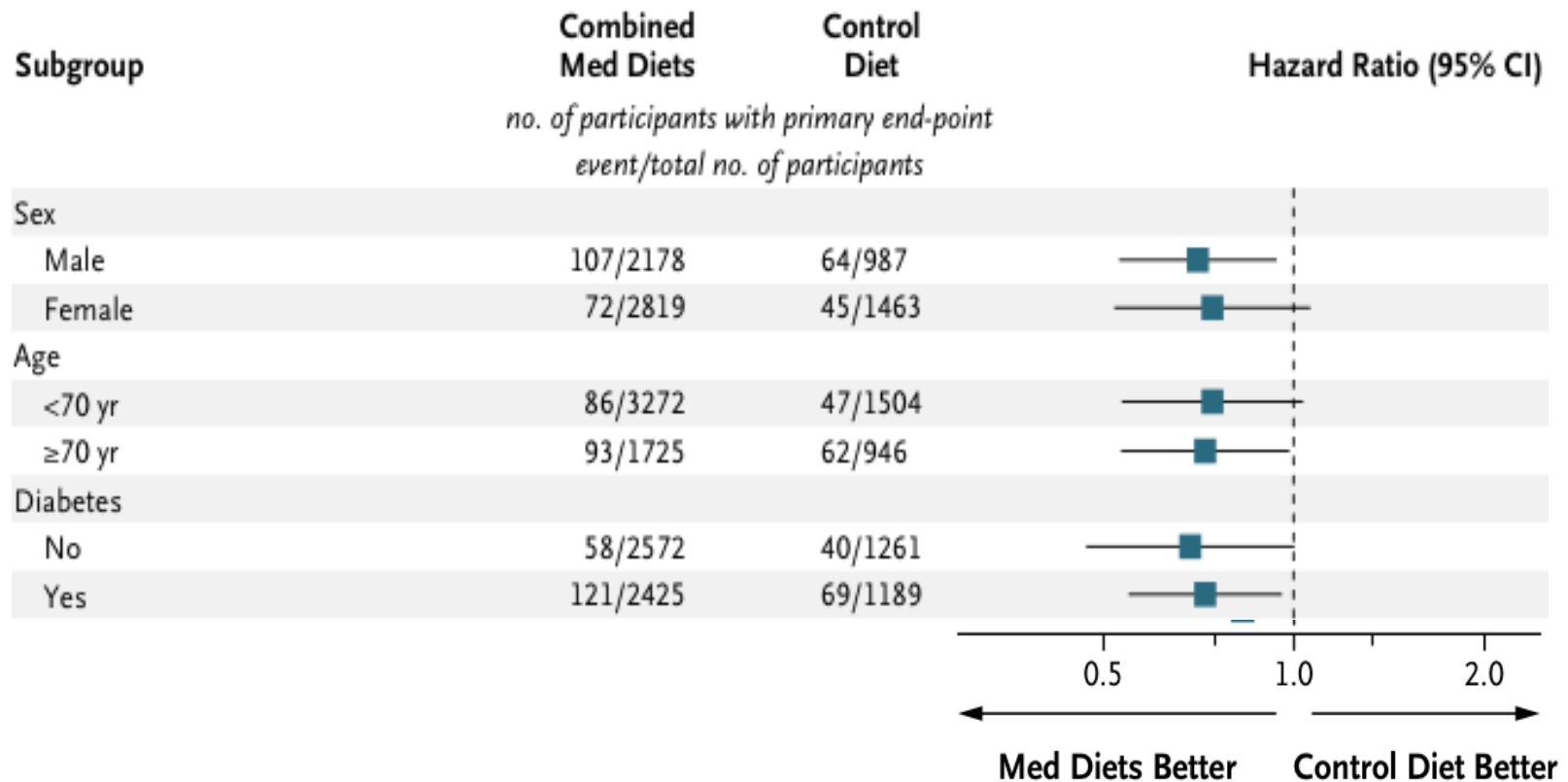
Control group	2450	2268	2020	1583	1268	946
MeDiet+EVOO	2543	2486	2320	1987	1687	1310
MeDiet+Nuts	2454	2343	2093	1657	1389	1031

Sensitivity Analyses of Combined Mediterranean Diet Groups and the Control Group



ORIGINAL ARTICLE

Primary Prevention of Cardiovascular Disease with a Mediterranean Diet



Mediterranean Diet Reduces the Adverse Effect of the *TCF7L2*-rs7903146 Polymorphism on Cardiovascular Risk Factors and Stroke Incidence

A randomized controlled trial in a high-cardiovascular-risk population



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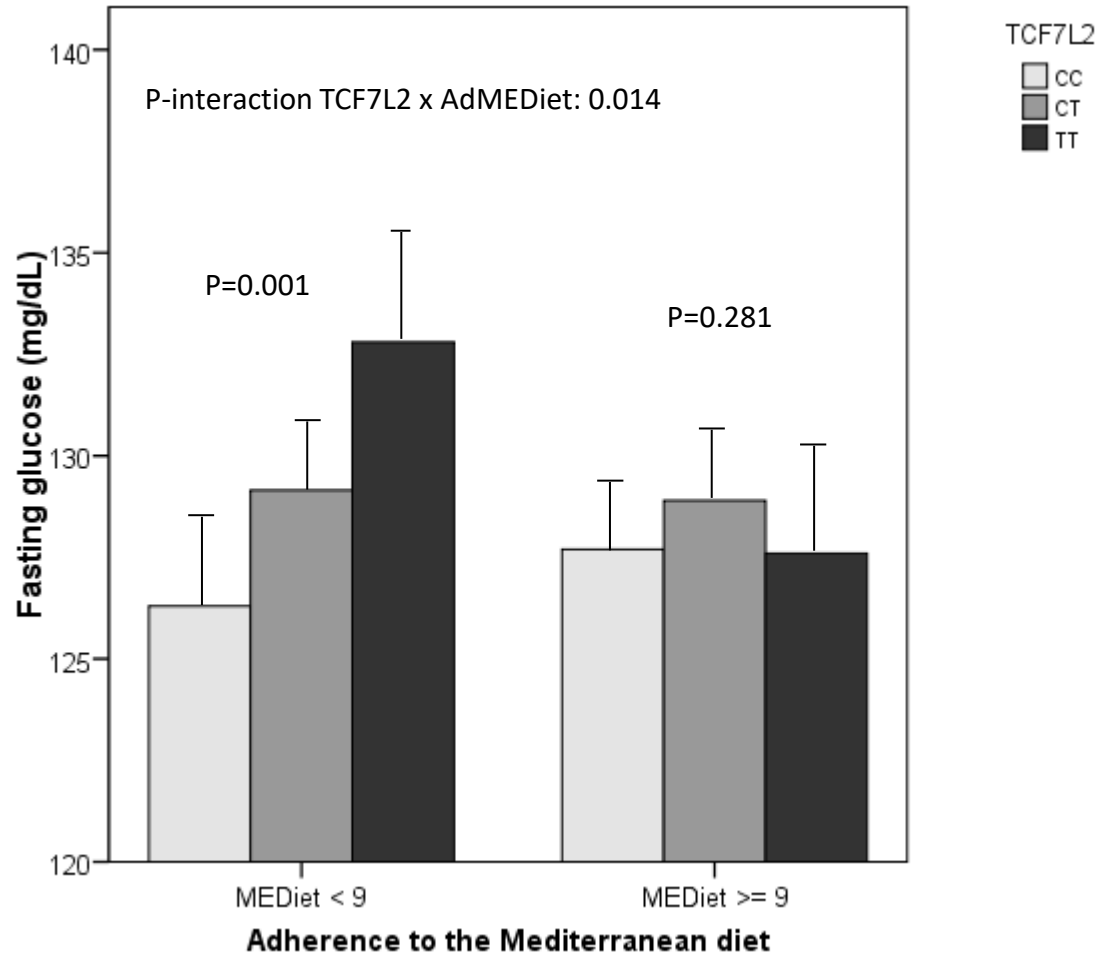
2013



Supplementary Table 2. Association between the TCF7L2 -rs7903146 polymorphism and fasting glucose, plasma lipid concentrations and type 2 diabetes at baseline*

Parameter	<i>TCF7L2</i> genotypes							
	CC		CT		TT		P [†]	P [‡]
	(n=2,770)		(n=3,249)		(n=999)			
Mean	SD	Mean	SD	Mean	SD			
Age (years)	67.0	± 6.0	67.0	± 6.1	66.7	± 6.3	0.392	
BMI (kg/m ²)	30.2	± 3.9	29.9	± 3.8	29.6	± 3.6	0.004	0.003
Waist circumference (cm)	100.7	± 10.7	100.2	± 10.4	100.1	± 9.8	0.147	0.193
Fasting glucose [§] (mg/dL)	117.5	± 39.0	124.2	± 42.7	128.1	± 43.6	1.18 x 10 ⁻¹²	0.021
Total cholesterol [§] (mg/dL)	211.6	± 39.7	210.6	± 40.0	211.7	± 38.6	0.587	0.275
LDL-C [§] (mg/dL)	130.6	± 34.4	130.2	± 36.5	130.0	± 34.1	0.901	0.509
HDL-C [§] (mg/dL)	53.4	± 14.0	53.9	± 14.2	54.4	± 13.6	0.204	0.098
Triglycerides [§] (mg/dL)	139.0	± 86.0	137.0	± 77.0	133.9	± 69.1	0.494	0.520
Type 2 diabetes: n (%)	1158	(41.8)	1680	(51.7)	573	(57.4)	3.1 x 10 ⁻²¹	
Type 2 diabetes risk (OR and 95% CI)	Ref.		1.50	(1.35-1.65)	1.87	(1.62-2.17)	3.3 x 10 ⁻²¹	5.4 x 10 ⁻²¹

Interacción entre el polimorfismo TCF7L2 y adherencia a la Dieta Mediterránea sobre las concentraciones plasmáticas de glucosa



Interacción entre el polimorfismo TCF7L2 y Adherencia a la Dieta Mediterránea sobre los lípidos plasmáticos

Supplementary Table 3. Interaction between the TCF7L2- rs7903146 polymorphism and pre-randomization adherence to the Mediterranean diet in determining plasma lipid concentrations. Multivariate* adjusted means and P values.

Parameter (mg/dL) / Adherence to Mediterranean Diet	<i>TCF7L2</i> genotypes		P^{\dagger}	P^{\ddagger}
	CC+CT Mean (SE)	TT Mean (SE)	<i>TCF7L2</i> Genotype	Interaction Genotype x Diet
Total cholesterol				0.005
Low (<9) (n=2992)	206.2 ± 3.5	211.3 ± 3.9	0.005	
High (>=9) (n=3576)	208.7 ± 3.5	206.5 ± 3.8	0.251	
LDL-C				0.003
Low (<9) (n=2946)	124.1 ± 3.2	128.7 ± 3.5	0.005	
High (>=9) (n=3529)	125.9 ± 3.2	124.5 ± 3.4	0.167	
HDL-C				0.628
Low (<9) (n=2968)	54.0 ± 1.3	54.9 ± 1.4	0.151	
High (>=9) (n=3529)	54.4 ± 1.3	55.8 ± 1.4	0.037	
Triglycerides				0.046
Low (<9) (n=2964)	142.5 ± 7.8	143.2 ± 8.5	0.528	
High (>=9) (n=3528)	139.2 ± 7.7	130.4 ± 8.4	0.036	

Interacción entre el polimorfismo del TCF7L2 e Intervención con Dieta Mediterránea sobre el riesgo de accidente vascular cerebral

Table 3—Incidence rates and HRs for total cardiovascular events and stroke stratified by the TCF7L2-rs7903146 polymorphism and the dietary intervention group after a median of 4.8 years of follow-up (multivariate adjusted models)

	Dietary intervention group in the follow-up									
	Control group (n = 2,291)					MedDiet groups† (n = 4,727)				
	Cases	Incidence* rate/1,000 person-years	HR	95% CI	P value	Cases	Incidence* rate/1,000 person-years	HR	95% CI	P value
Stroke§										
TCF7L2 (Model 1)										
CC	14	3.8	1.00	(Reference)		31	3.8	1.00	(Reference)	
CT	29	6.9	1.89	(0.98–3.53)	0.057	30	3.0	0.78	(0.49–1.28)	0.328
TT	14	10.9	3.19	(1.51–6.75)	0.002	12	4.0	1.06	(0.54–2.08)	0.856
TCF7L2 (Model 2)										
CC			1.00	(Reference)				1.00	(Reference)	
CT			1.84	(0.97–3.50)	0.063			0.79	(0.46–1.36)	0.386
TT			2.91	(1.36–6.19)	0.006			0.96	(0.49–1.87)	0.892

Model 1, multivariate model adjusted for sex, age, center, and dietary intervention group; Model 2, variables in model 1 plus type 2 diabetes, BMI, total energy intake, smoking, drinking, total energy intake, and adherence to MedDiet at baseline. *Crude incidence rates were expressed per 1,000 person-years of follow-up. †MedDiet + EVOO and MedDiet + nuts groups were pooled. ‡Total cardiovascular events is a composite end point including incident nonfatal myocardial infarction, nonfatal stroke, and cardiovascular deaths. §Total stroke incidence.

Interacción entre el polimorfismo del TCF7L2 e Intervención con Dieta Mediterránea sobre el riesgo de accidente vascular cerebral

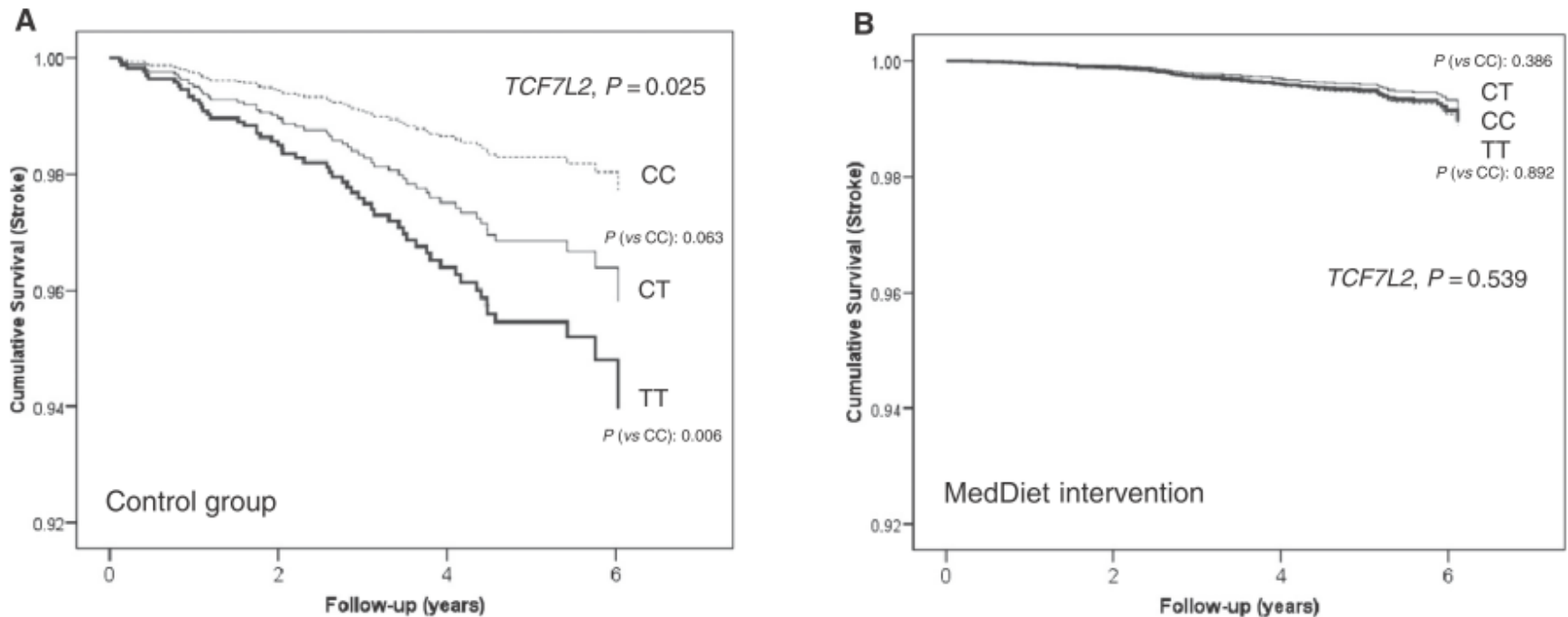


Figure 1—Cumulative stroke free-survival by TCF7L2-rs7903146 genotypes in the control group (A) (n = 2,291) and in the MedDiet intervention groups (B) (n = 4,827). Cox regression models with outcome of stroke and the TCF7L2-rs7903146 polymorphism (CC, CT and TT) adjusted by sex, age, center, type 2 diabetes, BMI, intervention group, alcohol, smoking, total energy intake, and adherence to the MedDiet at baseline. The P values for the TCF7L2 polymorphism and for the corresponding genotypes (CT vs. CC or TT vs. CC) were obtained in the multivariable adjusted models.

ORIGINAL RESEARCH ARTICLE

2018

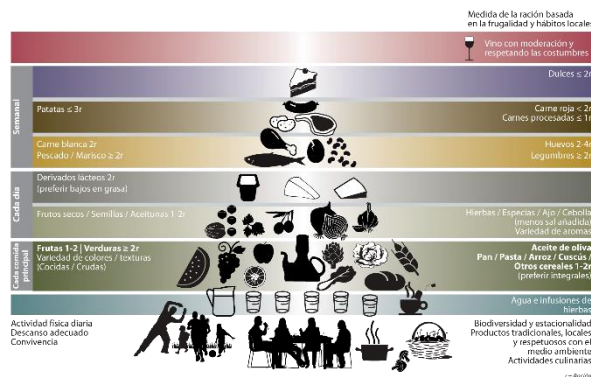
Impact of Healthy Lifestyle Factors on Life Expectancies in the US Population

123,219 persons followed-up 35 y.

BODY MASS INDEX (BMI)
18.5-22.9 m²



No Smoking
No fomer smokers



Helathy Dietary Patterns



≥ 6 h/week

Consumo de alcohol moderado
5-14,9 g/day

LIFE EXPETANCY AT 50 YEARS-OLD DEPENDING TO ADHERENCE TO THIS 5 ITEMS

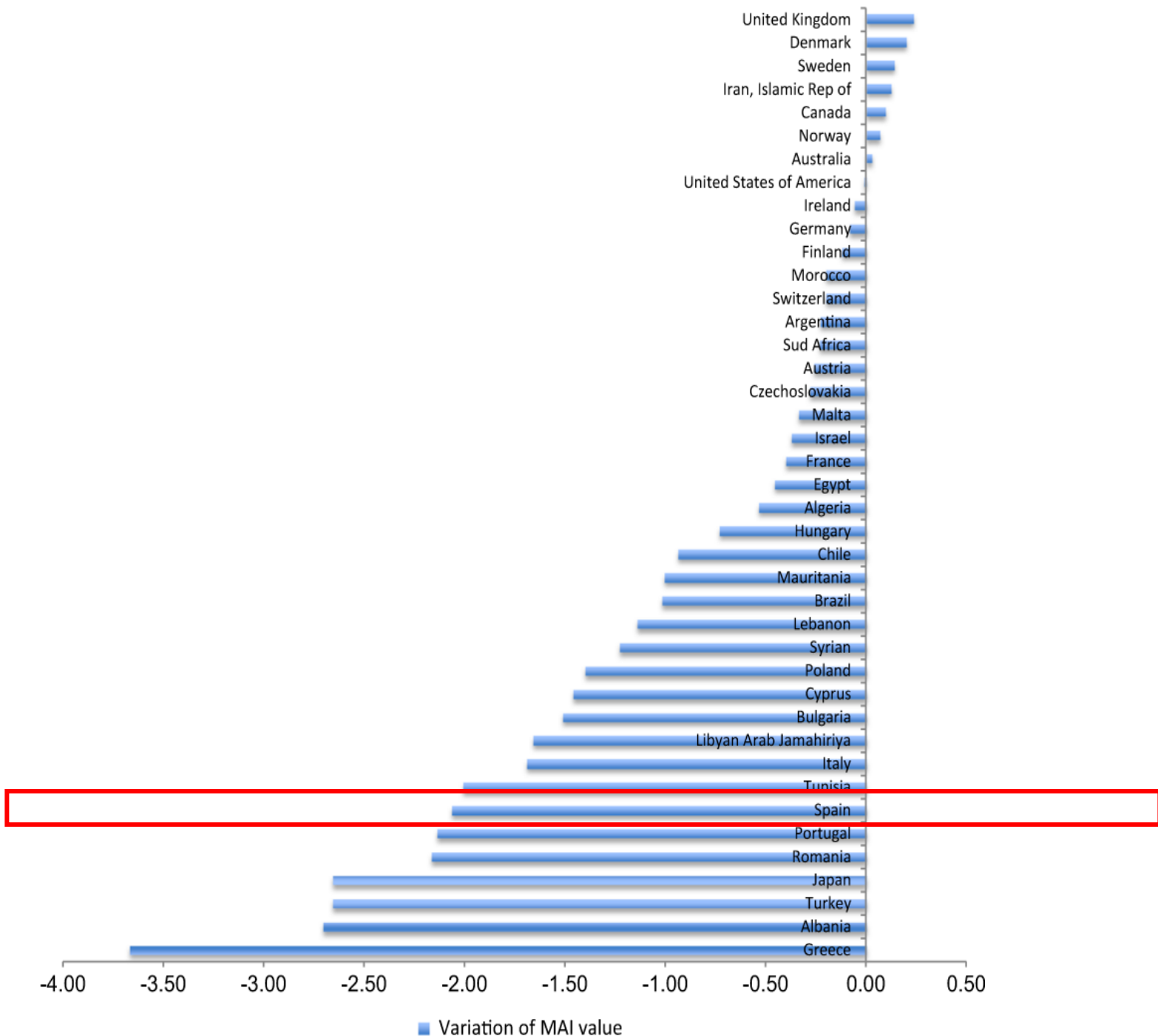
NONE

- Women: + 29.0 years
- Men: + 25.5 years

ALL 5 ITEMS

- Women: + 43.1 years
- Men: + 37.6 years

MAI variation between 1961-1965 and 2004-2011



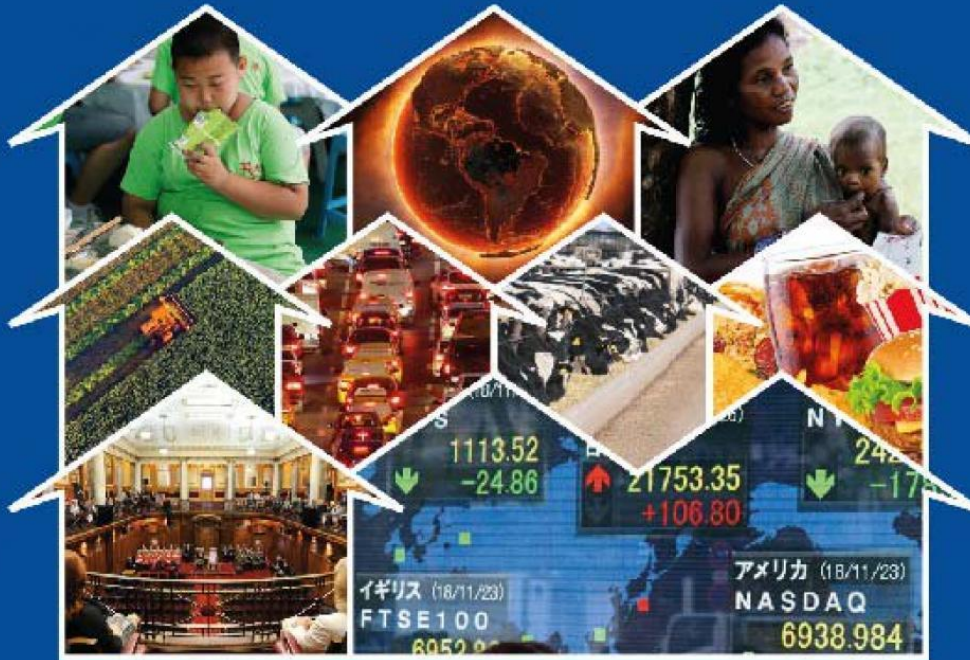
INTERVENCIÓN NUTRICIONAL

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SINDEMIA GLOBAL DE OBESIDAD, MALNUTRICIÓN Y CALENTAMIENTO GLOBAL



“The Global Syndemic represents the paramount health challenge for humans, the environment, and our planet in the 21st century.”

The Global Syndemic of Obesity, Undernutrition and Climate Change

DEBERÍA IMPORTAR TANTO LA CALIDAD NUTRICIONAL COMO EL IMPACTO AMBIENTAL AL DISEÑAR UNA DIETA

- **Calidad de la Dieta:** No todas las calorías son iguales
 - La caloría es una unidad de medida, no de calidad
 - Si consumes más calorías aumentas de peso
 - Nuestro cuerpo metaboliza diferentes tipos de calorías de manera diferente, por lo que enfocarse en la calidad de las calorías que servimos es clave. Un plato lleno de cereales integrales, verduras y pescado, por ejemplo, puede tener las mismas calorías que un helado. Pero lo que aporta a nuestro cuerpo es muy diferente.
- **Impacto ambiental**
 - No todos los alimentos tienen el mismo impacto ambiental. Hay que tener en cuenta cómo son cultivados o criados.
- **No separar ambos aspectos**
 - Los alimentos más saludables para nosotros (fruta, verdura, cereales integrales y legumbres) también son los más saludables para el planeta

LA PRODUCCIÓN DE CARNE ROJA IMPACTA NEGATIVAMENTE EN EL MEDIO AMBIENTE

FEED THE PLANET

Founded by **WORLDCHIEFS**
Powered by **Electrolux** and **AIESEC**

RELATIVE GREENHOUSE-GAS EMISSIONS ASSOCIATED WITH SOME COMMON PROTEIN SOURCES

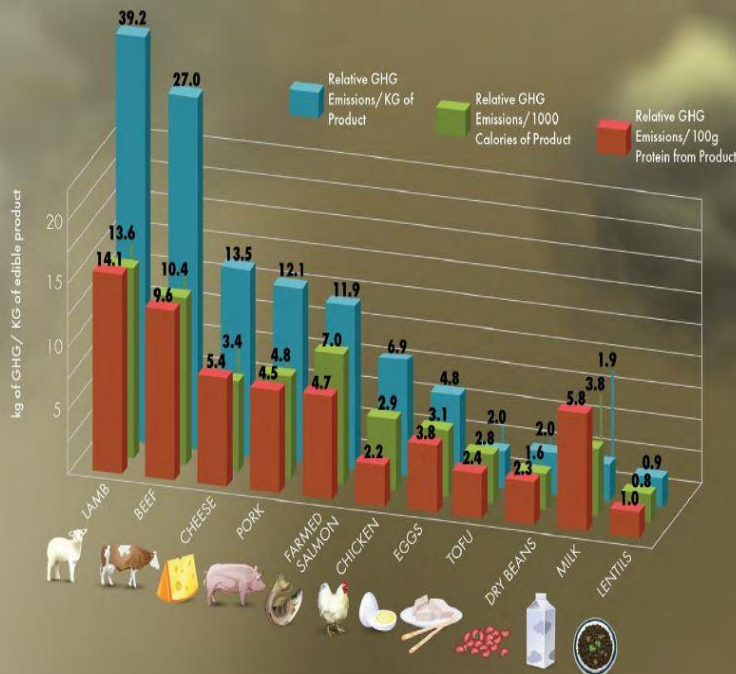
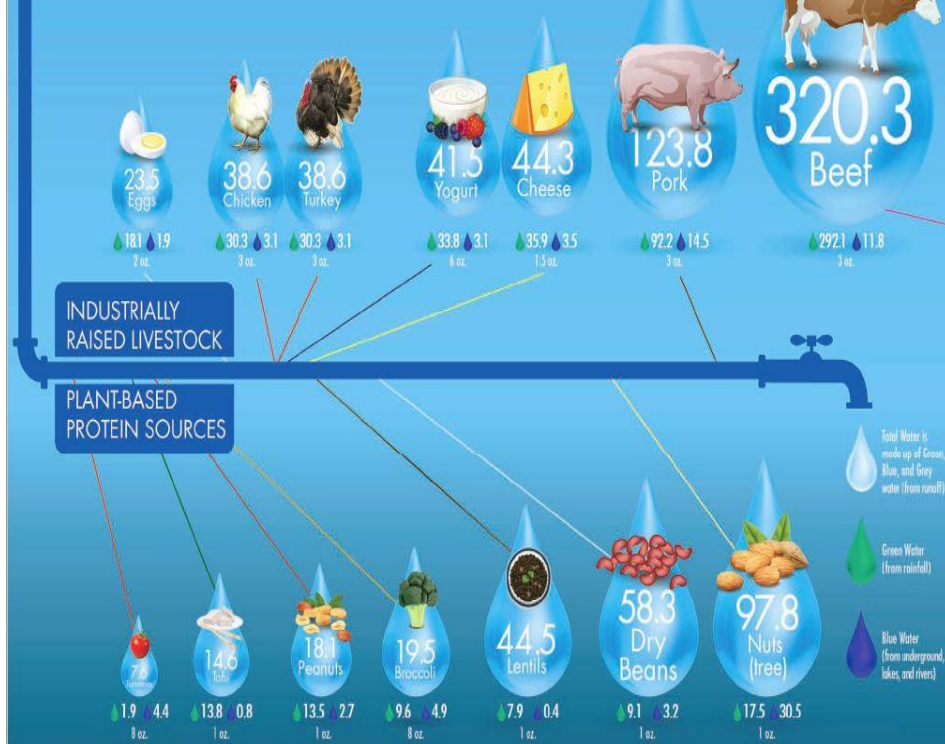


Illustration of the greenhouse-gas emissions associated with several common protein sources and is a good indicator of environmental impact including energy and chemical use, soil management, and mechanical irrigation. Both public health and the environment will improve if restaurants decrease the amount of red meat on menus and replace it with alternative protein sources.

*Calorie Reference: USDA National Nutrient Database for Standard Reference, Release 25: Energy (kcal) Content of Selected Foods per Common Measure, <https://www.ars.usda.gov/SP2UserFiles/Place/12354500/Data/SP25/nutrient/25a200.pdf>
**Protein Reference: USDA National Nutrient Database for Standard Reference, Release 25: Energy (kcal) Content of Selected Foods per Common Measure, <https://www.ars.usda.gov/SP2UserFiles/Place/12354500/Data/SP25/nutrient/25a200.pdf>

GALLONS OF WATER USED IN FOOD PRODUCTION PER SERVING




Source Data: mCarbon in Water Footprint Network Water Statistics Table (Animals, Crops) for the U.S.
Sources: T. Hartley, 2015, Changing Taste, 2016 and M.M. Mekonnen and A.Y. Hoekstra, "The Green, Blue and Grey Water Footprint of Crops and Derived Crop Products," and "The Green, Blue and Grey Water Footprint of Farm Animals and Animal Products," Value of Water Research Report Series No. 47 and 48, UNESCO-IHE, Delft, the Netherlands, 2010.

CONTENIDO DE PROTEÍNAS EN LAS PLANTAS; TENDEMOS A SOBRESTIMAR NUESTRAS NECESIDADES DE PROTEÍNAS

FEED THE
PLANET

Founded by **WORLD CHEFS**
Powered by **Electrolux** and **AIESEC**



Proteínas no es sinónimo de carne:
¡Muchos alimentos contienen proteínas!
Diga “proteína animal” cuando hablé de carne de ternera o de salmón. ¡Debemos cambiar nuestra mentalidad!

¿ Cuánta proteína necesitamos? 0,8 gramos por kilo de peso, 56 gramos para un adulto de 70-kilos (Cantidad Diaria

LAS GRASAS VEGETALES SON GENERALMENTE MÁS SALUDABLES

FATS THE GOOD THE BAD & THE UGLY



✓ GOOD

Monounsaturated & Polyunsaturated Fats

- Can lower bad cholesterol levels
- Can lower risk of heart disease & stroke
- Can provide essential fats that your body needs but can't produce itself

SOURCE

Plant-based liquid oils, nuts, seeds and fatty fish

EXAMPLES



Oils (such as canola, olive, peanut, safflower and sesame)



Avocados



Fatty Fish (such as tuna, herring, lake trout, mackerel, salmon and sardines)



Nuts & Seeds (such as flaxseed, sunflower seeds and walnuts)

✗ BAD

Saturated Fats

- Can raise bad cholesterol levels
- Can lower good cholesterol levels
- Can increase risk of heart disease & stroke

SOURCE

Most saturated fats come from animal sources, including meat and dairy, and from tropical oils

EXAMPLES



Beef, Pork & Chicken Fat



Butter



Cheese (such as whole milk cheese)



Tropical Oils (such as coconut, palm kernel and palm oils)

✗ UGLY

Hydrogenated Oils & Trans Fats

- Can raise bad cholesterol levels
- Can lower good cholesterol levels
- Can increase risk of heart disease & stroke
- Can increase risk of type 2 diabetes

SOURCE

Processed foods made with partially hydrogenated oils

EXAMPLES



Partially Hydrogenated Oils



Some Baked Goods



Fried Foods



Stick of Margarine

American Heart Association Recommendation

Eat a diet that:

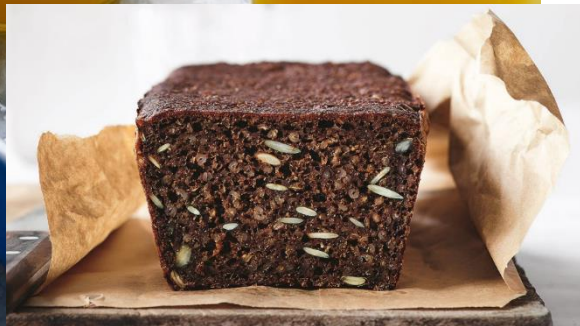
Includes GOOD FATS (nuts, seeds, fatty fish, non tropical oils)

Limits saturated fats to no more than **5-6%** of calories

Keeps trans fats as **LOW** as possible

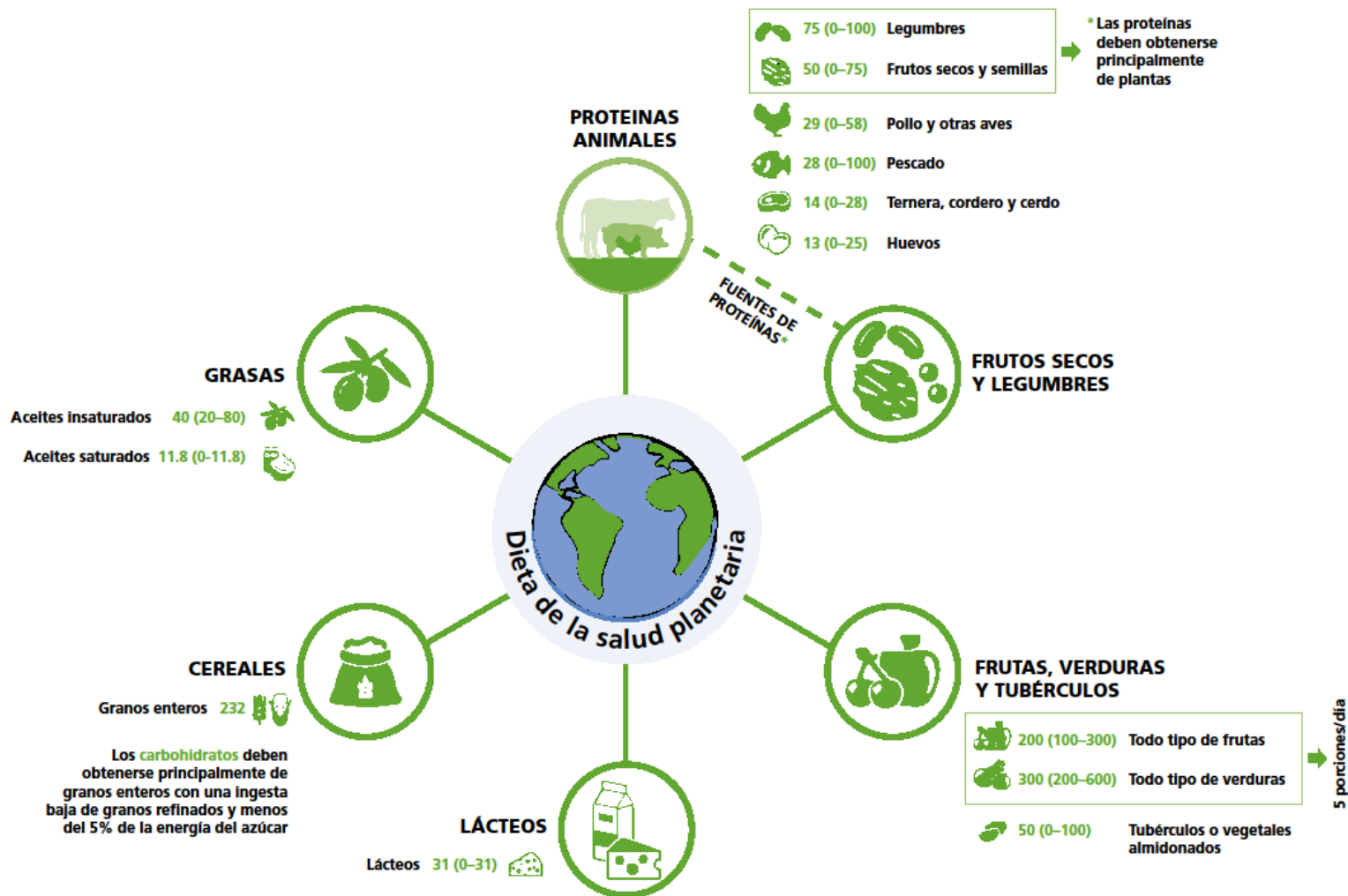
For more information, go to heart.org/fats

CARBOHIDRATOS DE ALTA CALIDAD Y MENOS AZÚCARES SON LAS MEJORES OPCIONES



- CALIDAD de los carbohidratos
- Focalizarse en cereales integrales e ingredientes mínimamente procesados
- Evitar bebidas azucaradas; beber agua o aguas aromatizadas con fruta y/hierbas frescas; té o café fríos o calientes, e infusiones.
- Cambie los postres tradicionales aumentando la proporción de fruta ; por ejemplo, una porción de tarta de queso con más fruta que tarta

DIETA PLANETARIA




Ingesta de macronutrientes gramos por día (rango posible)

PLANT-BASED OR PLANT-FORWARD DIETS



PARA MINIMIZAR EL EFECTO DE LA ALIMENTACIÓN SOBRE EL SISTEMA PLANETARIO DEBERÍA REDUCIRSE EL CONSUMO MUNDIAL DE CARNE Y PESCADO EN MÁS DE UN 50% Y EL CONSUMO DE FRUTA, VERDURA, FRUTOS SECOS Y LEGUMBRES APROXIMARSE AL 100%.


PLANT- BASED AND PLANT-FORWARD DIETS




WHAT'S IN A NAME?

FLEXITARIAN

Dietary patterns that are more focused on plant-sourced foods and much less reliant on meat—often following, for some or many meals, a vegetarian model—but that may occasionally include meat, as well as some poultry, fish, or dairy foods. Such plant-forward menus or food choices might also be called “plant-rich” or “more plant-based.”


MENUS  CHANGE



WHAT'S IN A NAME?

VEGETARIAN

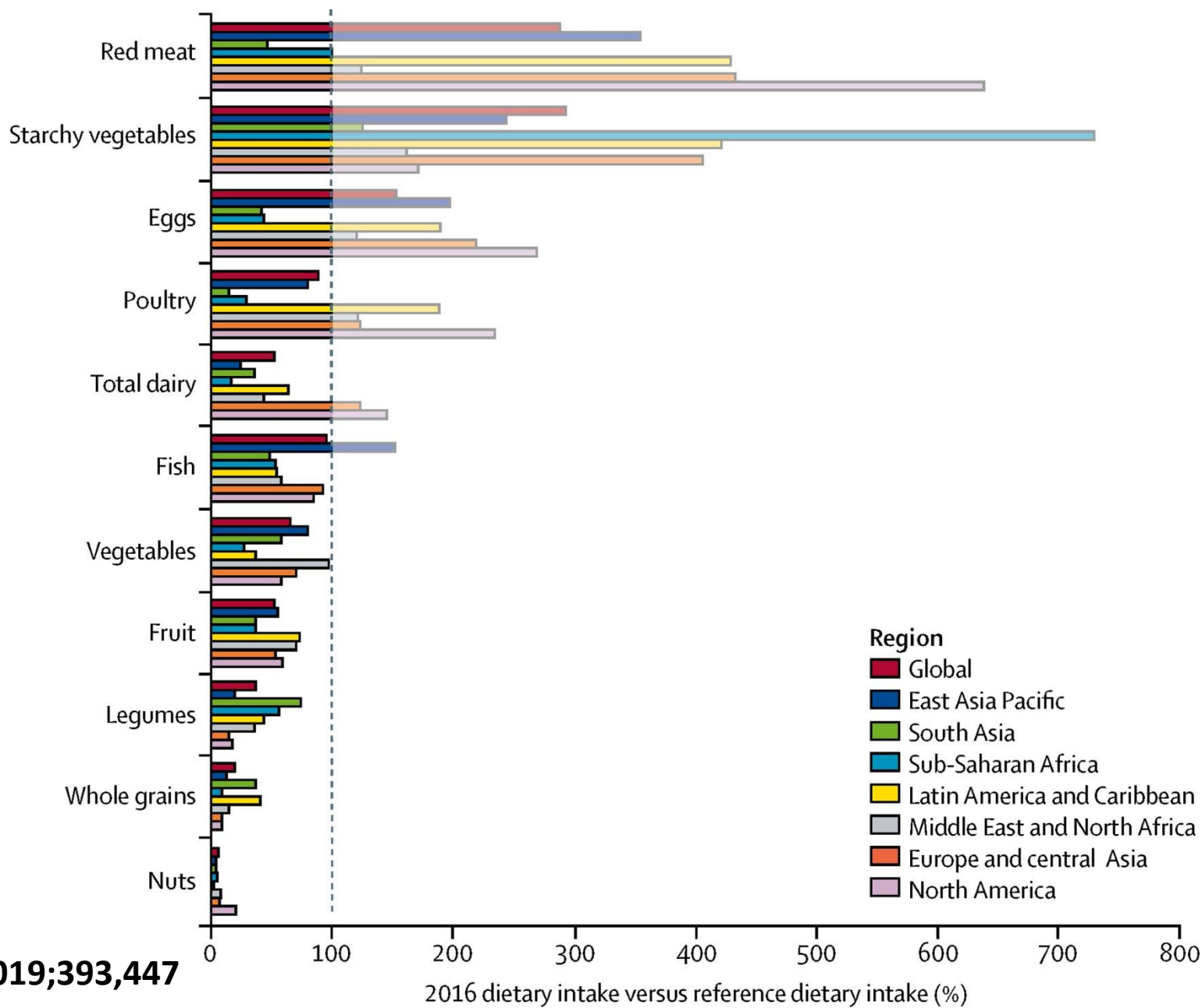
Dishes or dietary patterns that do not contain meat, poultry, or fish but may, or may not, contain dairy, eggs, and/or honey, and individuals who do not eat meat, poultry, or fish but may, or may not, eat dairy, eggs, and/or honey.

MENUS  CHANGE

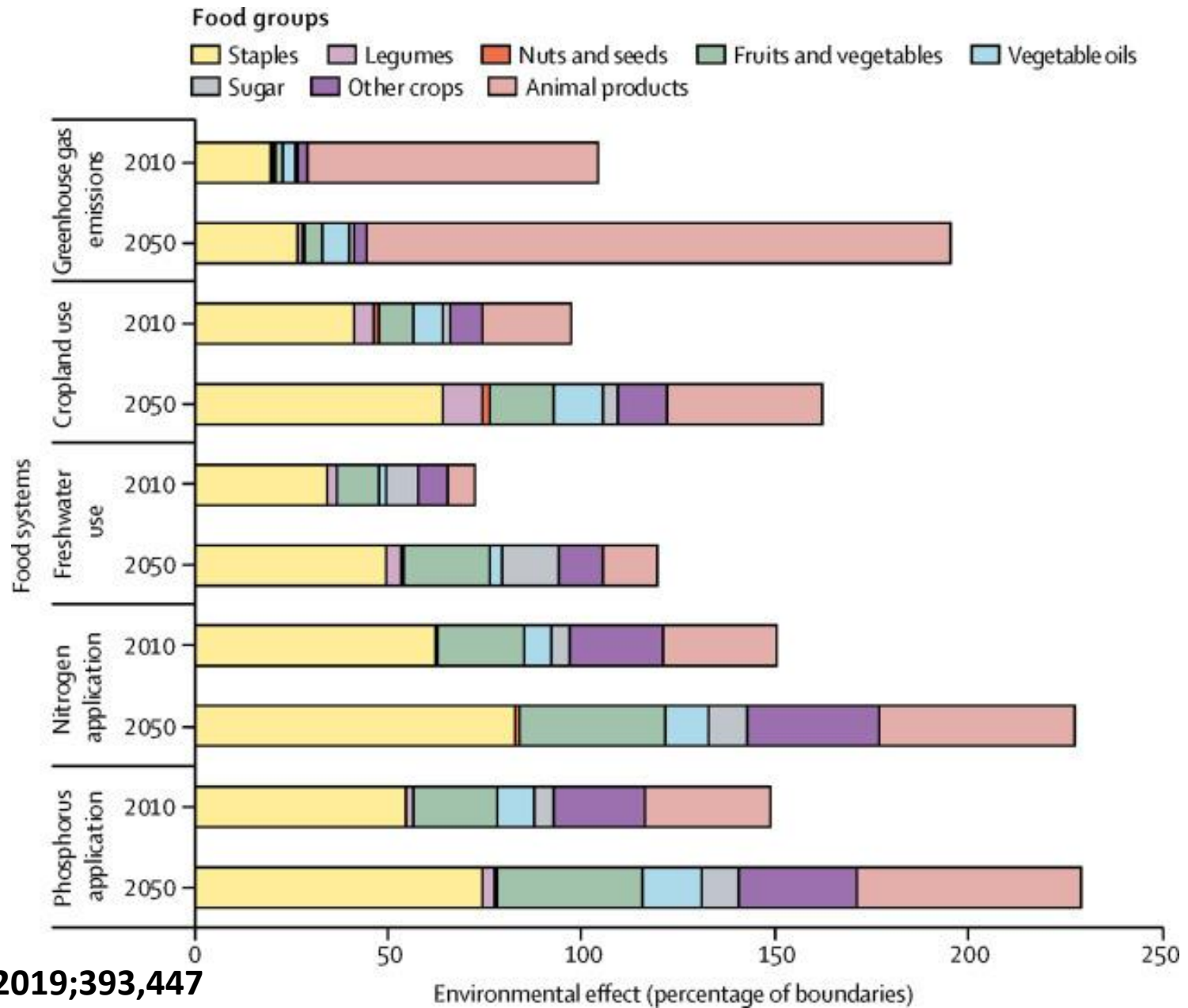
FEED THE
PLANET

Founded by **WORLD CHEFS**
Powered by **Electrolux** and **AIESEC**

DIETARY PATTERNS IN 2016 & REF. DIET INTAKES



ENVIRONMENTAL EFFECTS IN 2010 & 2050



CONCLUSIÓN

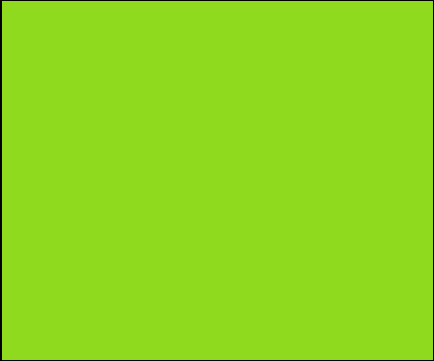
- La **nutrición personalizada** adaptada a las características y comportamientos individuales resulta prometedora, pero todavía son necesarios más estudios antes de poder implementarse de forma general.
- La Dieta Mediterránea es la mejor estrategia de **nutrición poblacional** para prevenir la enfermedad cardiovascular, diabetes, enfermedades neurodegenerativas y cáncer.
- Para preservar la **salud del planeta**, es preciso tener en cuenta tanto la calidad de la nutrición poblacional como el impacto medio-ambiental de los alimentos cultivados o criados.
- La mejor nutrición personal suele ser la mejor nutrición poblacional y también la mejor nutrición para el planeta.

CONCLUSIÓN



COMER BIEN ES BUENO PARA TI Y TAMBIÉN PARA EL PLANETA





LOS OLIVOS – Vicent van GOGH - MOMA – NEW YORK

Gracias por su atención