

SWEETNESS: THE EVOLUTION OF PERCEPTION

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An aerial photograph of the Burj Khalifa and the surrounding Dubai skyline at sunset. The Burj Khalifa is the central focus, towering above other skyscrapers. The sky is a mix of blue and pinkish-purple, with scattered clouds. In the foreground, there are several large, circular, tiered structures, likely part of a park or public space. A body of water is visible in the lower left corner, reflecting the sky. The overall scene is a vibrant and modern urban landscape.

BURJ KHALIFA FROM A DIFFERENT PERSPECTIVE

BUT WHY

Healthy Innovation Conference Dubai - My True Inspiration

FEBRUARY 2024

- A conference that gathered more than 40 international professionals from all over the world, to discuss challenges and solutions about future of food.
- Sessions about food security and how important are alternative proteins in this aspect.
- Food as a humanitarian mission to provide all humanity tasty, affordable and healthy foods, produced in harmony with nature



01

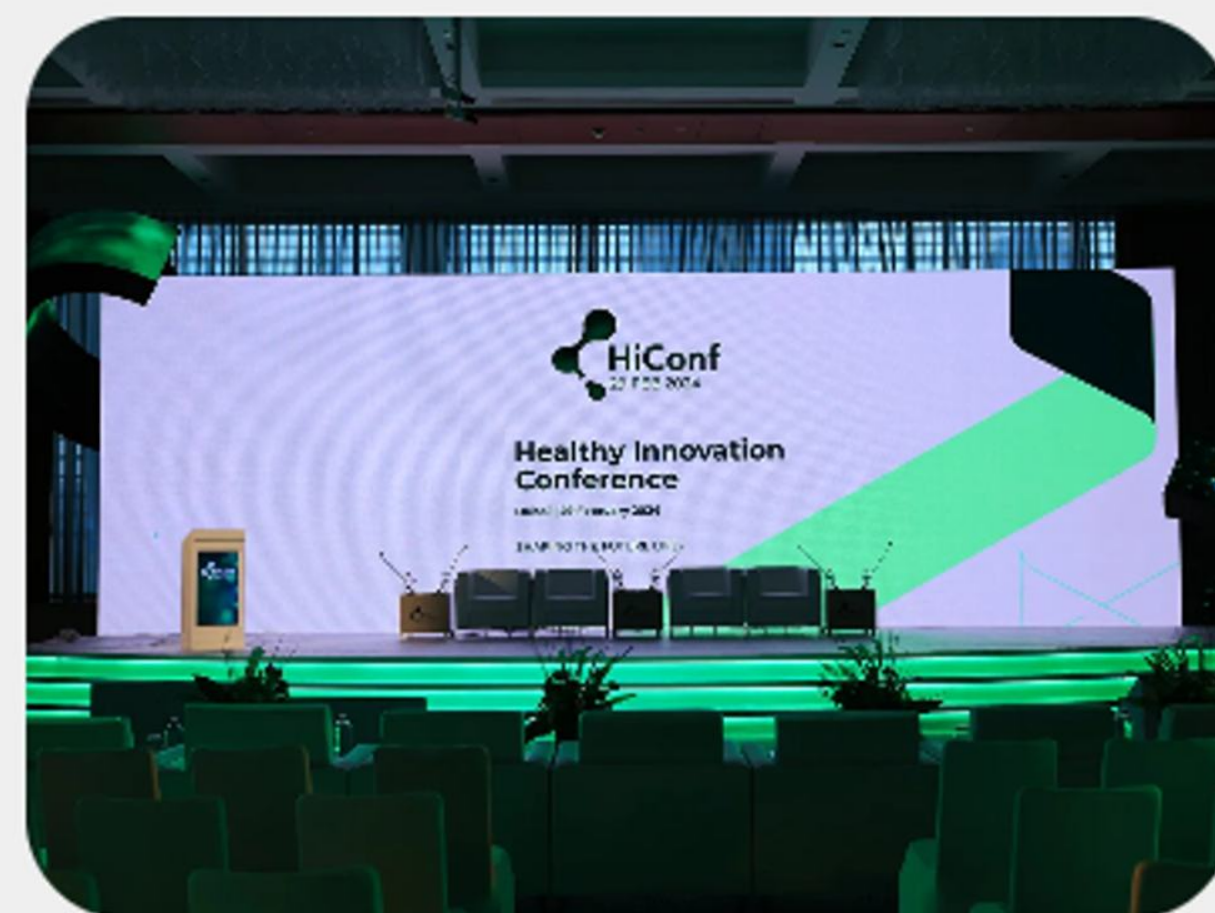
The world cannot decarbonize without alternative proteins

02

The global alternative protein sector has made huge progress (35% growth between 2020 and 2022)

03

Shockingly interesting insights: If all countries adopt the nutritional dietary guidelines, 1 earth will not be enough to produce our food. We will need 4 more!



THE ANSWERS

SUGAR: A MAJOR BURDEN ON EARTH

1 ton of CO₂e represents

1,961



vegetarian
meals

138



meat-based
meals

one-way trip



from Paris to
New York by plane

192



cotton
T-shirts

4,300 kWh



electricity consumption
in Belgium

143,190 hours



usage of a 30w
LED TV

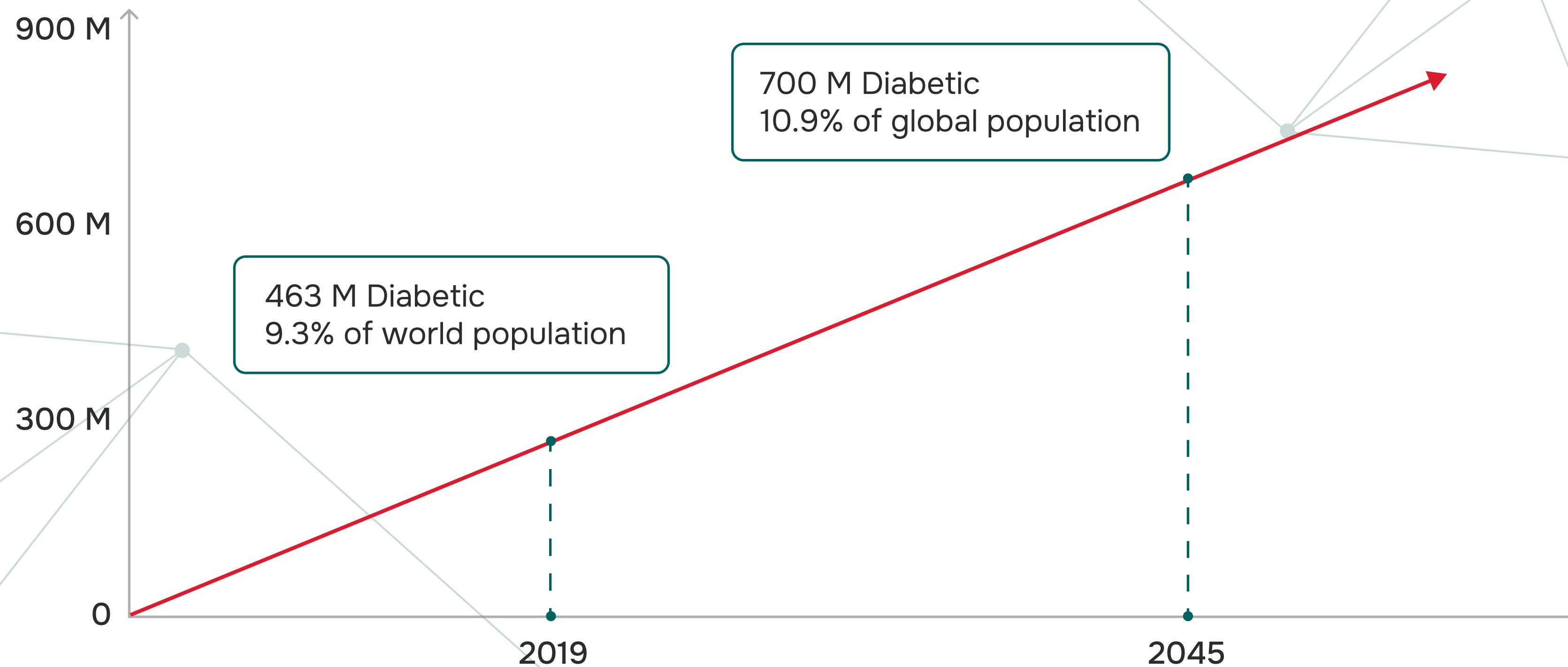


2 MT OF SUGAR PRODUCE 1 MT OF CO₂

**2 billion tons of cane
and sugar beet produced
globally every year**

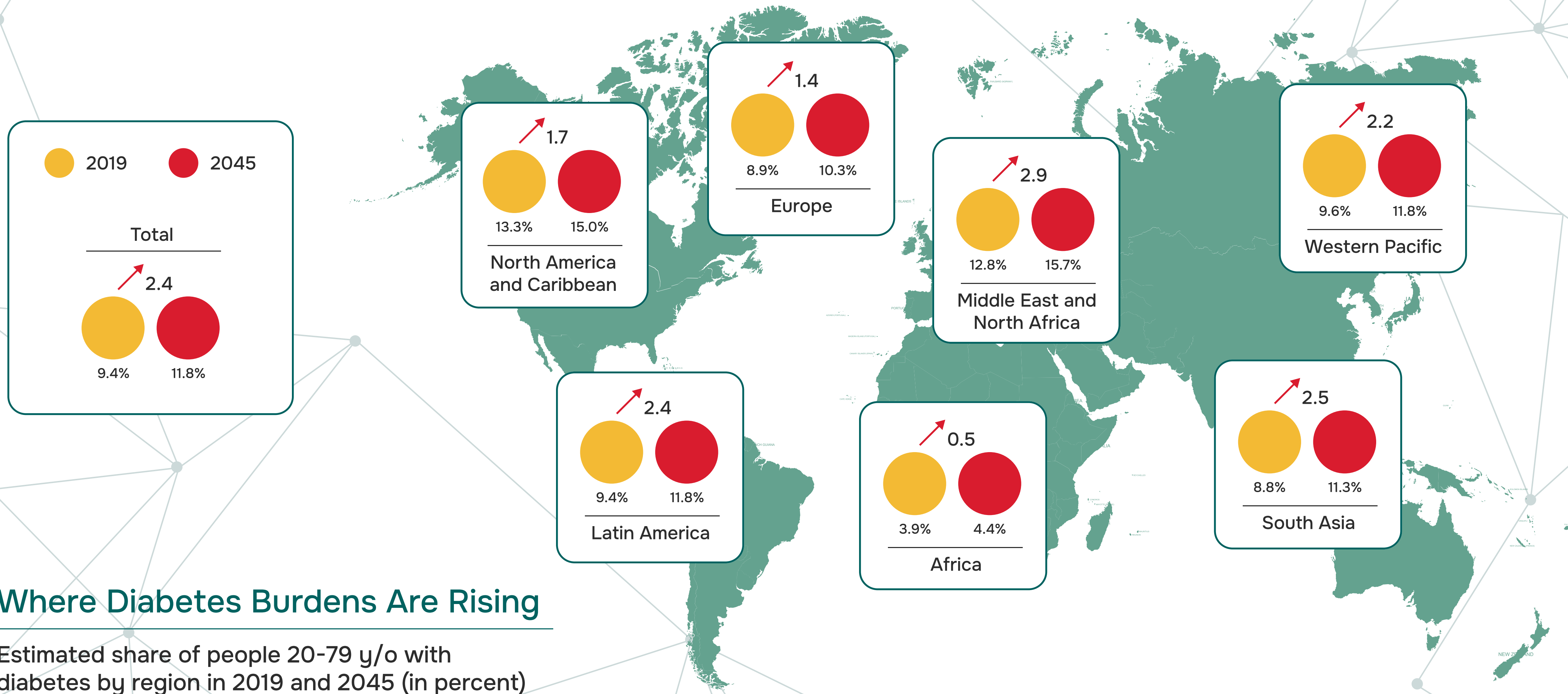
SUGAR: THE SILENT PANDEMIC

SUGAR: A MAJOR BURDEN ON HEALTH



According to the International Diabetes Federation

SUGAR: AN INTERNATIONAL HEALTH CONCERN



Where Diabetes Burdens Are Rising

Estimated share of people 20-79 y/o with diabetes by region in 2019 and 2045 (in percent)

THE HEALTH PROBLEM

17.3%

of UAE population
affected by type
2 diabetes

High diabetes
prevalence in UAE

\$2 bln

diabetes-related
healthcare expenses
in the UAE

Financial burden on
UAE health system

Top 20

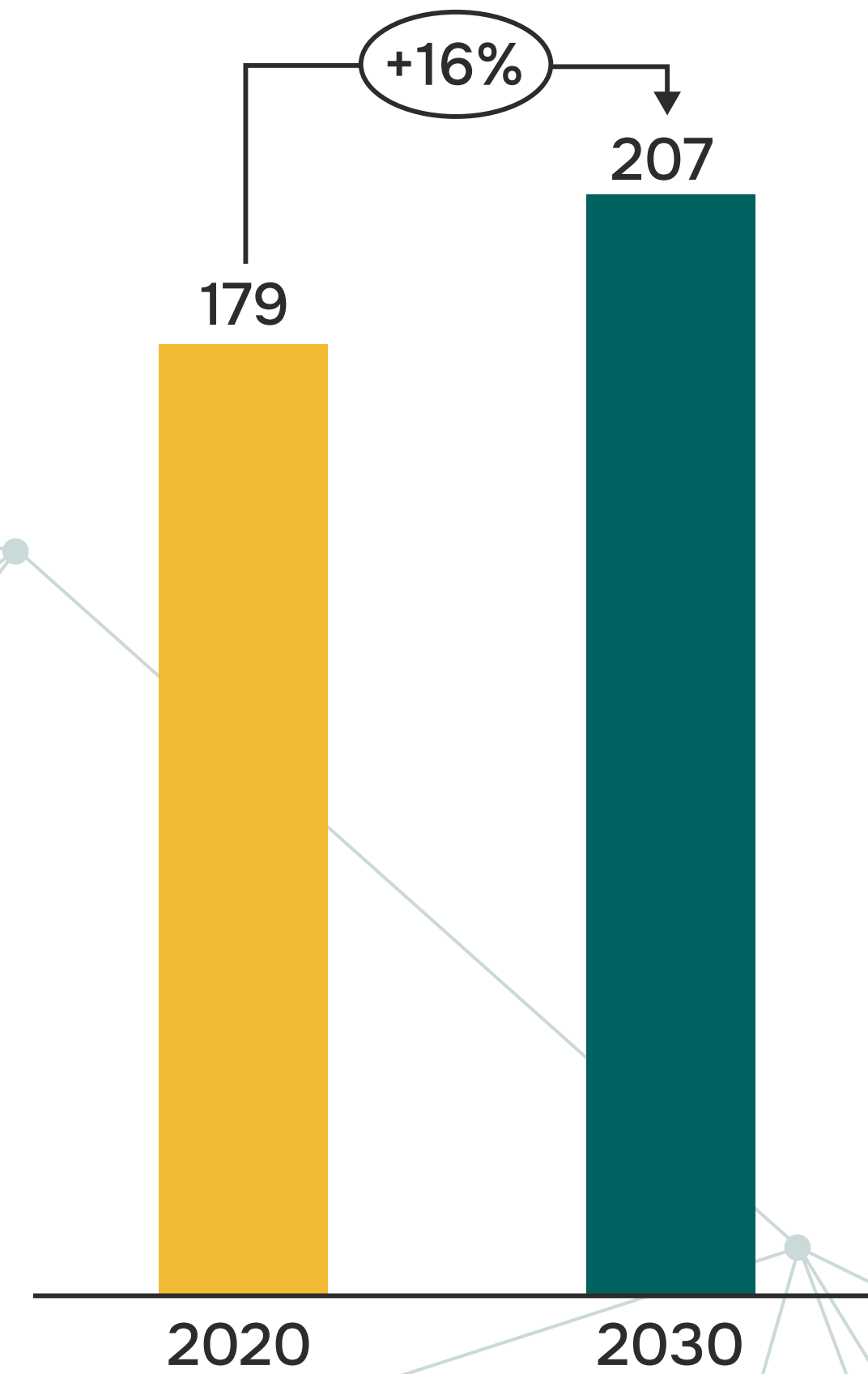
worldwide for diabetes
prevalence: Saudi
Arabia, UAE, Bahrain,
Kuwait and Qatar

Silent pandemic

SUGAR CONSUMPTION

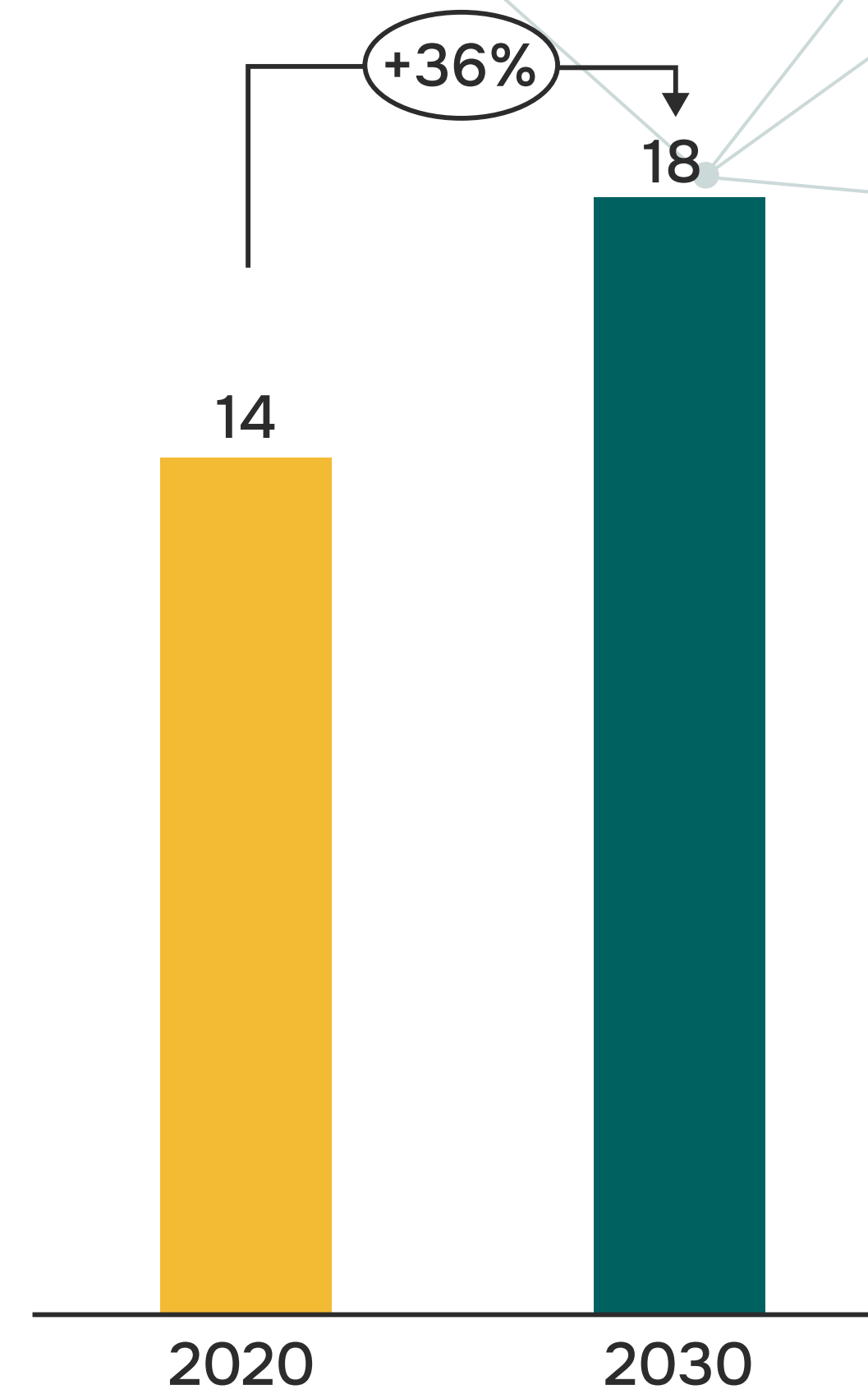
Global

(in million tons)



MENA

(in million tons)



SUGAR: A GROWING THREAT

Significant growth in global sugar consumption, with a particularly **strong increase** in the **MENA** region

Finding alternatives to replace sugar is key of effectively reducing diabetes and obesity



WE NEED TO REPLACE THE 75 NAMES OF SUGAR!



- Agave nectar
- Anhydrous dextrose
- Barbados sugar
- Barley malt
- Barley malt syrup
- Beet sugar
- Brown sugar
- Buttered syrup
- Cane juice
- Cane juice crystals
- Cane sugar
- Caramel
- Carob syrup
- Castor sugar

- Dextrin
- Dextrose
- Diastatic malt
- Diatase
- Ethyl maltol
- Evaporated cane juice
- Free-flowing brown sugars
- Fructose
- Fruit juice
- Fruit juice concentrate
- Galactose
- Glucose
- Glucose syrup solids
- Golden sugar

- Maltol
- Maltose
- Mannose
- Maple syrup
- Molasses
- Muscovado
- Nectar
- Palm sugar
- Pancake syrup
- Panela
- Panocha
- Powdered sugar
- Raw sugar
- Refiner's syrup

SWEET IMPACT



COLOUR



TEXTURE



SHELF-LIFE



MOUTHFEEL



SWEETNESS



TASTE
PERCEPTION



INDULGENCE



Sugar adds more than sweetness to cake!

Concentrated Sweeteners: usually used at minor dosages to increase the sweetness level and reflect on the overall taste profile
Aspartam, Acesulfam-K, Stevia etc

Backbone building sweeteners: play major role in texture and bulking properties in food application

- Sugar alcohols: Xylitol, Sorbitol, Maltitol, Mannitol, Erythritol etc
- Isomalt, sucralose, allulose, oligofructose, inulin etc



Good but not good enough...



COLOUR



TEXTURE



FUNCTIONALITY



SWEETNESS &
INDULGENCE



WHY CURRENT ARTIFICIAL SUGAR ALTERNATIVES ARE NOT THE SOLUTION?

Bad Taste

Artificial sweeteners have unpleasant tastes or leave a metallic aftertaste, altering the flavor of foods and drinks compared to natural sugar

Increasing appetite feeling

Studies suggest consuming sugarfree products with artificial sweeteners lead people to later consume more calories to compensate for the missing sugar substitute, potentially affecting weight

Negative impact on health

Artificial sweeteners affect blood sugar levels and insulin response, potentially impacting metabolism in the long term. Additionally, they have a negative impact on gut health by disrupting the balance of gut flora

Negative impact on health

Studies show a link between artificial sweetener consumption and mental health issues such as depression and anxiety, possibly due to their effects on neurotransmitters in the brain

Artificial Sweeteners SIDE EFFECTS

ASPARTAME

Saccharin

Sucralose

Migraines

Headaches

Dizziness

Altered taste buds

Cancer

Hypothyroidism

Breathing Problems

Lung Problems

Toxic Liver

Toxic Kidneys

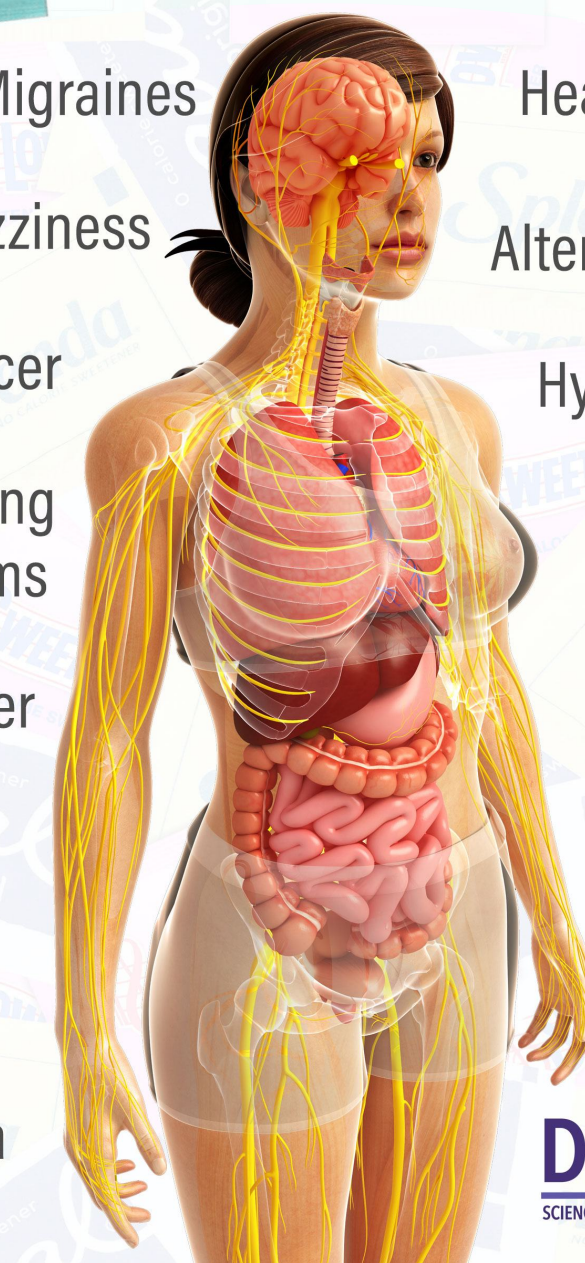
Diarrhea

Eczema

Bloating

Nerve Damage

Nausea



DR. OSBORNE
SCIENCE · FUNCTIONAL MEDICINE · COMMON SENSE · COMPASSION

The missing piece of the puzzle Sweet Proteins Brazzein

WHAT IS BRAZZEIN?



The sweet protein Brazzein naturally originates from the Oublie berry in West Africa (pentadiplandra-brazzeana)



**Challenging
to harvest**



**Not a sustainable
source**

Biotechnology precision fermentation for Brazzein production



SUSTAINABLE
& CONSISTENT



PRECISION
FERMENTATION

Importance for Global Health & Sustainability Challenges



No adverse health impact



1500 times sweeter than sugar



No habituation effect



Natural Sweet Taste



Low GI impact



Sustainable solution



pH & heat stable



A MISSION I HAVE SIGNED UP FOR...

Looking at sweetness from
a totally new, different &
unique perspective...



INNOVATING INDULGENT SUGAR FREE FOOD PRODUCTS

DEEP
FOOD
TECH
CONFERENCE 2024



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