DISCLAIMER 1

UNDANG-UNDANG REPUBLIK INDONESIA NOMOR 12 TAHUN 1997 (Pasal 14.c) tentang Hak Cipta

Bahan presentasi (data dan gambar) berasal dari interent dengan menyertakan sumber, bukan untuk tujuan komersial dan hanya untuk kalangan terbatas

EFISIENSI PROGRAM PANGAN BERBASIS BIORENIK

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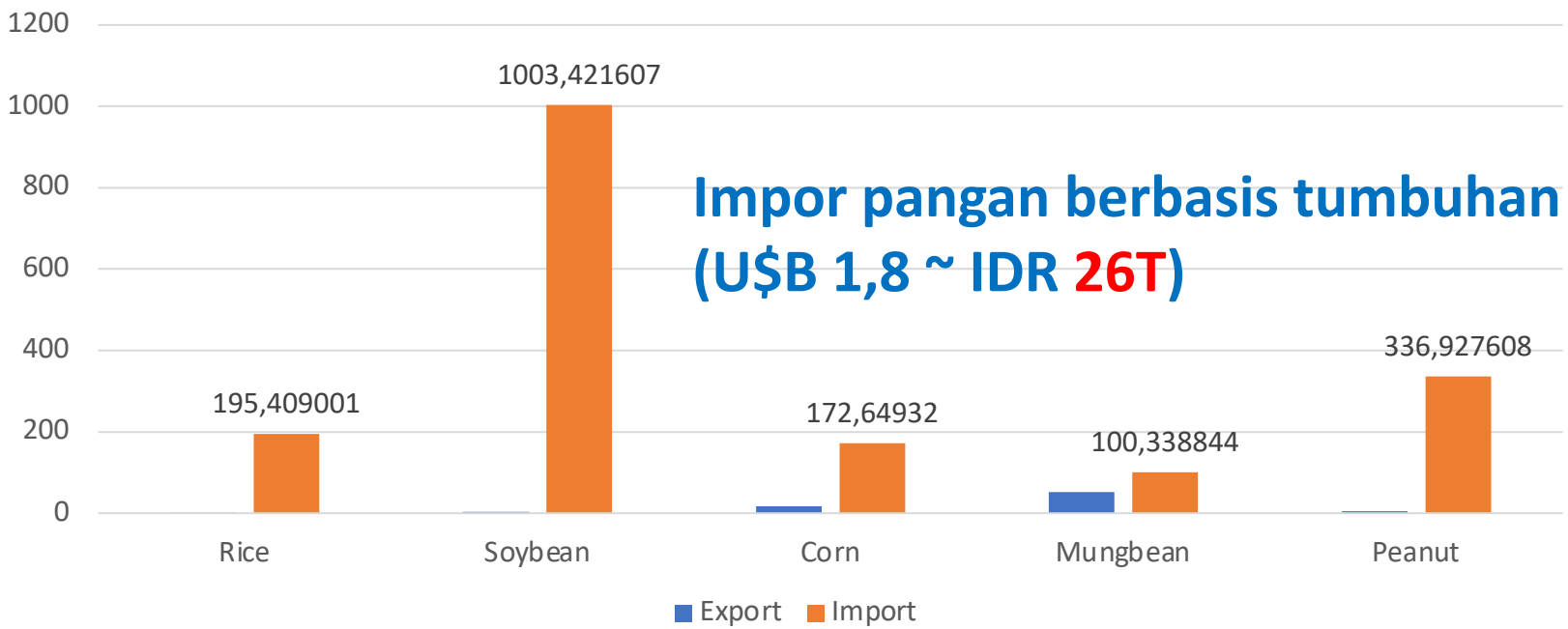
EXPORT-IMPORT FOOD INDONESIA 2020 (U$M)



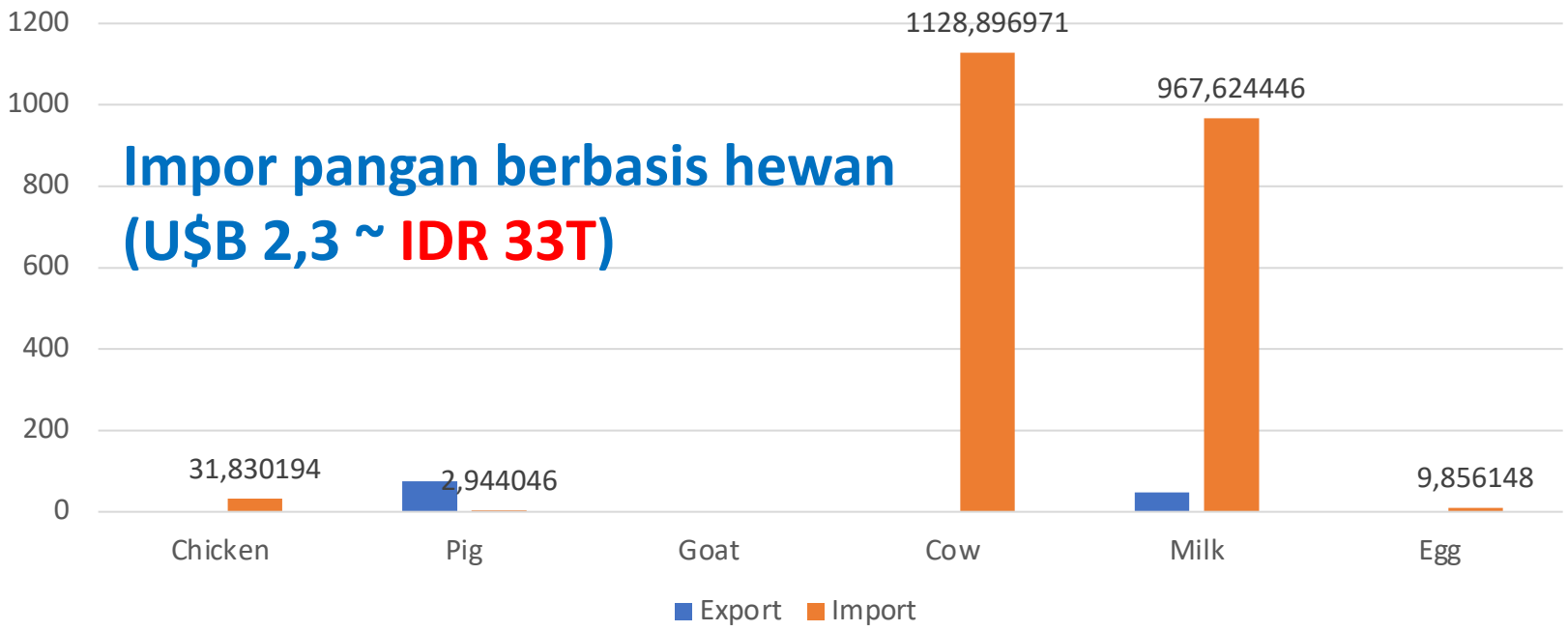
Impor pangan berbasis tumbuhan (U$B 1,8 ~ IDR 26T)

BPS Statistics Indonesia (2020)

BPS (2023) Impor beras Indonesia selama 2023 mencapai 3,06 juta ton. **(30T?)**

https://finance.detik.com/berita-ekonomi-bisnis/d-7142201/impor-beras-ri-meroket-613-di-2023-tertinggi-dalam-5-tahun.

EXPORT-IMPORT MEAT INDONESIA 2020 (U$M)



Impor pangan berbasis hewan (U$B 2,3 ~ IDR 33T)

BPS Statistics Indonesia (2020)

IRONI ?

- Geografis (luminasi penuh)
- Geologis (kaya mineral)
- Klimat (iklim tropika)
- Kultur (agraris)
- Sumber daya hayati (megabiodiversitas)

KEMENTERIAN PANGAN ?

- Pangan generator kehidupan
- Pendekatan berbasis rantai pasok pangan
- Efektivitas koordinasi hulu-hilir
- Hindari penyusutan pasca panen
- Irisan pangan-kesehatan lebih dekat

FOOD SUPPLYING UPSTREAM

- Perikanan tangkap
- Perikanan budidaya
- Pertanian
- Peternakan

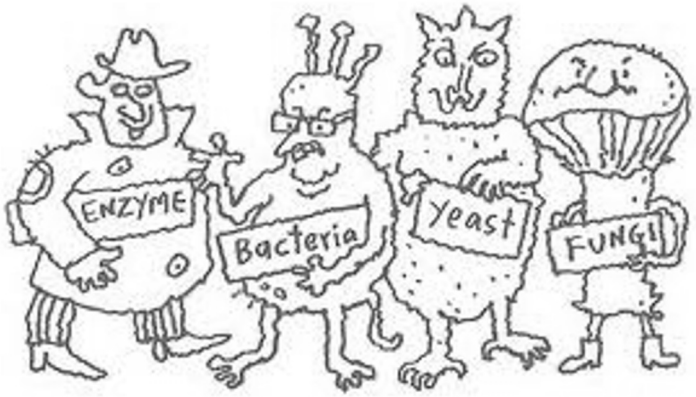
FOOD HANDLING DOWNSTREAM

- Pasca panen
- Penyimpanan
- Pengolahan
- Distribusi

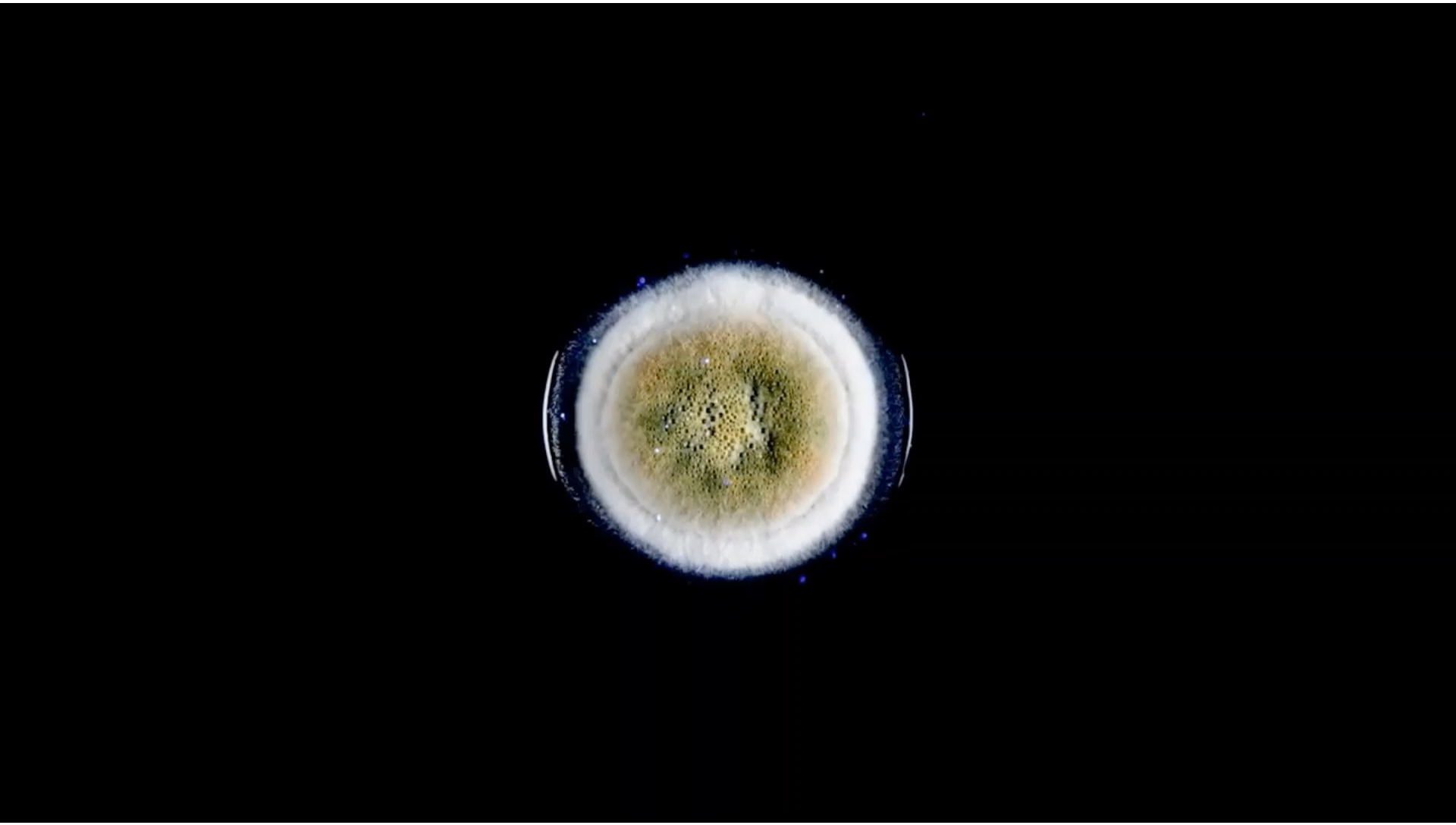
FOKUS PEMERINTAH

- Program penegakan aturan rantai pasok
- Program ketahanan pangan rakyat mandiri
- Program lumbung pangan
- Program pangan UMKM
- Program pangan BUMN

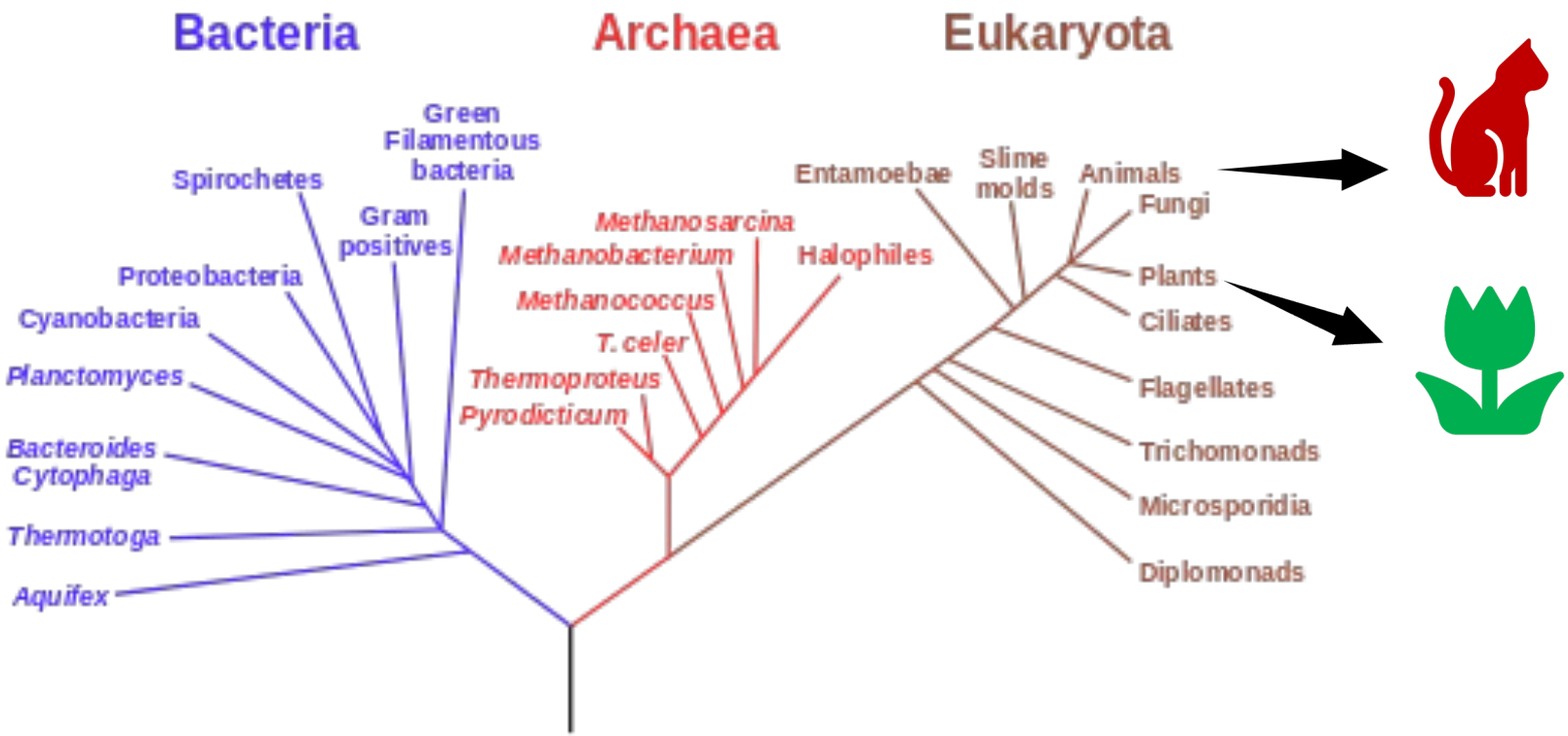
WHY MICROBIAL?



MICROBES BRING BACK LIFE AGAIN

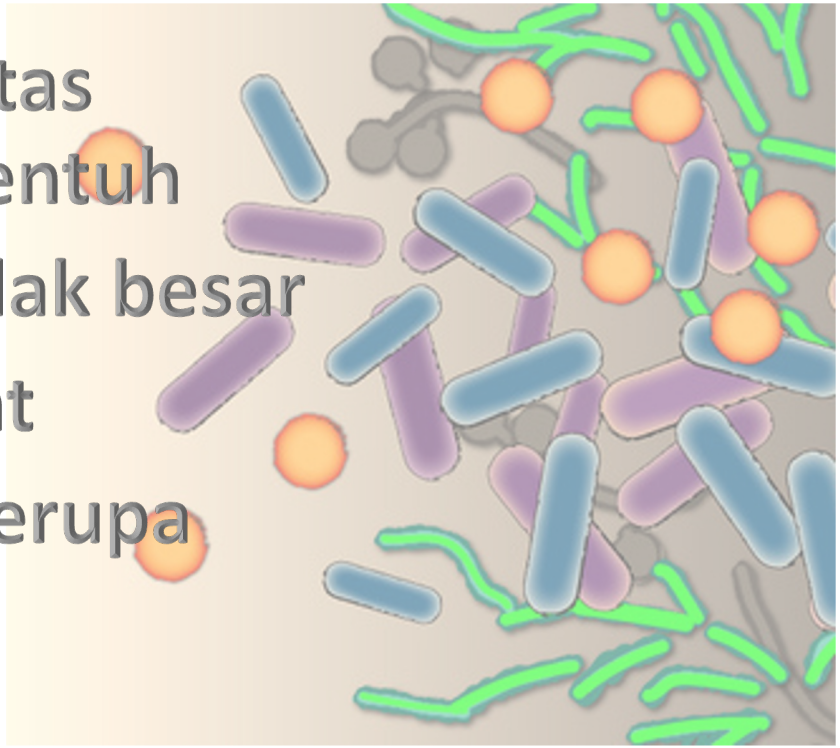


KOMPOSISI MAHLUK HIDUP



ADVANTAGES

- Banyak opsi komoditas mikroba belum tersentuh
- Kebutuhan ruang tidak besar
- Waktu proses singkat
- Bahan baku dapat berupa produk samping



http://hereboy.livejournal.com/58826.html http://www.dreamstime.com/stock-image-bacteria-time-image7082451

KEMANDIRIAN KARBOHIDRAT

SINGKONG BAHAN MIE INSTAN TANPA PROSES TEPUNG

The World's Most Consuming Instant Noodles

Updated on May 13, 2022

Rank	Country	Unit: Million Servings
2	Indonesia	13,270
3	Vietnam	8,560
7	Philippines	4,440
9	Thailand	3,630
14	Malaysia	1,580
18	Myanmar	760
22	Cambodia	410
36	Singapore	130

Estimated by World Instant Noodles Association (WINA)

seasia
GoodNews from Southeast Asia

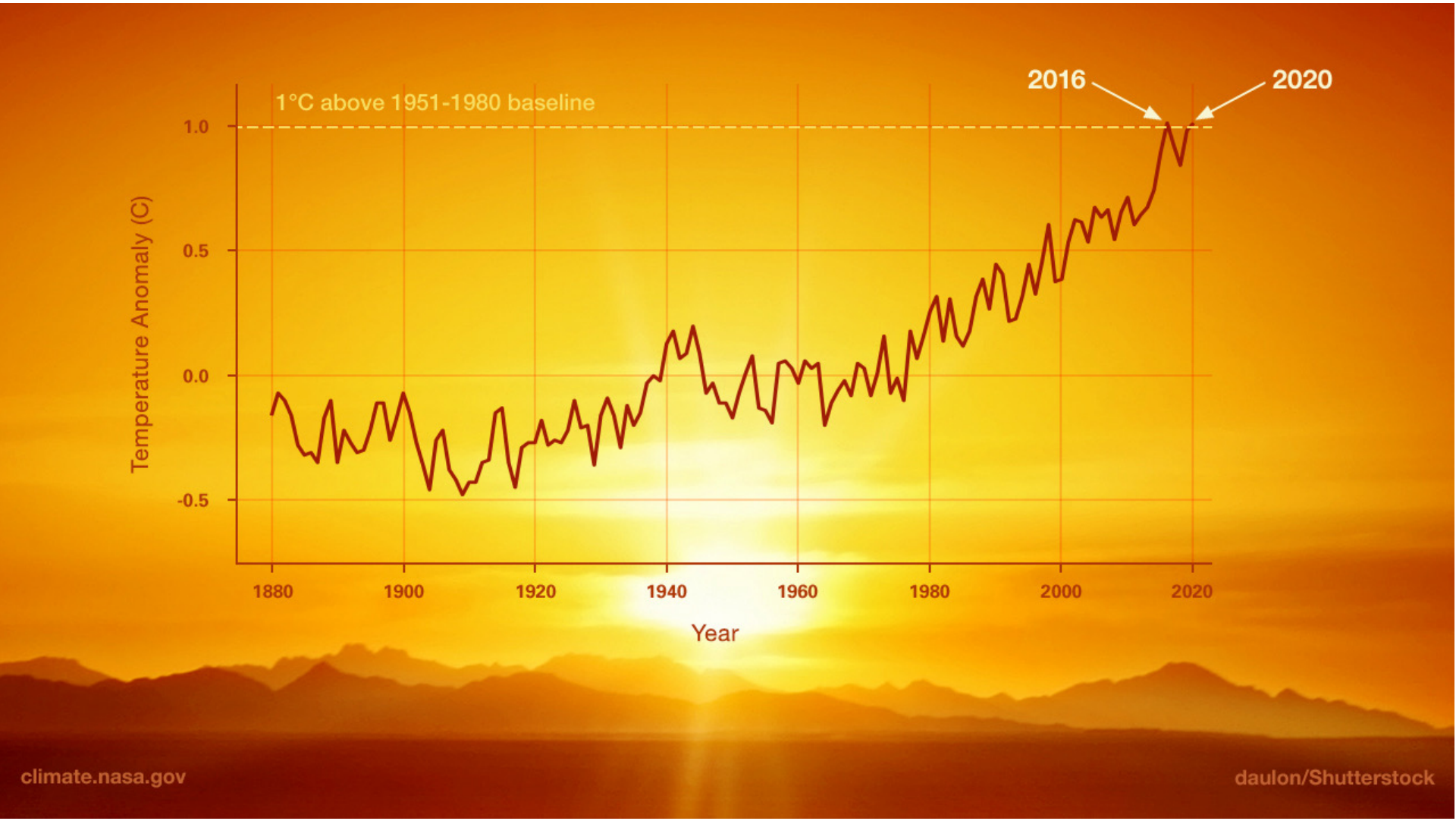
sea stats
SOUTHEAST ASIA STATISTICS

Impor Beberapa Komoditas Pangan *(juta dollar AS)* (IDR 32 T)

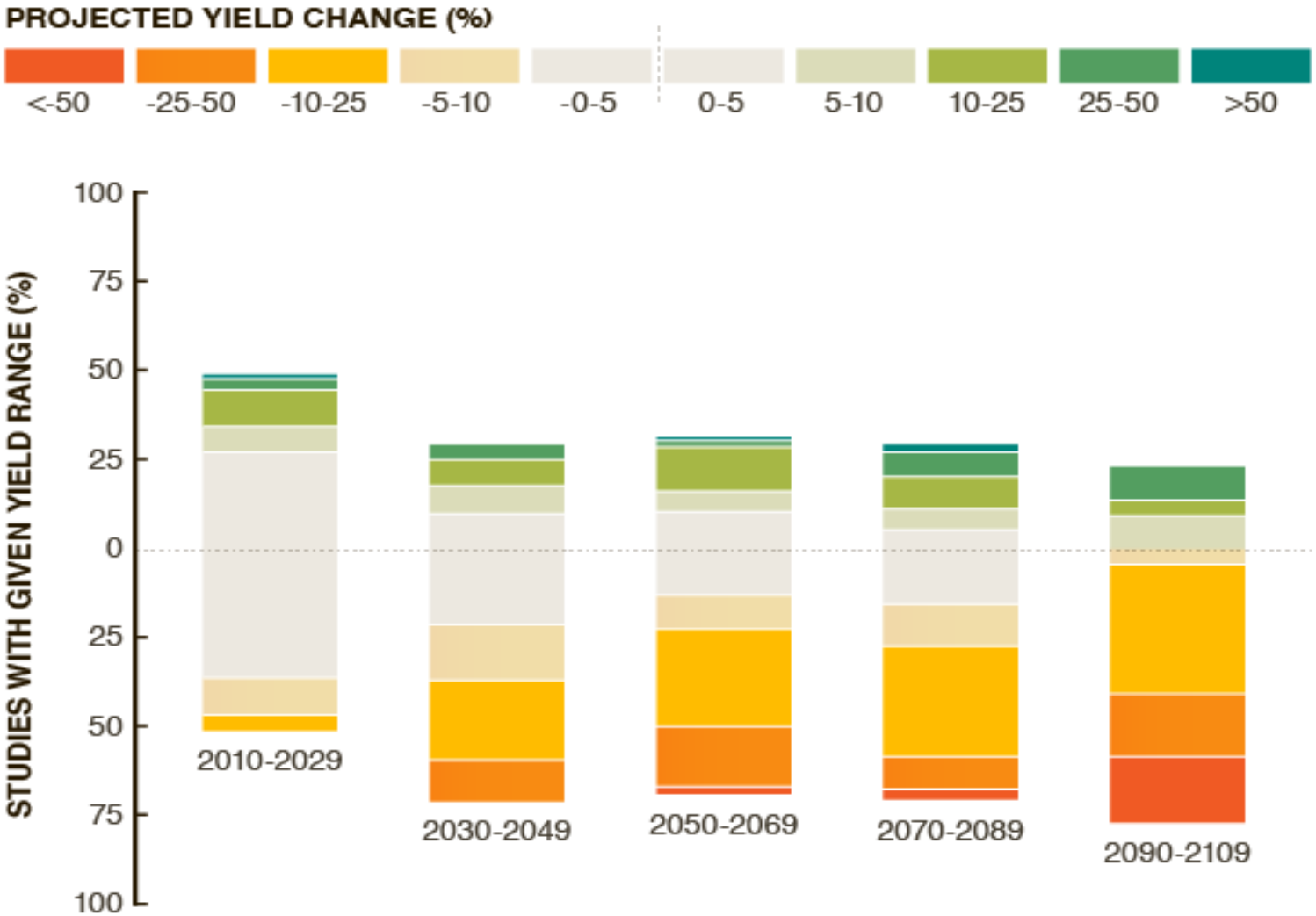
Sumber: BPS, Kemendag – Litbang KJ/and

GREEN PROTEIN TEMPE DAUN SINGKONG

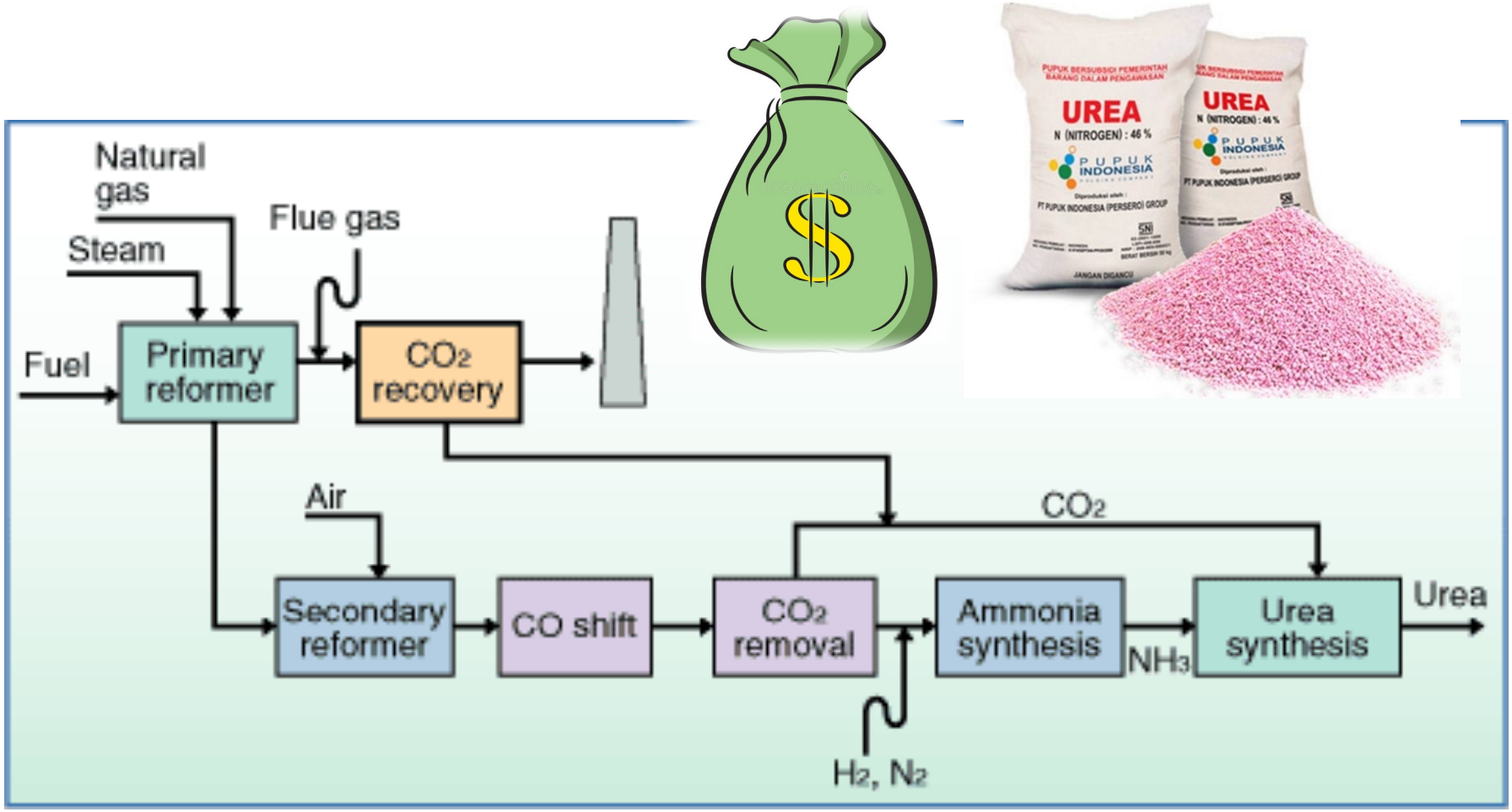
GLOBAL CLIMATE CHANGE



The majority of modeling studies agree that climate change impacts on crop yields will be negative from the 2030s onwards. Nearly half of projections beyond 2050 indicate yield **DECREASES GREATER THAN 10%.**



INTENSIF FARMING



KONSEP REDUKSI PUPUK

Tabel 7. Simulasi IP 400 padi varietas VUB Super genjah (umur 80—100 hari) pada tanah sawah berstatus rendah N, P, dan K dengan acuan pupuk standar 250 kg Urea, 100 kg SP36, dan 100 kg KCl per hektare.

Siklus Tanam ke dan Varietas	Produksi GKG (t/ha)	Hasil jerami kering ** (t/ha)	Kontribusi dan Defisit dosis Urea (kg)	Kontribusi dan Surplus dosis SP36 (kg)	Kontribusi dan Surplus dosis KCl (kg)
Siklus-1 *Batang Piaman*	*7**	*10,5*	*151,2* *(-98,8)*	*116,55* *(+16,55)*	*177,45* *(+77,45)*
Siklus-2 *Batang Lembang*	*7,80*	*11,70*	*168,48* *(-81,52)*	*129,87* *(+29,87)*	*197,73* *(+97,73)*
Siklus-3 *Pajajaran*	*8,00*	*12,00*	*172,8* *(-77,2)*	*133,2* *(+33,2)*	*202,8* *(+102,8)*
Siklus-4 *Inpari 13*	*8,00*	*12,00*	*172,8* *(-77,2)*	*133,2* *(+33,2)*	*202,8* *(+102,8)*

Keterangan:

* Pada siklus penanaman pertama, jerami diperoleh dari proses penanaman konvensional sebelumnya dengan varietas unggul super genjah.

**1 ton jerami kering diperkirakan mengandung (rata-rata) unsur N setara Urea, P setara SP36, dan K setara KCl masing-masing : 14,4; 11,1 dan 16,9 kg.

KONVERSI JERAMI OLEH MIKROBA

Tabel 8. Skema dosis pemupukan Urea, SP36 dan KCl per hektare metode IP 400 berbasis mikroba pro tani.

Jadwal	Usia (hari)	Urea (kg)	SP36 (kg)	KCl (kg)	Mikroba Pro Tani (L)*
1.	1-7	25	-	-	50
2.	10-14	25	25	25	50
3.	20-30	25	-	-	50
4.	40-50	25	-	-	50

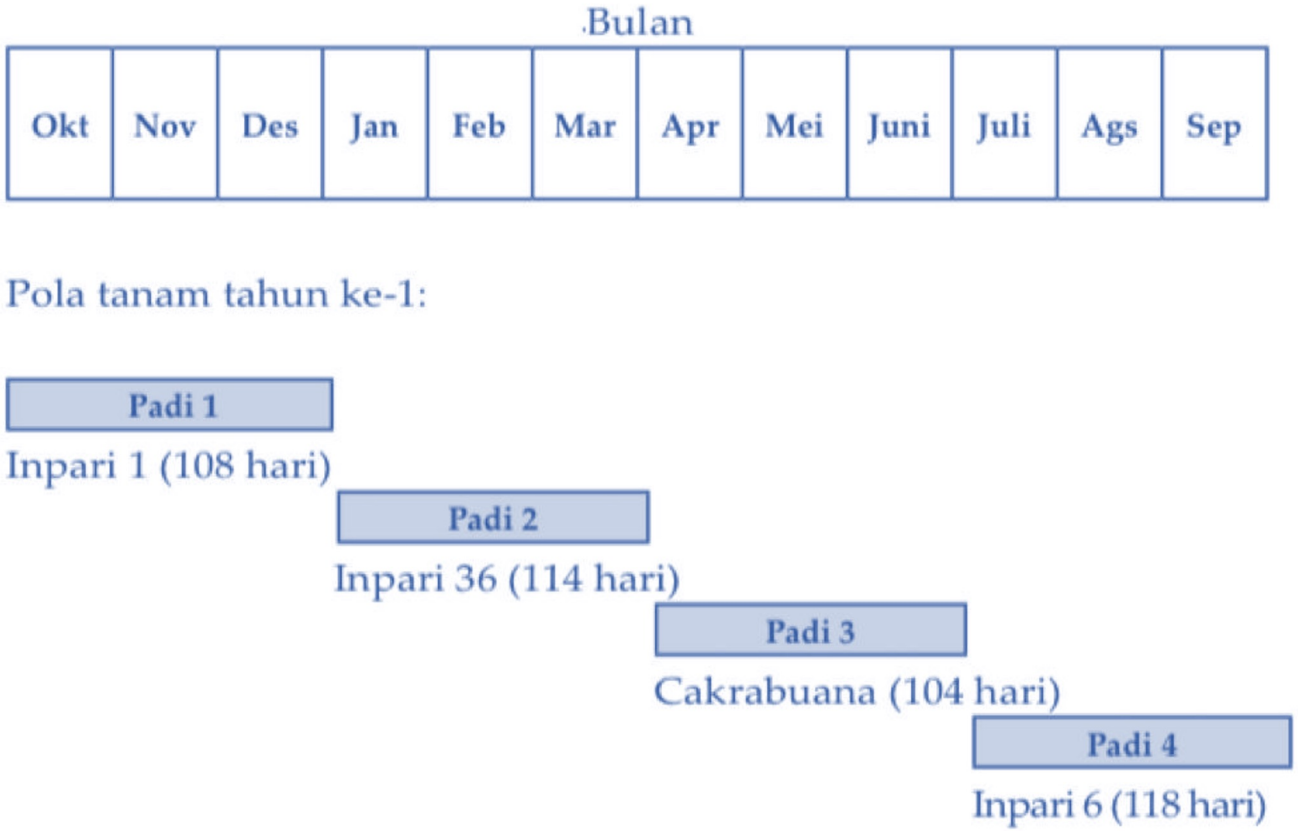
Keterangan:
* Mikroba pro tani sudah diaktifkan selama 24—48 jam.

REDUCTION OF INORGANIC FERTILIZER BY 50%

PANEN 4 SIKLUS

TERBIT JULI 2023

SKEMA PANEN 4 SIKLUS



BPS : Lahan (2023) 10,20 JHa : hasil 53,63 JT GKG (Beras 39 JT)
Kebutuhan nasional ~ 35 JT

MILKY MATURE GRAIN RICE

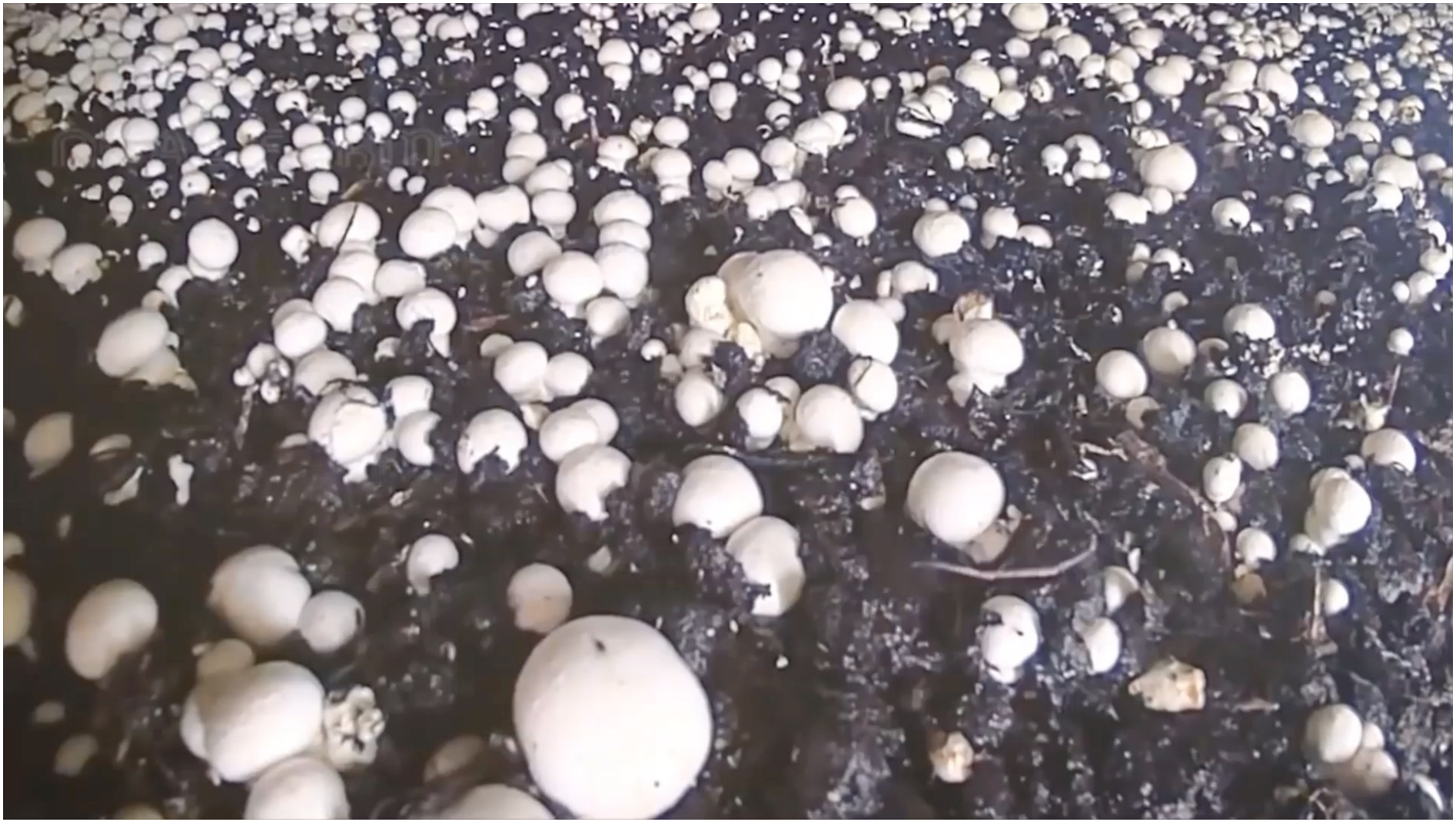
Aryantha, INP, Aos, Rijanti, Muhandini, 2019, Nutriceutical product from milky mature rice (**Patent filed** No : P00201809780)

KEMANDIRIAN PROTEIN HETEROTROF

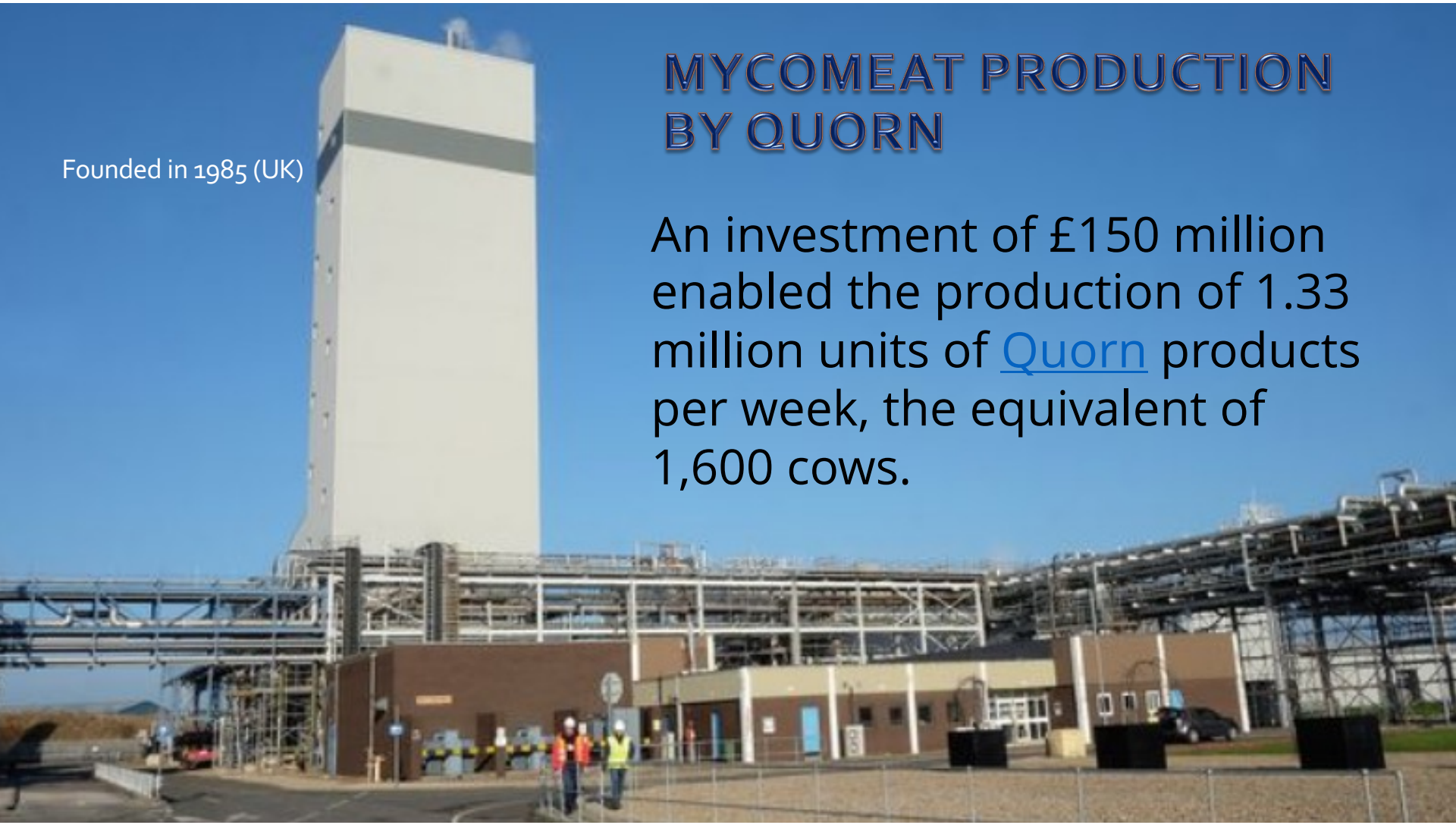
COWMEAT VS MYCOMEAT

- 7.3 ton biomass to produce 146 kg animal biomass over 6 months (efficiency 2%)

- 7.3 ton biomass (waste) can produce 3.6 of boneless mushroom biomass over 6 months (efficiency 50%)



MYCOMEAT



Founded in 1985 (UK)

MYCOMEAT PRODUCTION BY QUORN

An investment of £150 million enabled the production of 1.33 million units of Quorn products per week, the equivalent of 1,600 cows.

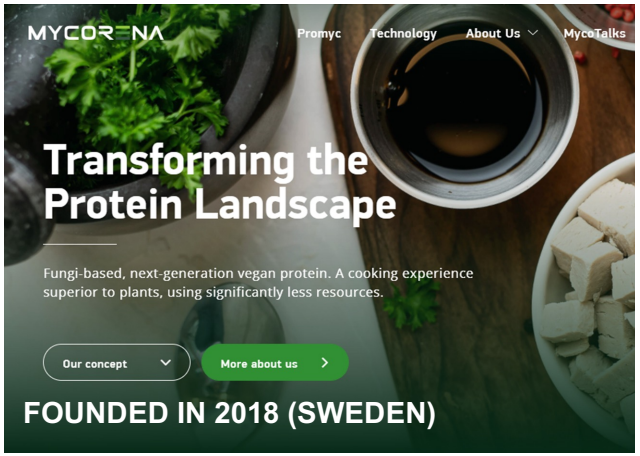
https://vegconomist.com/companies-and-portraits/quorn-reports-7-rise-in-sales-to-220m-as-it-continues-to-profit-from-greggs-sausage-roll/

How is Quorn's mycoprotein used in Quorn?

Quorn's mycoprotein is incredibly versatile and is used as an ingredient in all Quorn products, helping to create the amazing taste and texture

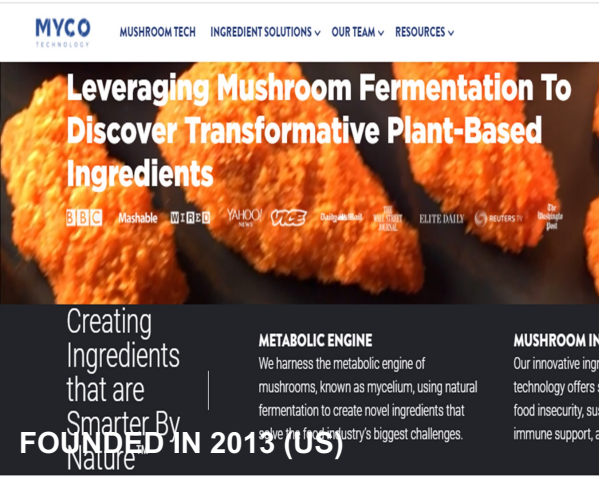
Quorn ™ Products (1)

FOUNDED IN 2015 (SCOTLAND)



FOUNDED IN 2018 (SWEDEN)

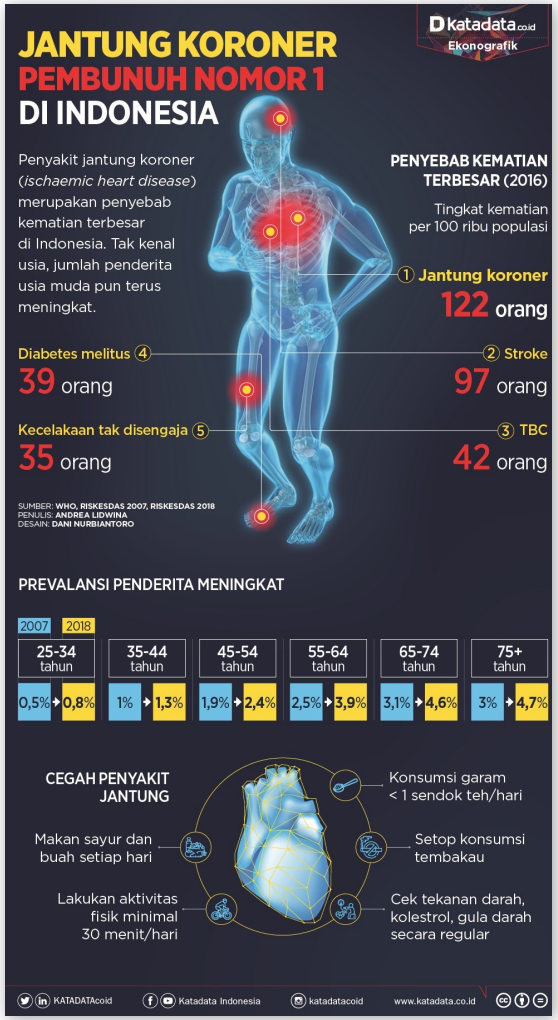
FOUNDED IN 2018 (US)

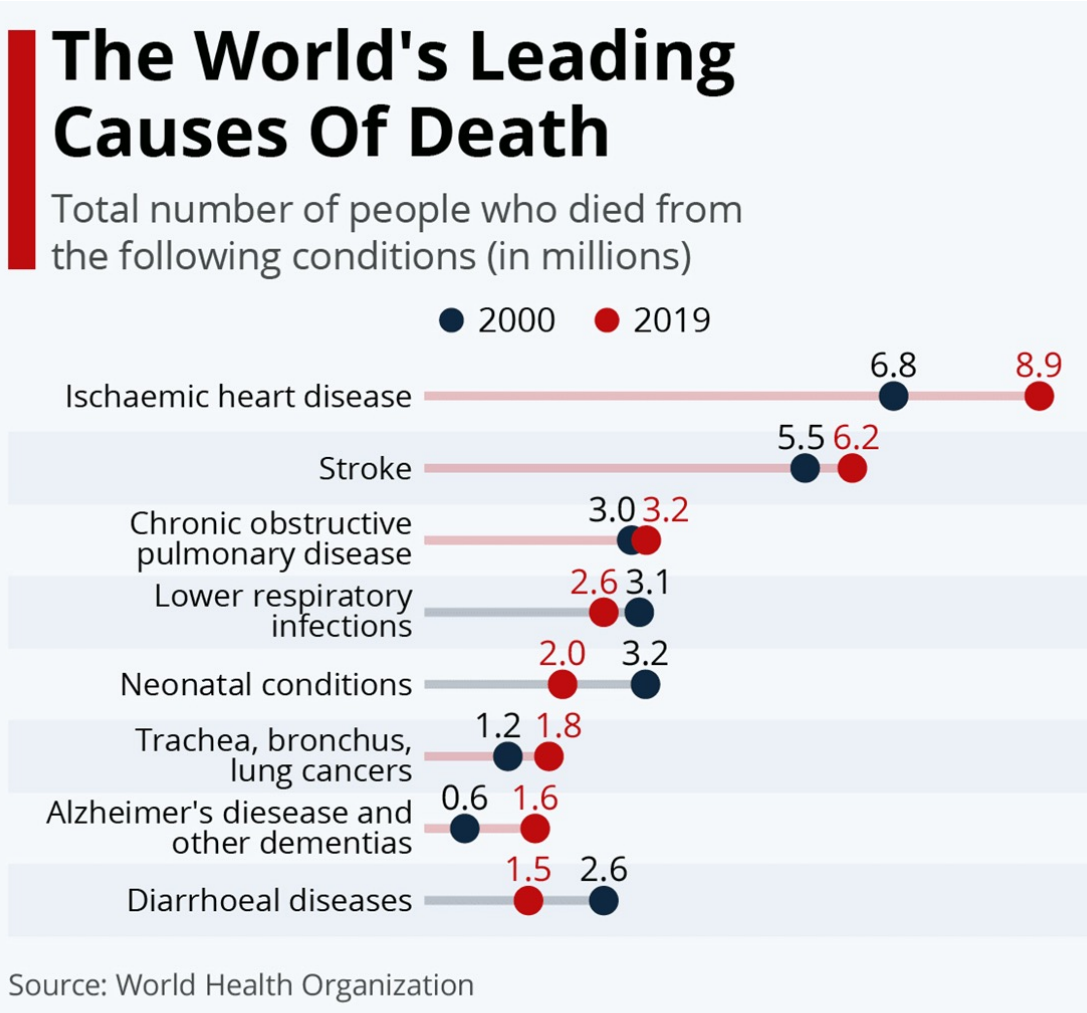


FOUNDED IN 2013 (US)

FOUNDED IN 2019 (US)

FOUNDED IN 2019 (SINGAPORE)



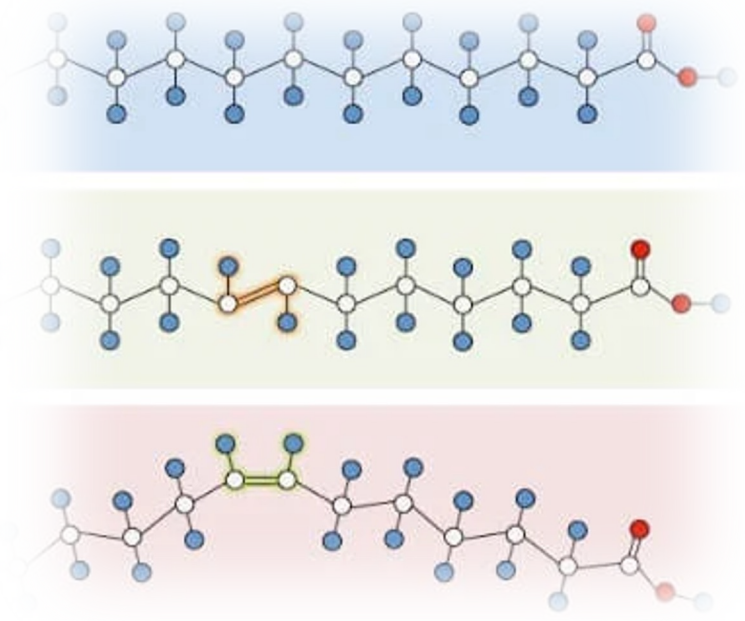


GENEVA, 20 May 2023 – Deaths from cardiovascular disease (CVD) jumped globally to **20.5 million in 2021**
https://world-heart-federation.org/news/deaths-from-cardiovascular-disease-surged-60-globally-over-the-last-30-years-report/

Kemenkes RI (Okt 2023) Indonesia angka kematian penyakit jantung 650.000 per tahun.

UNSATURATED FATTY ACIDS

- *Lentinula edodes* (76%)
- *Volvariella volvacea* (70%)
- *Agaricus bisporus* (69%)



Chang and Miles, 2004

PROTEIN AUTOTROF

HABITAT SHIFTING

https://upload.wikimedia.org/wikipedia/commons/c/ca/Gokasyo_Port_Nori_cultivation_ac_%282%29.jpg

https://www.agrifarming.in/growing-spirulina

https://seaofchi.com/Zi-Cai-Seaweed-Porphyra-Tenera-Herb-B000-79

https://en.wikipedia.org/wiki/Spirulina_%28dietary_supplement%29

INDOOR FARMING

INDUSTRIAL SYSTEM INTEGRATION FOOD RESEARCH

Integrasi big data riset laboratorium dalam sistem Industrial Internet of Things (IIoT) untuk otomatisasi pengembangan pangan baru

https://thespoon.tech/allergy-fears-and-transparency-among-issues-at-latest-usda-fda-meat-ing/

https://geneticliteracyproject.org/2019/05/28/from-lab-grown-burgers-to-3d-printed-steak-heres-why-alternative-meat-is-mainstream-in-2019/


THANK
YOU