

PERANAN KETEKNIKAN DALAM KETAHANAN PANGAN (MANDIRI DAN BERDAULAT)

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Senior Scientist

Southeast Asian Food & Agricultural Science & Technology (SEAFASST) Center,
Institut Pertanian Bogor



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PERANAN KETEKNIKAN DALAM KETAHANAN PANGAN (MANDIRI DAN BERDAULAT)

Kata –Kata Kunci /Pembahasan:

1. Ketahanan pangan?
2. Mandiri dan Berdaulat ?
3. Peranan keteknikan dalam ketahanan pangan (mandiri dan berdaulat) ?



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• Ketahanan Pangan

UU Pangan No 18, 2012

Ketahanan Pangan adalah kondisi terpenuhinya pangan bagi negara sampai dengan perseorangan, yang tercermin dari tersedianya pangan yang cukup, baik jumlah maupun mutunya, aman, beragam, bergizi, merata, dan terjangkau serta tidak bertentangan dengan agama, keyakinan, dan budaya masyarakat, untuk dapat hidup sehat, aktif, dan produktif secara berkelanjutan.



• Ketahanan Pangan

Pilar & Indikatornya

Ketersediaan Pangan

- Jumlah
- Mutu & Gizi Pangan
- Keamanan Pangan

Keterjangkauan /Akses Pangan

- Akses Fisik
- Akses ekonomi
- Akses Sosial Budaya (kesukaan, agama, dll)

Konsumsi (Asupan) Pangan

- Kecukupan asupan
- Pengolahan pangan
- Sanitasi/higiene

• Keberlanjutan

→ **Stabilitas suplai/ketersediaan, akses, konsumsi**

Perseorangan:
hidup sehat,
aktif, dan
produktif
secara
berkelanjutan



• Ketahanan Pangan Mandiri

Ketersediaan Pangan	<ul style="list-style-type: none"> Jumlah dan Diversifikasi Pangan Mutu & Gizi Pangan Keamanan Pangan 	<ul style="list-style-type: none"> Keberlanjutan <p>→ Stabilitas suplai/ketersediaan, akses konsumsi</p>
Keterjangkauan /Akses Pangan	<ul style="list-style-type: none"> Akses Fisik Akses ekonomi Akses Sosial Budaya (kesukaan, agama, dll) 	
Konsumsi (Kecukupan Asupan)	<ul style="list-style-type: none"> Kecukupan asupan Pengolahan pangan Sanitasi/higiene Mutu air minum 	

Perse-orangan: hidup sehat, aktif, dan produktif secara berkelanjutan

UU Pangan No 18, 2012: Kemandirian Pangan = kemampuan negara dan bangsa dalam memproduksi pangan yang beraneka ragam dari dalam negeri yang dapat menjamin pemenuhan kebutuhan pangan yang cukup sampai di tingkat perseorangan dengan memanfaatkan potensi sumber daya alam, manusia, sosial, ekonomi, dan kearifan lokal secara bermartabat.

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• Ketahanan Pangan Mandiri

SUMBER
DAYA
LOKAL

Ketersediaan Pangan	<ul style="list-style-type: none"> Jumlah dan Diversifikasi Pangan Mutu & Gizi Pangan Keamanan Pangan 	<ul style="list-style-type: none"> Keberlanjutan <p>→ Stabilitas suplai/ketersediaan, akses konsumsi</p>
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Perse-orangan: hidup sehat, aktif, dan produktif secara berkelanjutan

Indikator Kemandirian:
Ketergantungan pada impor :

- Pangan pokok
- Benih, mesin-mesin, kemasan, ingridien, dll

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• Ketahanan Pangan Mandiri dan Berdaulat

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LOKAL

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Perse-orangan:
hidup
sehat,
aktif, dan
produktif
secara
berkelanju-
tan

UU Pangan No 18, 2012: Kedaulatan Pangan adalah hak negara dan bangsa yang secara mandiri menentukan kebijakan pangan yang menjamin hak atas pangan bagi rakyat dan yang memberikan hak bagi masyarakat untuk menentukan sistem pangan yang sesuai dengan potensi sumber daya lokal.

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• Ketahanan Pangan Mandiri dan Berdaulat

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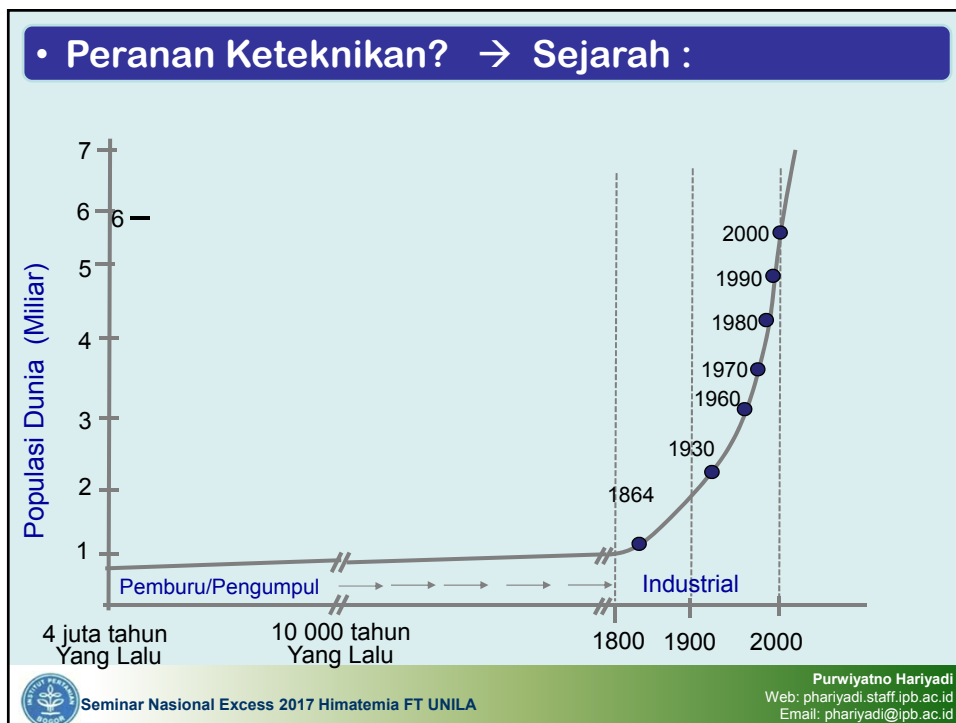
Perse-orangan:
hidup
sehat,
aktif, dan
produktif
secara
berkelanju-
tan

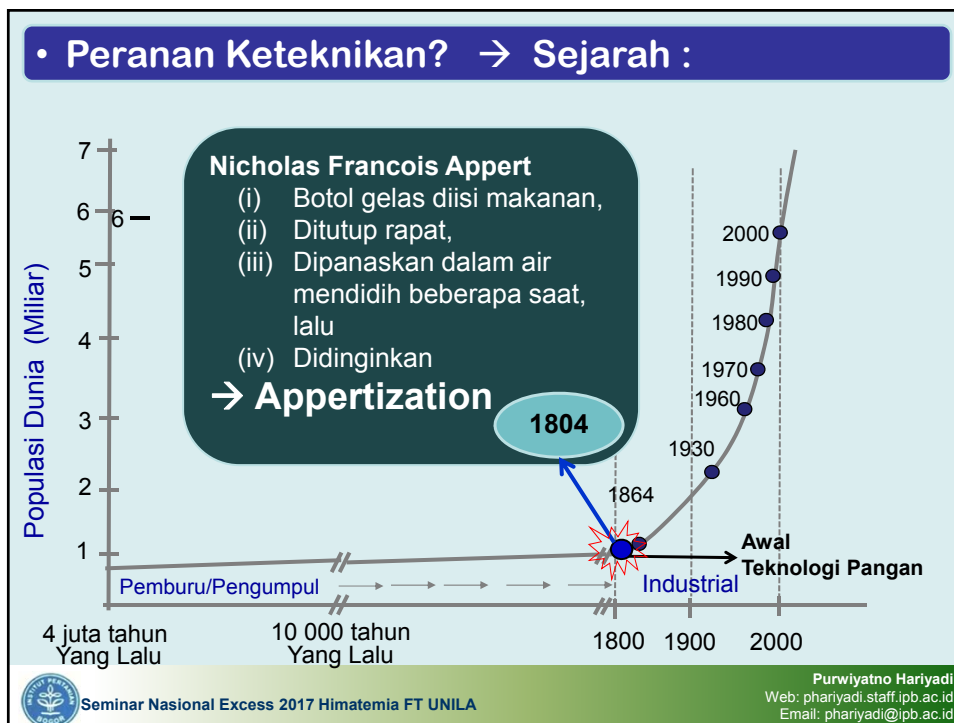
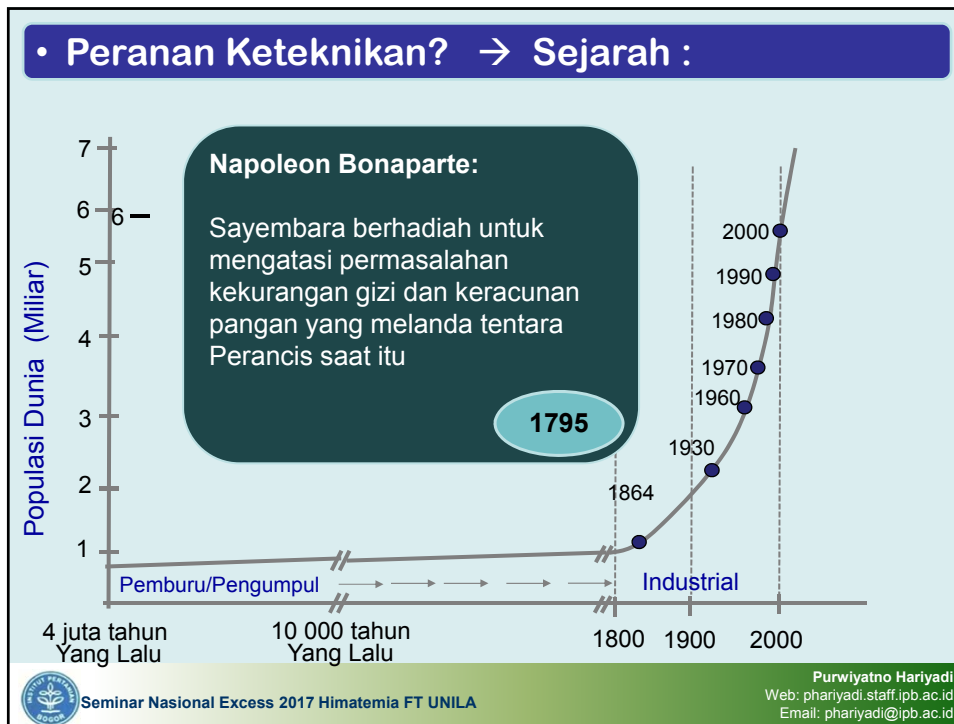
Daulat Negara dan Keterlibatan aktif masyarakat lokal

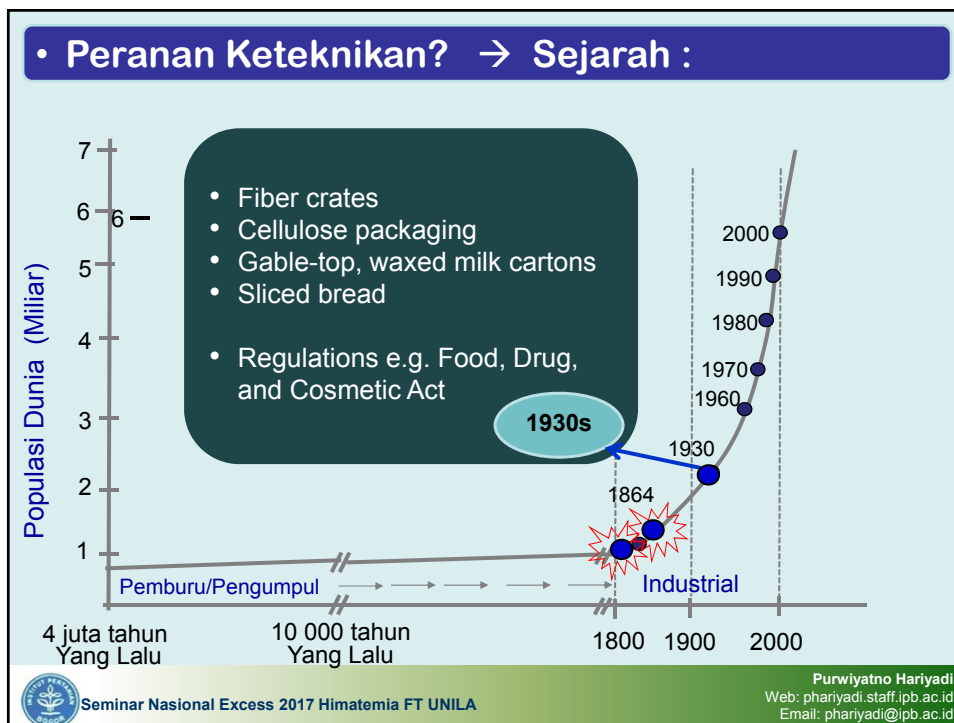
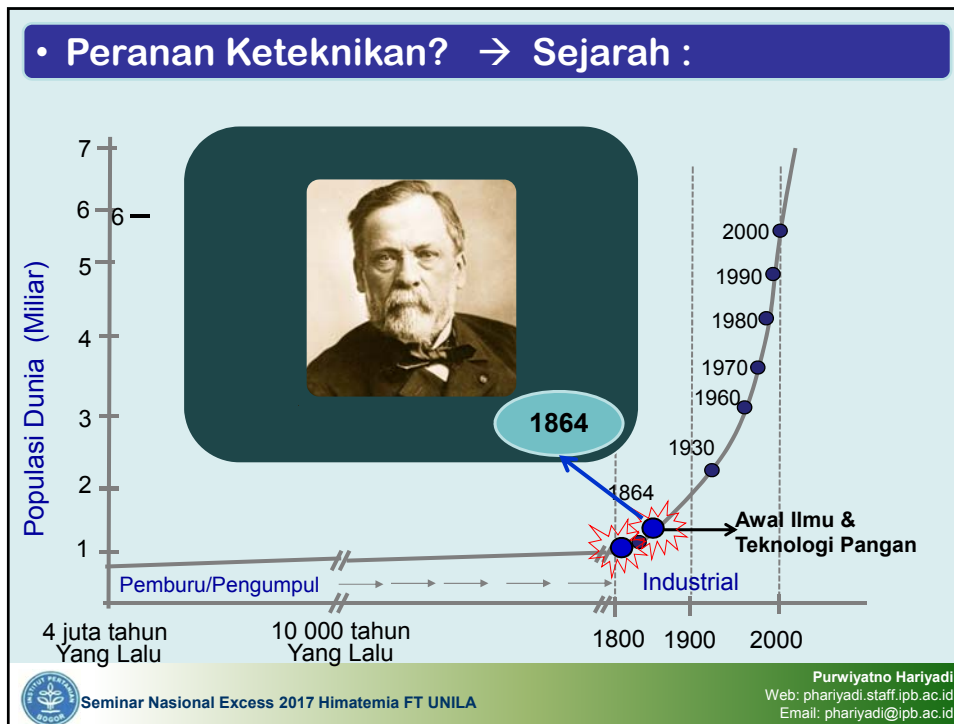
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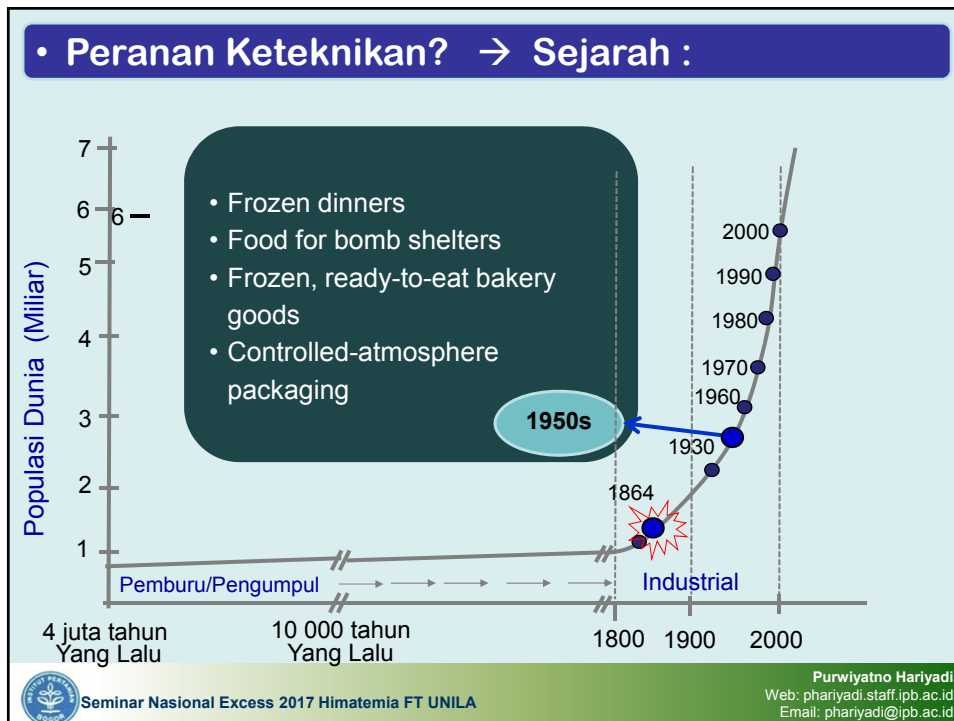
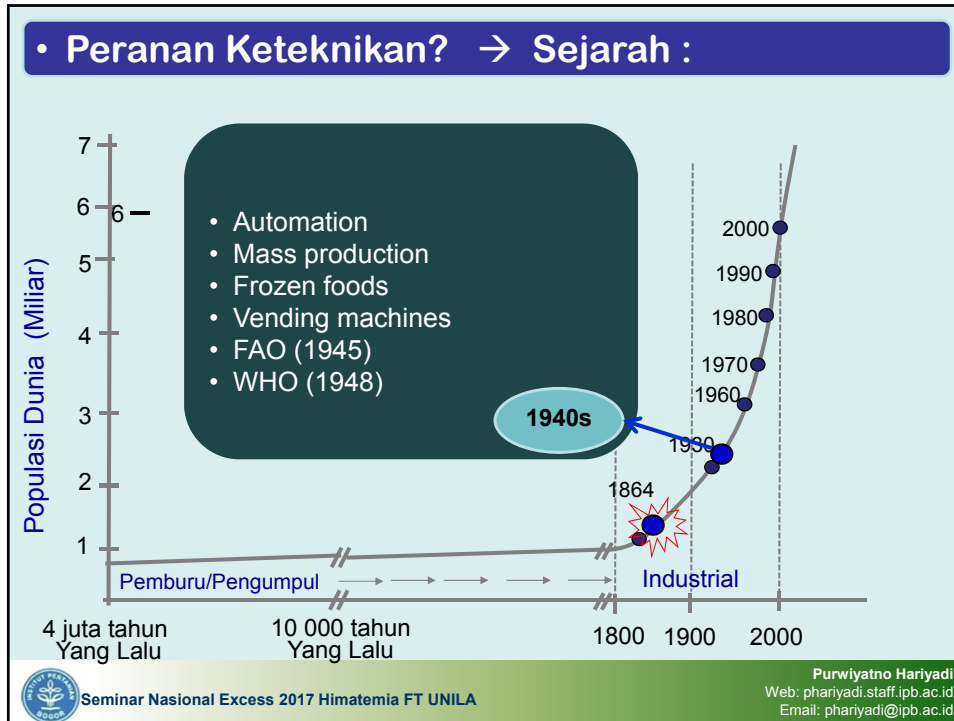
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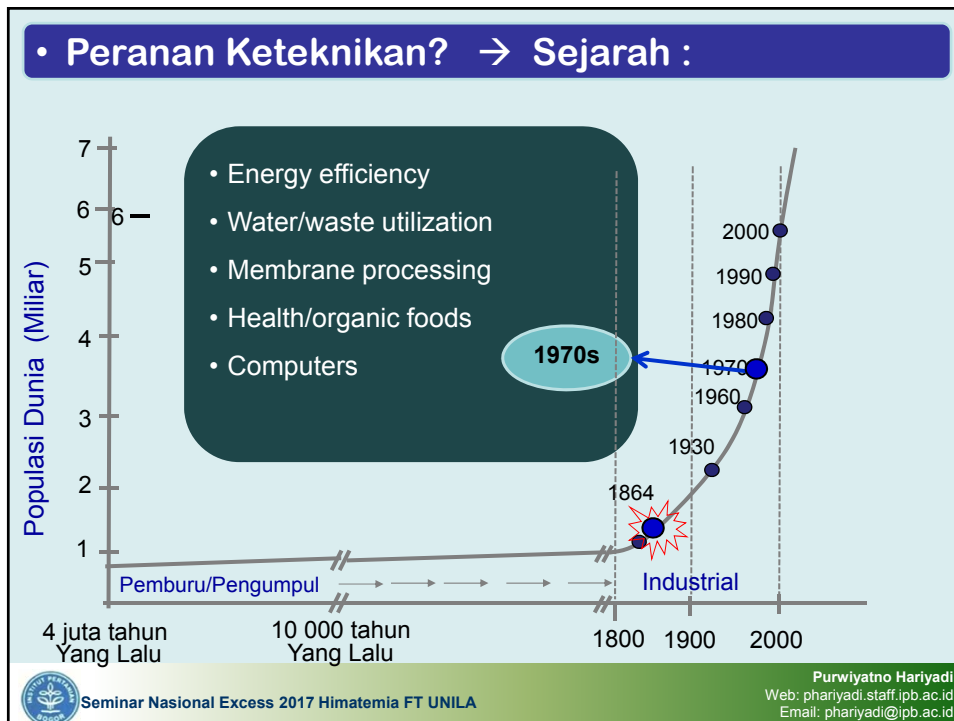
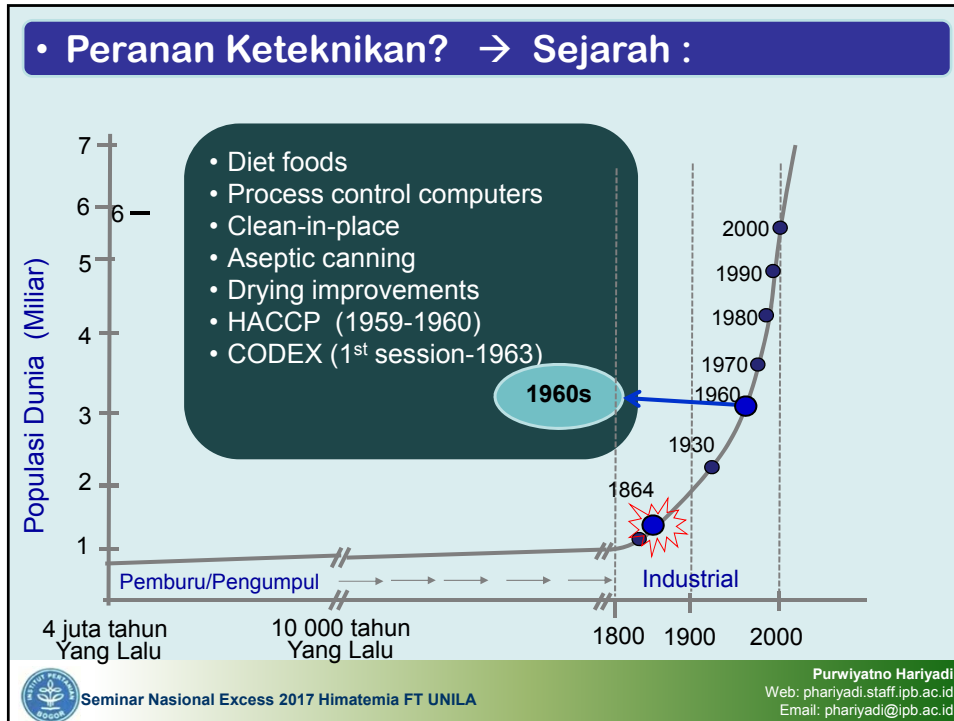


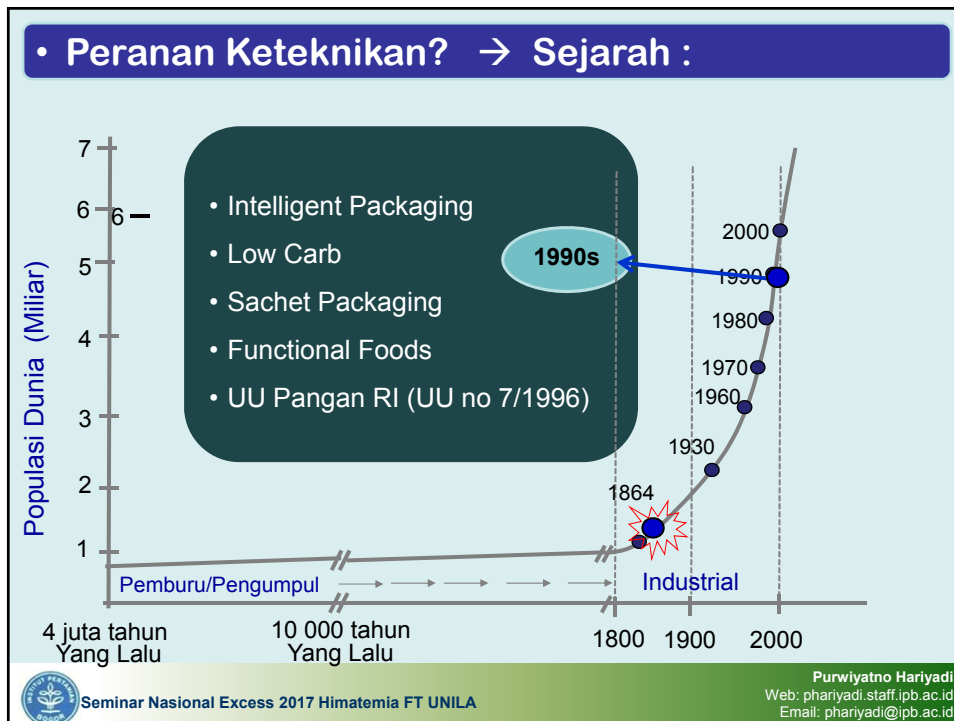
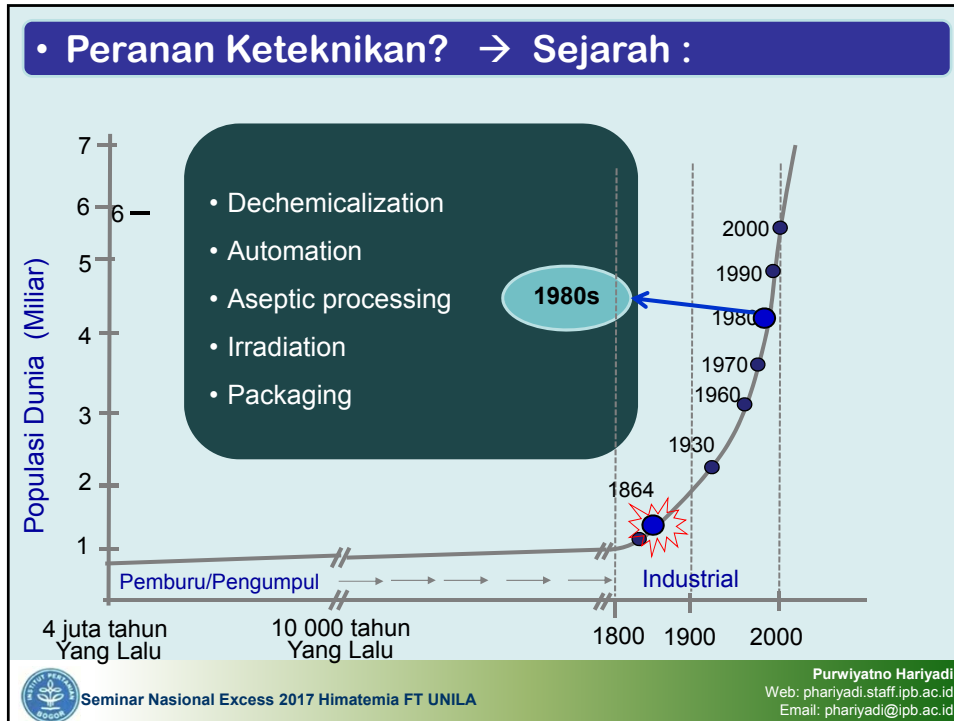


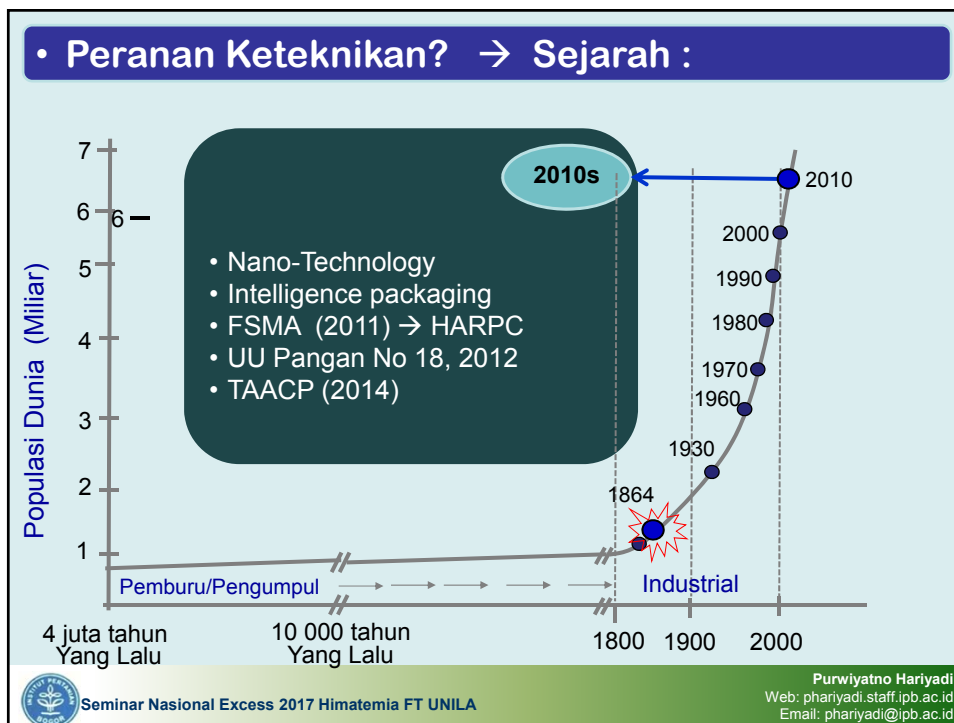
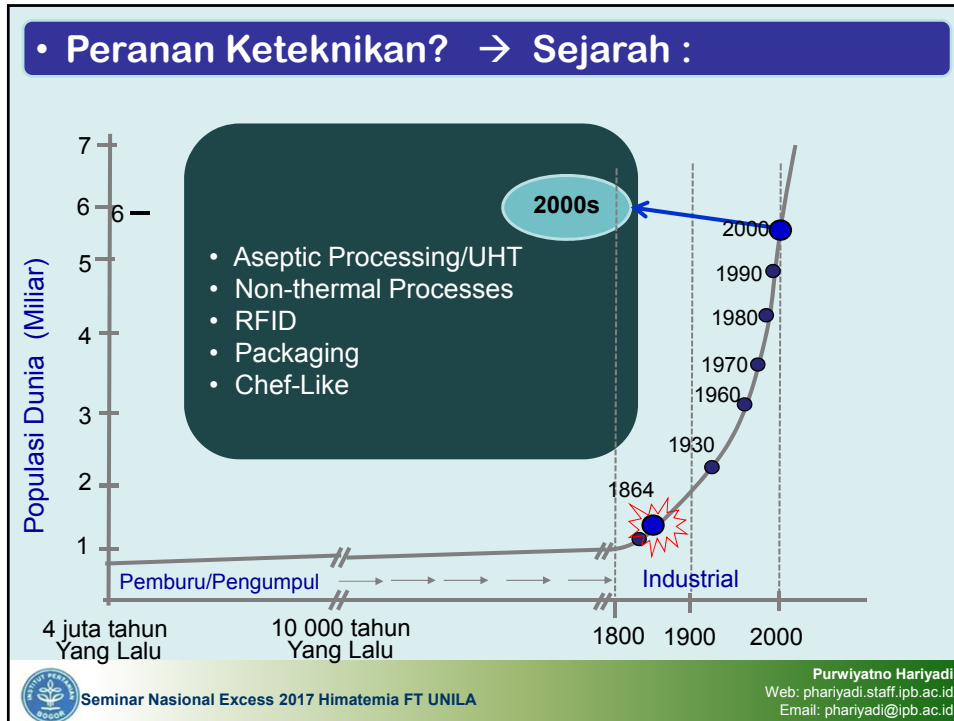












APA YANG ANDA BISA LAKUKAN? - sekedar contoh
→ *meningkatkan Nilai Pangan*



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APA YANG ANDA BISA LAKUKAN? - sekedar contoh
→ *meningkatkan Nilai Pangan*

$$\text{FOOD VALUE} = A \times B \times \left(\frac{X_s}{Y_s} \right)$$

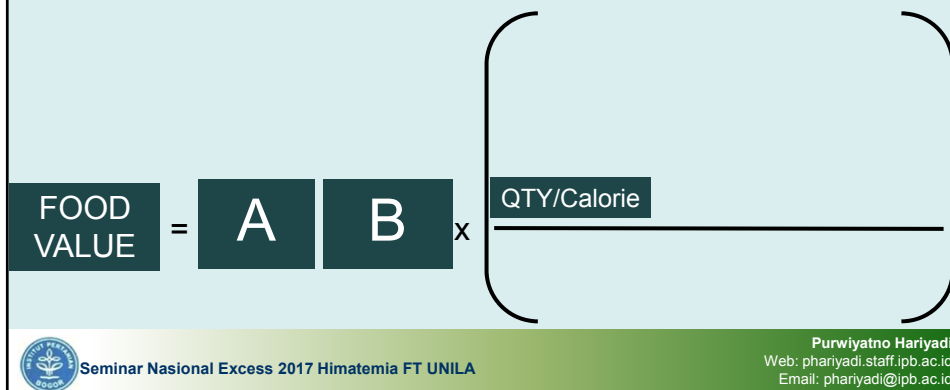



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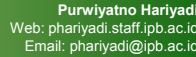
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APA YANG ANDA BISA LAKUKAN? - sekedar contoh
→ *meningkatkan Nilai Pangan*

$$\text{FOOD VALUE} = A \times B \times \frac{\text{QTY/Calorie}}{\text{Price}}$$

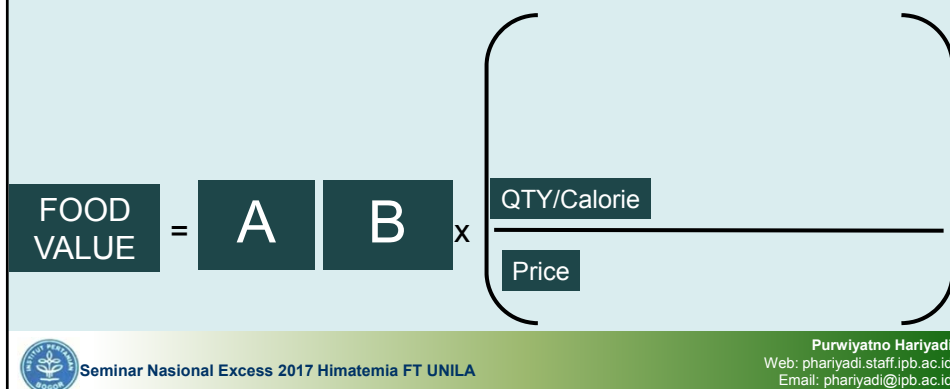





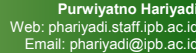


APA YANG ANDA BISA LAKUKAN? - sekedar contoh
→ *meningkatkan Nilai Pangan*

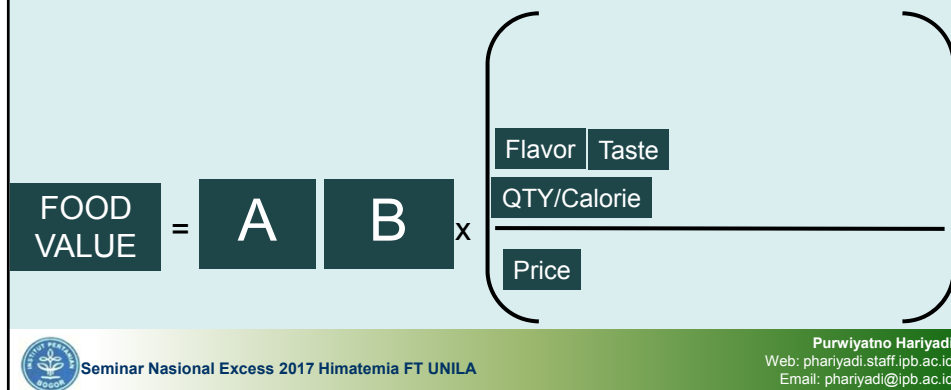
$$\text{FOOD VALUE} = A \times B \times \frac{\text{QTY/Calorie}}{\text{Price}}$$



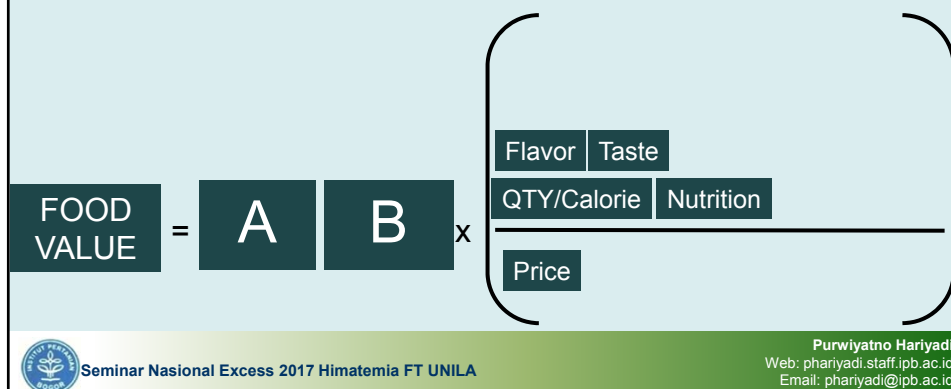




APA YANG ANDA BISA LAKUKAN? - sekedar contoh
→ *meningkatkan Nilai Pangan*



APA YANG ANDA BISA LAKUKAN? - sekedar contoh
→ *meningkatkan Nilai Pangan*



APA YANG ANDA BISA LAKUKAN? - sekedar contoh
→ *meningkatkan Nilai Pangan*

FOOD VALUE = A x B

Flavor | Taste
QTY/Calorie | Nutrition
Price | Time to Prepare | "handling complexity"

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APA YANG ANDA BISA LAKUKAN? - sekedar contoh
→ *meningkatkan Nilai Pangan*

FOOD VALUE = A x B

Texture
Appearance
Flavor | Taste
QTY/Calorie | Nutrition
Price | Time to Prepare | "handling complexity"

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APA YANG ANDA BISA LAKUKAN? - sekedar contoh
→ *meningkatkan Nilai Pangan*

FOOD VALUE = A B x

- Texture
- Appearance
- Flavor Taste Performance
- QTY/Calorie Nutrition Functionality
- Price Time to Prepare "handling complexity"

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→ *meningkatkan Nilai Pangan*

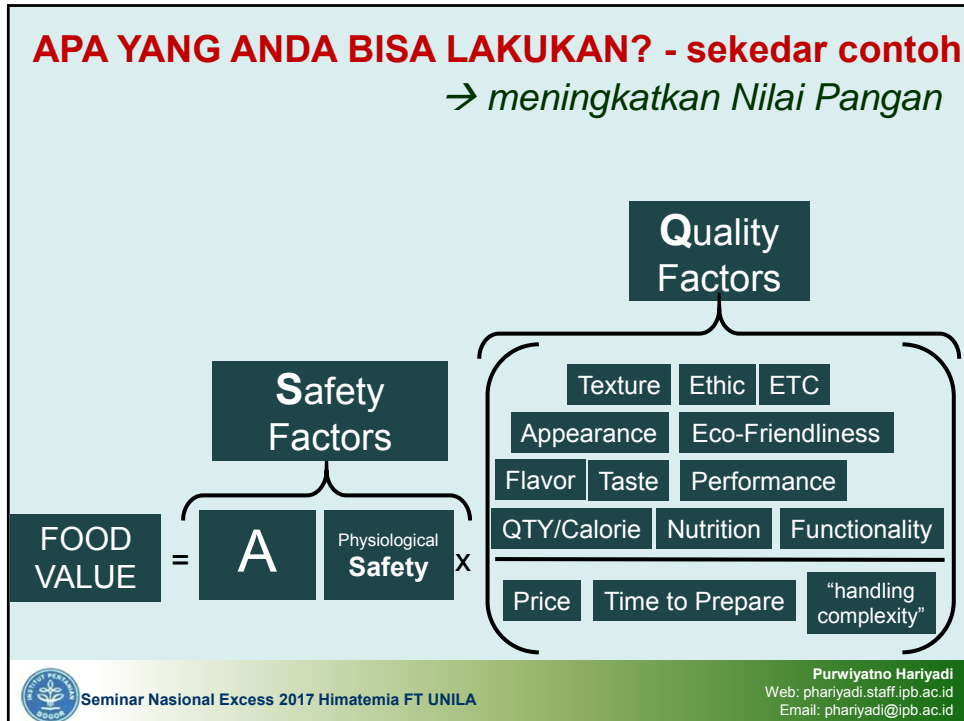
FOOD VALUE = A B x

- Texture Ethic ETC
- Appearance Eco-Friendliness
- Flavor Taste Performance
- QTY/Calorie Nutrition Functionality
- Price Time to Prepare "handling complexity"

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APA YANG ANDA BISA LAKUKAN? - sekedar contoh
→ *meningkatkan Nilai Pangan*

The diagram illustrates the connection between psychological safety and food quality. On the left, a magnifying glass labeled 'focus - 1' is positioned over a dark teal circle containing the text 'Psychological Safety'. Below this, a light blue box labeled 'FOOD VALUE' contains a list: '• Cultural/Life Style', '• Belief', and '• Religion'. A double-headed arrow connects this list to a white rounded rectangle on the right labeled 'Quality'. Inside the 'Quality' box are two organic certification logos: 'USDA ORGANIC' and '100% ORGANIC certified'. The background features a vertical stack of words: 'Quality', 'Safety', 'Health', 'Wellness', 'Nutrition', and 'Sustainability'.

FOOD VALUE

Psychological Safety

- Cultural/Life Style
- Belief
- Religion

Quality

USDA ORGANIC

100% ORGANIC certified

focus - 1

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APA YANG ANDA BISA LAKUKAN? - sekedar contoh
→ *meningkatkan Nilai Pangan*

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FOOD VALUE

Psychological Safety

- Cultural/Life Style
- Belief
- Religion

Quality

Vegetarian Society APPROVED

Vegan

focus - 1

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APA YANG ANDA BISA LAKUKAN? - sekedar contoh
→ meningkatkan Nilai Pangan

The diagram illustrates the concept of 'FOOD VALUE' and its connection to 'Quality'. A magnifying glass is positioned over a list of factors under 'Psychological Safety': 'Cultural/Life Style', 'Belief', and 'Religion'. The 'Religion' item is highlighted with a yellow underline and a blue arrow points from it to a large black circle containing a white letter 'K'. The word 'Quality' is written in a light blue box above the 'K' logo. The magnifying glass handle is labeled 'focus - 1'.

FOOD VALUE

- Psychological Safety
 - Cultural/Life Style
 - Belief
 - **Religion**

Quality

K

focus - 1

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APA YANG ANDA BISA LAKUKAN? - sekedar contoh
→ meningkatkan Nilai Pangan

The diagram illustrates the concept of 'FOOD VALUE' and its connection to 'Quality'. A magnifying glass is positioned over a list of factors under 'Psychological Safety': 'Cultural/Life Style', 'Belief', and 'Religion'. The 'Religion' item is highlighted with a yellow underline and a blue arrow points from it to a circular logo for 'MAJELIS ULAMA HALAL INDONESIA'. The word 'Quality' is written in a light blue box above the logo. The magnifying glass handle is labeled 'focus - 1'.

FOOD VALUE

- Psychological Safety
 - Cultural/Life Style
 - Belief
 - **Religion**

Quality

MAJELIS ULAMA HALAL INDONESIA

focus - 1

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APA YANG ANDA BISA LAKUKAN? - sekedar contoh
 → meningkatkan Nilai Pangan

FOOD VALUE

Physiological Safety

- Chemicals
- Physicals
- Microbiologicals

Quality Factors

- Texture
- Ethic
- ETC
- Appearance
- Eco-Friendliness
- Flavor
- Taste
- Performance
- QTY/Calorie
- Nutrition
- Functionality
- Price
- Time to Prepare
- "handling complexity"

focus - 2

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APA YANG ANDA BISA LAKUKAN? - sekedar contoh
 → meningkatkan Nilai Pangan

FOOD VALUE

Physiological Safety

- Chemicals
- Physicals
- Microbiologicals

Quality

CHEMICAL HAZARDS:

Include natural chemicals that may be in a food or chemical agents that we may add to a food (cleaning agents).

focus - 2

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APA YANG ANDA BISA LAKUKAN? - sekedar contoh
→ *meningkatkan Nilai Pangan*

FOOD VALUE

Quality

Physiological Safety

- Chemicals
- Physicals
- Microbiologicals

focus - 2

• Also include **alergen**

- Peanuts
- Tree Nuts (*walnuts, pecans, almonds, cashews, hazelnuts/ macadamia nuts, pistachio nuts, etc.*)
- Milk
- Egg
- Wheat
- Soy
- Fish
- Shellfish

with fruity raspberry jam

Allergies

Contains egg, gluten and milk
May contain traces of nuts

Ingredients: buttercream filling (1% ...)

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APA YANG ANDA BISA LAKUKAN? - sekedar contoh
→ *meningkatkan Nilai Pangan*

FOOD VALUE

Quality

Physiological Safety

- Chemicals
- Physicals
- Microbiologicals

focus - 2

PHYSICAL HAZARDS:

Include foreign objects that can be introduced into food during growing, harvest/slaughter, and or processing.

- rocks (vegetables)
- bone (animal products), and
- metal (from processing equipment).

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APA YANG ANDA BISA LAKUKAN? - sekedar contoh
 → *meningkatkan Nilai Pangan*

FOOD VALUE

- Psychological Safety
- Physiological Safety
- Microbiologicals

MICROBIOLOGICAL HAZARDS:

Include bacteria like *Salmonella*, viruses like Hepatitis, and parasites like those that cause trichinosis.

Quality

focus - 2

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APA YANG ANDA BISA LAKUKAN? - sekedar contoh
 → *Inovasi ke depan (menuju Era Industri 4.0)*

FOOD VALUE = Psychological Safety × Physiological Safety × **Quality Factors**

Safety Factors

- Psychological Safety
- Physiological Safety

Quality Factors

Texture	Ethic	ETC
Appearance	Eco-Friendliness	
Flavor	Taste	Performance
QTY/Calorie	Nutrition	Functionality
Price	Time to Prepare	"handling complexity"

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APA YANG ANDA BISA LAKUKAN? - sekedar contoh

→ Apa itu Industri 4.0

→ Era of SMART "everything's"

Bagaimana membuat
"FOOD VALUE" manjadi :



- Available?
- Readable?
- Retrievable?
- Transferable?
- Communicable?
- SMART?

→ able to apply a scientific logic



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APA YANG ANDA BISA LAKUKAN? - sekedar contoh

→ Apa itu Industri 4.0

→ Era of SMART "everything's"

How to make information of
"FOOD VALUE" readily :



- Available?
- Readable?
- Retrievable?
- Transferable?
- Communicable?
- SMART?

→ able to apply a scientific logic

- Keterlibatan konsumen
- Keterleurusan
- Analisis → sistim logistic/inventory



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APA YANG ANDA BISA LAKUKAN? - sekedar contoh

→ Apa itu Industri 4.0

→ Era of SMART “everything’s”

Example :

The Fresh-Check monitors your food from the plant, to the store and all the way to your home. It is the perfect on-package food freshness management tool.

The Extra for freshness™

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APA YANG ANDA BISA LAKUKAN? - sekedar contoh

→ Apa itu Industri 4.0

→ Era of SMART “everything’s”

Example :

SmartMark

WarmMark

30°C/86°F

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APA YANG ANDA BISA LAKUKAN? - sekedar contoh

→ Apa itu Industri 4.0

→ Era of SMART "everything's"

Example :

RipeSense®



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APA YANG ANDA BISA LAKUKAN? - sekedar contoh

→ Apa itu Industri 4.0

→ Era of SMART "everything's"

Example :

SensorQ™



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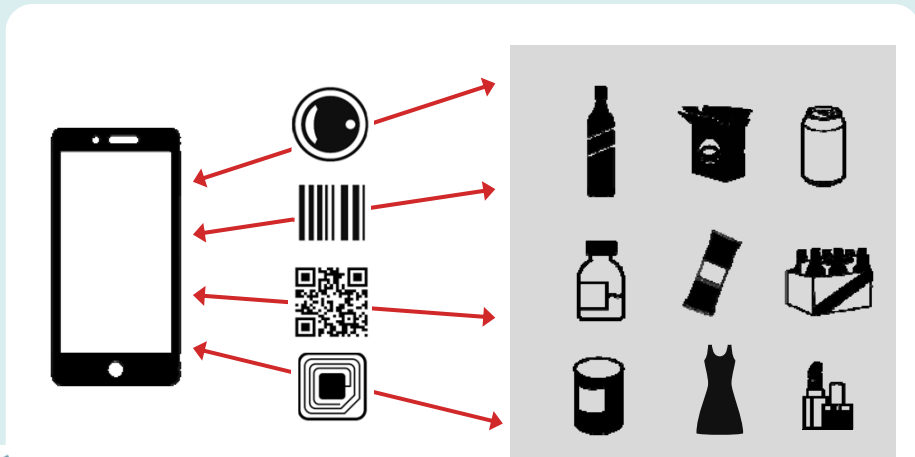
Web: pharyadi.staff.ipb.ac.id
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APA YANG ANDA BISA LAKUKAN? - sekedar contoh

→ Apa itu Industri 4.0

→ Era of SMART “everything’s”

→ The Internet of “everything’s”



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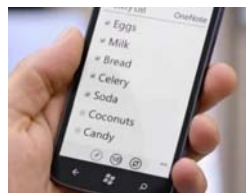
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In-Store product engagement (Millennials)

Source: Interactions, Retail Perception Report, Sept. 2014

34%



Make mobile shopping lists

29%



Scan products to get info, deals or experiences

27%



Communicate via mobile about products



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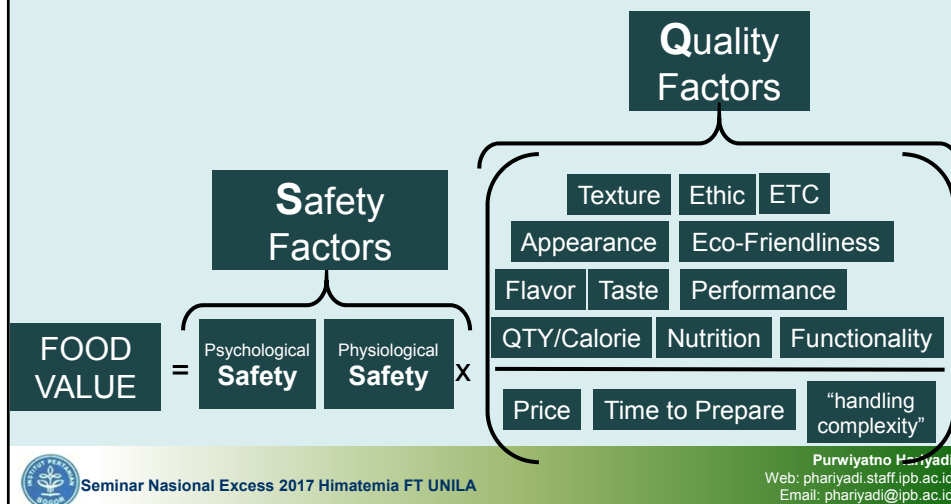
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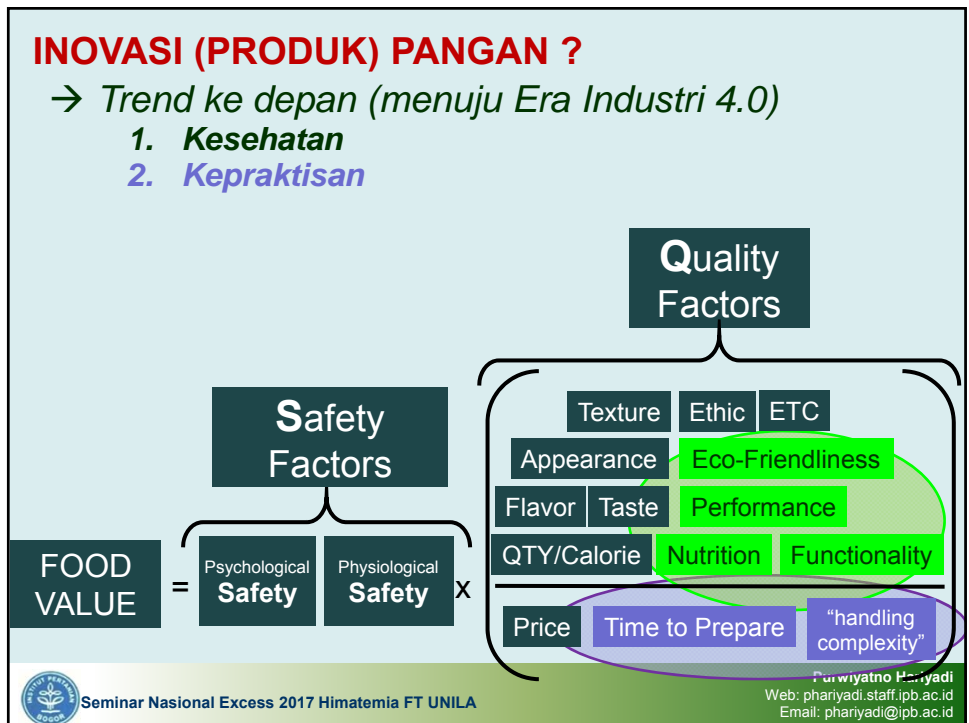
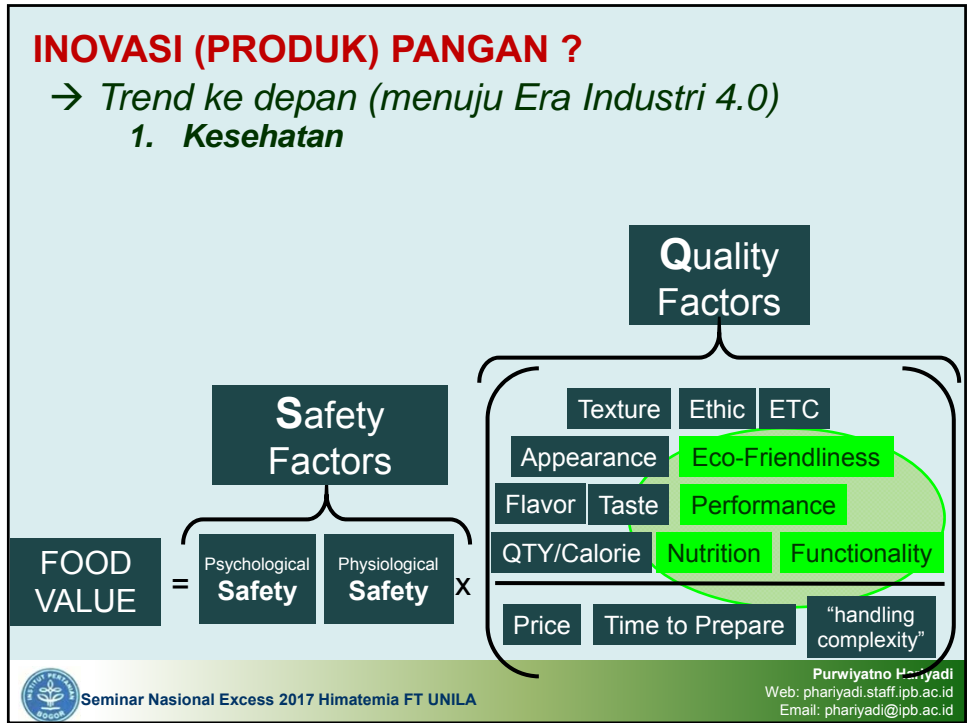
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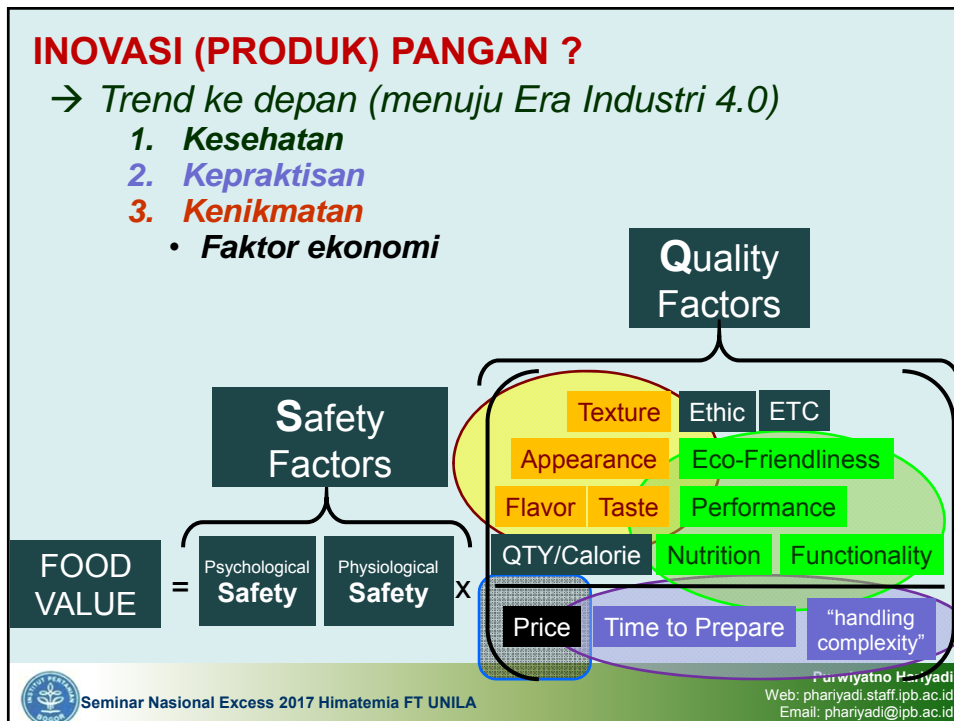
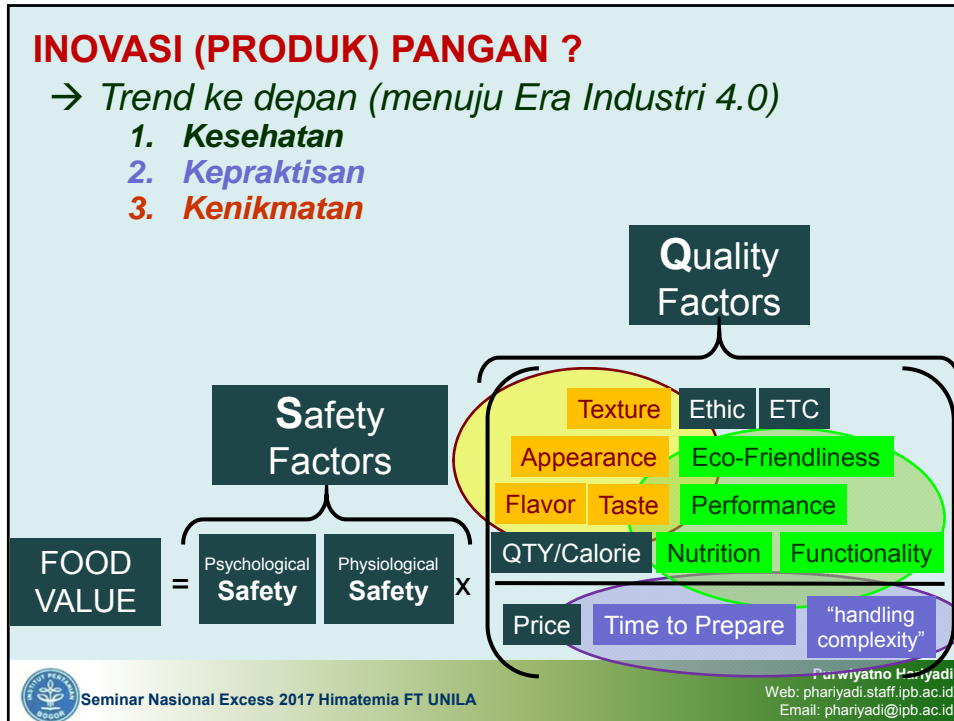


INOVASI (PRODUK) PANGAN ?

→ Trend ke depan (menuju Era Industri 4.0)





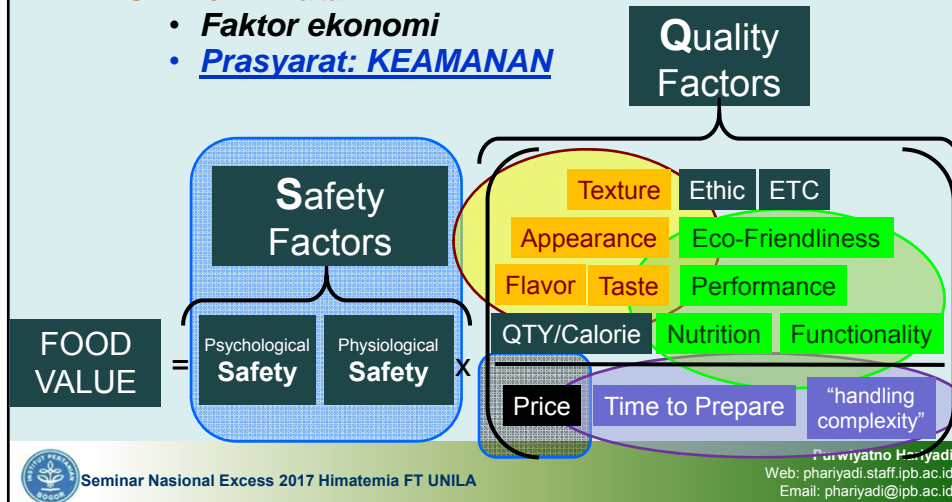


INOVASI (PRODUK) PANGAN ?

→ Trend ke depan (menuju Era Industri 4.0)

1. **Kesehatan**
2. **Kepraktisan**
3. **Kenikmatan**

- **Faktor ekonomi**
- **Prasyarat: KEAMANAN**



TERIMAKASIH