



# 10th ASEAN Food Conference 2007

The Premier Food Science and Technology Conference in ASEAN

KUALA LUMPUR, MALAYSIA  
August 21 - 23, 2007



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## FOOD CANNING INDUSTRY IN INDONESIA

*The need for Quality Optimization*

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## INTRODUCTION ..... 1

### Food Canning Industry

- Important for Indonesian Economy
- Many varieties (canned fish/seafood, desserts, meat products, pasta & noodle, vegetables, fruits & ready meals)
- Growing at about 3.1% (2001-2005)

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## INTRODUCTION ..... 2

- More demand on Quality
  - Canned Fish and Seafood
  - Retail Sales (2001-2003)\*)

Description	2001	2002	2003
Value (Rp billion)	396.7	438.3	482.2
Volume (000 tons)	16.67	18.00	19.62
Value growth	2002/2003: 10%		
Volume growth	2002/2003: 9%		
Total Value growth	2003/2008: 35.6%		
Total Volume growth	2003/2008: 81%		

\*) Global Agriculture Information Network Report, ID5012, 2005, Fish & Seafood)

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## INTRODUCTION ..... 3

- More demand on SAFETY  
→ Focus : Low Acid Canned Foods

*Low Acid Food :*

*a food, other than alcoholic beverages,  
where any component of the food has a  
**pH > 4.6** and a **a<sub>w</sub> > 0.85**.*

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## INTRODUCTION ..... 4

- More demand on SAFETY  
→ Focus : Low Acid Canned Foods

*Low Acid **Canned** Food :*

- pH > 4.6
- Water Activity > 0.85
- Thermally processed
- Hermetically sealed container
- Non-refrigerated

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## COMMERCIALY STERILE

RECOMMENDED INTERNATIONAL CODE OF HYGIENIC PRACTICE FOR LOW AND ACIDIFIED LOW ACID CANNED FOODS  
CAC/RCP 23-1979, Rev. 2 (1993)<sup>1</sup>

- Scheduled processes for low-acid canned foods must be established only by competent persons
  - having expert knowledge of thermal processing and
  - having adequate facilities for making such determinations.
- The heat process required to make low-acid canned foods commercially sterile depends on the microbial load, storage temperature, the presence of various preservatives, water activity, composition of the products and container size and type.

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## COMMERCIALY STERILE

Performance Standards (USFDA/USDA) :

For a low-acid product that receives thermal or other sporicidal lethality processing, that processing must be **validated** to achieve :

- a probability of  $10^{-9}$  that there are spores of *C. botulinum* in a container of the product that are capable of growing, or,
- a 12-log<sub>10</sub> reduction of *C. botulinum*, assuming an initial load of  $\leq 1000$  spores per container.

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## COMMERCIALY STERILE

Performance Standards (USFDA/USDA) :

- *C. botulinum*
  - $D_{Bot,250F} = 0.21$  minutes
  - 12-log<sub>10</sub> reduction of *C. botulinum*  
 $\rightarrow F_o = 2.52$  minutes

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## COMMERCIALY STERILE

In practice

*F<sub>o</sub>* values of commercially sterile foods on the UK market

Product	Can sizes	<i>F<sub>o</sub></i> values
Babyfoods	babyfood	3-5
Beans in tomato sauce	All	4-6
Peas in brine	Up to A2	6
	A2 to A10	6-8
Carrots	All	3-4
Green beans in brine	Up to A2	4-6
	A2 to A10	6-8
Celery	A2	3-4
Mushrooms in brine	A1	8-10
Mushrooms in butter	Up to A1	6-8
Meats in gravy	All	12-15
Sliced meat in gravy	Ovals	10

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## OUR SURVEY



- Survey on “Thermal process adequacy of Commercially Sterile/Low Acid Canned Foods” in Indonesia
- Data were collected since 2000– 2006; expressed as **F<sub>0</sub>-value**
- **F<sub>0</sub>-value** = equivalent heating time at constant temperature of 250°F
- Determined based on IFTPS guidelines ([www.iftps.org](http://www.iftps.org))

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## OUR RESULTS ... (1)



Product	Can Size	F <sub>0</sub> (min)	
<b>FCE 1</b>			
Snail meat in brine	401 x 411	47,2	224 D
Baby corn in brine	301 x 407	9,5	
	603 x 700	27,3	130 D
Champignon in brine	307 x 407	31,1	
<b>FCE 2</b>			
Baby corn in brine	301 x 407	6,4	
	307 x 407	7,4	
	603 x 700	6,3	

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## OUR RESULTS ... (2)



Product	Can Size	F <sub>o</sub> (min)	
<b>FCE3</b>			
Snail meat in brine	301 x 407	<b>38,9</b>	<b>185 D</b>
	401 x 411	<b>54,7</b>	<b>260 D</b>
Baby corn in brine	301 x 407	<b>5,7</b>	
	307 x 407	<b>7,2</b>	
	603 x 700	<b>12,1</b>	

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## OUR RESULTS ... (3)



Product	Can Size	F <sub>o</sub> (min)	
<b>FCE 4</b>			
Chicken Curry	307 x 113	<b>18,4</b>	<b>87 D</b>
Beef Sausage	301 x 408	<b>4,7</b>	
Champignon in brine	603 x 700	<b>148,4</b>	<b>706 D</b>
<b>FCE 5</b>			
Nata de Coco	200 x 505	<b>4,9</b>	
Nata de Coco	209 x 311	<b>4,9</b>	
Nata de Coco	209 x 401	<b>6,2</b>	
Nata de Coco	209 x 609	<b>4,6</b>	

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## OUR RESULTS ... (4)



Product	Can Size	F <sub>0</sub> (min)
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### FCE 6

Coconut water	200 x 505	7,1
Coconut water	209 x 401	4,4
Coconut water	209 x 413	6,1
Coconut water	209 x 614	4,7

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## OUR RESULTS ... (5)



Product	Can Size	F <sub>0</sub> (min)
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### FCE 7

Red meat in Chili Sauce	202x308	12,9
Pet food	301x407	14,1
Red meat in Chili Sauce	301x407	10,6
Mackerel in Brine	301x407	12,4
Sardine in Oil	301x407	8,8
Mackerel in Tomato Sauce	301x407	6,6
Mackerel in Oil	301x407	9,0
Sardine in Brine	301x407	11,6

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## OUR RESULTS ... (6)



Product	Can Size	F <sub>o</sub> (min)
<b>FCE 7 (Cont'd)</b>		
Fried Sardine	202x308	15,7
Sardine in tomato sauce	301x407	7,0
Sardine in Oil	202x308	14,8
Sardine in Brine	202x308	15,7
Fried Sardine	301x407	6,5
Tuna in Dressing	307x113	4,0
Flake in Oil	603x408	1,9
Flake in Oil	307x113	3,7
Chunk in Brine	603x408	3,0

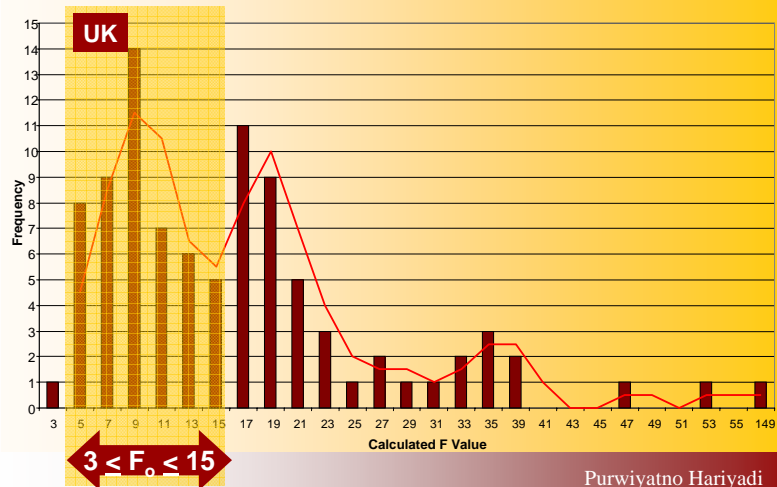
**9 D**

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## OUR RESULTS ... (7)

- Number of data collected = 93 (from 23 FCEs)
- Range :  $1.9 < F_o < 148.4$



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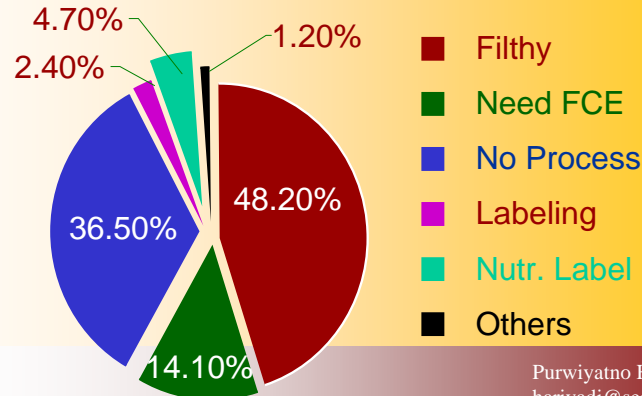


## OUR RESULTS ... (8)

Detention/refusal of canned food from Indonesia by USFDA ..... WHY???

([www.fda.gov/ora/oasis/ora\\_oasis\\_det.html](http://www.fda.gov/ora/oasis/ora_oasis_det.html))

Thermally processed foods?



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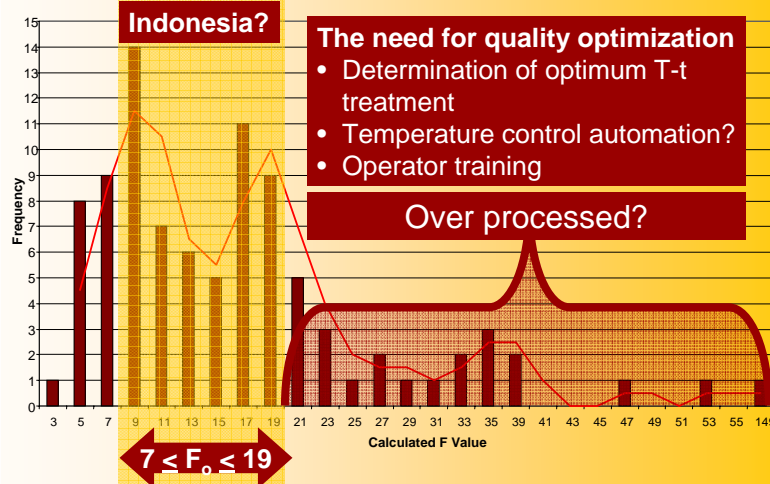
## RECOMMENDATION ... (1)

- Assurance of commercially sterile foods?
  - Develop registration mechanism for food canning industry
  - Develop evaluation mechanism for assurance of
    - i. good manufacturing practices?
    - ii. performance of processing equipments/facilities?
    - iii. thermal adequacy ( $F_0$ -value)?

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## RECOMMENDATION ... (2)



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## RECOMMENDATION ... (3)

### Training

US-FDA :

All operators of processing systems for commercially sterile foods and container closure technicians shall be under the direct supervision of a person who has successfully completed a school of instruction that is generally recognized as adequate for training supervisors of canning operations.

CODEX :

It is extremely important that the heat processing is carried out by operators under the supervision of personnel who understand the principles of heat processing and who realize the need to follow instructions closely.

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*Thank You  
terimakasih*



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