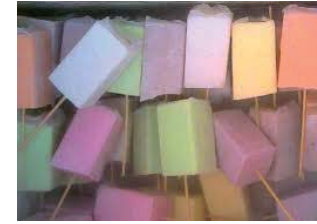
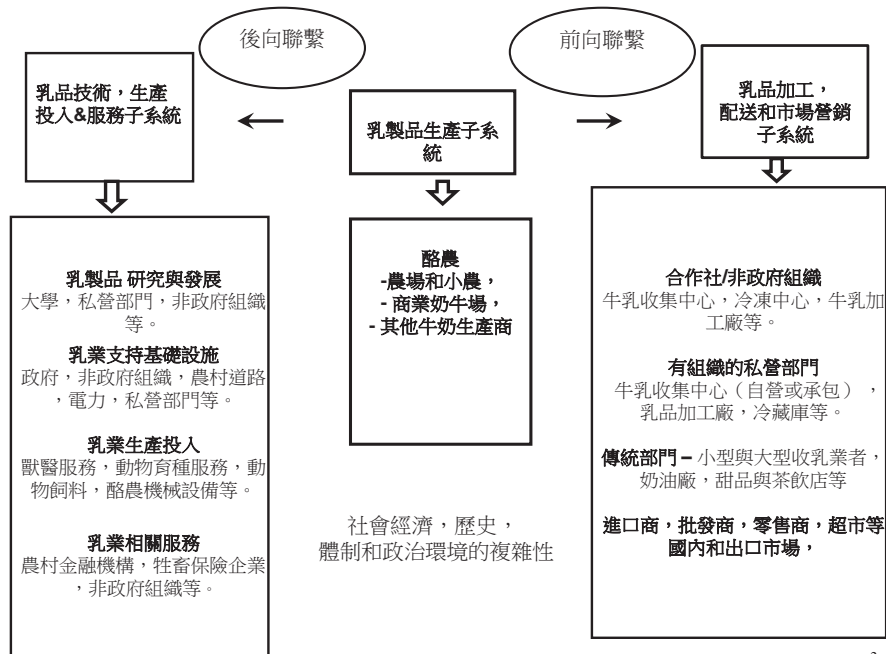


# 泰國乳業發展 Dairy Development in Thailand

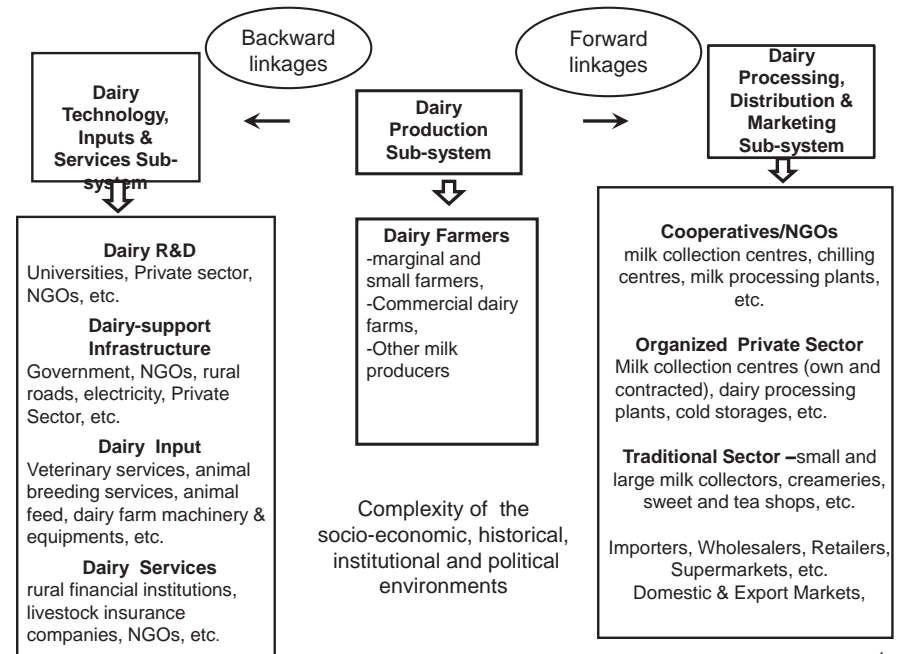
Thanee Pak-uthai  
畜產推廣與發展署  
畜產發展局, 泰國



~47~



資料來源: 泰國, 緬甸和孟加拉國的小農乳業發展計畫



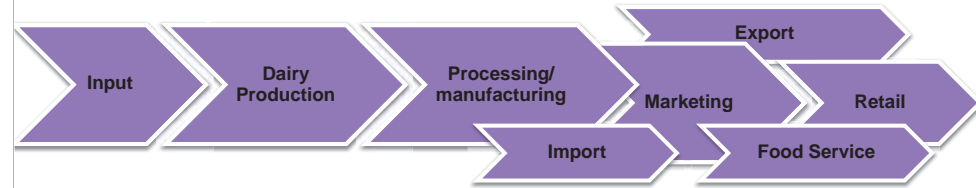
Source: Smallholder Dairy Development Program in Thailand, Myanmar and Bangladesh

# 泰國乳業結構



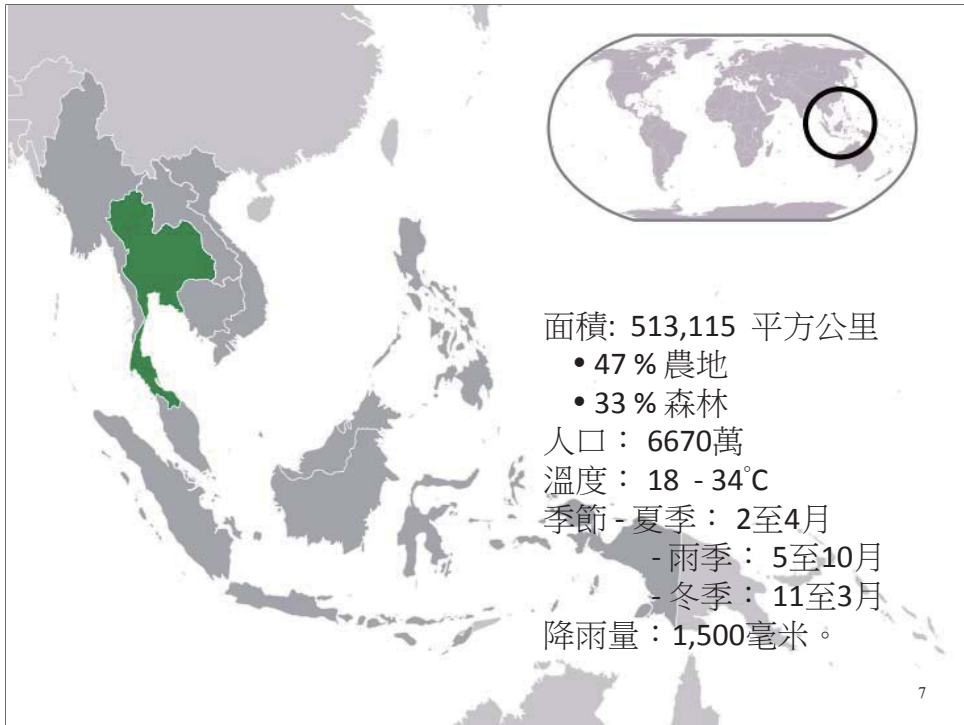
技術移轉	酪農戶	食品安全	D&S Balance	消費者策略
服務	乳品合作社	多角化經營	學童乳	
基礎設施 - 農場服務 - 金融	農場管理與技術開發		商用乳	
	- 母牛群 - 飼料與秣料 - 品種 - 動物健康			

# Thailand Dairy Industry Structure



Tech.Transfer	Dairy Farm	Food Safety	D&S Balance	Consumer Campaign
Services	Dairy Cooperative	Diversification	School Milk	
- Infrastructure - Farm service - Financial	Farm Management / Technology Dev.		Commercial Milk	
	- Dairy Herd - Feed and Fodder - Breed - Animal Health			

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面積: 513,115 平方公里

- 47 % 農地
- 33 % 森林

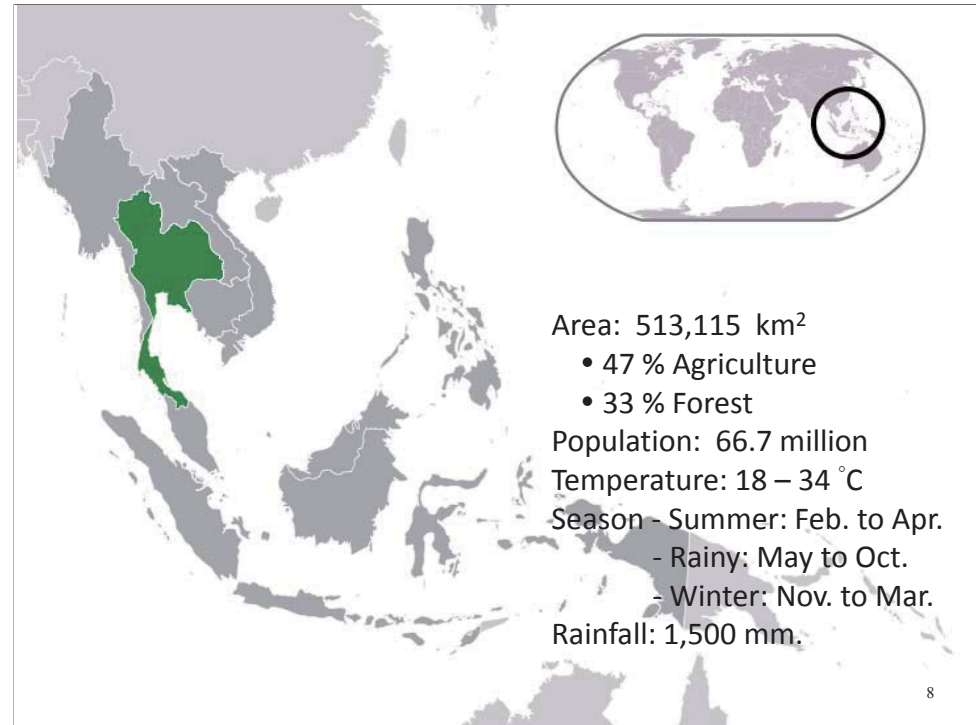
人口: 6670萬

溫度: 18 - 34°C

季節 - 夏季: 2至4月

- 雨季: 5至10月
- 冬季: 11至3月

降雨量: 1,500毫米。



Area: 513,115 km<sup>2</sup>

- 47 % Agriculture
- 33 % Forest

Population: 66.7 million

Temperature: 18 – 34 °C

Season - Summer: Feb. to Apr.

- Rainy: May to Oct.
- Winter: Nov. to Mar.

Rainfall: 1,500 mm.

## 泰國的乳業發展



- **1910:** 乳牛養殖引進
- **1960:** 皇室訪問H. M.丹麥國王
- **1961:** 丹麥與泰國進行技術合作簽署
- **1962:** 位於北標府的泰國-丹麥農場正式啟用典禮
- **1992:** 學童奶計劃啟動
- **Present:** 繼續支持政府（DLD和DPO）和公私合作夥伴關係

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## Dairy Development in Thailand



- **1910:** Dairy farming introduced
- **1960:** Royal visit of H.M. the King to Denmark
- **1961:** Technical cooperation between Denmark and Thailand signed
- **1962:** Inauguration of Thai-Danish farm in Saraburi
- **1992:** School milk programme launched
- **Present:** Continuing support of the Government (DLD and DPO) and Public-private partnership

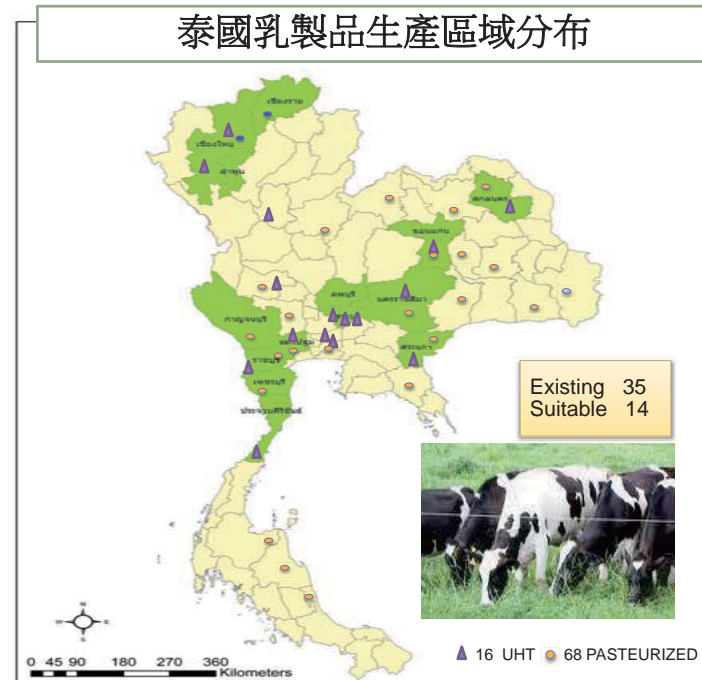
10

## 泰國的乳品生產



11

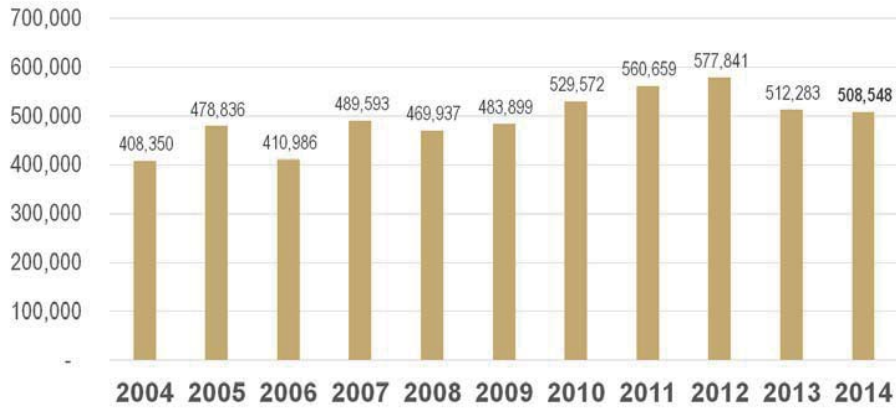
## 泰國乳製品生產區域分布



12



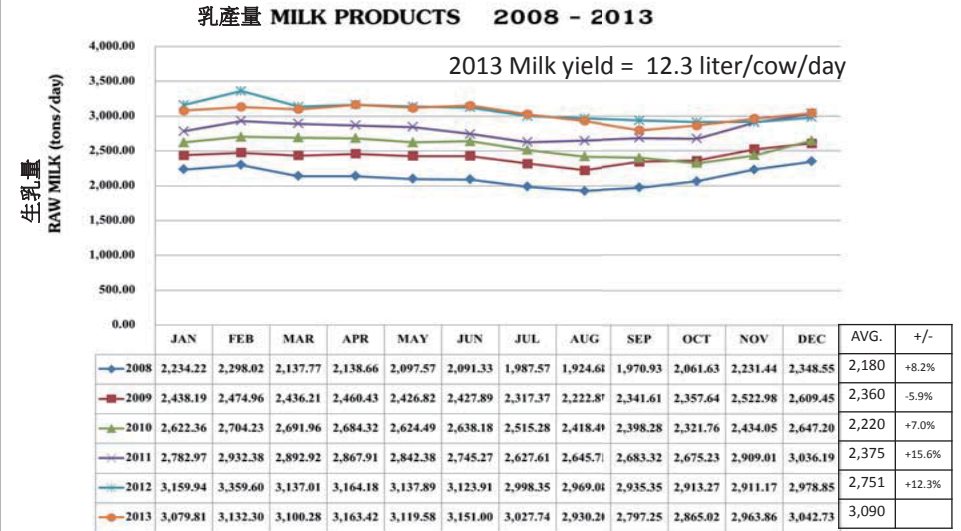
## 泰國乳牛頭數



- 酪農戶數: 16,634 (31 頭/場)
- 乳牛生產頭數: 236,865

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## 泰國的生乳產量(噸/天)



14

## 乳牛場管理



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## 1. 遺傳改良

- 使用本地改良的牛群
- 產生雜交種: 帶有82.5-93.75 % 荷蘭牛(HF)血統的熱帶地區用荷蘭牛
- 人工授精使用率達100 %



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# 1. 遺傳改良

- Use upgrading native cows
- Produced crossbred Tropical HF contain 82.5-93.75 % HF
- Use A.I. ~100 %



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泰國農業部畜產廳 乳用種公牛：熱帶地區用荷蘭牛

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## 熱帶荷蘭牛



- 已發展超過十年以上
- 乳產量**5,000-6,000** 公斤/ 泌乳期
- 供應冷凍精液**250,000** 劑/年

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## 優良種公牛名錄

[http://biotech.dld.go.th/Data/Document\\_Announces/Sire\\_Summary/2552/Sire\\_Summary2552.pdf](http://biotech.dld.go.th/Data/Document_Announces/Sire_Summary/2552/Sire_Summary2552.pdf)

20



## 2. 飼養管理

### 粗料

- 主原料: 天然青草(Natural grass), 稻稈(Rice straw), 玉米桿(corn stem) (來自於甜玉米生產)及玉米穗(Corn husk)

- 乾季容易產生原料不足與品質不良(蛋白質含量不足)的狀況

### 精料

- 酪農戶使用大量的精料來擬補粗料品質的不足

- 多數使用工廠生產之商用飼糧與添加物原料 如: 啤酒酒粕(Beer residue)、粗糠(Rice bran)、木薯副產物(Cassava 副產物)及棕櫚粕(palm cake)

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## 2. Feed Management

### Roughage

- Mainly: natural grass, rice straw, corn stem from sweet corn industry, corn husk

- Insufficient and low quality (protein content) especially in dry season

### Concentrate

- According to low quality of roughage, farmers use high amount of concentrate

- Mostly use commercial feed and supplement raw materials from factories e.g.beer residue, rice bran, cassava byproduct and palm cake

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許多中大型農場使用TMR 飼糧  
Many medium and large scale farms use TMR feed

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## 牛乳品質管控

- 合作社或農民團體設立具有基礎實驗室的收乳中心
- 收集會員生產的新鮮牛奶：上午及下午
- 每桶進行取樣
- 計價品質檢測: 2次/月
- 冷卻（板式熱交換器）及保存於儲乳槽（ $<4^{\circ}\text{C}$ ）
- 集乳前進行抗生素檢測
- 以乳車進行運送（ $<5^{\circ}\text{C}$ ）



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## Milk quality control

- Co-op or Farmer group set up milk collection center with basic lab.
- Collect fresh milk from members : morning & afternoon
- Sampling every churn for release
- Quality check for payment 2/month
- Chilled (PHE) & stored in tank ( $<4^{\circ}\text{C}$ )
- Antibiotic check before loading
- Transported by milk truck ( $<5^{\circ}\text{C}$ )



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## 農場端的品質管控

- 確保農場內良好的衛生習慣
- 良好的擠乳操作
- 擠乳設備的檢查和維護
- 足夠的乳桶供儲存
- 避免抗生素污染
- 以最快速度運送至集乳中心



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## Quality control at farm

- Ensure good hygiene on farm
- Good milking practice
- Milking machine check & maintenance
- Milking bucket enough to milking cow
- Avoid Antibiotics and contaminants in milk
- Send fresh milk to Milk collecting center as fast as possible



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## 收乳中心的品質管控

### 收乳品質?

- 外觀
- 75 %酒精試驗
- 密度

### 計價品質

- 總固形物
- 總生菌數, 美藍試驗
- 體細胞數

### 抗生素

- 快篩測試套組
- Delvo 測試 (卸乳前)



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## Quality control at milk collection center

### Quality for release

- Appearance
- Alcohol test 75 %
- Density

### Quality for payment

- Total Solid
- TPC, MBRT
- Somatic cell

### Antibiotic

- Test kit
- Delvo test (before loading)



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## 乳品廠的品質管控

### 生乳取樣

- 以攪拌器至少攪拌25次(每桶)
- 每桶完成攪拌後再進行取樣



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## Quality control at milk factory

### Sampling of raw milk

- Stir milk 25 times using Plunger (each compartment)
- Take sample from each compartment after finished stirring



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## Quality control at milk factory

### 乳品工廠端的品質管理

#### 收乳檢測項目?

項目	規格
Appearance, Color, Odor 外觀, 顏色, 氣味	IN
Temperature 溫度	Max. 8°C
Alcohol Test / Clot on boiling 酒精/熱凝試驗	Negative
Antibiotic by Twin Sensor, Charm Rosa/Delvo Test 抗生素雙系統檢測 Charm Rosa/Delvo 測試	Negative
Antibiotic by CHARM II (Chloramphenicol 0.1 ppb) CHARM II 抗生素檢測	Negative

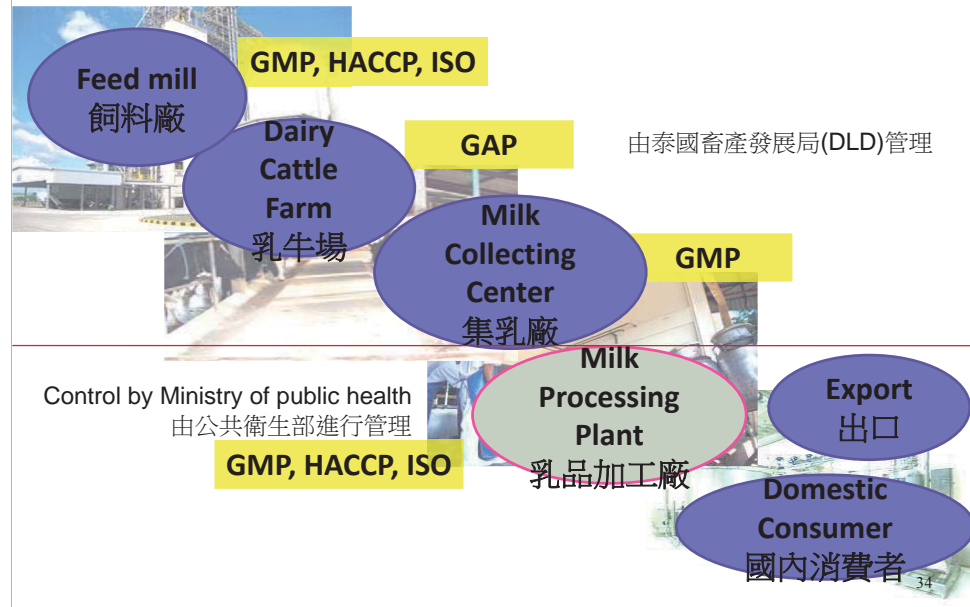
#### 計價項目 (基本價格18 泰銖/公斤)

項目	規格
Fat 乳脂	Min 3.2%
Total Solids 總固形物	Min 12.0%
Freezing Point 冰點	Max -0.520°C
Total Plate Count 總生菌數	<500,000 cfu/ml
Somatic Cell Count 體細胞數	<500,000 cells/ml

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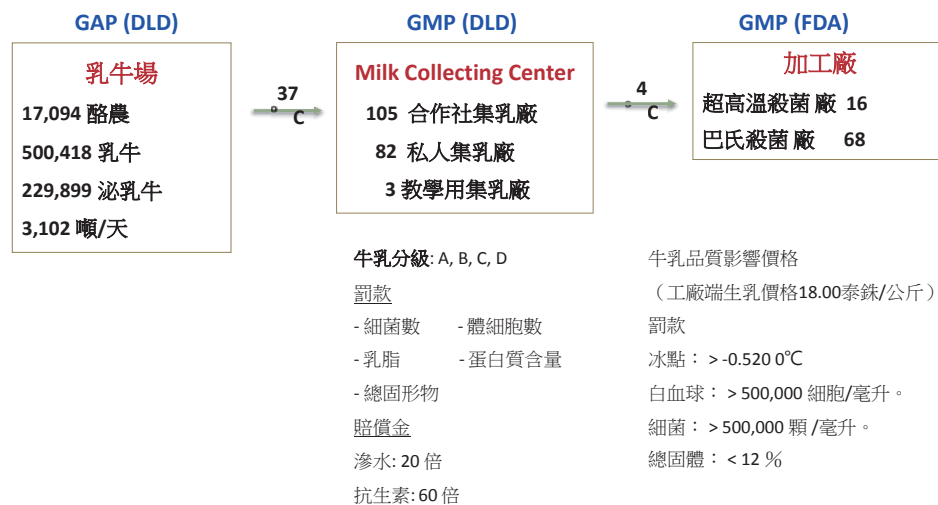
## Food safety management in dairy industry

### 乳品產業食品安全管理



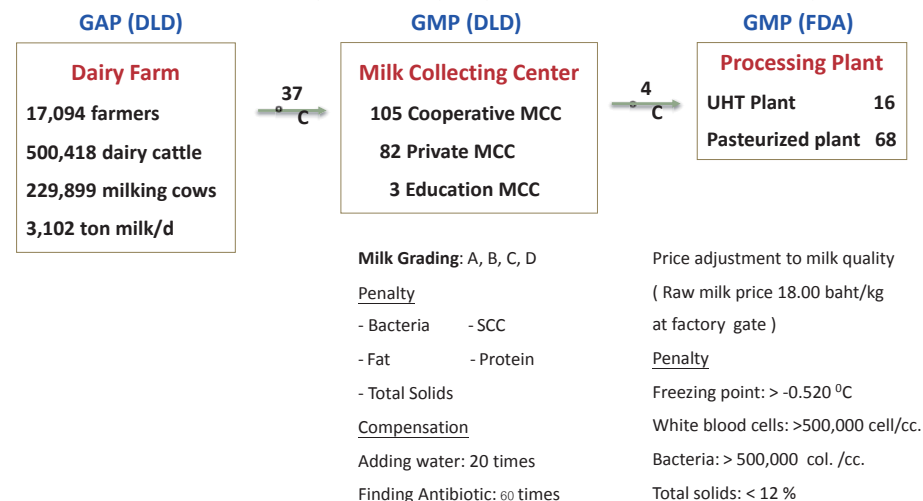
34

## 泰國畜產發展署生乳品質管控步驟



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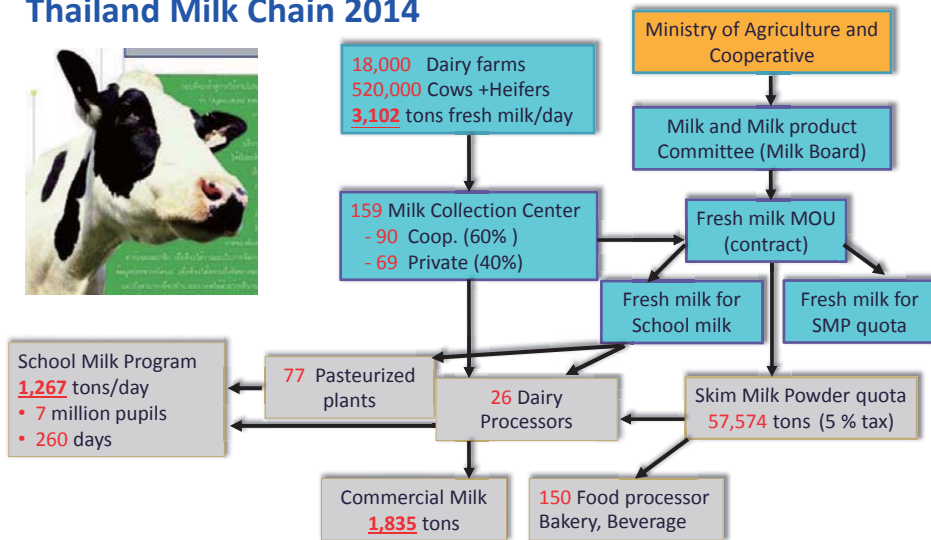
## Process of Raw Milk Quality Control by Department of Livestock Development



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## Thailand Milk Chain 2014



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## 乳業協會

- 建立於2008年,共有25個會員
  - 政府機關 (14)
  - 國有企業 (1)
  - 酪農代表 (5)
  - 企業代表 (5)

## 乳業協會小組委員會

1. 牛乳標準
2. 牛乳價格
3. 牛乳宣傳?
4. 學童奶
5. 乳品管理
6. 脫脂乳粉配額

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## Milk Board

Established since 2008, consisting of 25 members;

- Government Body (14)
- State Enterprise (1)
- Farmer Rep. (5)
- Business Rep. (5)

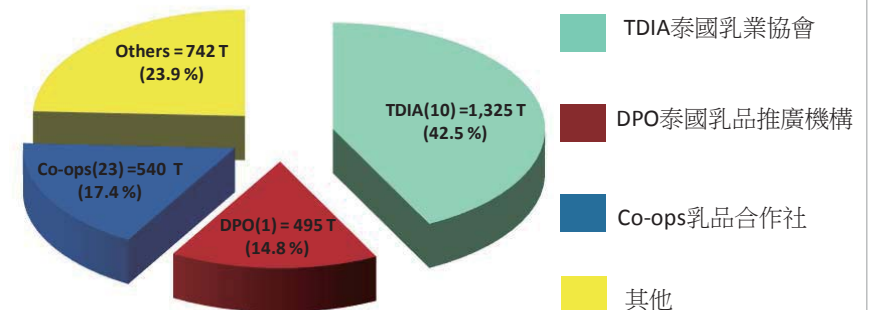
## Sub-Committee under Milk Board

1. Milk Standard
2. Milk Price
3. Milk Campaign
4. School Milk
5. Milk Management
6. Skim Milk Powder Quota

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## 2013/2014 鮮乳需求量

泰國國內總鮮乳生產量 = 3,102噸/天  
Total fresh milk in country = 3,102 tons/day

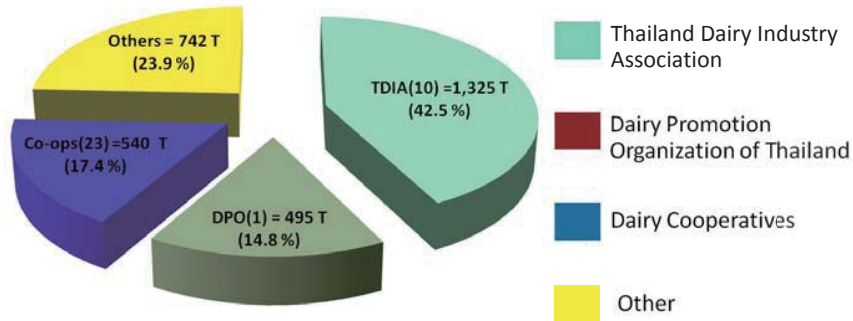


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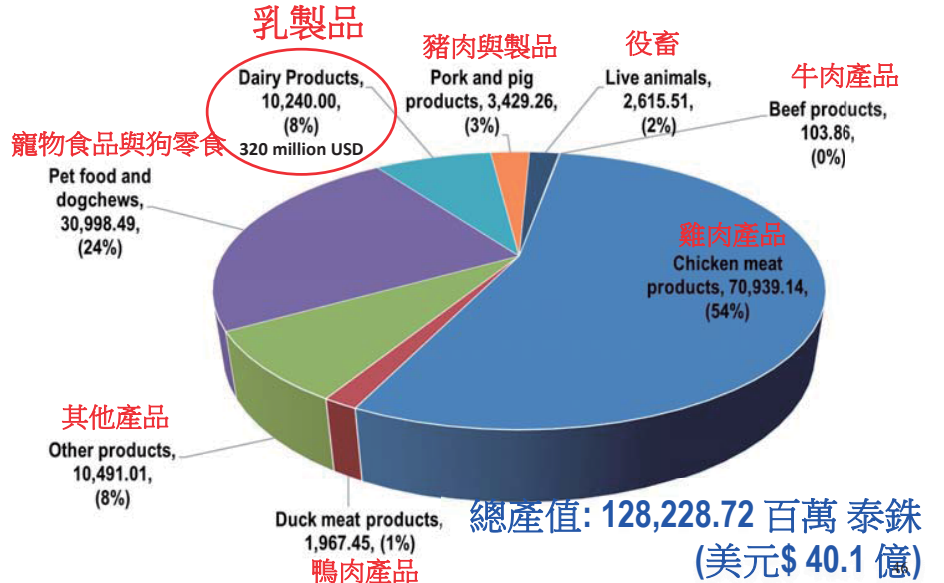
## Fresh milk requirement 2013/2014

Total fresh milk in country = 3,102 tons/day

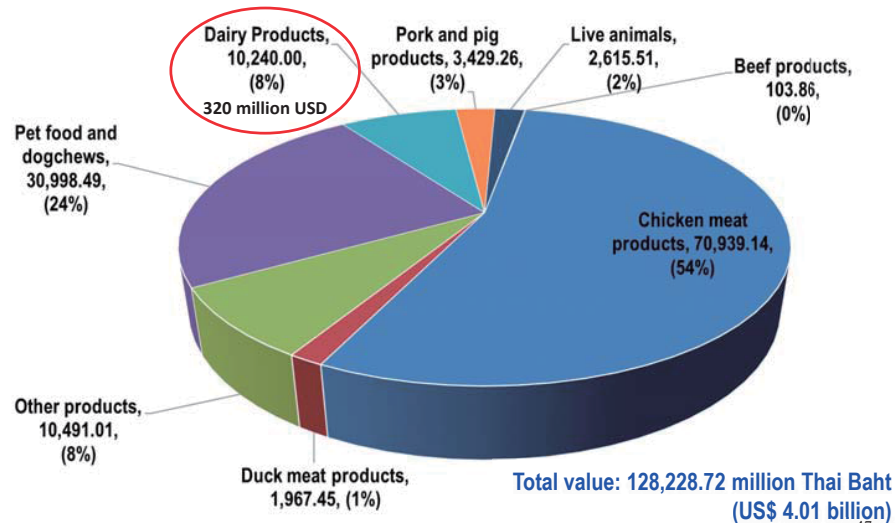


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## Exports of Thai livestock products by types, 2013



## Exports of Thai livestock products by types, 2013



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## 泰國的學童奶計畫



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## 學童奶計畫- 現行方式

- 產品 : 鮮奶與液態乳  
: 本地生乳
- 分布 : 50% 巴士德殺菌(實際 ~60%)  
: 50%超高溫殺菌法(實際 ~40%)



### 巴氏殺菌法

#### 72 製造業者

- Chilled
- 降低16% 價格
- 授權於行動收單平台/合作社?

### 超高溫殺菌法

#### 11 製造業者

- 便利
- 延長保存期限
- 食品安全
- 降低物流成本

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## School Milk Programme - Today

- Products : Fresh and white milk only (liquid milk)  
: Local raw milk
- Distribution : 50% PPP (actual ~60%)  
: 50% UHT carton (actual ~40%)



### Pasteurized

#### 72 manufacturers

- Chilled
- 16% lower price
- Empower MPOs / cooperatives

### UHT

#### 11 manufacturers

- Convenience
- Long-shelf life
- Food safety
- Lower logistic cost

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## 學童奶計畫- 現行方式

- 預算: ~500 百萬 美元/年  
(100% 政府支持)
- 學生族群: ~8 百萬名學生  
: 學前教育, 幼兒園1 - 6年級  
: 全國公私立學校
- 生乳用量 : 1,267 噸/天 (最高達3,102 tons?)
- 改進目標:
  - 2006 年營養不良下降至低於5 %
  - 增加5公分身高。(相較於第一年實施的2-3 公分)



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## School Milk Programme - Today

- Budget : ~500 million USD/year  
(100% government support)
- Students : ~8 million students  
: Pre-school, Kindergarten 1 – Grade 6  
: Government and private schools nationwide
- Raw milk : 1,267 tons/day used (out of 3,102 tons)
- Improvement:
  - Malnutrition dropped to less than 5% in 2006
  - Height increased at 5 cm. a year compared to 2-3 cm at the 1<sup>st</sup> year



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# 泰國的乳製品



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泰國奶業振興機構 ( D.P.O. )

[www.dpo.go.th](http://www.dpo.go.th)



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清邁鮮乳股份有限公司

E-mail: [chiangmaifreshmilk@yahoo.com](mailto:chiangmaifreshmilk@yahoo.com)



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(達美)Dutch Mill Co., Ltd

[www.dutchmill.co.th](http://www.dutchmill.co.th)



發酵乳飲品  
“Dutch Mill ”



UHT發酵乳飲品  
“Dutch Mill ”



發酵乳飲品  
“Delight”

56

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(達美) Dutch Mill Co., Ltd  
www.dutchmill.co.th



鮮乳杯裝優格 "BIO"



鮮乳 "Dutch Mill Selected"



鮮乳杯裝優格 "Dutchie"



巧克力麥芽飲料  
巧克力口味 "DMALT"

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<http://www.cpmeiji.com>

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<http://www.cpmeiji.com>



菲仕蘭康柏尼 (泰國) Foremost

[www.foremostforlife.com](http://www.foremostforlife.com)

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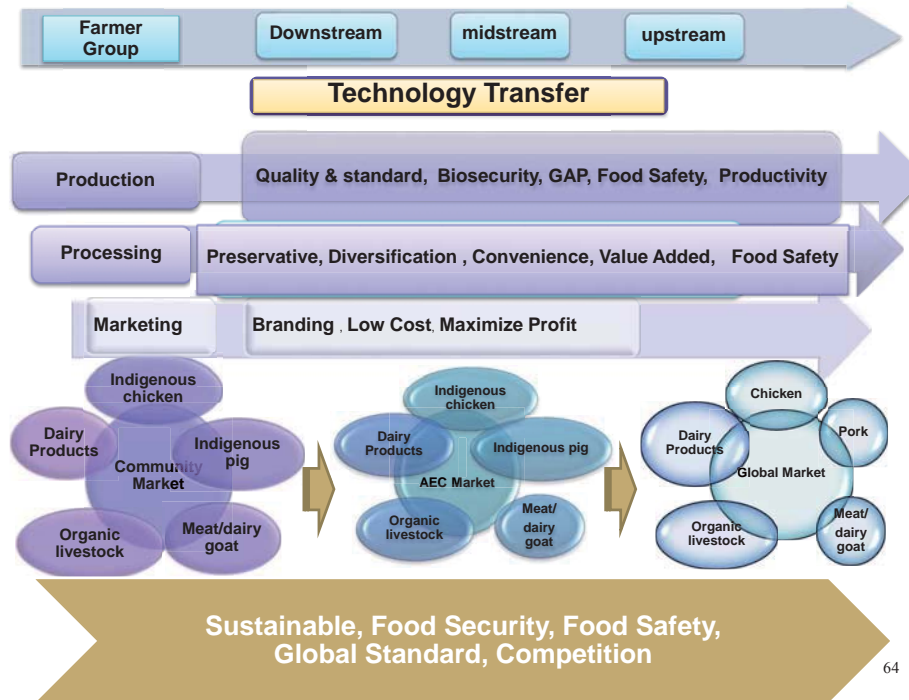
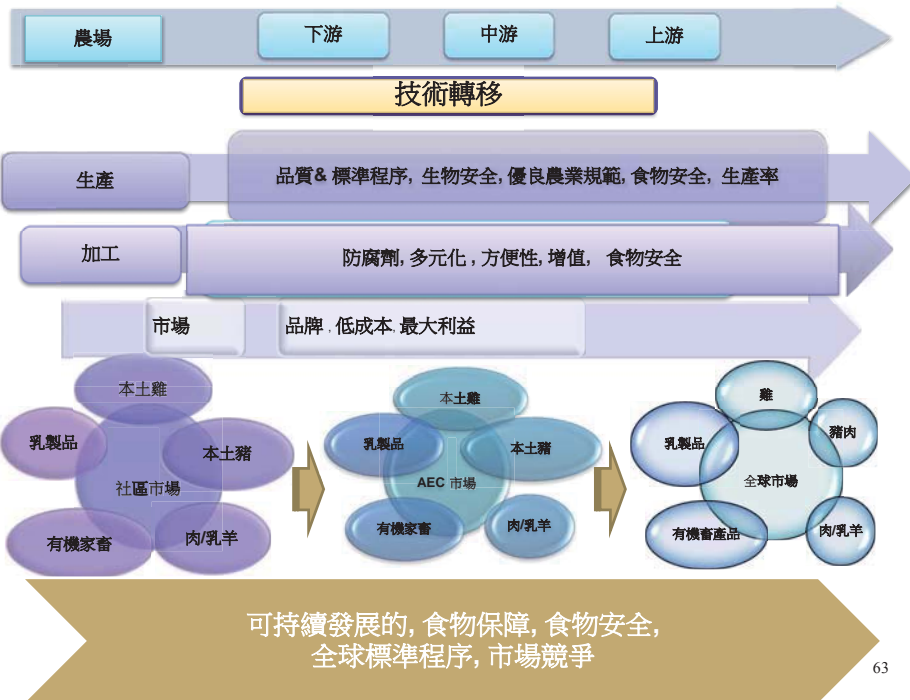
www.fnthaidairies.com

F&N 供應不同區域國家



www.fnthaidairies.com

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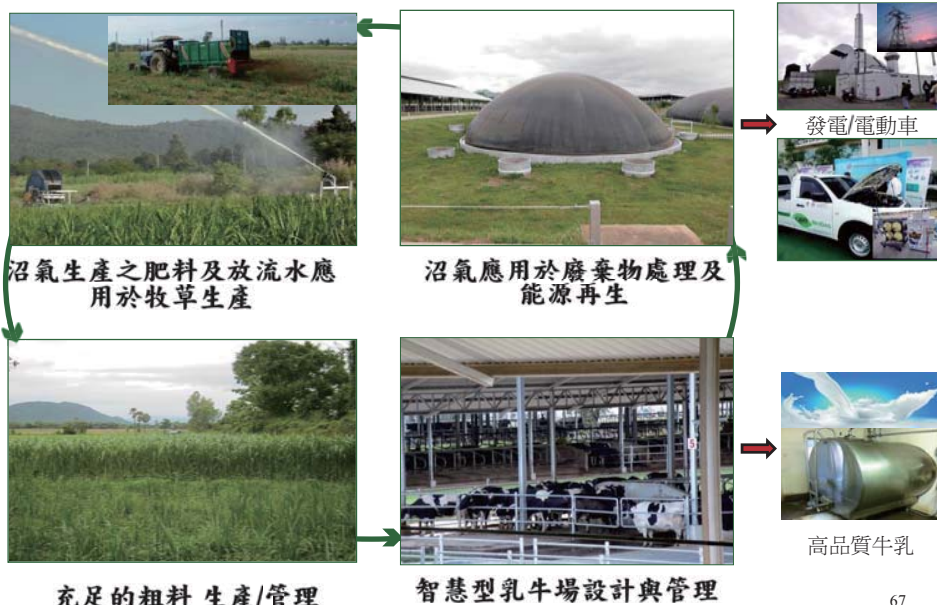
# 泰國乳品業的未來展望

- Optimize the cost-benefit of dairy farmer (reduce the cost of production)
- 乳牛場的成本效益最佳化 (降低生產成本)
- Improve a quality of milk at farm and milk collecting center (GAP, GMP)
- 改善乳牛場和牛乳收集中心的牛乳品質
- Increase the production of domestic dairy products (i.e. cheese)
- 增加國產乳製品的生產(如:起司)
- Increase the dairy market domestically and internationally
- 增加乳製品市場的國產化和國際化
- Extend the South-South cooperation on dairy sector development in the Region
- 擴展南南合作區域的乳製品產業發展
- Smart farmer and green farm
- 綠色智能農場

# Future of dairy sector in Thailand

- Optimize the cost-benefit of dairy farmer (reduce the cost of production)
- Improve a quality of milk at farm and milk collecting center (GAP, GMP)
- Increase the production of domestic dairy products (i.e. cheese)
- Increase the dairy market domestically and internationally
- Extend the South-South cooperation on dairy sector development in the Region
- Smart farmer and green farm

## 智能牧場與綠色牧場



## Smart Farmer and Green Farm

