

**Dairy cows!**

# Development, status and prospects of dairy industry in Taiwan



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Time : **Nov. 27, 2007**

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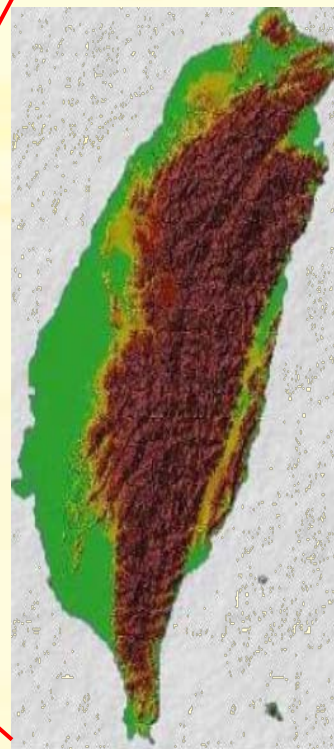
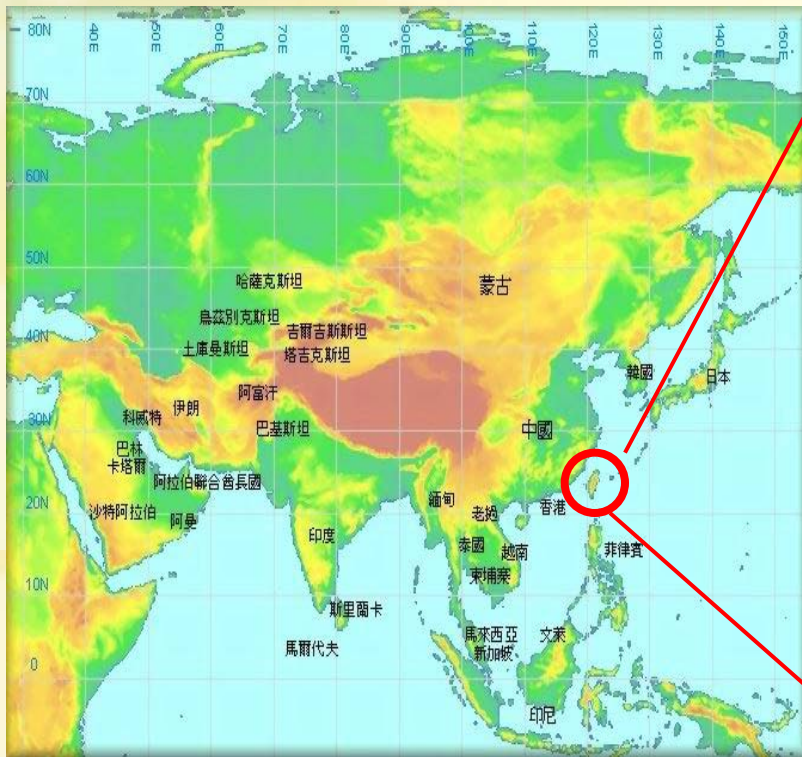
# Outline

- 1. The geography and climate of Taiwan**
- 2. Development and status of Dairying**
- 3. Dairy Herd Improvement (DHI)**
- 4. Problems and Constrains of Dairying**
- 5. Prospects of Dairying**



# The geography of Taiwan

- Located on the Tropics of Cancer in the Pacific Ocean East of Mainland China.





# The climate of Taiwan

- The climate is mainly subtropical.
- The average of temperature is 28°C (8 to 35°C).
- The average of relative humidity is 85% (70 to 99 %).



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# The dairy breeds in Taiwan and their origin

- Commencing the dairy farming in 1957
- Imported animals from foreign country including Jersey, Brown Swiss, Gurnsey, Illawala etc





# The results of performance test trial

- Milk yield of purebred Holstein were better than other purebreds and crossbreds.
- Milk quality was best for fresh milk market consumption.
- Purebred Holsteins were recognized as the sole dairy breed in Taiwan.
- The milk productivity of Holstein in Taiwan enhanced.



# Breeding Strategies

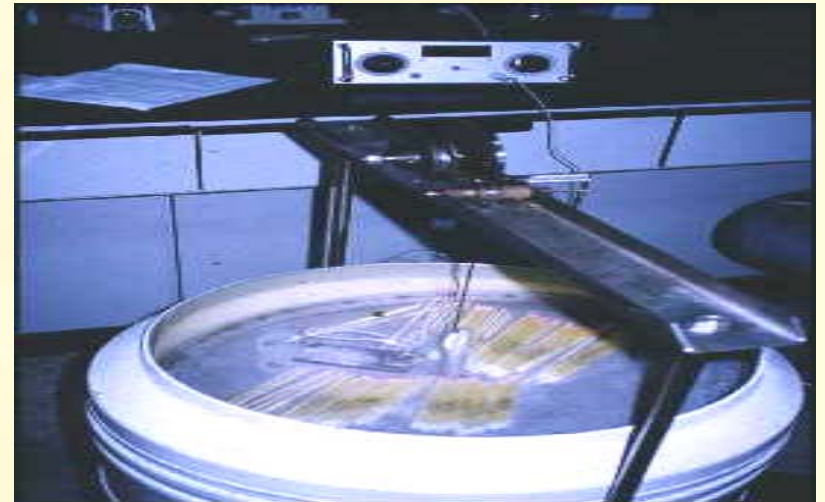
- AI was introduced into Taiwan in 1970
- Farmers did AI by themselves and AI skill was trained by AI school at LRI.





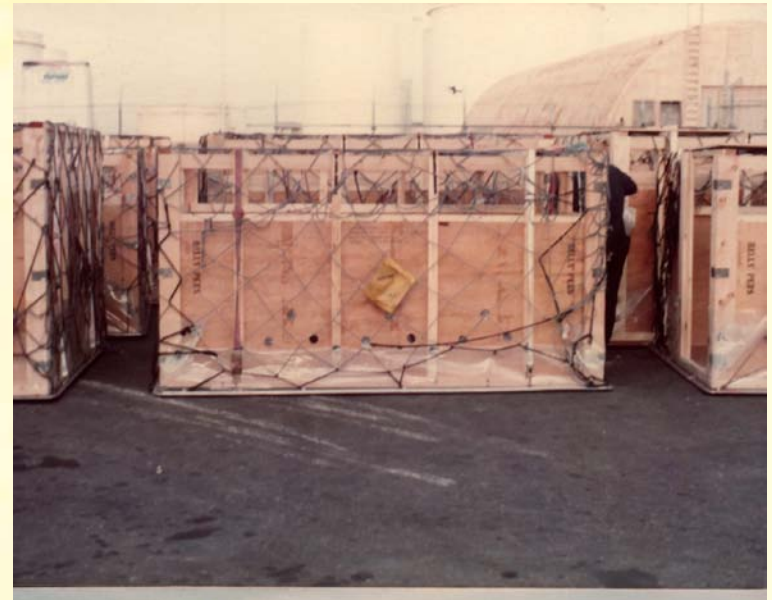


A governmental bull station was established in 1977



# The Importation of Holsteins

- All transported by air.
- Stop importation since 1997





# Feeds and Feeding

- Total Mixed Ration (TMR) extension program
- Reduce cows' digestion disorder
- Save much labor
- According daily milk yield, grouping into 3~4 herds





# Management and Facilities

- Dairy barn changed from straw-roofed hut to free stall barn



# Design of the barn

With open, high, insulated roof, good ventilation and enough space



Big Fans





# Facilities of the barn (1)

- Automatic manure scraper, Individual cow bed mat and automatic washing machine





# Facilities of the barn (2)



- Milking cows were cooling by water sprinklers in barn





# Management (1)

- Calves are raised in elevated individual pens
- To keep calves body clean and dry
- To control the spread of infectious scours



# Management (2)

- The emphasis place on normal growth rates, economical rations and labor efficiency.
- Heifers are grouped by age as a unit for feeding and management.





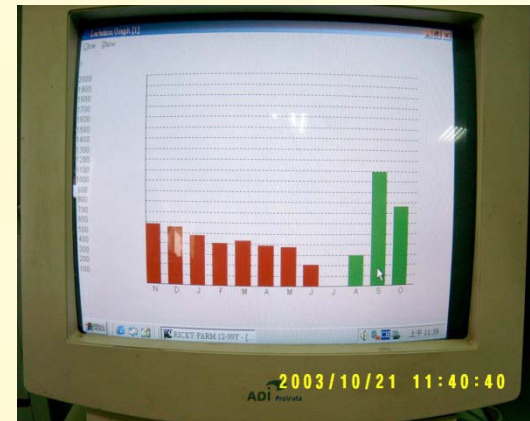
# Management (3)

- Milking cows were cooling by water sprinklers on the floor in holding area before milking.
- New style milking equipment.



# Management (4)

■ Using remote monitor and computer to manage herd





# Management (5)

- Barn, waste treatment, shade, breeding, trimming and cure area





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# ❖ **DHI is one of the most important projects for dairy farms**

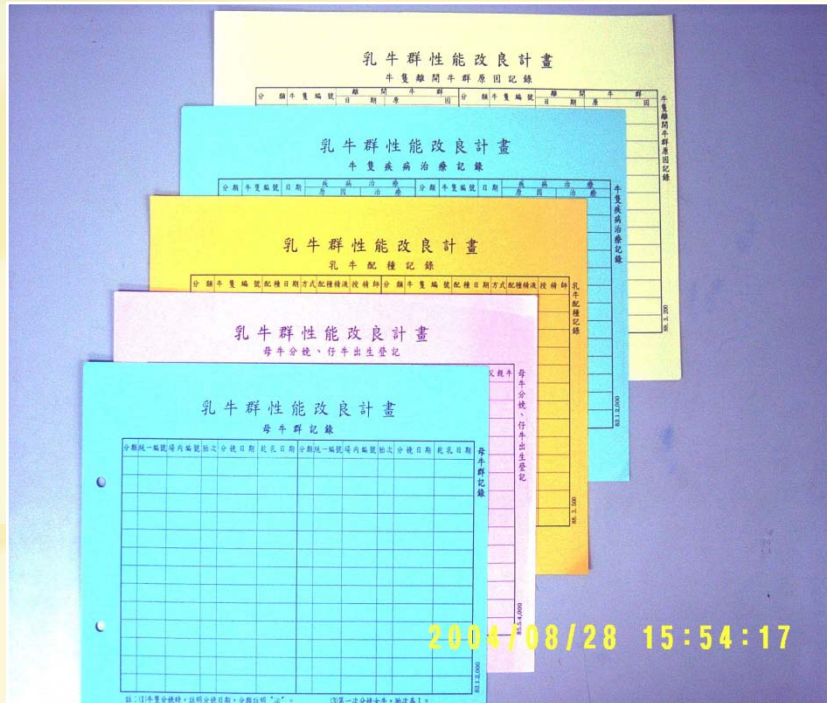
## **PERFORMANCE TEST**

- **Milk yield weighing and sampling of all individual COWS.**
- **Collected data will be processed and generate information to provide the farmers can know the performance of cows.**
- **Form a national dairy database.**



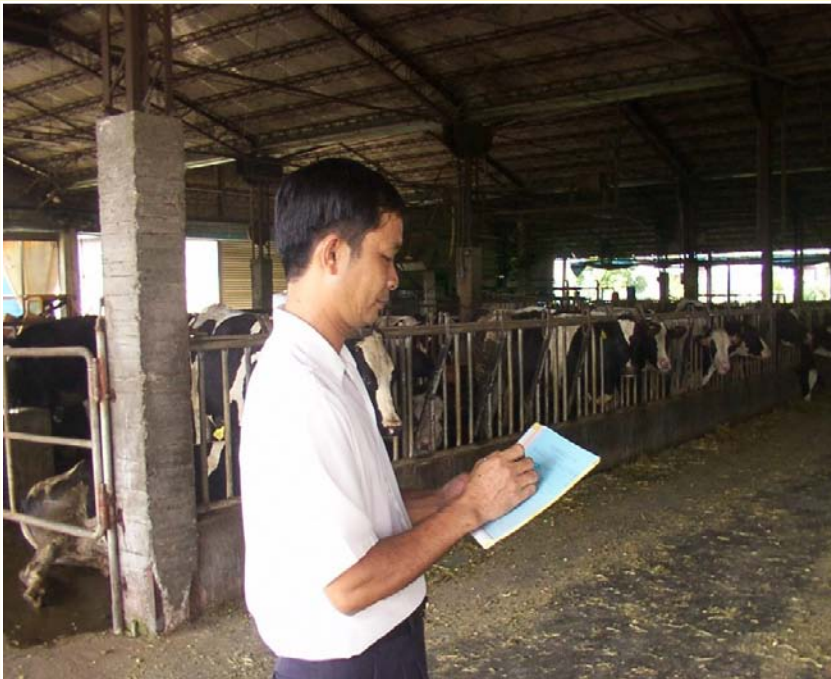
# Records

- Farmers uphold all essential data with different color cards in the folder.



# Technicians

- DHI technicians visit farm once a month routinely to identify each of cows in the herd and to collect data on the barn sheets





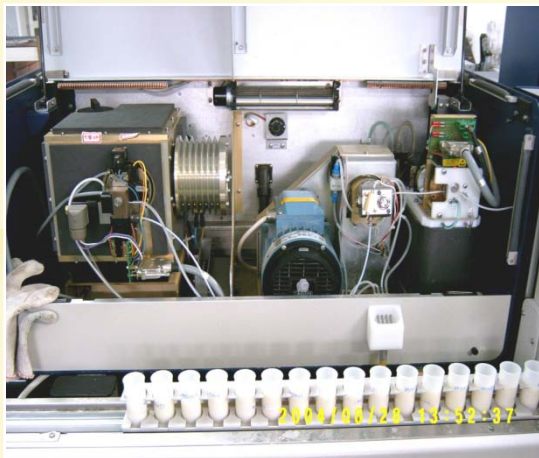
# Milk weighing and sampling

- Weigh and take milk sample from each milking for all individual cows in the herd
- Writing down calving, breeding, drying, culling data of the herd on barn sheet



# Milk sample testing

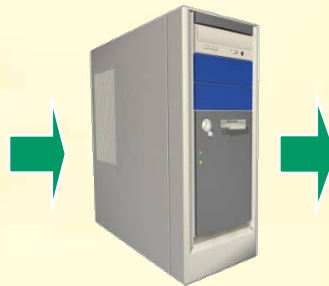
- Fat%, protein%, lactose%, and SCC, MUN in milk will be determined by approved procedures and equipment
- Solid-not-fat (SNF) through calculation
- Computers capture milk component test results
- Transmit results to the DRPC





# Dairy Records Processing Center (DRPC)

- Calculating the lactation milk yield totals
- Standardizing milk yield (305-2X-ME)
- Generating reports and transmit data to Server of LRI



# DHI reports (1)

## ■ Monthly reports

- Milk component report
- Performance monthly report

## ■ Management reports

- Sorted and derived for a specific purpose.
- Somatic cell count (mastitis), cows to be bred, pregnancy check, dry off, calve, cull....



# DHI reports (2)

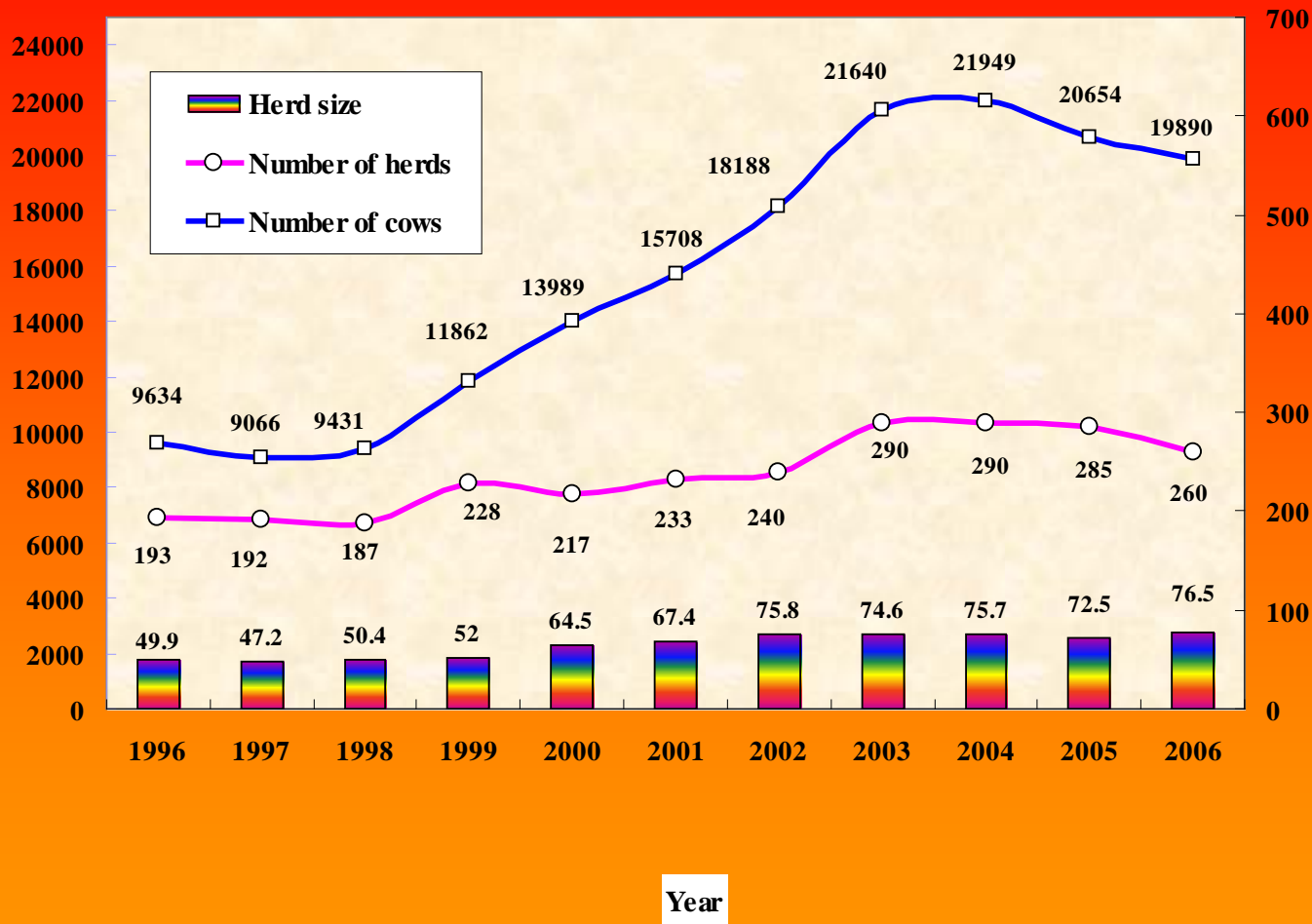
## ■ Operation efficiency reports

- Rolling herd average, somatic cell summaries, reproductive statistics and many other useful information reports in the past 12 month.

## ■ Statistics reports

- Dairy Farming News, The top 50 individual cows on milk, fat, and protein yield, The top 50 farms on lowest SCC in milk...

Number of cows



Number of herds

Figure 1. Number of herds and cows enrolled in DHI from 1996 to 2006



**Table 1. Dairy cows enrollment in Taiwan and in DHI from 2002 to 2006**

<b>year</b>	<b># of herds in Taiwan<sup>a</sup></b>	<b># of herds in DHI</b>	<b># of cows in Taiwan<sup>a</sup></b>	<b># of cows in DHI</b>	<b>% of herds enrollment</b>	<b>% of cows enrollment</b>
<b>2002</b>	<b>751</b>	<b>240</b>	<b>64517</b>	<b>18188</b>	<b>32</b>	<b>28</b>
<b>2003</b>	<b>715</b>	<b>290</b>	<b>59467</b>	<b>21640</b>	<b>41</b>	<b>36</b>
<b>2004</b>	<b>674</b>	<b>290</b>	<b>54615</b>	<b>21949</b>	<b>43</b>	<b>40</b>
<b>2005</b>	<b>638</b>	<b>285</b>	<b>53150</b>	<b>20654</b>	<b>45</b>	<b>39</b>
<b>2006</b>	<b>636</b>	<b>260</b>	<b>50879</b>	<b>19890</b>	<b>41</b>	<b>39</b>

<sup>a</sup> Agricultural statistics yearbook (from 2002 to 2006).

**Table 2. The average of daily milk yield and 305-2X-ME milk yield as well as herd size from 2002 to 2006**

<b>year</b>	<b>Number of herd (herds)</b>	<b>Number of cows (herd)</b>	<b>305-2X-ME milk yield (kg)</b>	<b>Dairy milk yield (kg)</b>	<b>Herd size (herds/herd)</b>
<b>2002</b>	<b>240</b>	<b>18188</b>	<b>6860</b>	<b>21.8</b>	<b>75.8</b>
<b>2003</b>	<b>290</b>	<b>21640</b>	<b>7064</b>	<b>22.1</b>	<b>74.6</b>
<b>2004</b>	<b>290</b>	<b>21949</b>	<b>7115</b>	<b>21.7</b>	<b>75.7</b>
<b>2005</b>	<b>285</b>	<b>20654</b>	<b>7244</b>	<b>22.3</b>	<b>72.5</b>
<b>2006</b>	<b>260</b>	<b>19890</b>	<b>7436</b>	<b>22.8</b>	<b>76.5</b>



**Table 3. The average of milk component in DHI from 2002 to 2006**

<b>Year</b>	<b>n</b>	<b>Fat (%)</b>	<b>Protein (%)</b>	<b>Lactose (%)</b>	<b>Log somatic cell score<sup>b</sup></b>
<b>2002</b>	<b>18,188</b>	<b>3.78 ± 0.01</b>	<b>3.28 ± 0.01</b>	<b>4.77 ± 0.01</b>	<b>4.82 ± 0.01</b>
<b>2003</b>	<b>21,640</b>	<b>3.83 ± 0.01</b>	<b>3.28 ± 0.01</b>	<b>4.78 ± 0.01</b>	<b>4.75 ± 0.00</b>
<b>2004</b>	<b>21,949</b>	<b>3.86 ± 0.00</b>	<b>3.32 ± 0.00</b>	<b>4.75 ± 0.00</b>	<b>3.18 ± 0.00</b>
<b>2005</b>	<b>20,655</b>	<b>3.82 ± 0.00</b>	<b>3.35 ± 0.00</b>	<b>4.77 ± 0.00</b>	<b>3.06 ± 0.00</b>
<b>2006</b>	<b>19,890</b>	<b>3.81 ± 0.00</b>	<b>3.33 ± 0.00</b>	<b>4.80 ± 0.00</b>	<b>2.78 ± 0.00</b>

<sup>a</sup> Mean ± SE

<sup>b</sup> LSCS = somatic cell count : transformed to a logarithmic scale with base 2 and added 3.

**Table 4. The calving interval of Taiwan Holsteins in 2002 and 2006**

Calving interval (days)	Cows (head)		Percentage	
	2002	2006	2002	2006
<b>Total</b>	<b>15844</b>	<b>19705</b>	<b>100.0</b>	<b>100.0</b>
300 — 330	1398	1552	8.8	7.9
331 — 360	2627	3083	16.6	15.6
<b>361 — 390</b>	2727	3283	17.2	16.7
391 — 420	2191	2706	13.8	13.7
421 — 450	1700	2280	10.7	11.6
451 — 480	1399	1857	8.8	9.4
481 — 510	1233	1621	7.8	8.2
510 — 540	1016	1345	6.4	6.8
541 — 600	1553	1978	9.8	10
<b>Mean</b>	<b>422 ± 0.6</b>	<b>425 ± 0.5</b>		



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# Cost and Price

- Milk production cost varied from farms to farms from US\$ 0.48 to 0.53 per kg.
- Somatic cell count was put into pricing and made the raw milk cost higher due to more investment since 1999.
- Price of imported hay and concentrate such as corn, soybean meal continued soaring.



# Supply and Demand

- Though summer raw milk price is much higher than winter milk, surplus milk still existed.
- Annual per capita milk consumption grew from 4.6 kg to 16 kg from 1985 to 1995 .

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# Prospects of Dairying in Taiwan (1)

- To encourage dairy farmers to participate in DHI or take owner sampling DHI.
- To establish a nationwide forage supply system to promote good-quality local produced grass.





# Prospects of Dairying in Taiwan (2)

- Dairy farm appraisals to improve farm image and management effectiveness.
- Continue to promote the fluid milk to increase annual per capita consumption from 16 kg up to 35 kg.



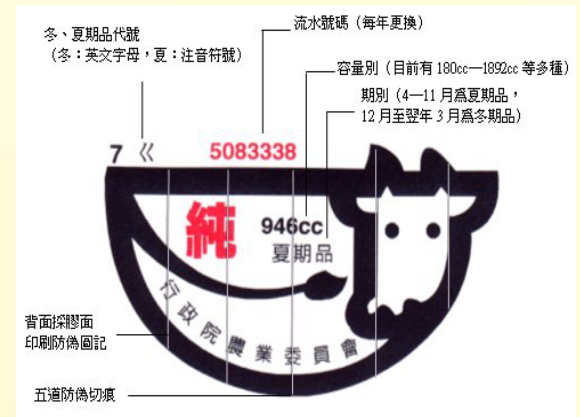
# Prospects of Dairying in Taiwan (3)

- There will be fluid milk products with traceability label on the package.
- The raw milk of the product is produced under Taiwan Agriculture Practices (TAP).





# Future efforts to create image of fresh, premium, and safe of the domestic milk





**Thanks for  
Your attention**

