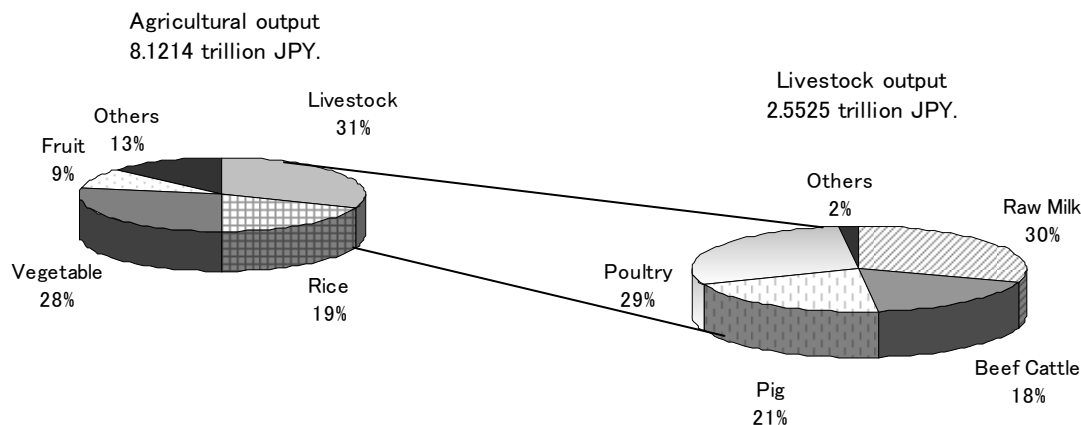


### 3. Current situation of Japanese dairy farming

#### ■ Japanese dairy farming with the advance of intensification and expansion

The Japanese agricultural production in 2010 was approximately 8 trillion jpy, of which milk production was accounted for around 10%. **Fig 1**

**Fig. 1: Agricultural production / output (2010)**



Resources : Production agriculture income statistics by Ministry of Agriculture, Forestry and Fisheries.

Commercial dairy farming had started about 100 years ago in Japan, and it started developing in full scale when school lunch was introduced in primary schools.

Compared to the rice and vegetable growing, dairy farming had a benefit of generating income monthly and consistently despite of the weather conditions. For those reasons dairy farming grew its popularity rapidly, however, in those days farmers still grew rice and vegetables and kept a smaller herd of just 2-3 cows. In 1965 average herd size per farm was only 3.4 cows, and annual production yield was 3.84 millions tonnes.

With Japan's economical growth, many young people had moved from the countryside to cities. This has resulted in the shortage of successors, agriculture as a whole had to advance towards rationalization, intensification and expansion in their size. Dairy was no different.

In 1963 at its peak, there were 418,000 dairy farms in Japan, but since then the numbers had declined rapidly to about 160,000 in 1975 and only 82,000 in 1985. With this trend continuing, about 4-5% dairy farmers leave farming every year, and in 2012 there were only 20,000 farms left which was only one twentieth of the numbers at its peak time.

On contrary, the herd size continued to be increased, the scale of Japanese dairy farms became almost equal to the EU member states which are the leading dairy countries. **table 1** In 2012 the average herd

size of Japanese farm was 72.1, and annual raw milk production was 7.53 million tones. **table 2**

With this increased herd size securing its supply, raw milk is used approximately 54% for drinking milk and 45% for processed dairy products such as cheese and butter. **table 3**

**Table 1: International Comparison of Dairy Farming (2010)**

Classification		Unit	Netherlands	France	Germany	Denmark	UK	Canada	USA	Australia	NZ	Japan	Hokkaido
Number of parous cows		1000	1,479	3,729	4,182	573	1,847	987	9,117	1,600	4,397	933	480
Number of Farms		1000	20	82	90	4	16	13	63	7	12	21	8
Number of parous cows per farm			75	45	46	133	117	76	146	230	386	44	64
Raw Milk Production Cost		1000t	11,941	24,000	29,610	4,965	13,935	8,434	86,769	9,374	17,859	7,631	3,897
Average production yield per cow		kg	7,440	6,657	7,113	8,589	7,501	9,768	9,517	5,871	3,944	8,046	8,045
Volume of Dairy Products	cheese	1000t	753	1,756	2,169	292	335	349	4,742	333	282	123	18
	butter	1000t	181	409	449	33	119	83	709	132	478	82	69
	SMP	1000t	64	320	261	27	66	72	824	244	363	170	144
Consumption per person	Drinking milk	kg	59.6	58.5	53.0	91.4	107.0	80.3	79.9	105.0	79.7	32.7	-
	Cheese	kg	21.2	25.6	22.8	16.2	11.2	12.7	15.0	11.9	6.1	1.9	-
	Butter	kg	3.4	7.5	6.0	1.8	3.2	2.6	2.2	3.8	3.8	0.6	-
Farm-gate price of raw milk		JPY/kg	44.4	38.4	39.6	44.3	36.0	60.4	34.1	30.5	43.3	88.2	77.2

Resources : IDF 『World Dairy Situation』、AMI 『Marktbilanz Milch 2011』、CDC 『ANNUAL REPORT』、USDA 『Milk Production』、『Farms, Land in Farms, and Livestock Operations』 DairyAustralia 『Australian Dairy Industry In Focus 2011』、LIC 『Dairy Statistic 2010/2011』、Livestock Statistics, Milk Products Statistics, Statistics of Agricultural Products prices by Ministry of Agriculture, Forestry and Fisheries.

Note: Figures for Hokkaido Japan is of 2010. Currency exchange rate by Mitsubishi Tokyo UFJ Bank (TTS Market) is used For Raw Milk production and Average production yield per cow, figures were calculated using 1 pound=0.45kg for USA, 1 litre=1.03KG for Australia and NZ.

**Table 2: Number of dairy farms and cows by year**

Year	Numbr of Farms	Number of cows						Number of cows per farm	change from previous	
		Total	Over 2 years old			Under 2 years old	Number of farms		Number of cows	
			total	Parous cows						
				subtotal	Milking cow					Dry cow
1963	417,640	1,145,370	729,170	636,240	538,310	...	416,200	2.7	100.5	114.3
1970	307,600	1,804,000	1,198,000	1,060,000	884,900	174,900	606,600	5.9	94.8	108.5
1975	160,100	1,787,000	1,235,000	1,111,000	910,000	200,900	549,700	11.2	89.6	102.0
1980	100,032	1,829,343	1,324,911	...	...	...	504,432	...	81.1	88.5
1985	82,400	2,111,000	...	1,322,000	1,101,000	...	648,600	25.6	94.3	100.0
1990	63,300	2,058,000	...	1,285,000	1,081,000	204,700	...	32.5	94.9	101.3
1995	44,300	1,951,000	1,342,000	1,213,000	1,034,000	178,700	609,700	44.0	93.1	96.7
2000	33,600	1,764,000	1,251,000	1,150,000	991,800	157,900	513,200	52.5	94.9	97.1
2001	32,200	1,725,000	1,221,000	1,124,000	971,300	153,100	504,700	53.6	95.8	97.8
2002	31,000	1,726,000	1,219,000	1,126,000	966,100	160,300	506,700	55.7	92.3	97.8
2003	29,800	1,719,000	1,210,000	1,121,000	964,200	156,400	508,900	57.7	96.1	99.6
2004	28,800	1,690,000	1,180,000	1,088,000	935,800	152,000	602,600	58.7	96.6	98.3
2005	27,700	1,655,000	1,145,000	1,055,000	910,100	144,900	510,200	59.7	96.2	97.9
2006	26,600	1,636,000	1,130,000	1,046,000	900,000	146,100	505,300	61.5	96.0	98.8
2007	25,400	1,592,000	1,093,000	1,011,000	871,200	140,100	499,600	62.7	95.5	97.3
2008	24,400	1,533,000	1,075,000	998,200	861,500	136,700	458,000	62.8	96.1	96.3
2009	23,100	1,500,000	1,055,000	985,200	848,000	137,200	445,100	64.9	94.7	97.8
2010	21,900	1,484,000	1,029,000	963,800	829,700	134,100	454,900	67.8	94.8	98.9
2011	21,000	1,467,000	999,600	932,900	804,700	128,200	467,800	69.9	95.9	98.9
2012	20,100	1,449,000	1,012,000	942,600	812,700	129,900	436,700	72.1	95.7	98.8

Resources: Livestock statistics, Annual Statistics on dairy farms and cows

**Table 3: Milk Products Statistics**

Classification	actual number								
	raw milk production	component ratio	Processed amount by uses					Others	component ratio
			For Drinking milk, etc.	component ratio	For Dairy products	component ratio			
2009	7,881,390	100.0%	4,218,563	53.5%	3,586,821	45.5%	76,006	1.0%	
2010	7,631,304	100.0%	4,109,761	53.9%	3,451,217	45.2%	70,326	0.9%	
2011	7,533,851	100.0%	4,082,808	54.2%	3,387,420	45.0%	63,623	0.8%	

Resources: Milk Products Statistics, by Ministry of Agriculture, Forestry and Fisheries.

## ■ Family run business

Unlike corporate managed beef cattle, pig and poultry farms, the characteristics of Japanese dairy farm management is its heavily reliance on family labour. About 85% of dairy farmers are not company registered (unincorporated), [table 4](#) and about 80% employ no full time workers. [table 5](#) These figures clearly show that dairy farms in Japan heavily rely on family labour. Cows have very delicate nerves like humans, so farmers have no choice but work along with their physiology. Such 24 hours 365 days care could have been only available by family run business. This trend is a feature seen not just in Japan but also in all other leading dairy countries.

**Table 4: Management Style**

Unit : %

		Number of Dairy farms	ICorporation per farm	Joint Corpoproration	Not company-registered	Non-response	Corporation Management
Total		2,696	12.2	0.7	85.2	1.9	12.9
B l o c k	hokkaido	933	12.1	1.5	84.5	1.9	13.6
	tofuken total	1,763	12.3	0.3	85.6	1.8	12.6
	tohoku	435	10.1	0.5	87.6	1.8	10.6
	kanto	548	10.2	0.2	88	1.6	10.4
	hokuriku	65	9.2	1.5	89.2	-	10.7
	tokai	144	14.6	-	82.6	2.8	14.6
	kinki	95	7.4	1.1	89.5	2.1	8.5
	chugoku	101	11.9	-	88.1	-	11.9
	shikoku	77	14.3	-	83.1	2.6	14.3
	kyushu	298	19.8	0.3	77.5	2.3	20.1
2009 Researcg Total		2,635	10.6	0.8	86	2.6	11.4

**Table 5: Number of employees outside family**

Unit : Number,%

Number of Dairy Farms		0	1	2	3	4	5~9	Over 10	Non-response	Total excluding 0 and non-response	Valid response including 0	Average without 0
Total		2,696	80.3	8.3	3.3	1.4	1.1	1.4	0.5	3.7	16.0	2.6
B l o c k	hokkaido	933	70.7	10.9	4.4	1.8	1.4	1.4	0.5	8.8	20.4	2.4
	tofuken total	1,763	85.3	6.9	2.7	1.2	1.0	1.4	0.5	1.0	13.7	2.7
	tohoku	435	88.3	5.1	2.1	0.9	0.5	0.5	0.5	2.3	9.6	2.3
	kanto	548	84.9	7.1	3.3	1.1	1.1	1.8	0.2	0.5	14.6	2.6
	hokuriku	65	80.0	15.4		1.5		0.1			20.0	2.2
	tokai	144	74.3	9.7	2.8	4.2	2.1	2.8	2.1	2.1	23.7	3.5
	kinki	95	86.3	4.2	2.1		3.2	2.1	1.1	1.1	12.7	5.4
	chugoku	101	92.1	3.0	2.0		1.0	1.0	1.0		8.0	4.5
	shikoku	77	83.1	9.1	3.9			2.6		1.3	15.6	2.0
	kyushu	298	86.2	7.4	3.0	1.7	1.0	0.7			13.8	1.9
2009 research total		2,635	86.2	6.2	3.0	1.3	0.5	1.2	0.3	1.3	12.5	2.5

Resources: National Basic Research of Dairy Farming

## ■ Facilities on the farm

### Barn

There are two major methods to keep cattle on the farm, by tying them up or by loose-housing, and barn plans are different accordingly.

#### Stall barn

A stall is the space allocated for each cow, and in the stall barn each cow is tied up in a stall. A stall barn does not require big space, and majority of Japanese farms use this system. This might be a little cramped for cows, but there are some benefits also as farmers do not have to worry about cows fighting with each other, they can pay attention to individual animal, and it is easier to check their health.

On the other hand, cows cannot move about by themselves, so it requires more labour in milking and feeding. In this style, the herd size is generally around 50 cows.



Stall barn

#### Free stall barn

In this barn, cows are not restrained and are free to move around in a resting area called freestall. A stall provides a separate space per animal, and cows spend most of the time here. It is easier to feed and water them as they were given in allocated feeding area and water basins, but there can be a problem among cows fighting for food. Milking can be carried out efficiently as cows go in to the milking parlours by themselves.



Free stall barn

#### Pipeline milker

This milker (milking machine) is designed to deliver raw milk suckled from cows directly to the milk processing room through pipes. They cut the labour of delivering raw milk and are used in middle to large size farms. There are two types of pipeline milkers, Cow Shed Pipeline Milker is used in the barns, and Milking Parlour Pipeline Milker is used in the designated milking areas..



Pipeline Milker

#### Waste treatment facility

If mishandled, animal waste (feces and urine) can incur problems such as odours and water pollution. In order to resolve such problems, farmers are currently undergoing some original and inventive ideas such as improved manure production.

## ■ Dairy farmers' work (typical day as a farmer)

5:30–8:00

A day starts with cleaning cows' feces and urine. It is important to keep barns clean for cows and for their milk.

When cleaning is done, it is time to feed cows. First, mixed grass such as green grass, hay and silage (fermented hay) are given, then grains and composite feed are distributed by bait car.

At the same time as distributing feed, milking is prepared, and raw milk is collected using milkers. Milk suckled in the morning and evening before is put together and collected by the tank lorry. At the time of collection, milk is weighed, and its sample is tested.



Cleaning cow's feces and urine



To feed cow

8:00–17:00

Once all the morning tasks finished, farmers can have breakfast, then until the evening farmers can spend their time in so many different ways. Some may check health of their cows, make manure, work on the maintenance of their barns. If farmers own grazing fields, they may take care of them. Some also use this time to take a brief break.

17:00–19:30

Evening care of the cows begins. Just as in the morning, they start with cleaning barns, feed the cows and collect milk. Milking is normally carried out twice a day in the morning and in the evening.

(There may be pregnant cows on farm.) Cows' delivery is just like human birth, a calf can be born at any time. So when cows are in labour, farmers have to keep their eyes on them 24 hours a day.



Collect milk

## ■ Cost of milk production

The breakdown of the costs in raw milk production shows that the feed cost takes up a large share at about 46% in the 2010 fiscal year. Within this feed cost, distributed feed cost (purchased feed cost) was accounted for the great part accumulating up to 36% of total production cost. Japanese dairy depends on imported feed from other countries, and the cost of production is hugely influenced by the international grain market situation and currency exchange rates. It is a big challenge for Japan to improve self-sufficiency in animal feed. **table 6**

**Table 6-1: Production cost per cow (2010)**

Item	Amount	proportion
Feed	329,594	46.0 %
Commercial Feed	257,148	35.9 %
Others	72,446	10.1 %
Depreciation of cows	107,764	15.0 %
Other property expenses	147,317	20.6 %
Labour	161,632	22.6 %
Family Labour	146,896	20.5 %
Employment Labour	14,736	2.1 %
By-Product	-71,281	-9.9 %
Ground rent	18,538	2.6 %
Capital Interest	22,965	3.2 %
Production cost	716,529	100.0 %

**Table 6-2: Production cost per 1kg of raw milk (2010)**

Item	Amount	proportion
Feed	40.9	46.0 %
Commercial Feed	31.9	35.9 %
Others	9.0	10.1 %
Depreciation of cows	13.4	15.1 %
Other property expenses	18.3	20.6 %
Labour	20.0	22.5 %
Family Labour	18.2	20.5 %
Employment Labour	1.8	2.0 %
By-Product	-8.8	-9.9 %
Ground rent	2.3	2.6 %
Capital Interest	2.8	3.1 %
Production cost	88.9	100.0 %

Resources: Research on Raw Milk Production Costs, Ministry of Agriculture, Forestry and Fisheries

## ■ Environmental conservation and dairy farming

It is a mission of dairy farmers to produce safe and tasty milk and to contribute towards consumers' diet. In recent years, the natural rotation cycle of the dairy farming has attracted some attention as it is beneficial to the protection of environment and land and to organic farming.

### Environmental conservation

Grass and trees purify air. Forests and rice pads prevent natural disasters such as floods and mud slides, and also purify and protect water resources. However, right now the forests in the middle and mountainous regions are devastated without enough caring hands due to declining population, and fields of rice and other crops are increasingly not used due to the ageing farmer population, lack of successors and with regulated reduction of cultivated land. Under these circumstances, dairy farmers are renting such unused land to graze cows and grow grass and feed. Such dairy farming activities are preventing forests from getting devastated and soil from becoming sterile. They are also helping to keep green scenery.

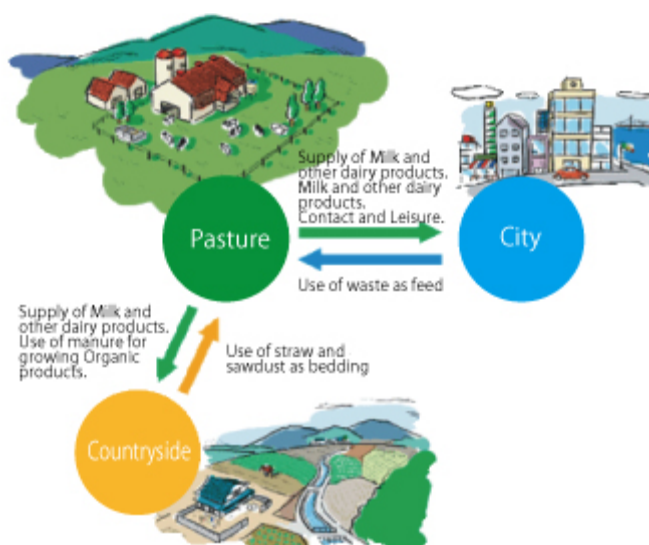
### From the cities to the farms

Life in the cities is very convenient but lacking the satisfaction of sensing nature and seasons. Dairy farms are where nature, people and animals live and work together. More and more urban people are visiting farms to refresh their mind through being in contact with nature and animals.

Meanwhile, part of waste come out of cities (soya bean meal, coffee grounds, brewer's grain, bean curd lees, oil cake etc.) are efficiently utilised to feed the cows.

### Dairy farming to organic farming

On farms, manure is produced mixing cows urine and feces with bedding straw and sawdust. This manure makes soil healthy and is a strong ally of organic farmers. Dairy farmers also exchange manure for rice straw with rice growers and use them as bedding for cows. This exchange is not only useful for both farmers but also beneficial to the environmental protection.





## ■ Comparison with the world

Dairy farming in Japan has a handicap of small national land with large mountaineous areas compared to Europe and US. In order to overcome this condition and to respond to the growing consumption, the priority has been made to improve production yield.

In 1985, average production yield per cow was approximately 5.6 tonnes. In contrast, in 2010 the average was 8.0 tones.

These figures show the improvement of production yield. Also with this average figure, Japan has already surpassed France, UK, Australia and New Zealand and is getting closer to Canada, the country with the highest yield (9.8 tones). [table 7](#)

Current consistent supply is the result of efforts to improve the production yield as well as to expand the scale of management.

**Table7: Change of Raw Milk Production Yield per cow in the world**

Countries	1985	1990	1995	2000	2005	2006	2007	2008	2009	2010
Belgium	3,930	4,082	4,800	5,409	5,408	5,554	5,700	5,585	5,787	6,018
Denmark	5,622	6,107	66,153	7,123	8,060	8,292	8,323	8,226	8,386	8,589
Germany	4,629	4,739	5,427	6,122	6,761	6,849	6,944	6,827	6,977	7,113
Greece	3,200	3,230	3,690	4,725	4,984	5,024	5,100	5,112	5,193	5,241
Spain	3,382	3,369	4,381	4,964	6,342	6,500	6,700	6,934	7,328	7,328
France	4,159	4,555	5,554	5,496	6,214	6,220	6,381	6,398	6,356	6,657
Ireland	3,926	3,953	4,437	4,362	4,546	4,787	4,846	4,699	4,540	4,900
Italy	3,537	3,682	4,780	4,912	5,859	5,966	5,998	5,730	6,051	6,057
Luxemburg	4,401	4,604	5,527	5,991	6,575	6,521	-	6,593	6,745	6,998
Netherlands	5,330	5,861	6,613	7,296	7,568	7,744	7,879	7,322	7,544	7,674
Australia	3,817	-	4,217	5,215	5,789	5,889	5,935	6,038	6,060	6,101
Portugal	3,021	3,045	4,800	5,787	5,494	5,509	5,859	6,051	6,218	6,909
Finland	4,956	-	6,161	6,900	7,491	7,554	7,460	7,873	8,023	8,023
Sweden	5,748	-	6,853	7,829	8,055	8,175	8,265	8,160	8,280	8,201
United Kingdom	4,888	4,950	5,541	6,066	6,802	7,168	7,175	7,207	7,290	7,501
Average of 15 EU Member stat	4,435	-	5,351	5,800	6,374	6,494	6,644	6,573	6,673	6,872
Average of 25 EU Member State	-	-	-	-	6,140	6,250	6,350	6,400	6,407	6,557
Average of 27 EU Member State	-	-	-	-	-	5,950	6,060	6,060	6,192	6,373
USA	5,908	6,416	7,462	8,256	8,879	9,050	9,193	9,260	9,333	9,517
Canada	4,654	5,689	6,207	9,152	9,422	9,481	9,481	9,642	9,592	9,768
Australia (1/cow)	3,337	3,614	4,846	5,146	5,108	5,163	5,231	5,691	5,445	5,700
New Zealand (1/cow)	3,170	3,056	3,489	3,700	3,531	3,876	3,791	3,710	3,642	3,829
Japan	5,640	6,380	6,986	7,401	7,893	7,864	7,988	8,011	8,088	8,046

Resources: EU: ZMP 「Dairy Review」 till 2007 and AMI 「Marktbilanz Milch 2011」 from 2008, USA : USDA 「Milk Production」、Canada : CDC 「Annual report」、Australia : DA 「Australian Dairy Industry In Focus」、NZ: LIC 「Dairy Statistic」, Japan: 「Livestock Statistics」, 「Milk Products Statistics」 by Ministry of Agriculture, Forestry and Fisheries

Note: In USA, 1 pound = 0.45kg