



China Tapioca Market Research

April 2007

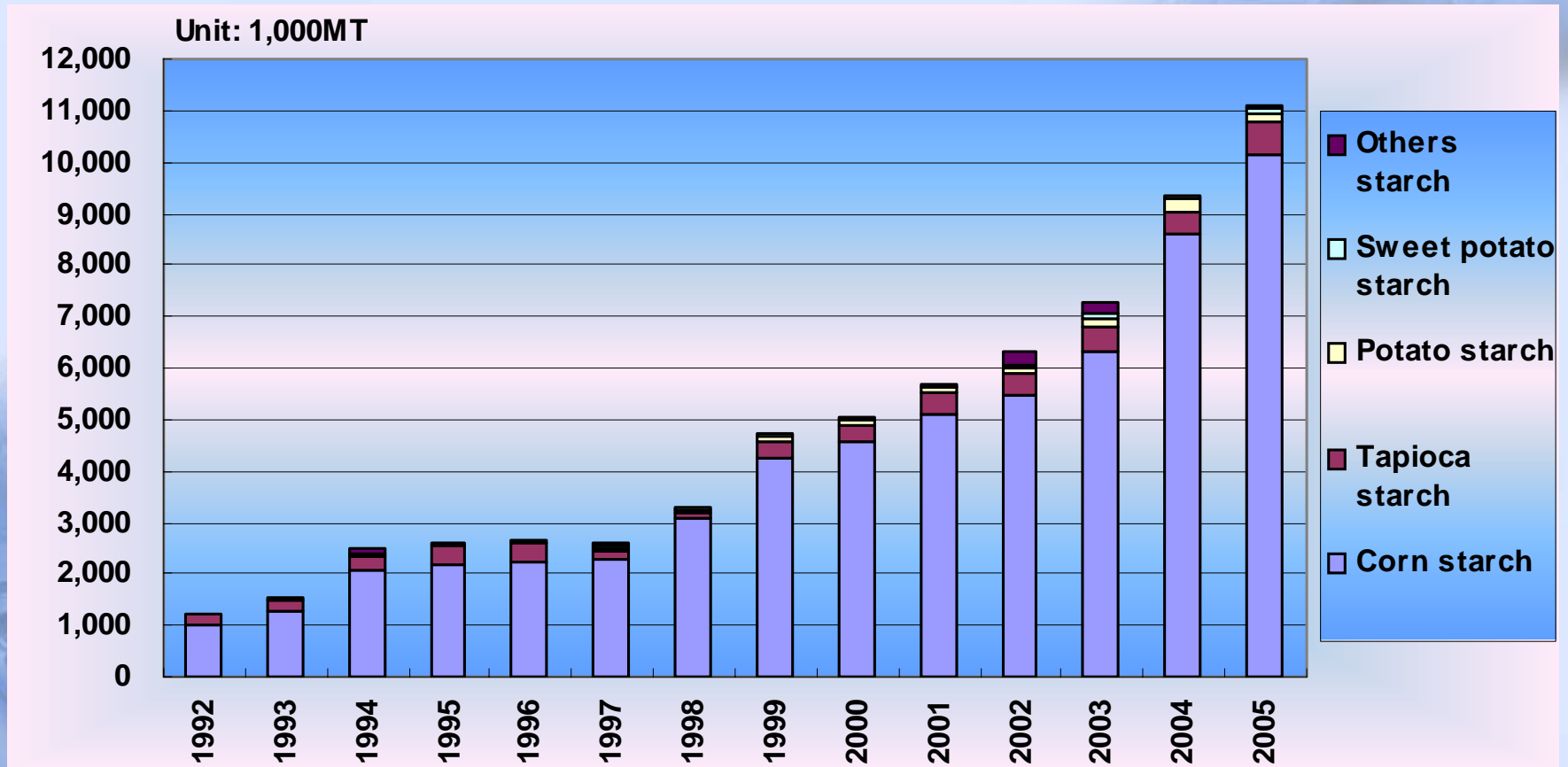
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CHAPTER ONE Overview of China's Starch Industry

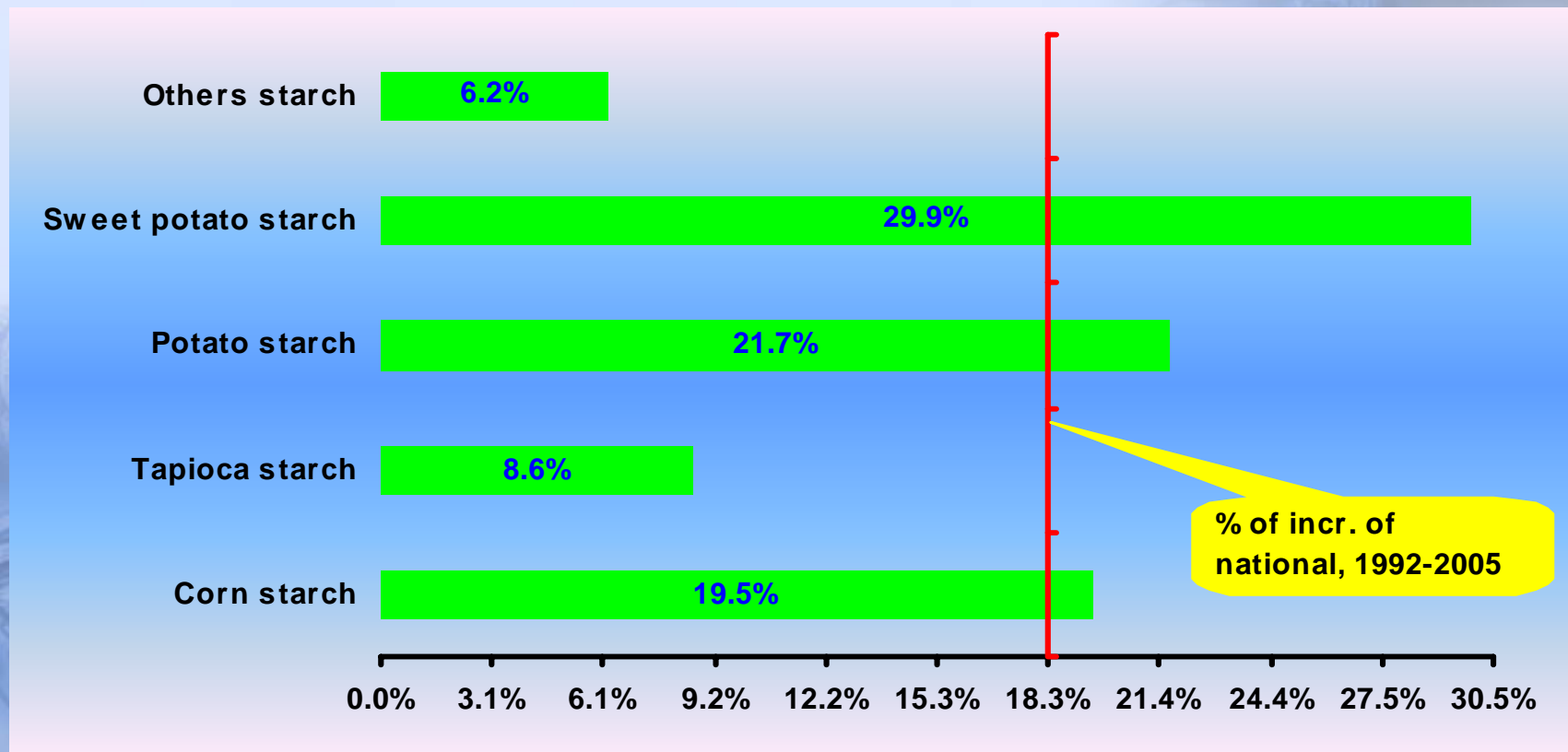
- Starch Production
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- Starch Imports & Exports

China's Starch Production in 1992~2005



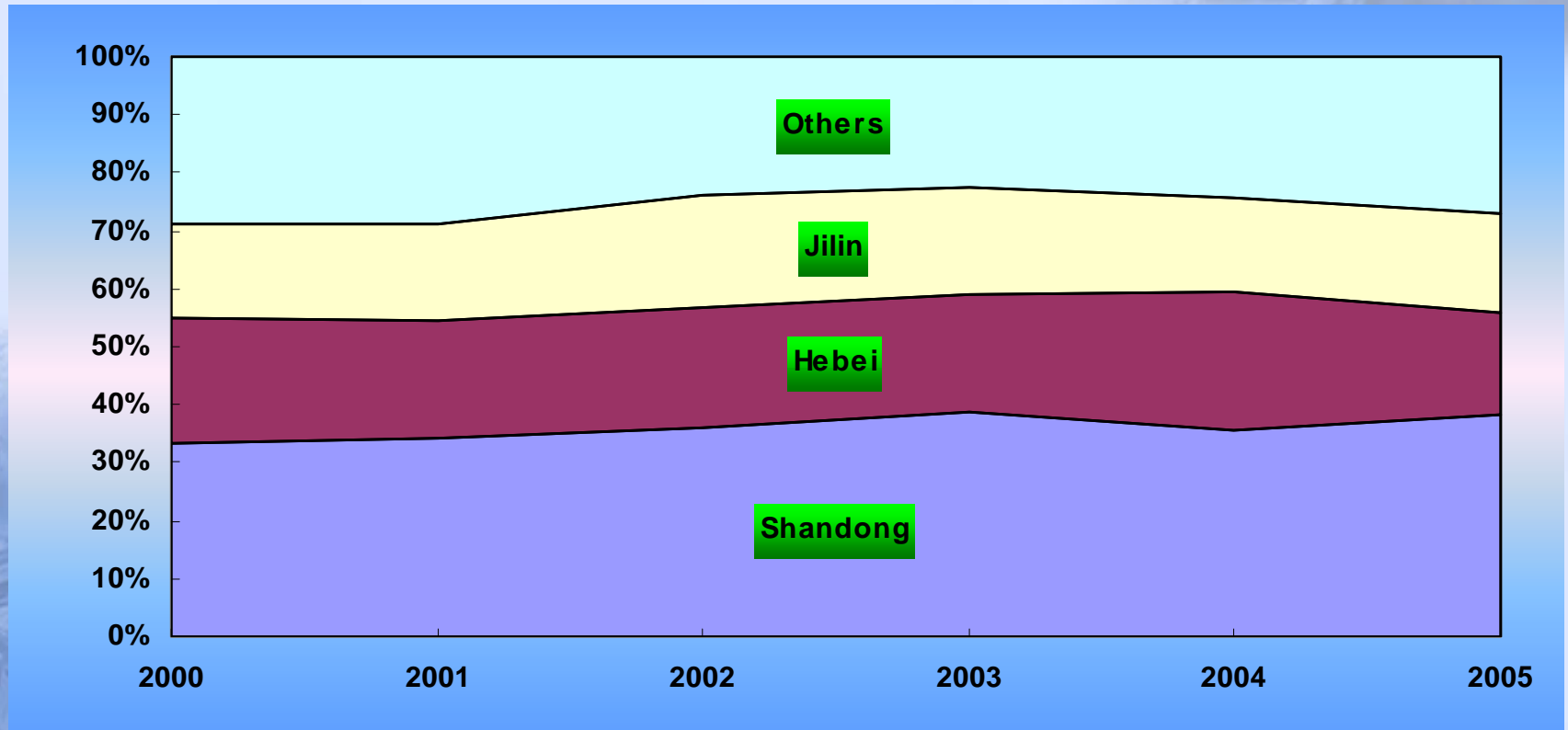
Starch Production

Annual Increase Rate of Starch Production in 1992~2005



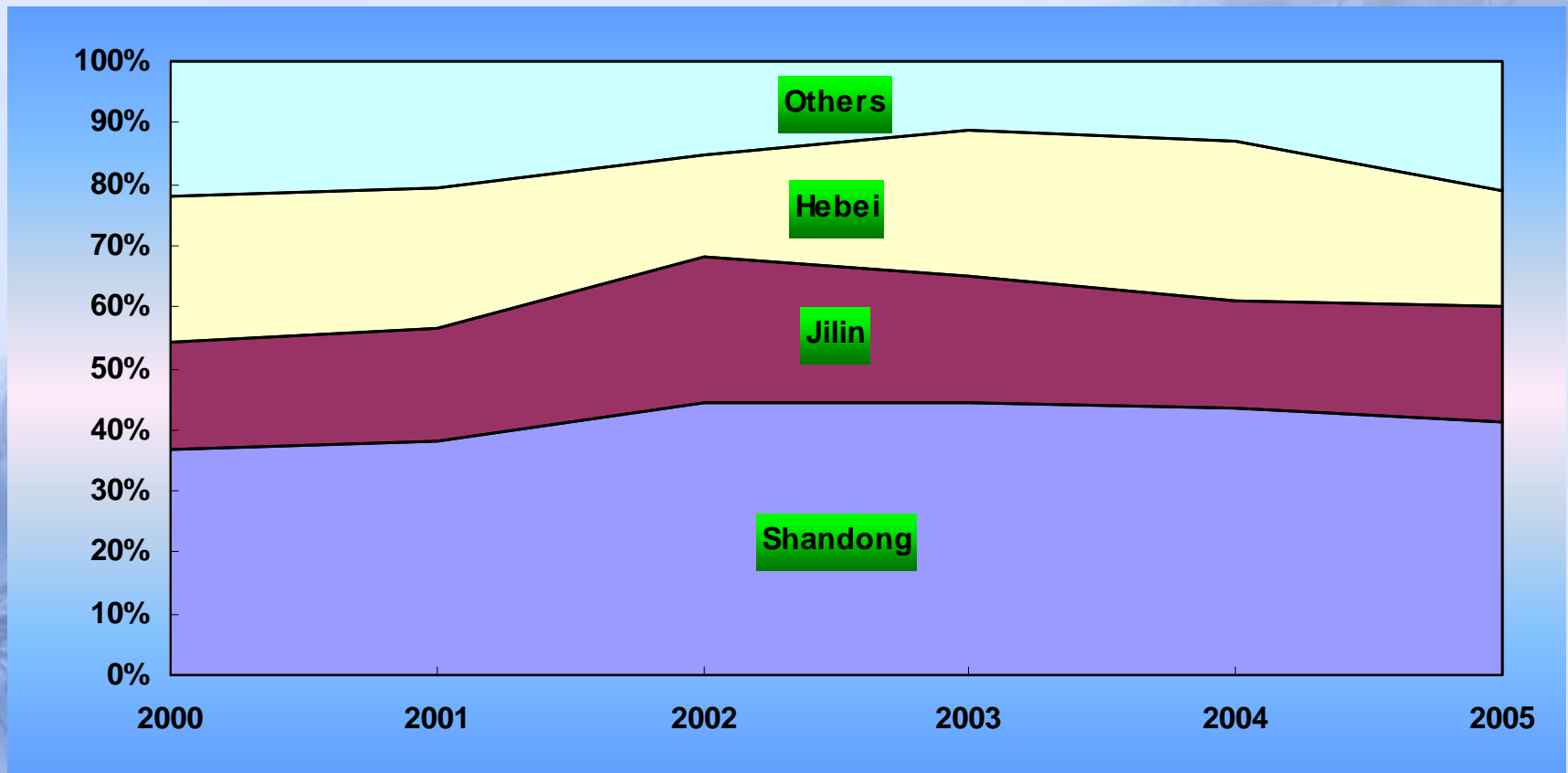
Starch Production

Major Starch-Producing Provinces' Share in Total Production



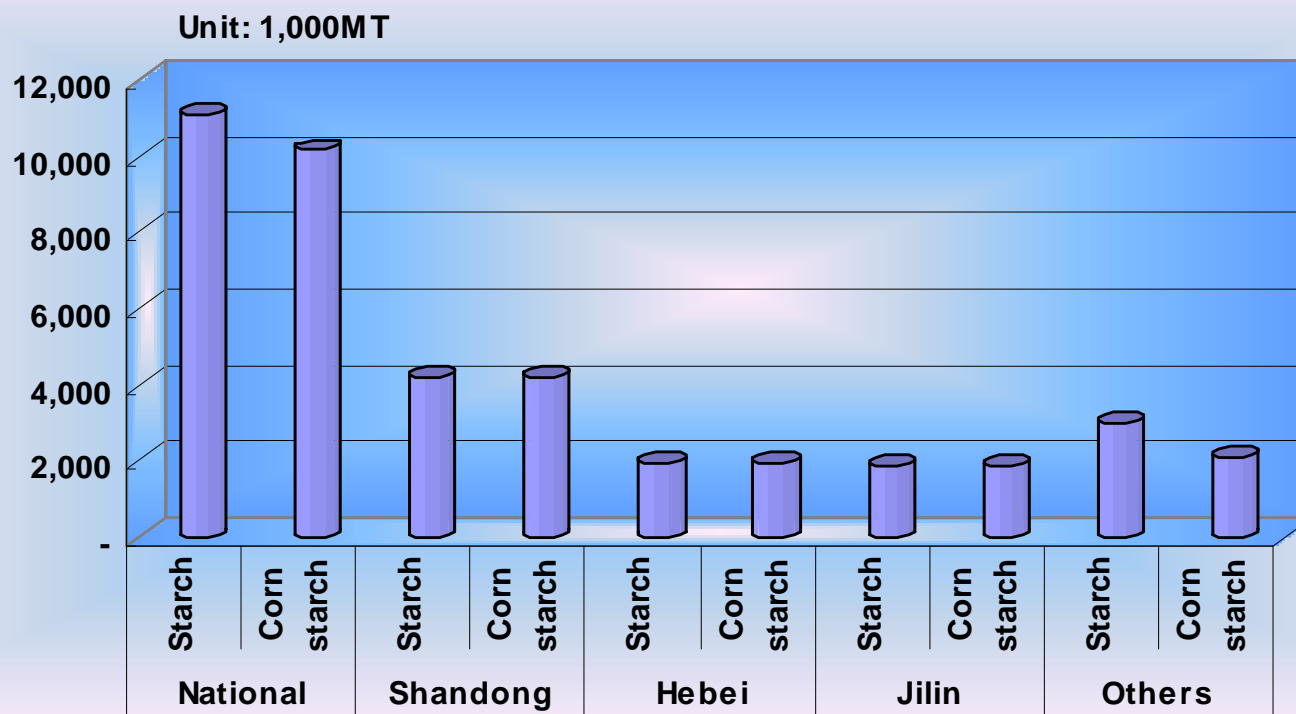
Starch Production

Major Corn Starch-Producing Provinces' Share in Total Production



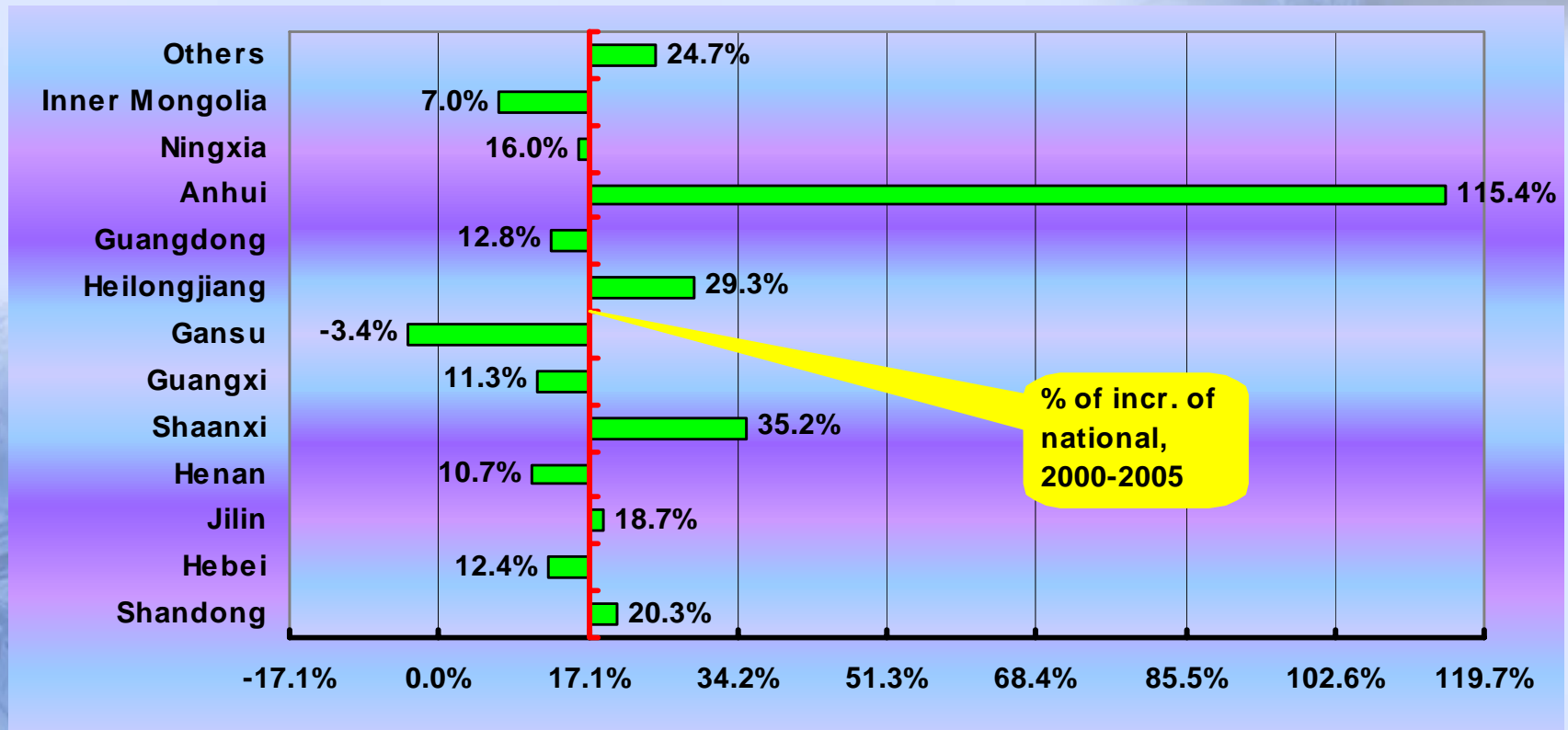
Starch Production

Comparison of Starch Production with Corn Starch Production in Major Producing Provinces in 2005



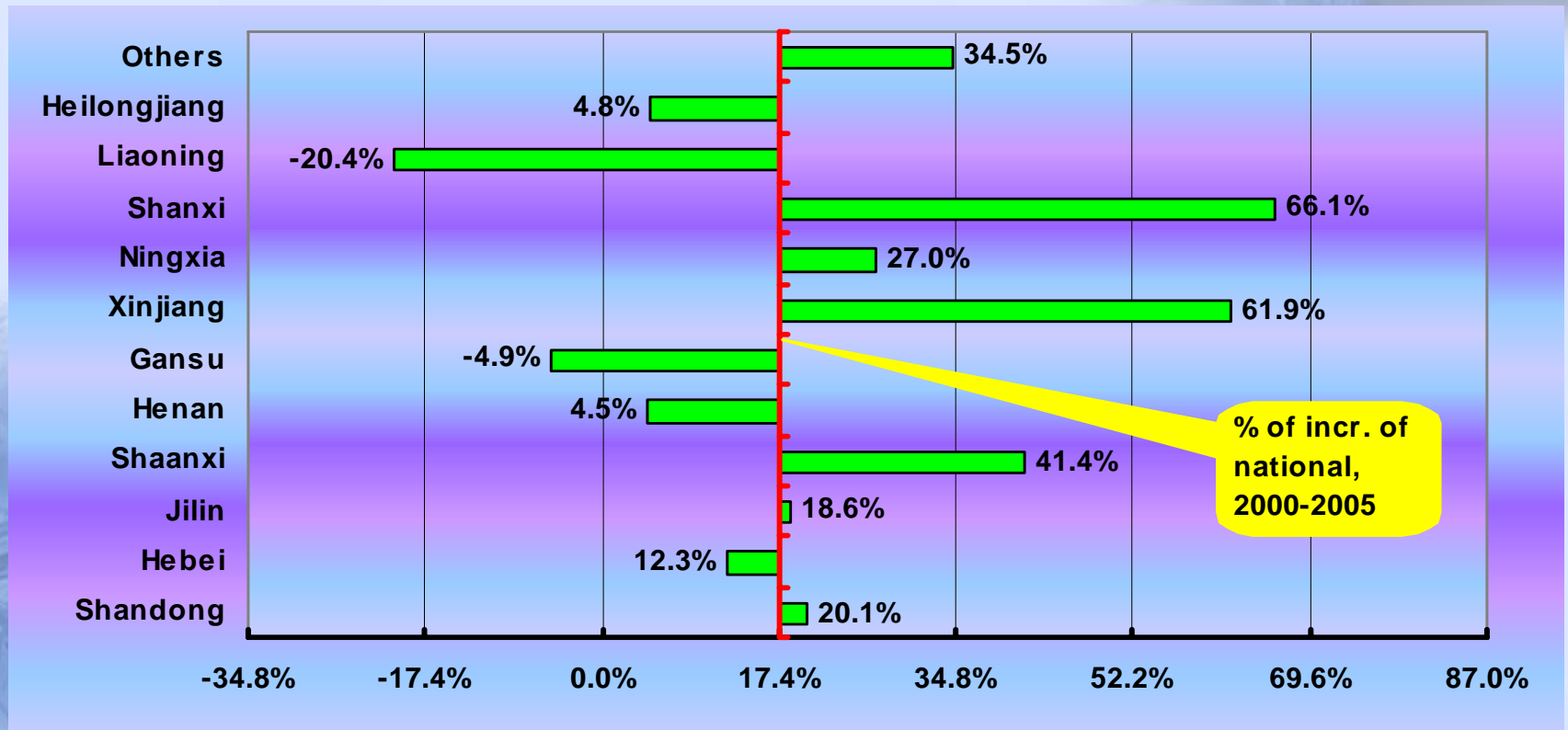
Starch Production

Major Starch-Producing Provinces' Average Increase Rate in 2000~2005



Starch Production

Major Corn Starch-Producing Provinces' Average Increase Rate in 2000~2005



Starch Production

Chinese Starch Enterprises' Development in 1995~2005

Unit: Number

Year	50-100 (1,000MT)	101-200 (1,000MT)	201-300 (1,000MT)	301-500 (1,000MT)	501-1,000 (1,000MT)	≥ 1,000 (1,000MT)	Total(≥ 50) (1,000MT)
1995	6	2	0	0	0	0	8
1996	8	2	0	0	0	0	10
1997	8	3	0	1	0	0	12
1998	9	3	1	2	0	0	15
1999	4	5	2	2	1	0	14
2000	3	8	1	3	0	1	16
2001	7	6	2	2	1	1	19
2002	6	6	2	4	1	1	20
2003	9	5	3	5	2	1	25
2004	10	5	3	6	4	1	29
2005	11	5	5	6	4	2	33

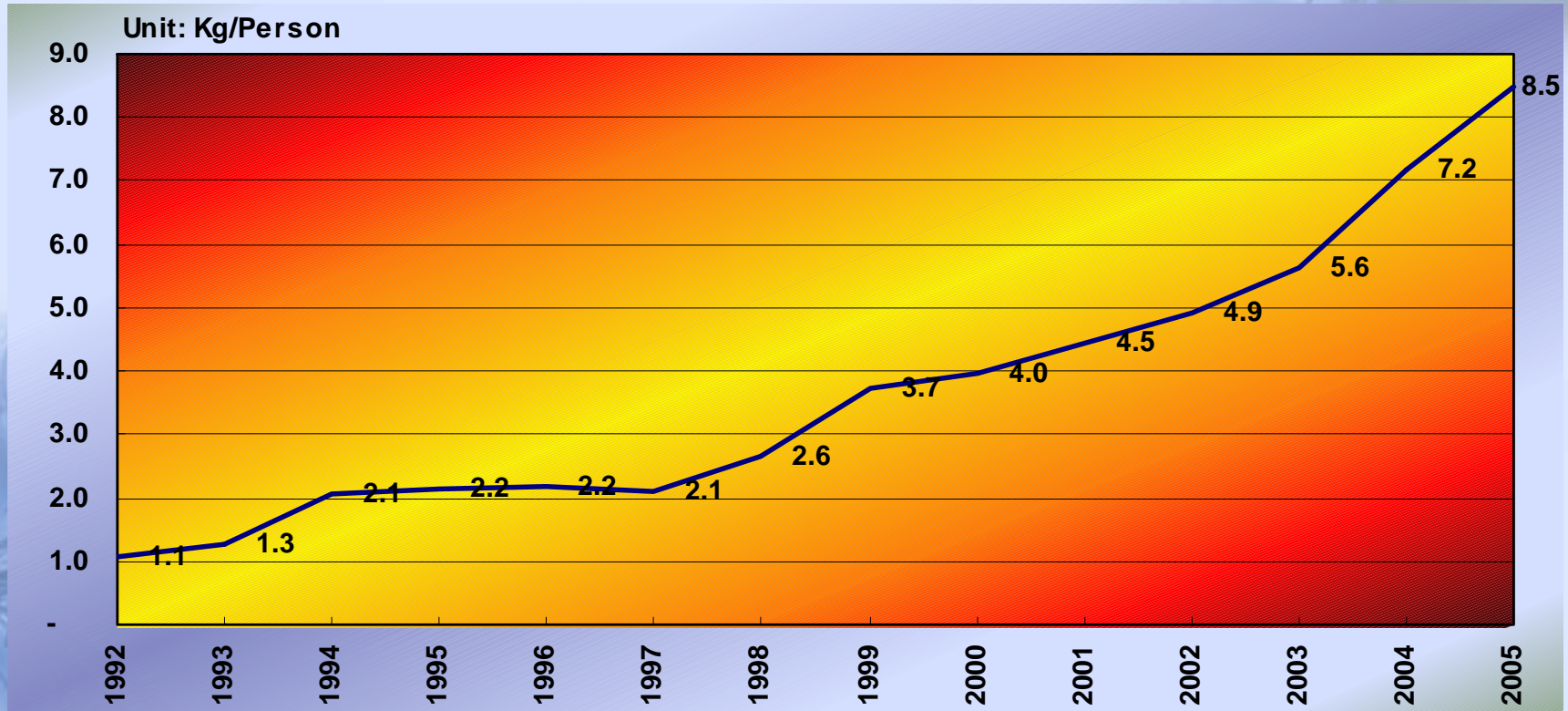
Distribution of Starch Enterprises

Distribution of Starch Enterprises

- With corn being the major raw material of starch production, more than 70% of starch producers are concentrated in Shandong, Hebei and Jilin, the nation's major corn-producing provinces. Of the nation's twenty-two large starch producers, 11 are located in Shandong, 3 in Jilin and 4 in Hebei, whose productive capacity are 4.91 million MT, 1.93 million MT and 980,000 MT classified by province, accounting for 37.8%, 14.8% and 7.5% of the nation's total respectively.
- modified corn starch producers are located in Shandong and Jilin, modified tapioca starch producers are concentrated in Guangdong and Guangxi and modified potato starch producers in mostly in Ningxia.

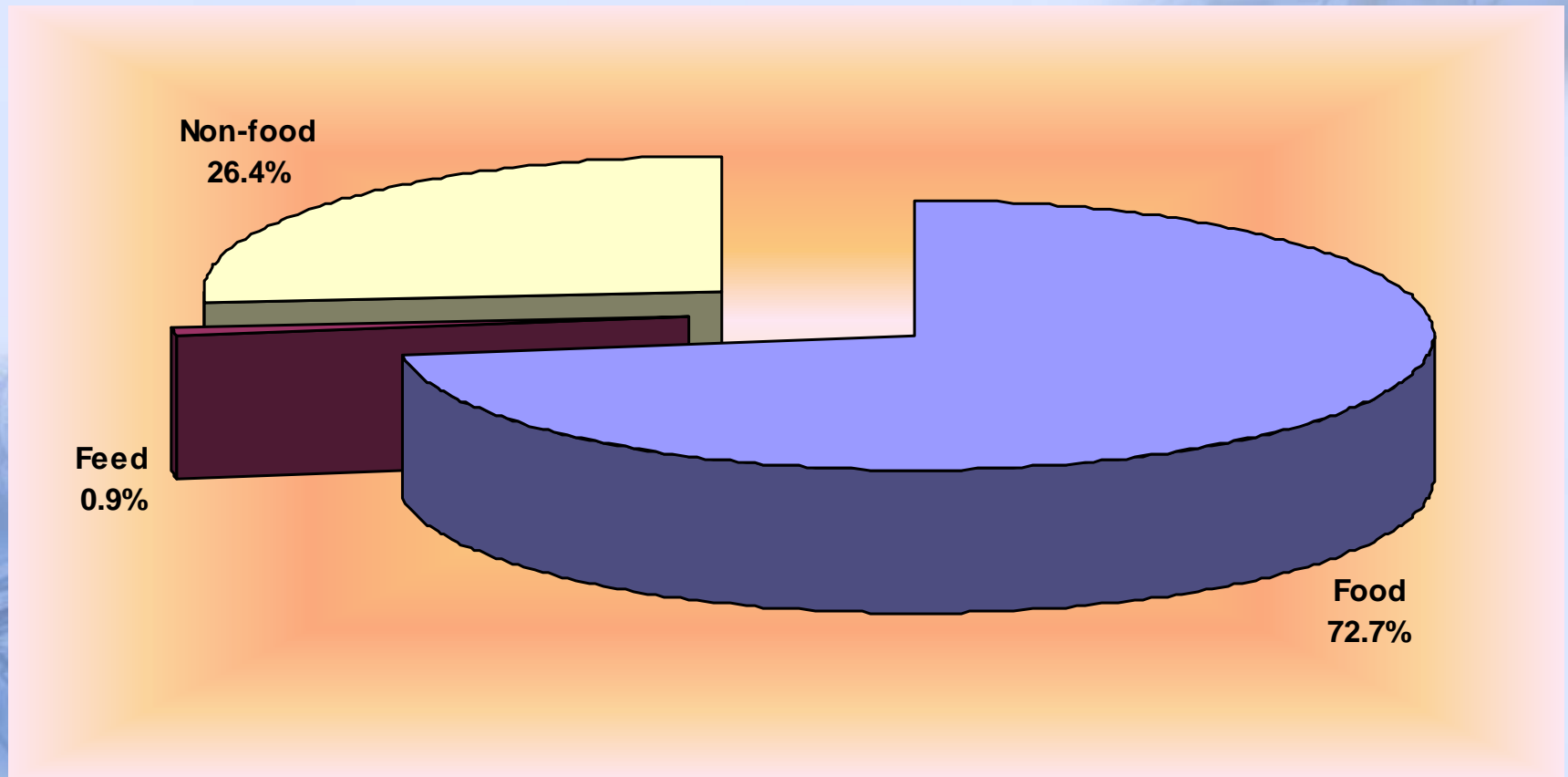
Distribution of Starch Enterprises

Per Capita Starch Consumption in China in 1992~2005



Starch Consumption

Proportions of Starch Consumption For Different Purposes in 2005



Starch Consumption

Proportions of Starch Consumption for Various Uses in 2000~2005

Unit: %

	Starch sugar	Monosodium glutamate	Modified starch	Citric acid	Lysine	Others	Total
2000	11.8	30.3	3.3	9.3	4.9	40.4	100.0
2001	14.5	28.9	3.0	9.0	6.3	38.3	100.0
2002	18.4	31.5	6.0	9.0	7.0	28.0	100.0
2003	17.2	29.4	7.3	8.2	5.9	32.0	100.0
2004	17.7	22.2	6.4	7.8	7.2	38.6	100.0
2005	20.6	22.1	6.5	7.8	9.0	34.0	100.0

Starch Consumption

Major Starch Deep-Processing Products in 2000~2005

Unit: 1,000MT

	Starch sugar	Monosodium glutamate	Modified starch	Citric acid	Lysine
2000	1,353.5	845.0	163.8	350	74.6
2001	1,806.8	913.0	170.6	385	107.2
2002	2,791.6	1,102.8	376.8	425	133.0
2003	2,565.6	1,189.8	530.0	450	129.8
2004	3,472.0	1,149.2	600.0	550	202.0
2005	4,200.0	1,359.7	720.0	650	300.0

Starch Consumption

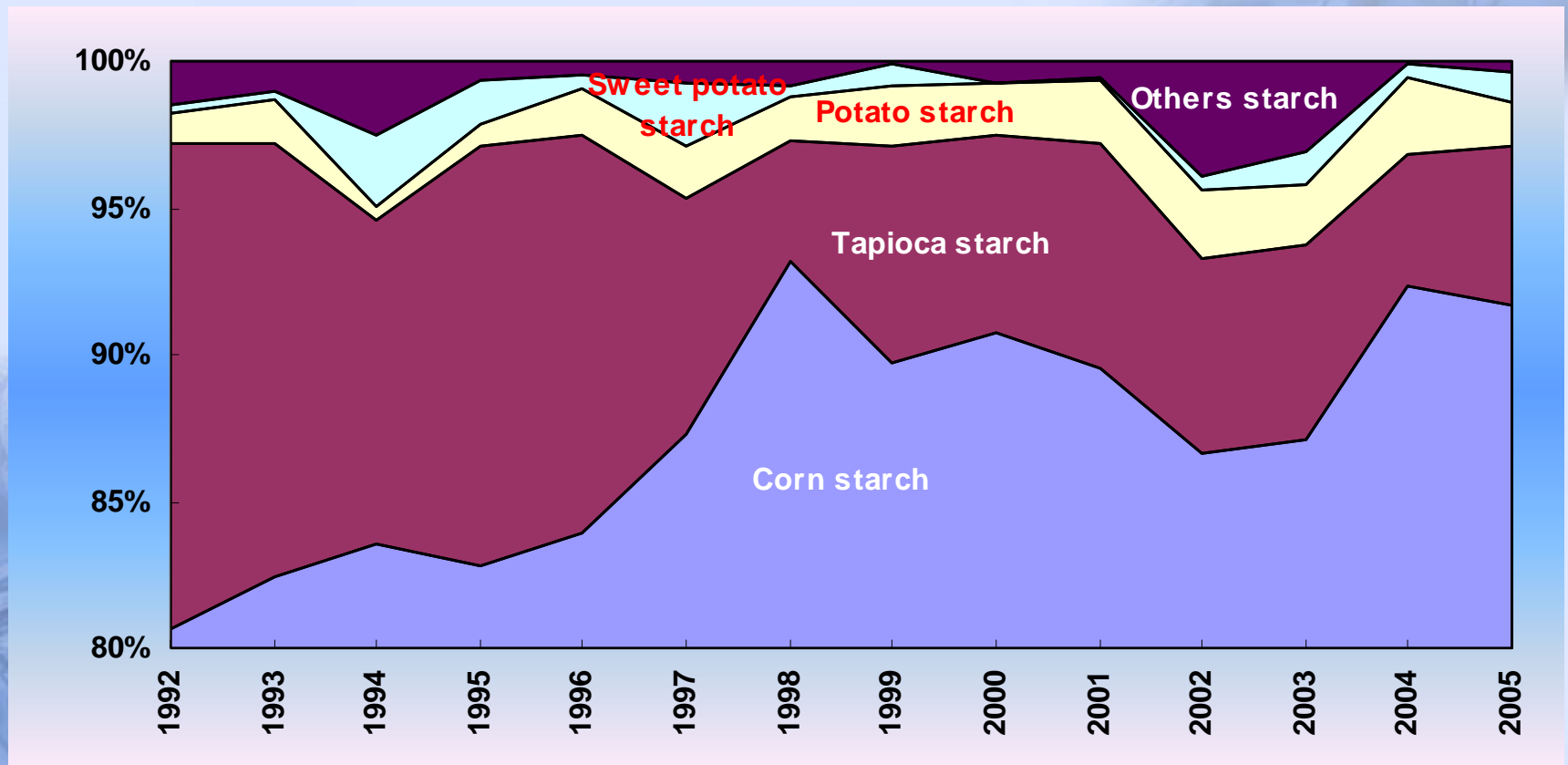
Starch Consumption for Major Deep-Processing Products in 2000~2005

Unit: 1,000MT

	Starch sugar	Monosodium glutamate	Modified starch	Citric acid	Lysine
2000	594.1	1,521.0	163.8	465.50	248.3
2001	824.7	1,643.4	170.6	512.05	357.0
2002	1,158.2	1,985.0	376.8	565.25	443.0
2003	1,248.6	2,141.6	530.0	598.50	432.2
2004	1,656.0	2,068.5	600.0	731.50	672.7
2005	2,280.0	2,447.5	720.0	864.50	999.0

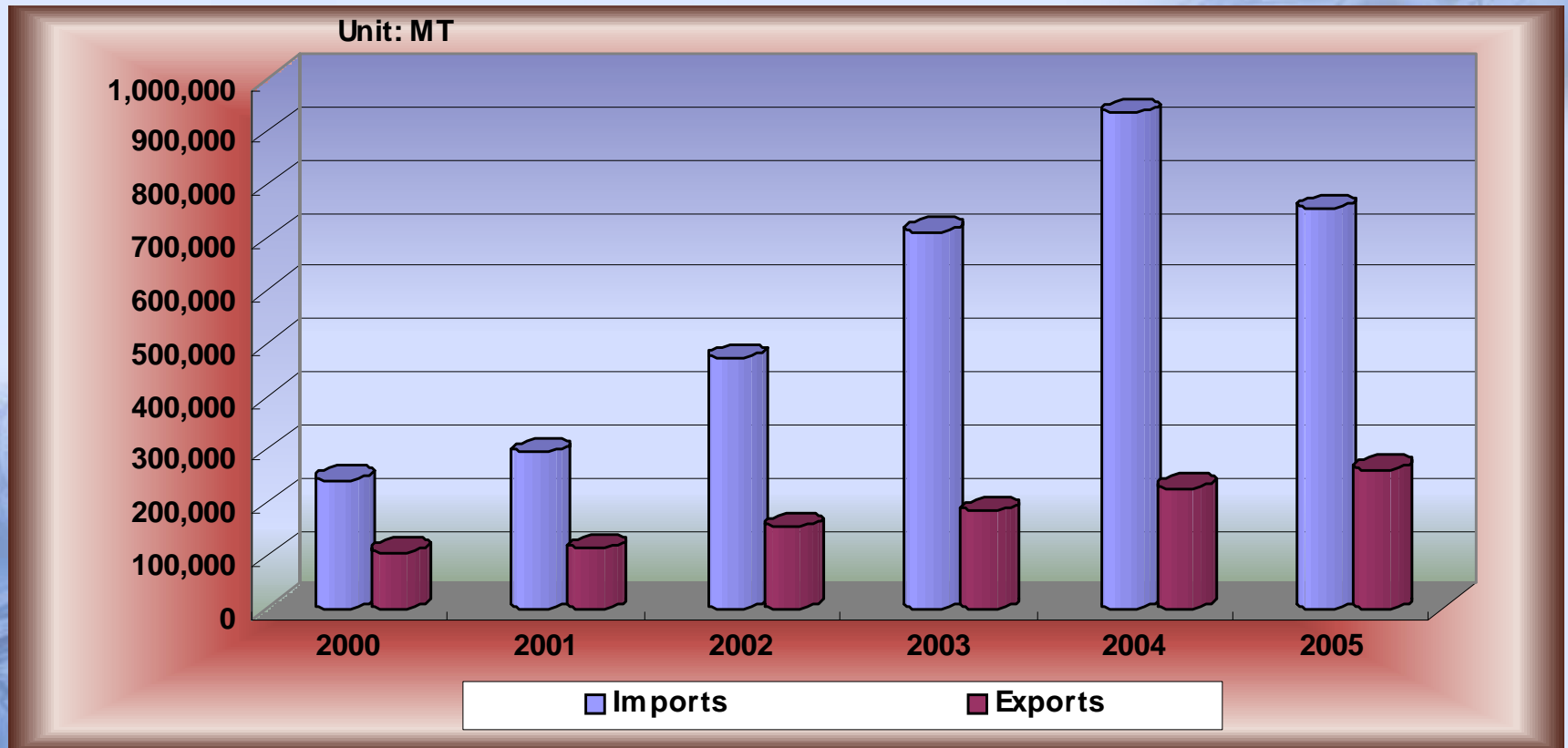
Starch Consumption

Changing Proportions of Starch Raw Materials in 1992~2005



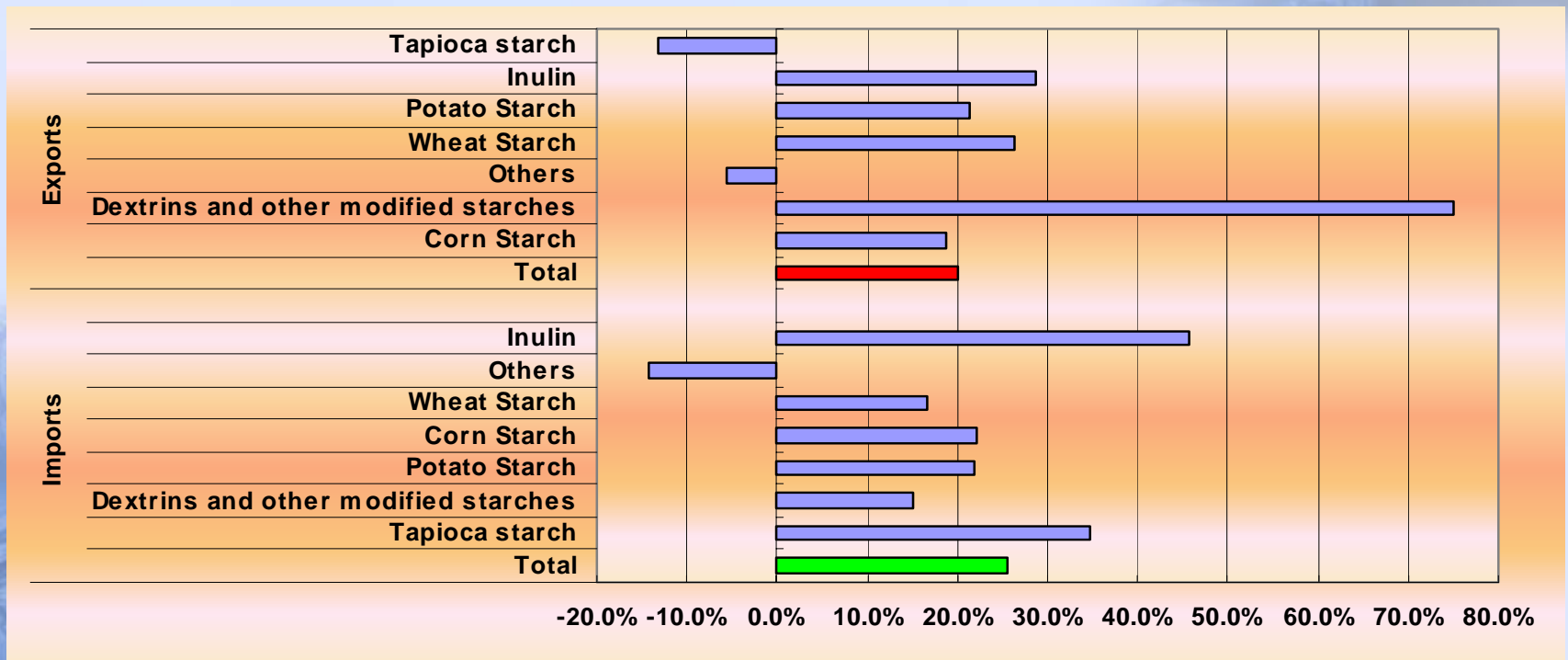
Starch Raw Material Structure

China's Starch Imports & Exports in 2000~2005



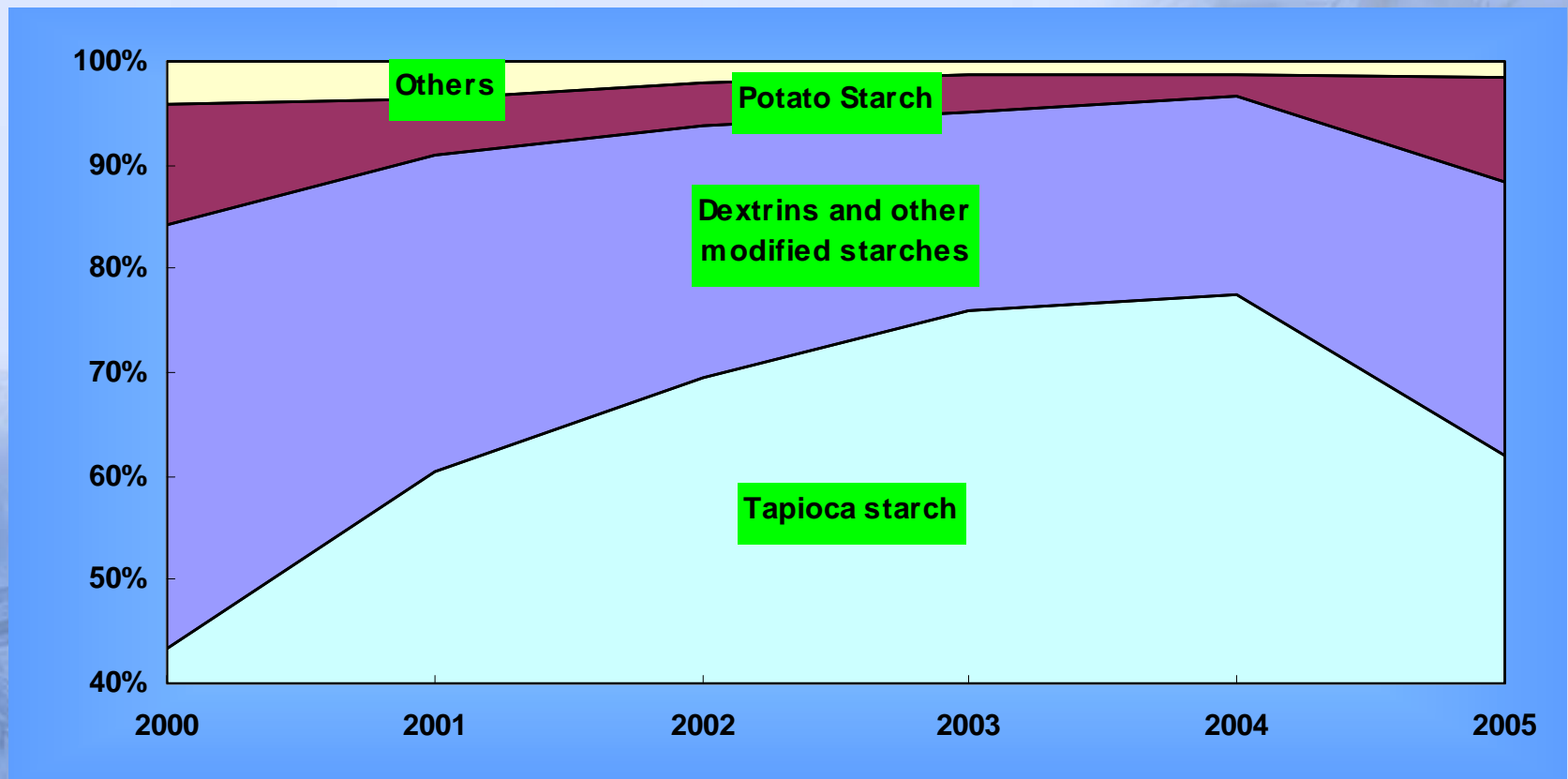
Starch Imports & Exports

Annual Growth Rate of Starch Imports & Exports in 2000~2005



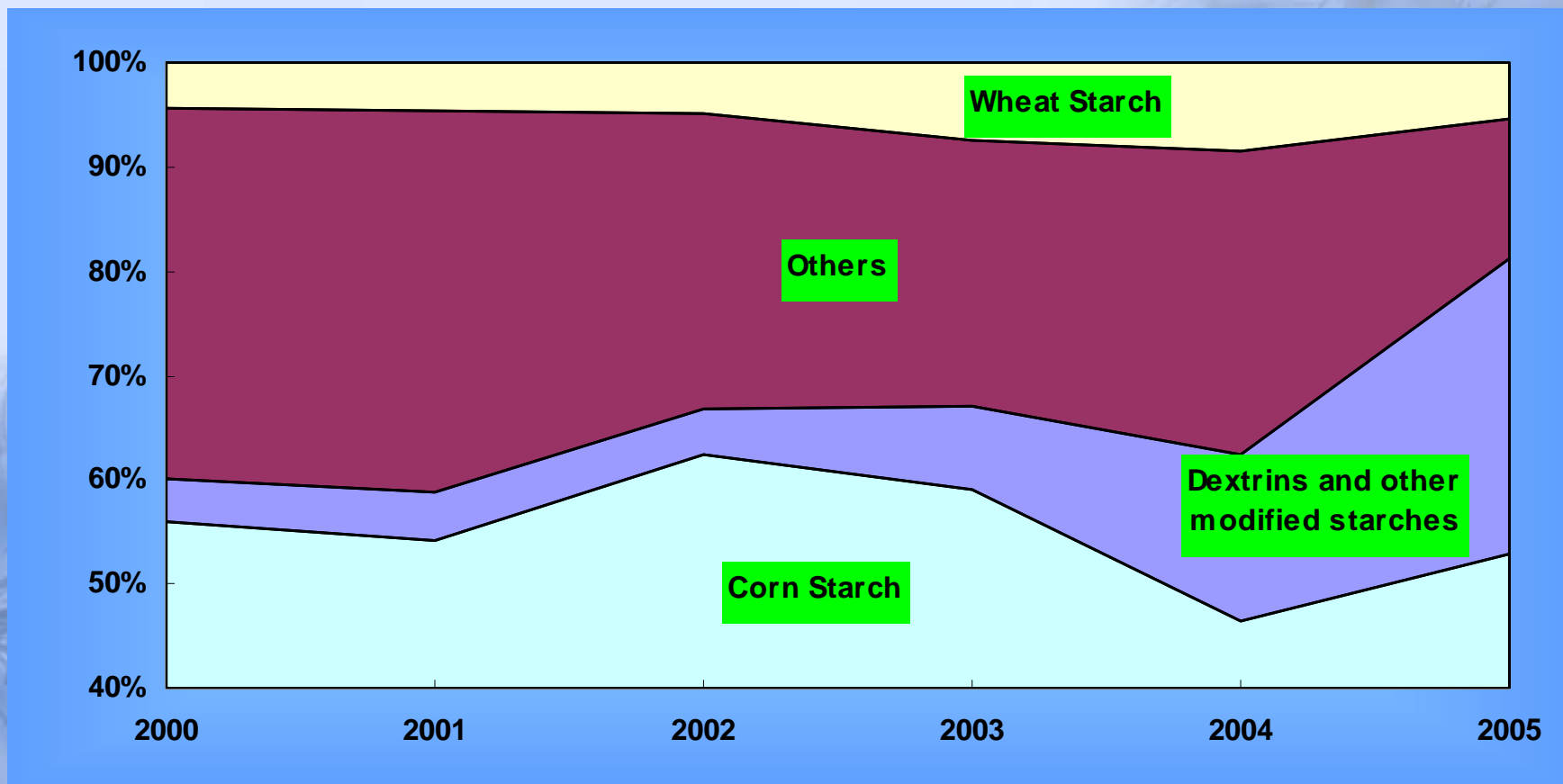
Starch Imports & Exports

Proportions of Imported Starch Products in 2000~2005



Starch Imports & Exports

Proportions of Exported Starch Products in 2000~2005

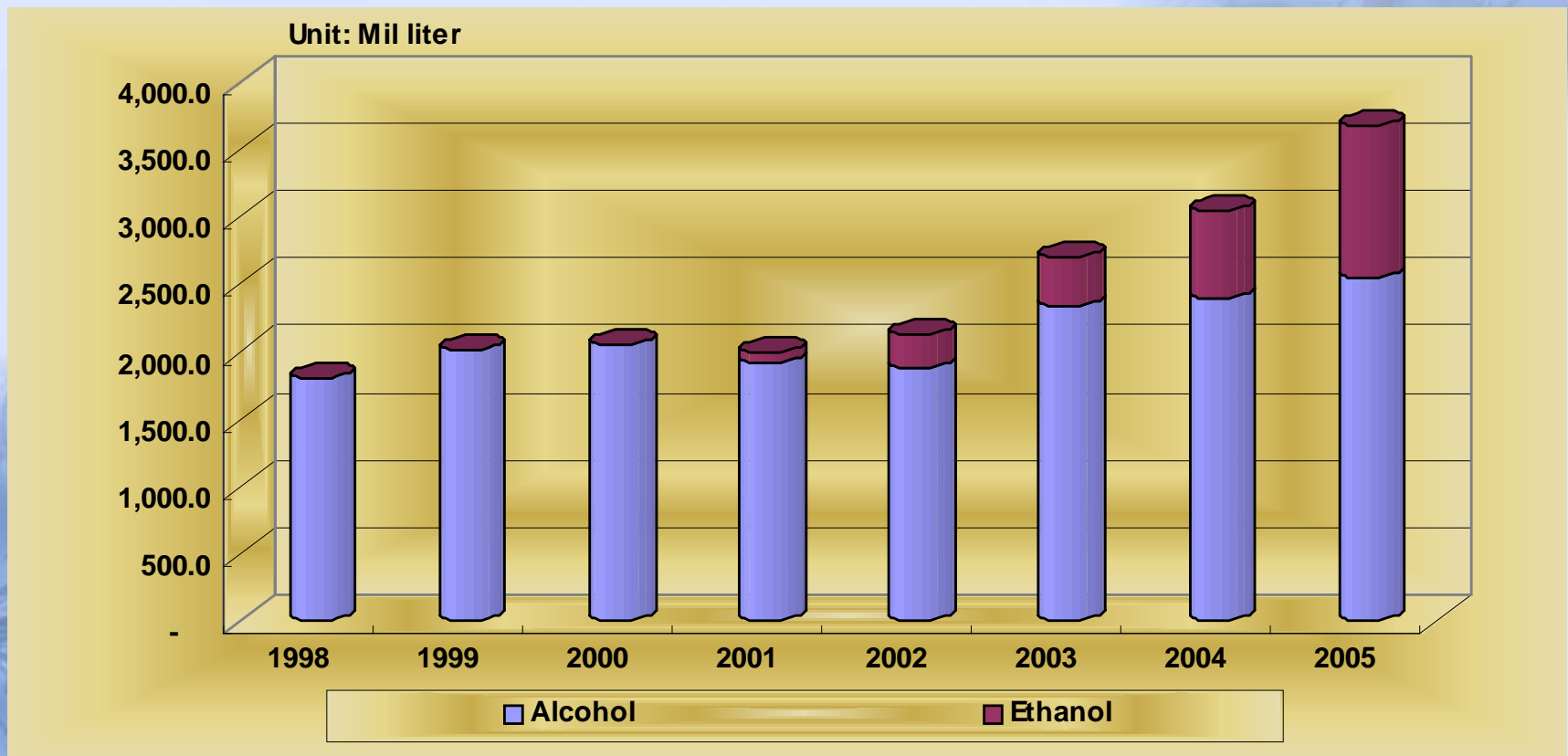


Starch Imports & Exports

CHAPTER TWO Overview of China's Alcohol Industry

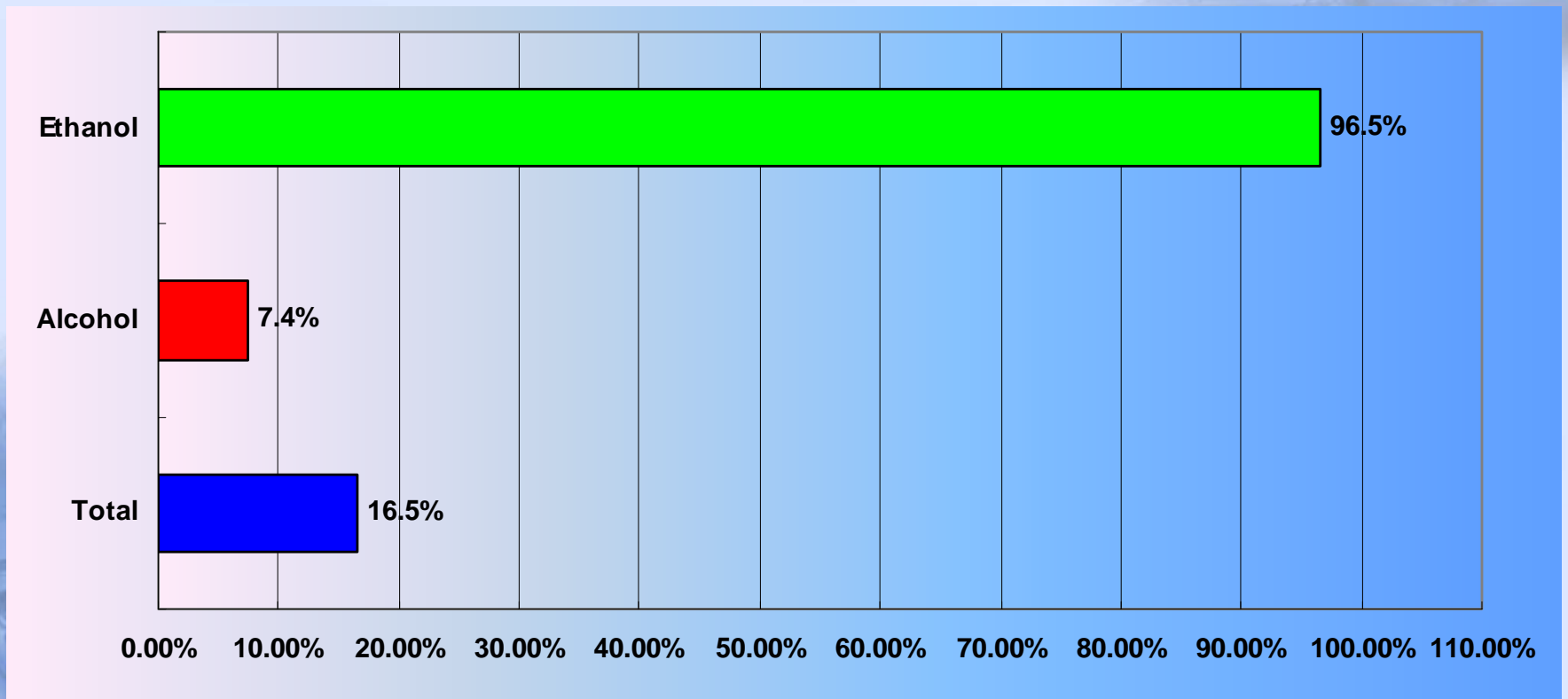
- Alcohol Production
- Distribution of Alcohol Producers
- Alcohol Consumption
- Alcohol Raw Material Structure
- Alcohol Imports & Exports

China's Alcohol Production in 1998 ~ 2005



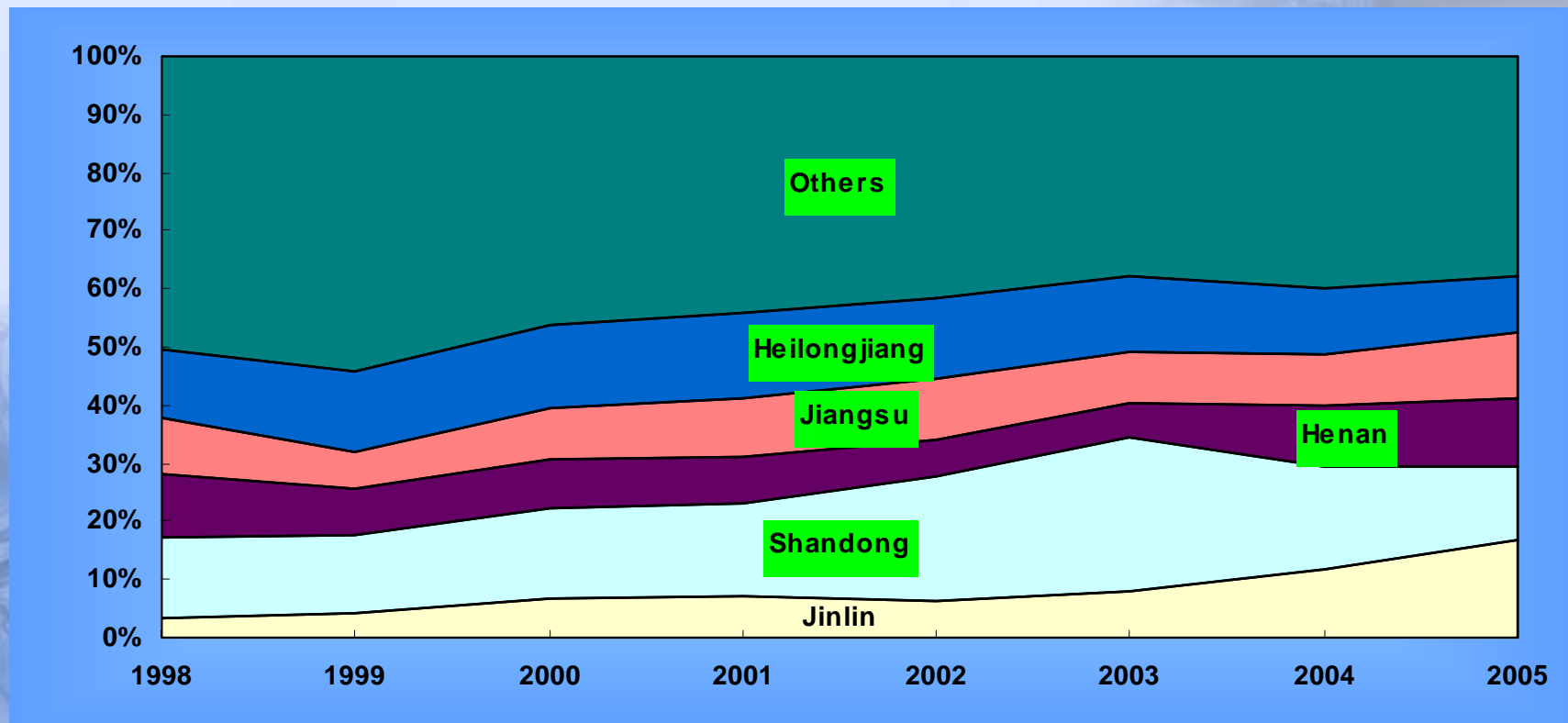
Alcohol Production

Annual Increase Rate of Alcohol Production in 2001 ~ 2005



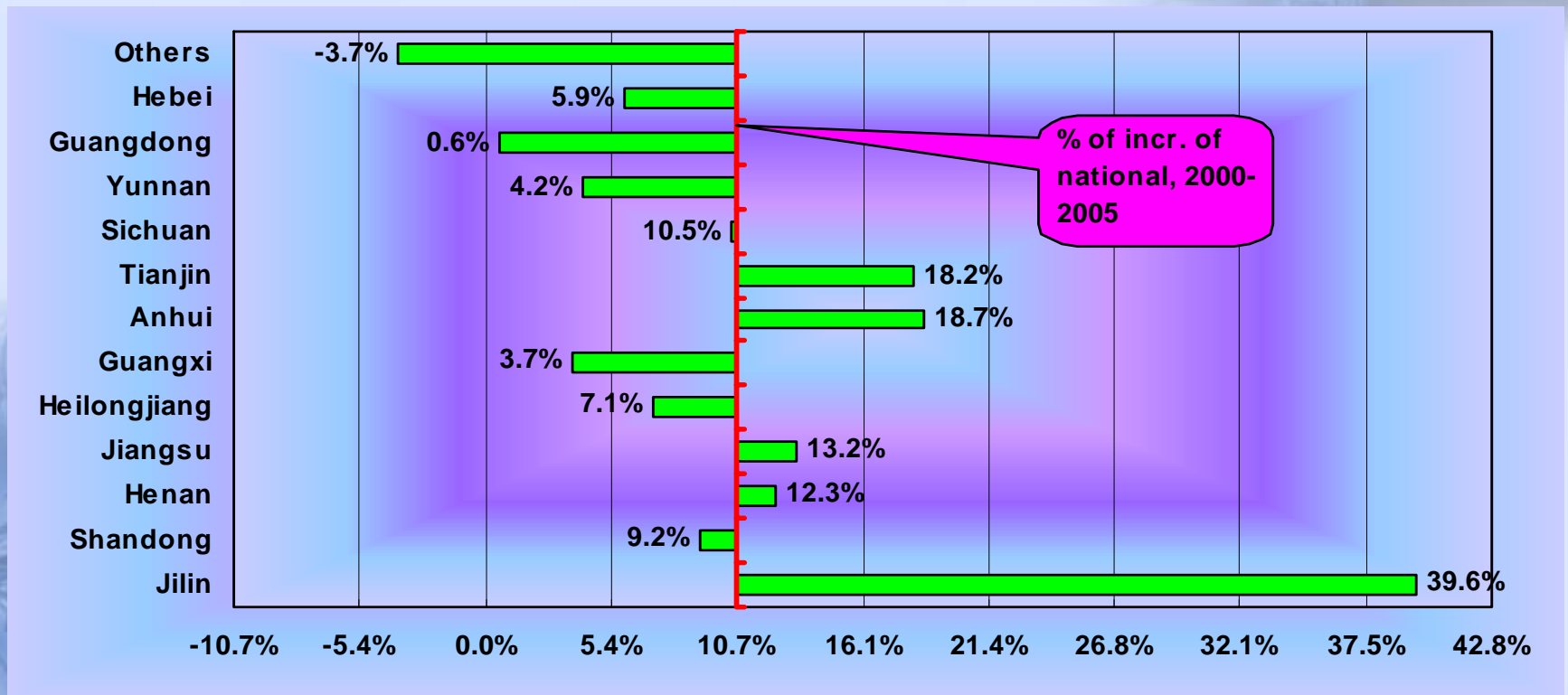
Alcohol Production

Major Alcohol-Producing Provinces' Shares in 1998~2005



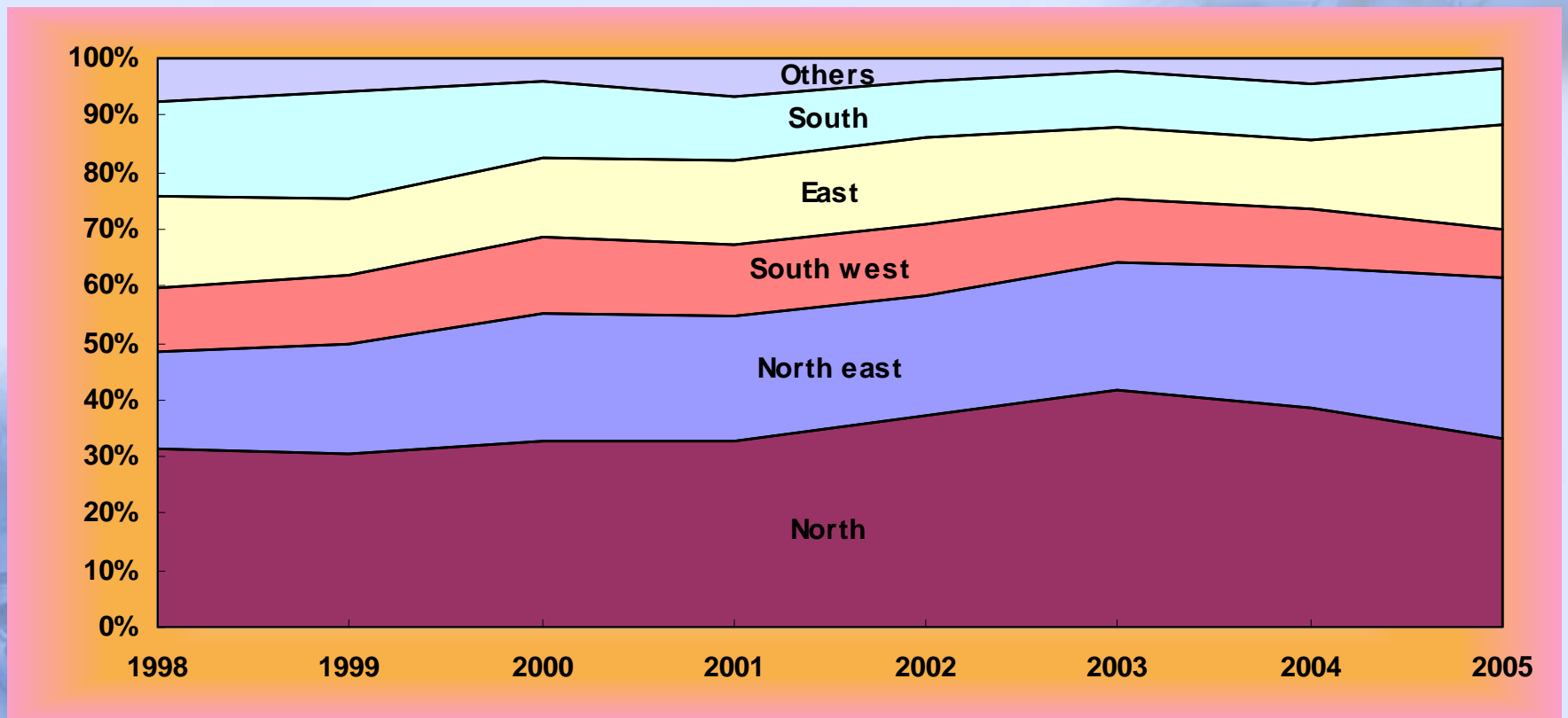
Alcohol Production

Major Alcohol-Producing Provinces' Production Increase Rate in 1998~2005



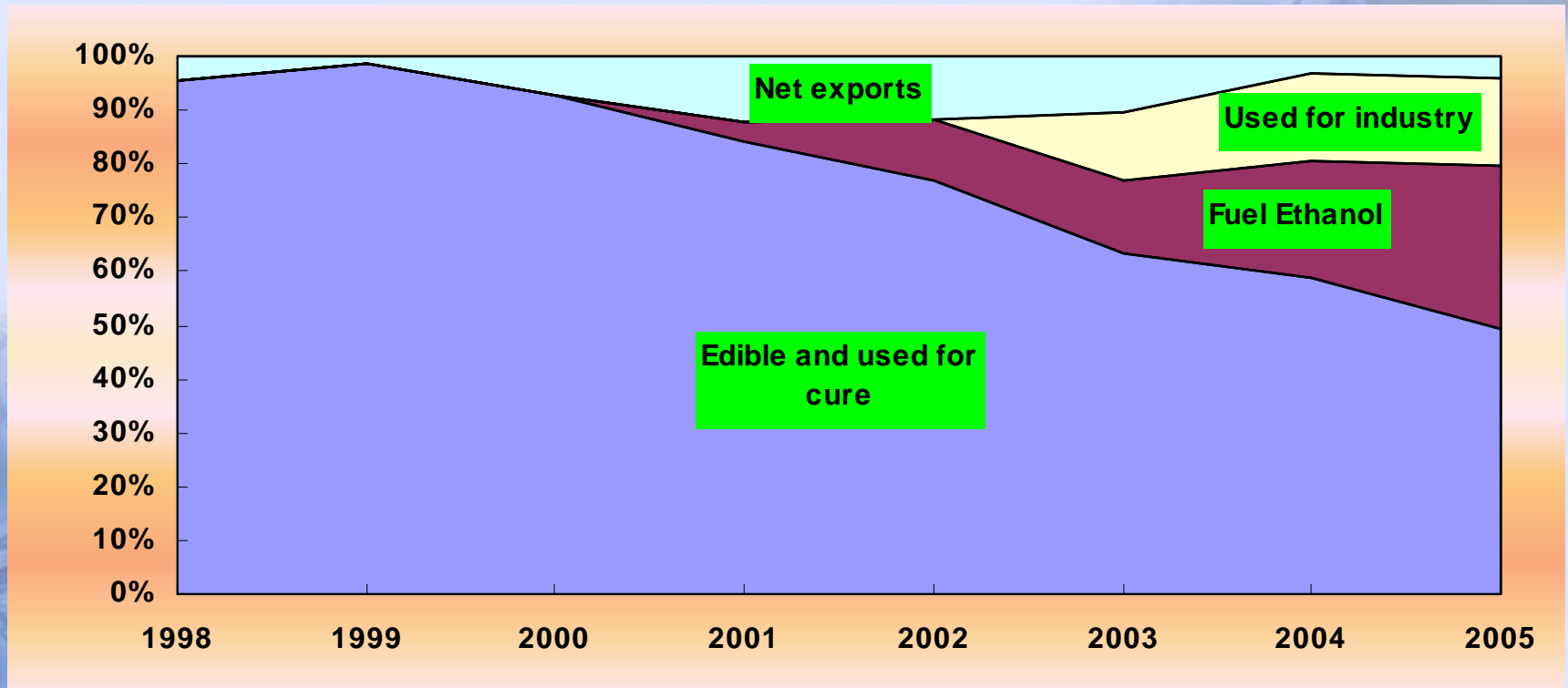
Alcohol Production

Distribution of China's Alcohol Productive Capacity



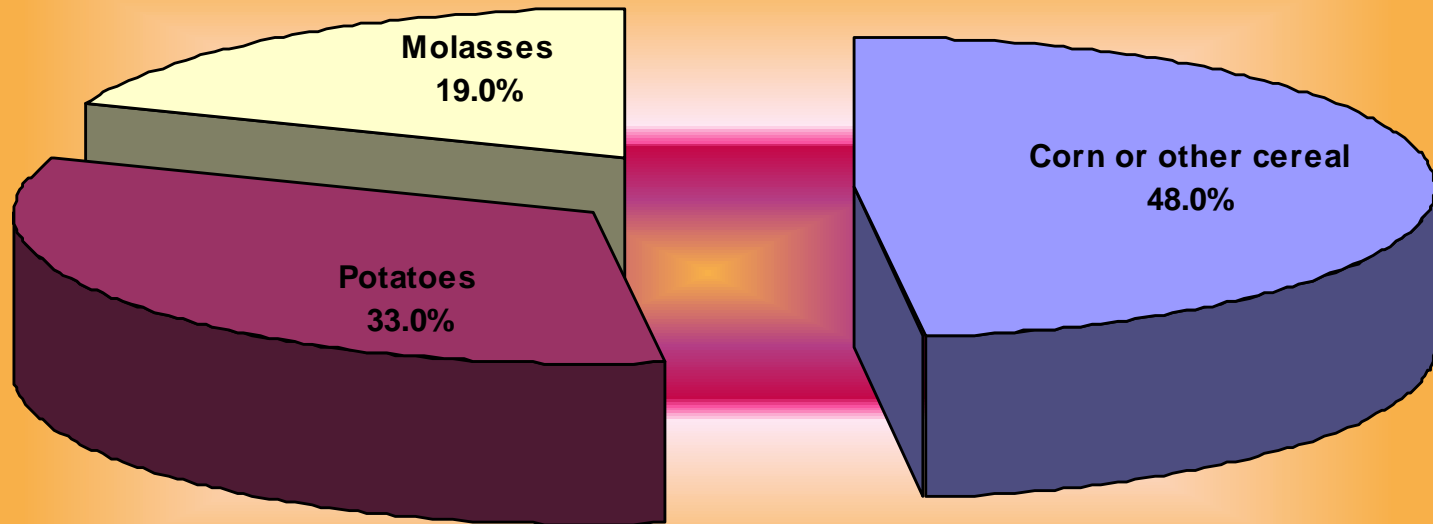
Distribution of Alcohol Producers

Proportions of Alcohol Consumption for Various Purposes in 1998~2005



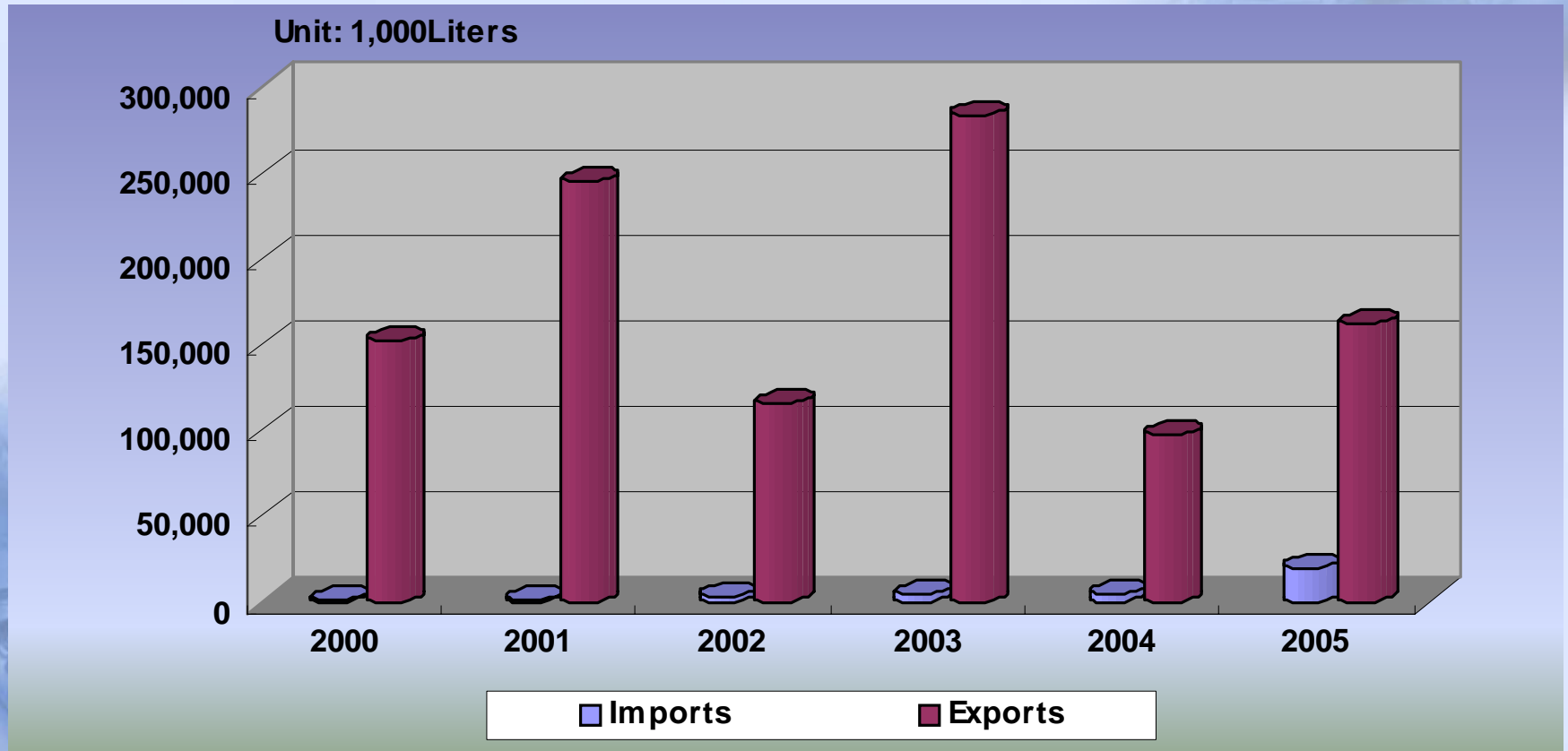
Alcohol Consumption

Alcohol Raw Material Structure



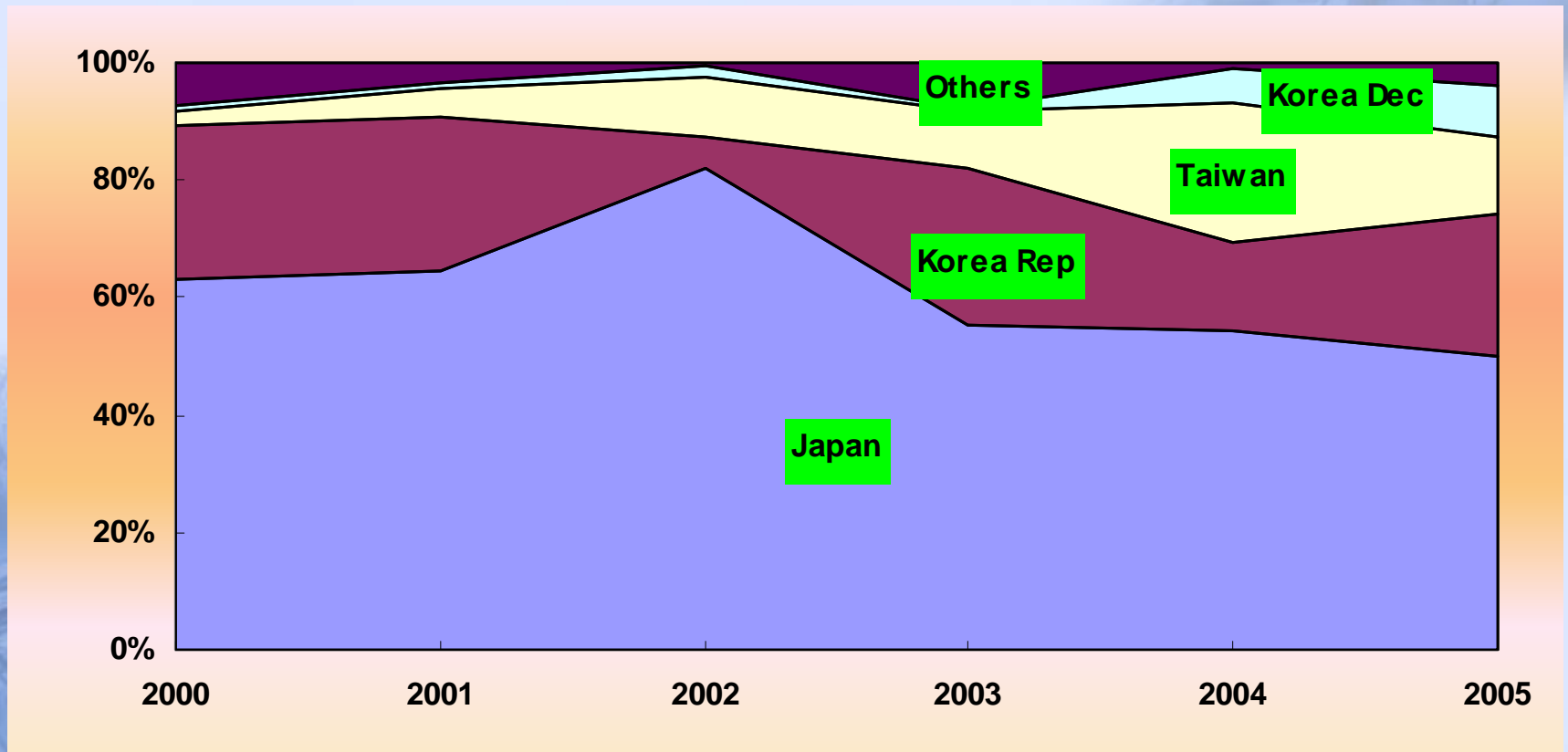
Alcohol Raw Material Structure

Alcohol Imports & Exports in 2000~2005



Alcohol Imports & Exports

Alcohol Exports by Destination Country in 2000~2005

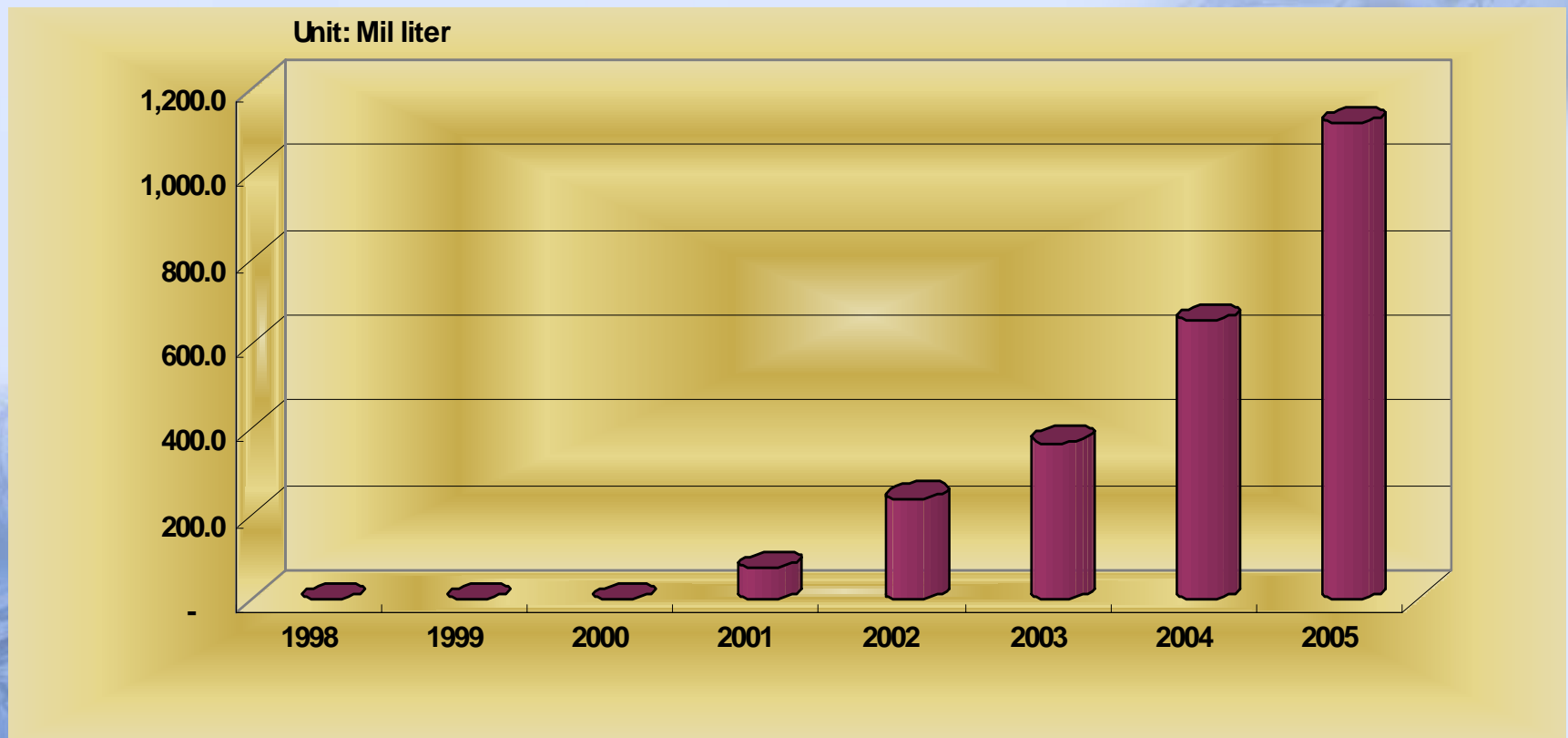


Alcohol Imports & Exports

CHAPTER THREE Overview of China's Ethanol Industry

- Ethanol Production
- Distribution of Ethanol Producers
- Ethanol Consumption
- Ethanol Raw Material Structure
- Ethanol Imports & Exports

Ethanol Production in 1998~2005



Ethanol Production

Ethanol Producers' Capacity

Unit: 1,000MT

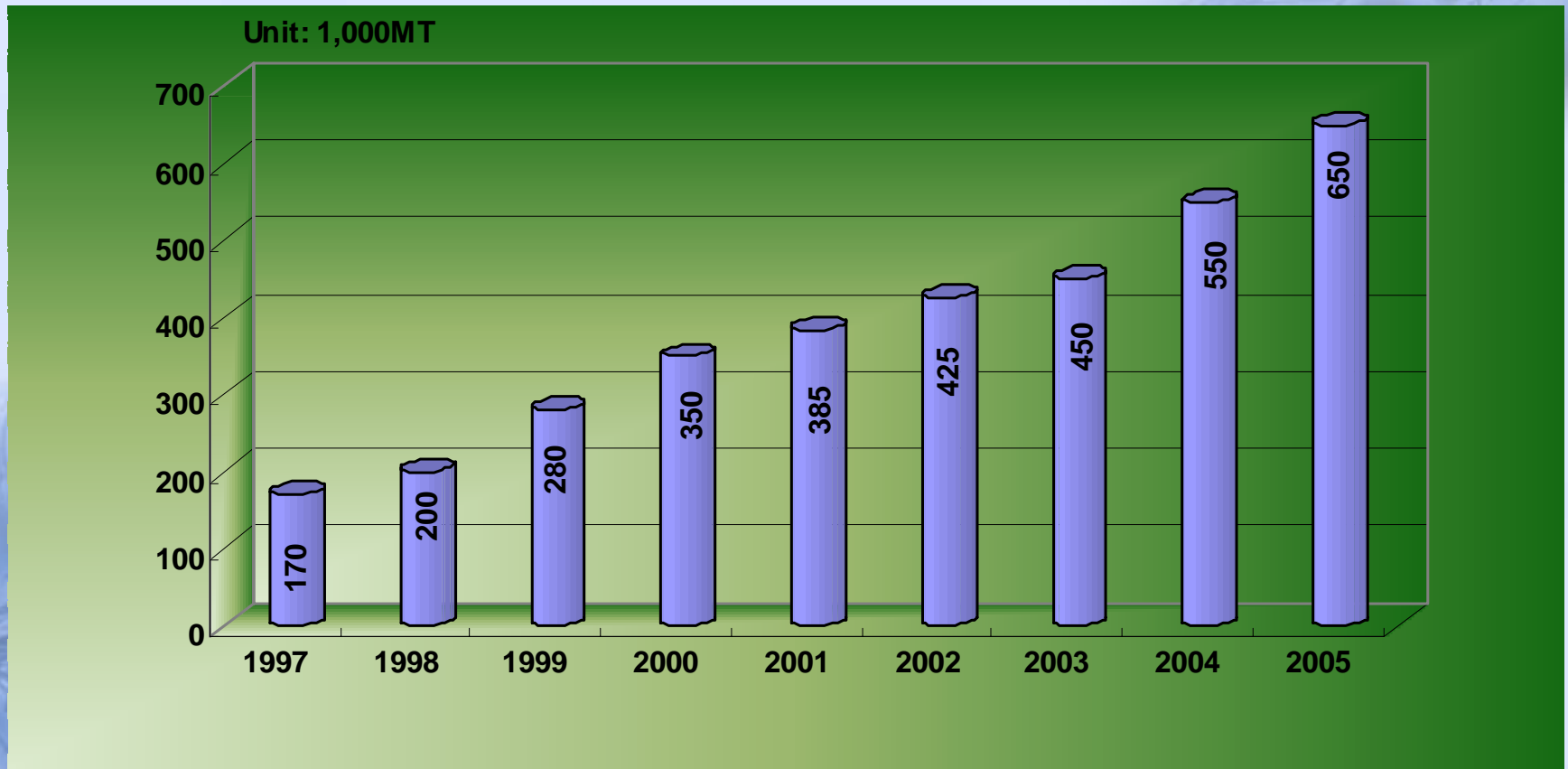
Enterprise	Capacity
Total	1,630
Jilin Fuel Alcohol Company Ltd	440
China Resources Alcohol Co., Ltd	250
Henan Tianguan Group	500
Anhui BBKA Group	440

Distribution of Ethanol Enterprises

CHAPTER FOUR Overview of China's Citric Acid Industry

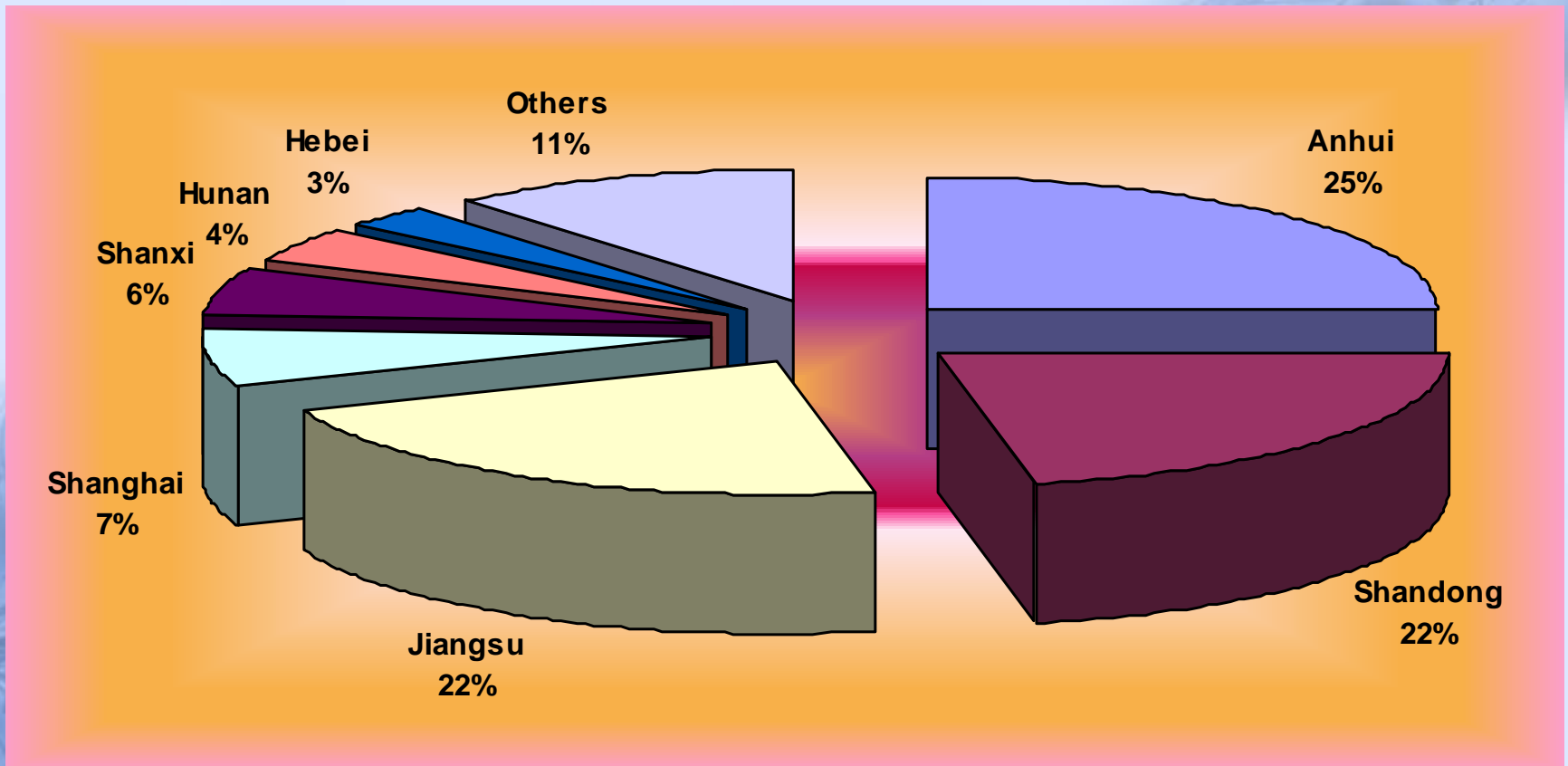
- Citric Acid Production
- Distribution of Citric Acid Producers
- Citric Acid Consumption
- Citric Acid Raw Material Structure
- Citric Acid Imports & Exports

Citric Acid Production in 1997~2005



Citric Acid Production

Distribution of Citric Acid Production



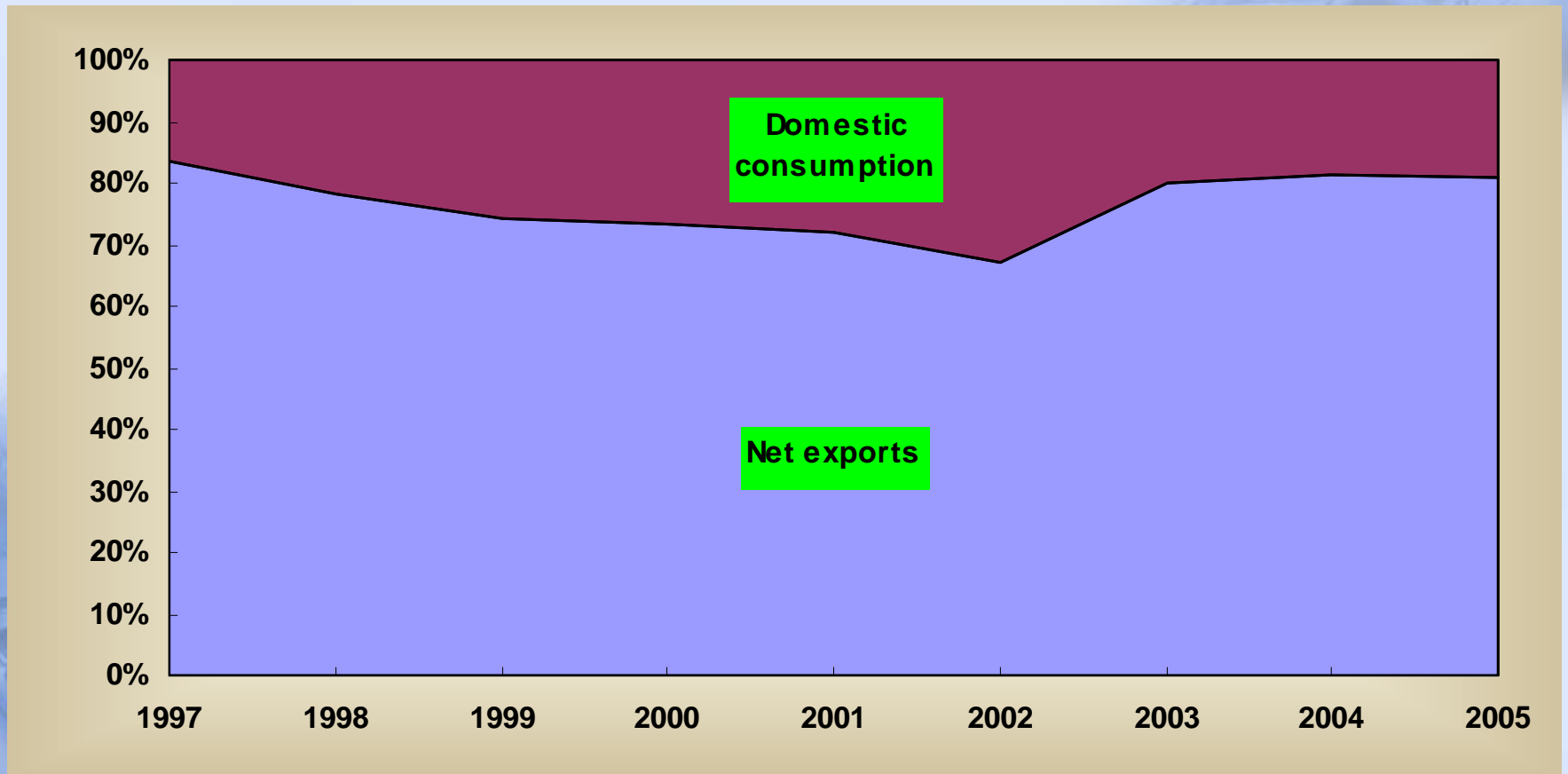
Citric Acid Production

Distribution of Citric Acid Enterprises

- Citric acid factories have been set up in nearly every province, but only more than 30 factories are in normal operation. These thirty-odd factories have a total capacity of 1 million MT a year. Of these, Anhui Fenyuan, Jiangsu Luoshi and ten others jointly contribute to 70% of the nation's total.

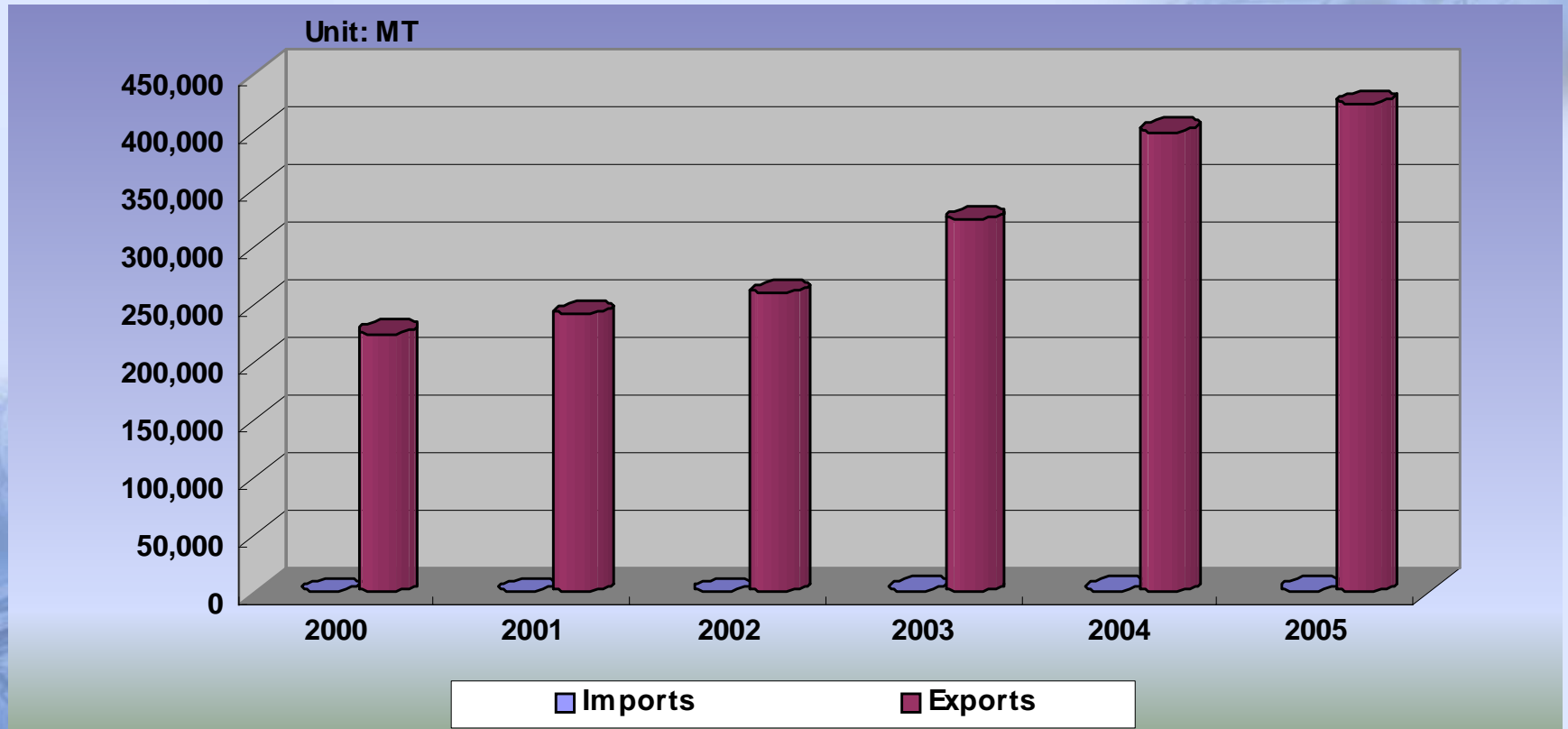
Distribution of Citric Acid Enterprises

Citric Acid Consumption in 1997-2005



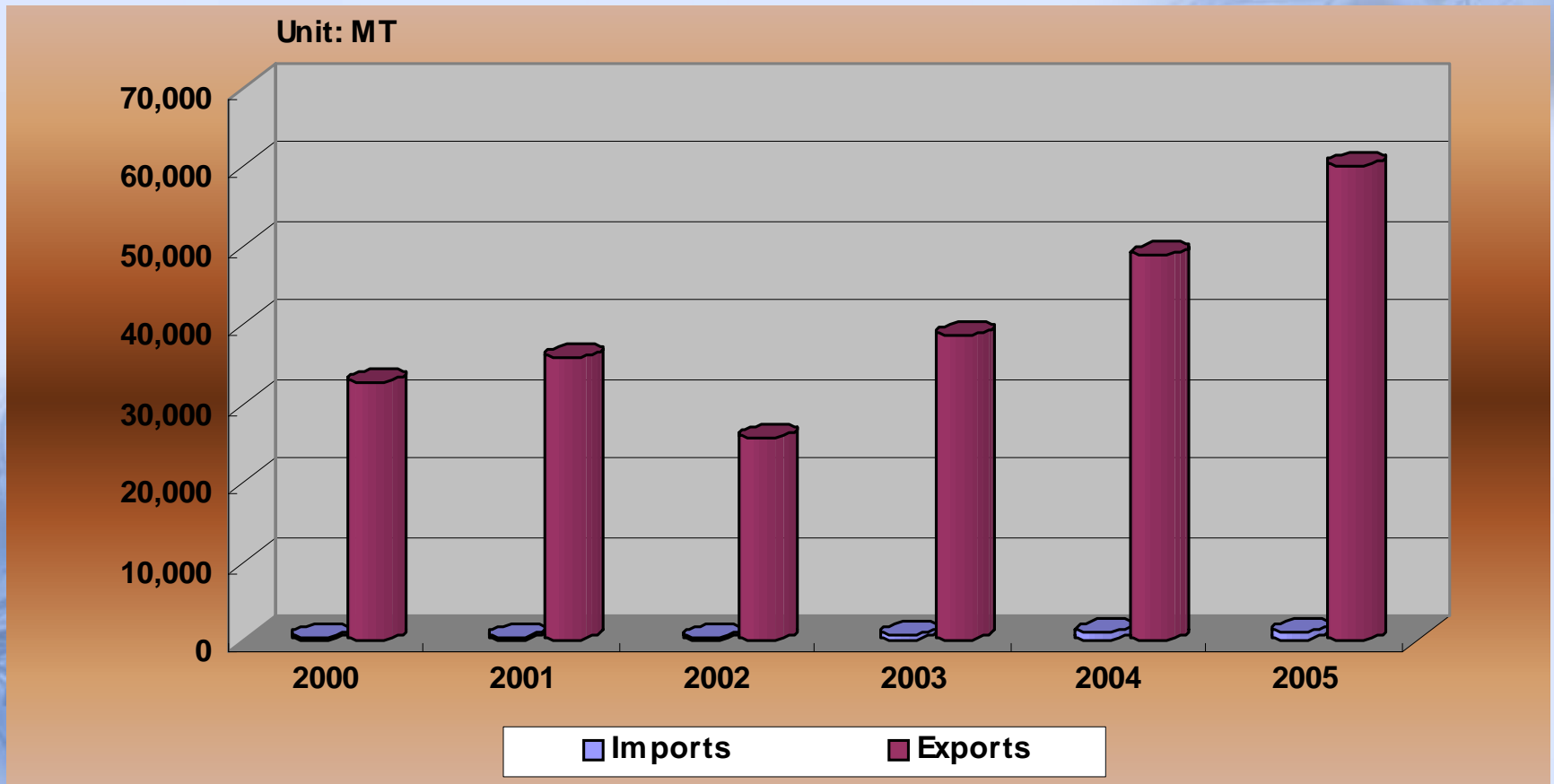
Citric Acid Consumption

China's Citric Acid Imports & Exports in 2000~2005



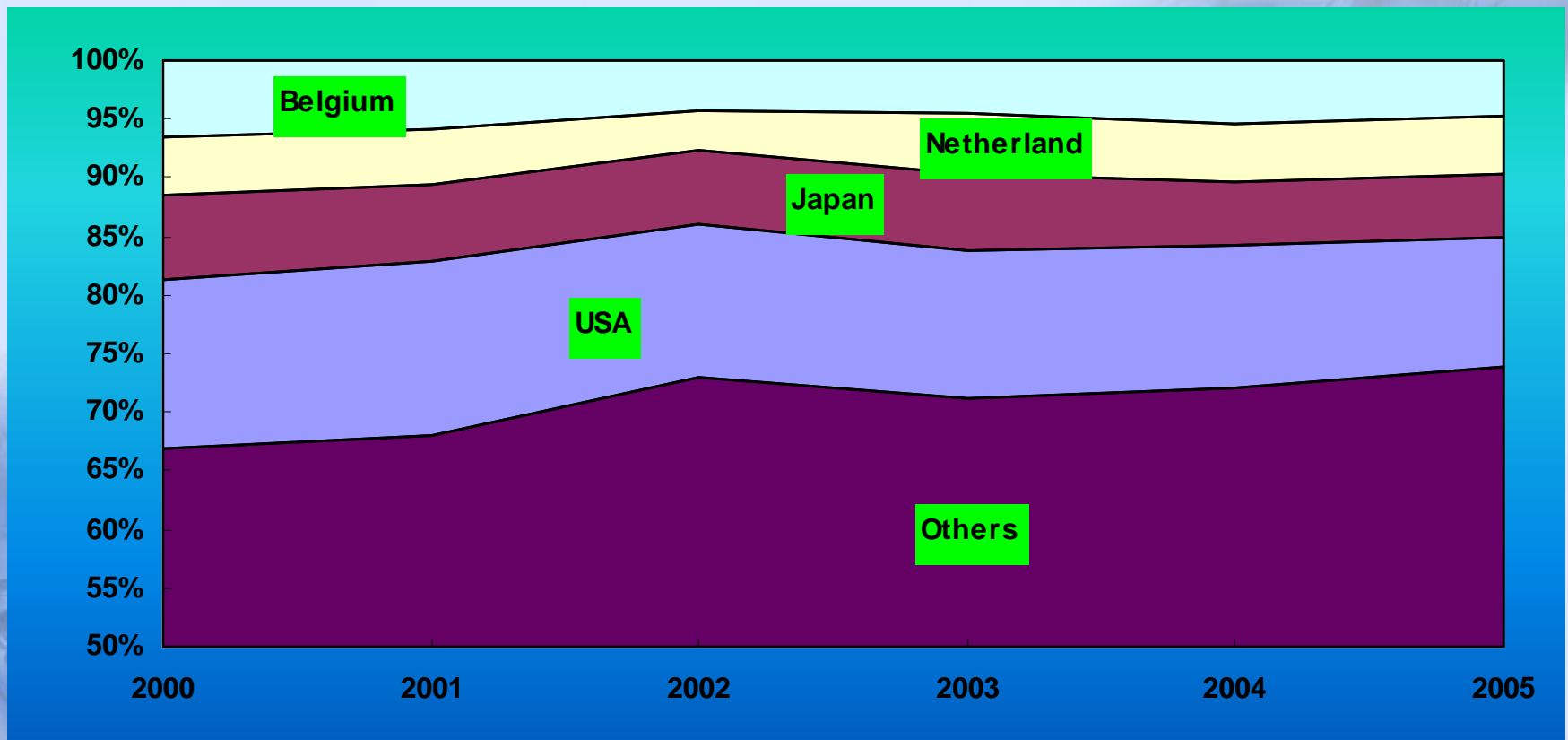
Citric Acid Imports & Exports

China's Citrate Imports & Exports in 2000~2005



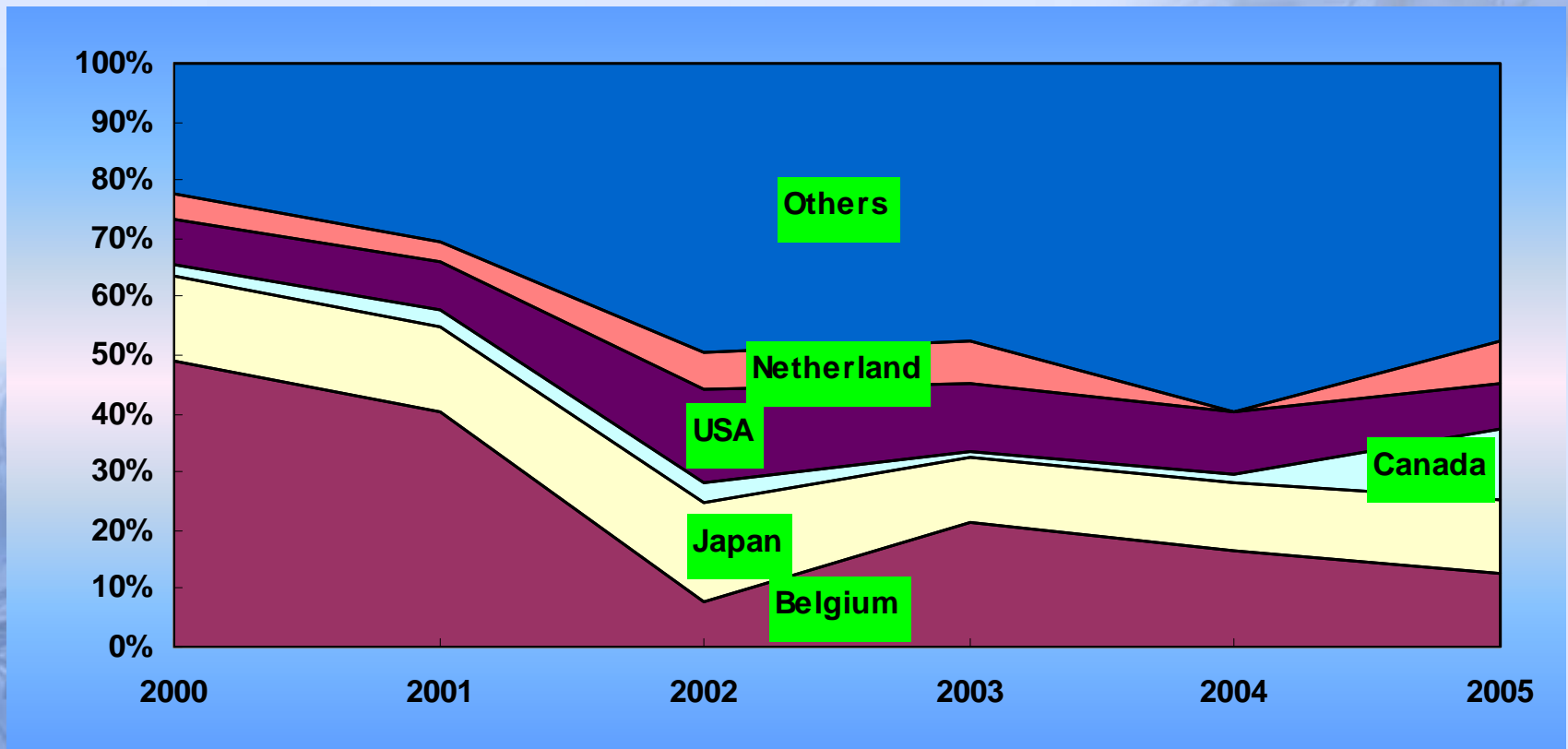
Citric Acid Imports & Exports

Proportions of Citric Acid Exports by Destination Market in 2000~2005



Citric Acid Imports & Exports

Proportions of Citrate Exports by Destination Market in 2000~2005



Citric Acid Imports & Exports

Sorbitol Production in 2000~2005

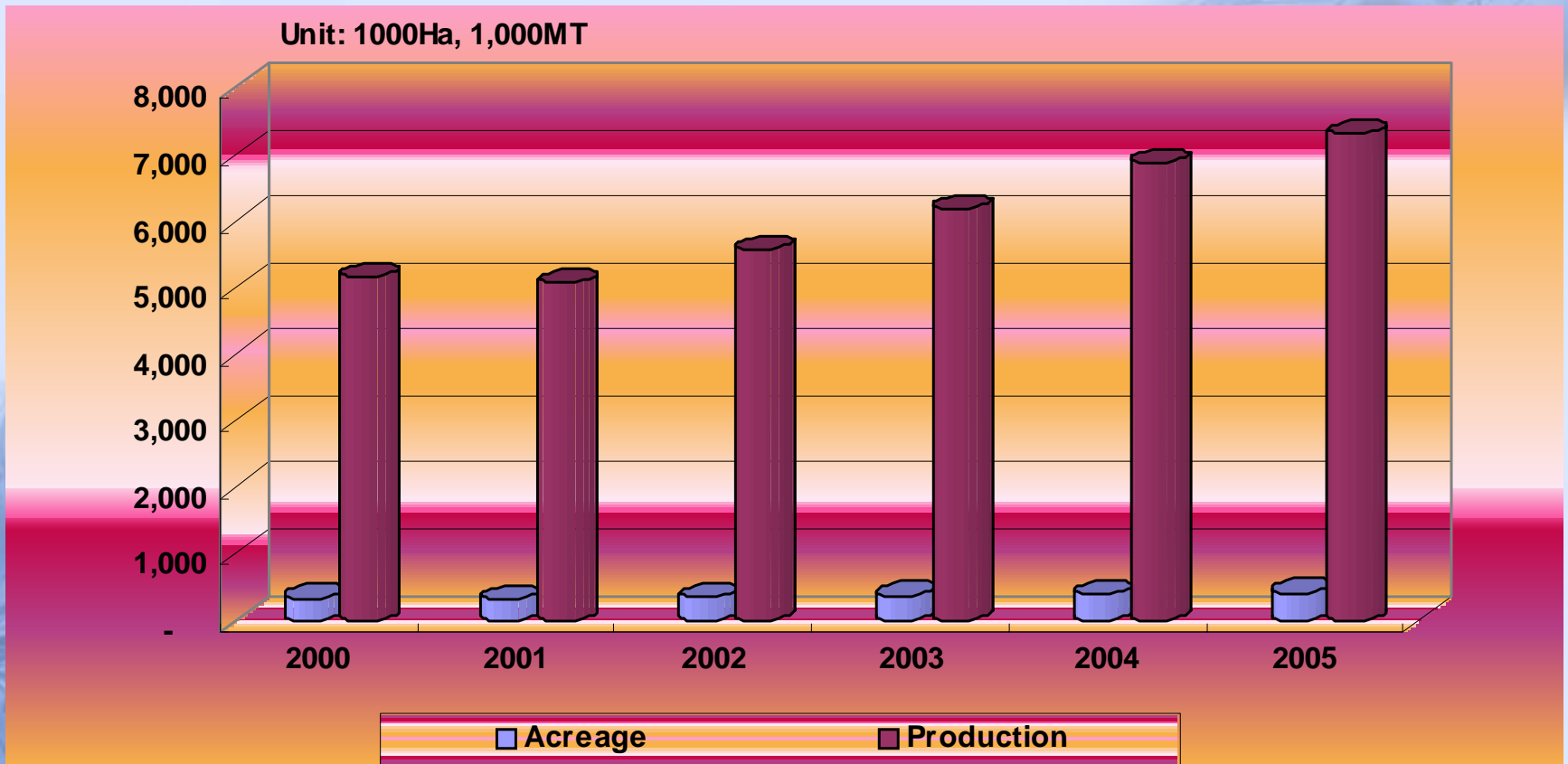
Unit: 1,000MT

Year	2000	2001	2002	2003	2004	2005
Production	100	170	200	280	300	500

CHAPTER FIVE Overview of China's Tapioca Market

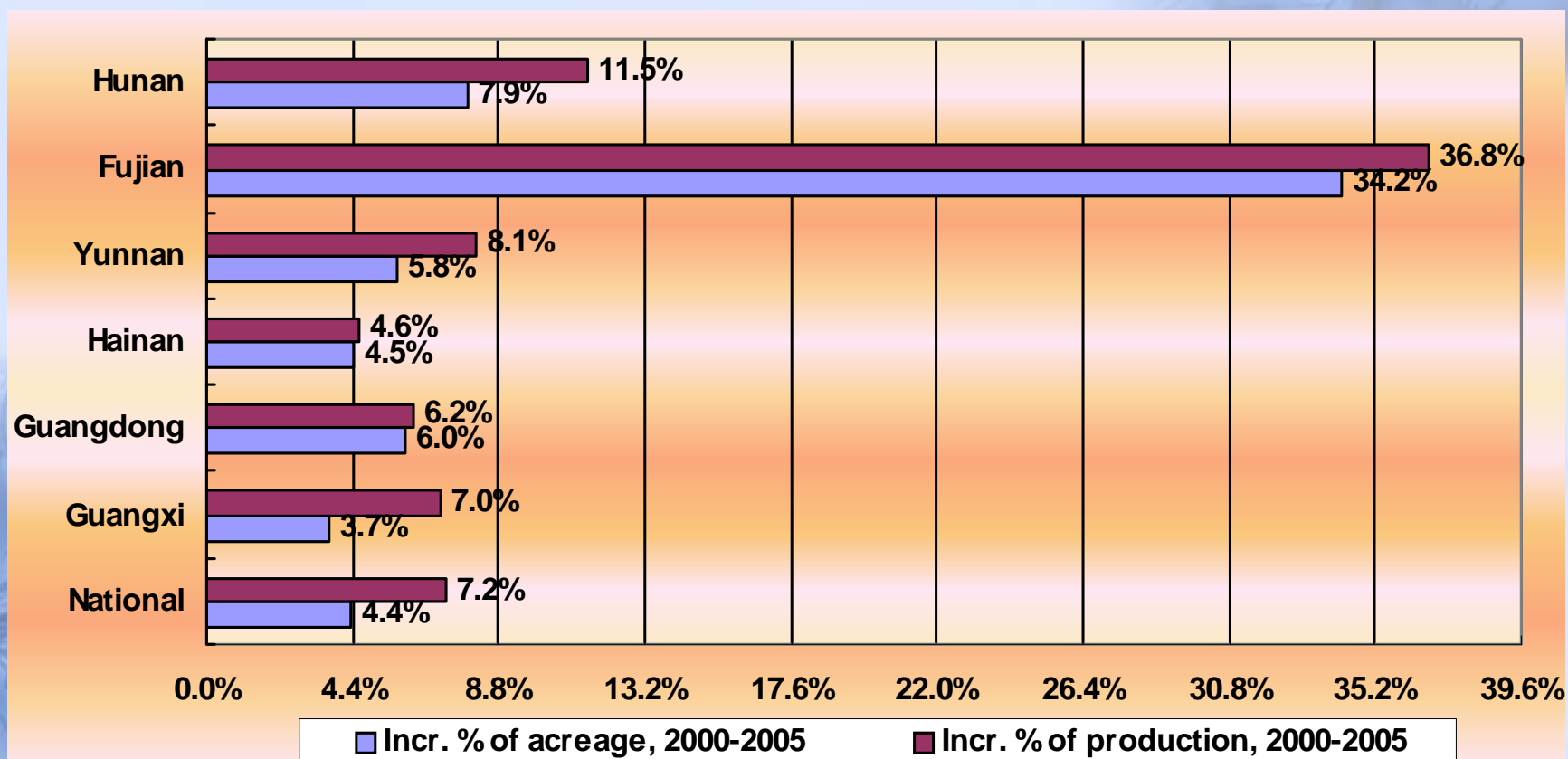
- Tapioca Production
- Imports & Exports of Tapioca & Tapioca Starch
- Overview of Tapioca Processing Industry

China's Tapioca Acreage & Production in 2000~2005



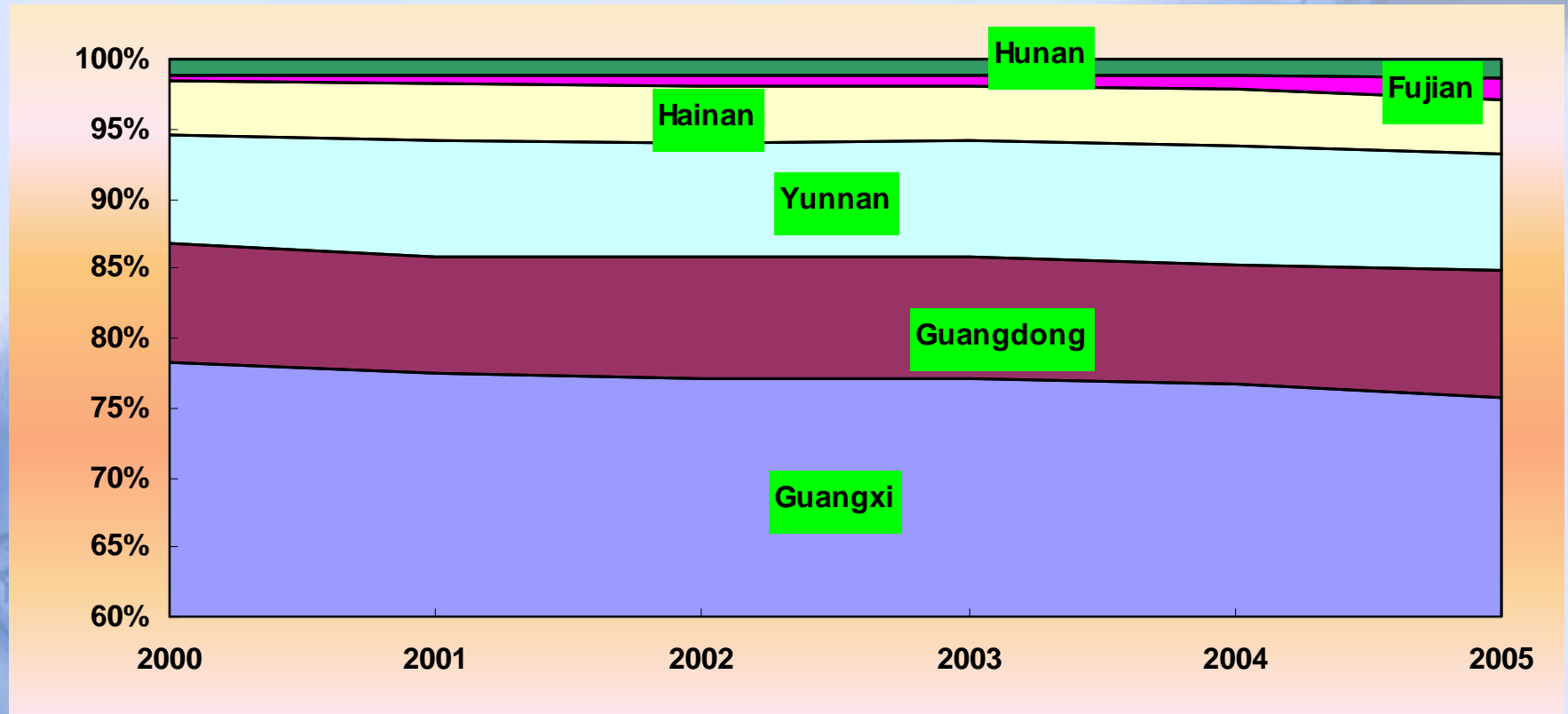
Tapioca Production

Annual Increase Rate of Tapioca Acreage & Production in 2000~2005



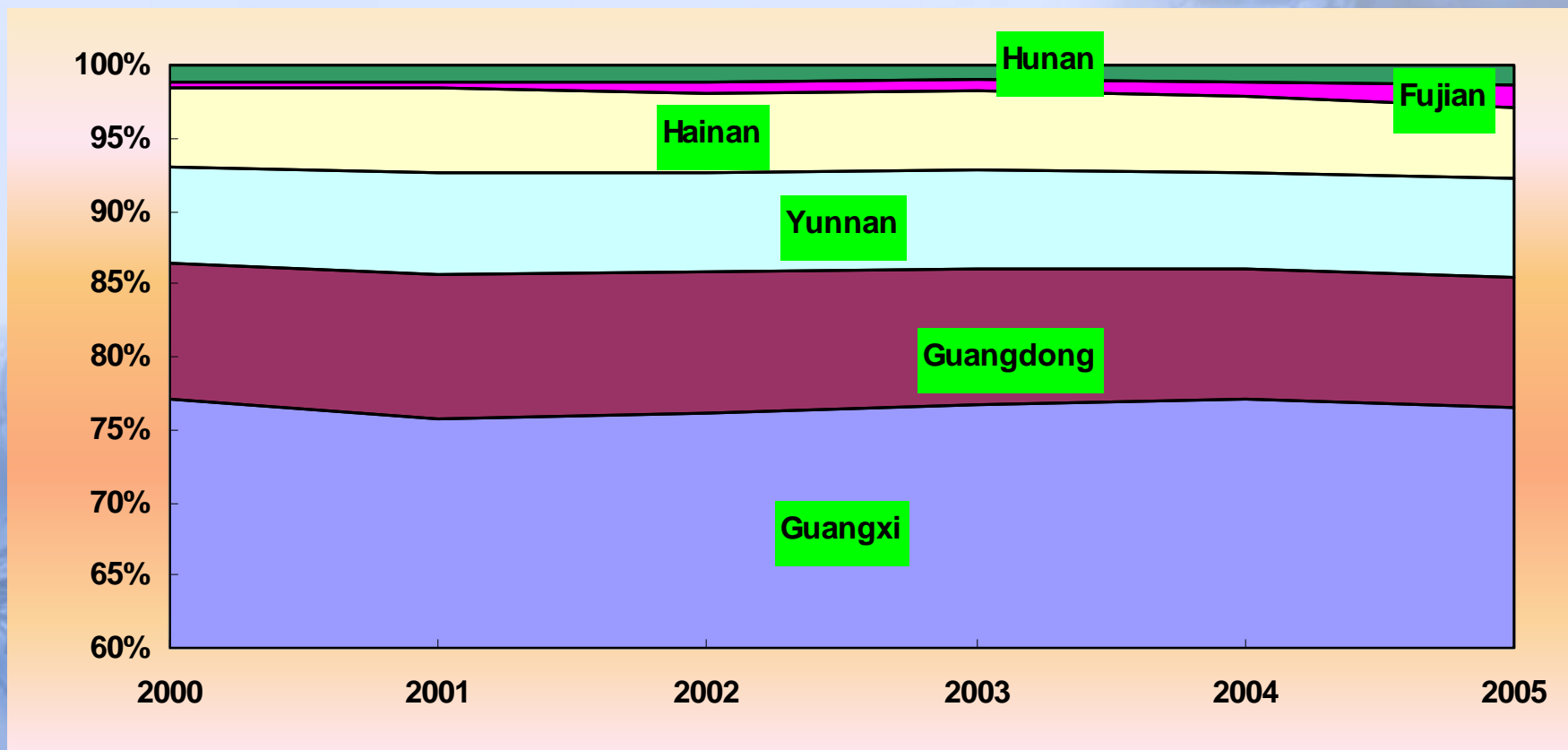
Tapioca Production

Proportions of Tapioca Acreage by Province in 2000~2005



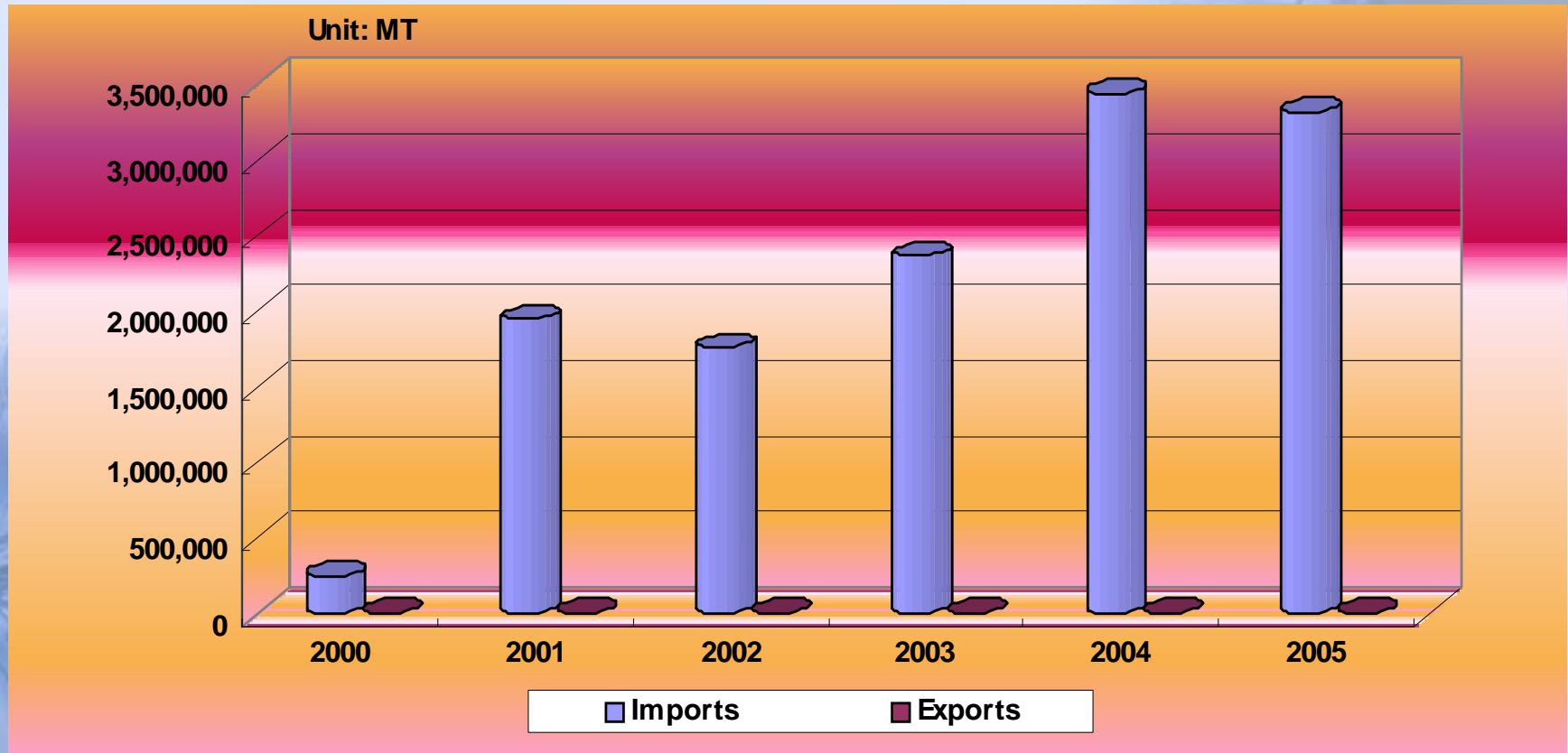
Tapioca Production

Proportions of Tapioca Production by Province in 2000~2005



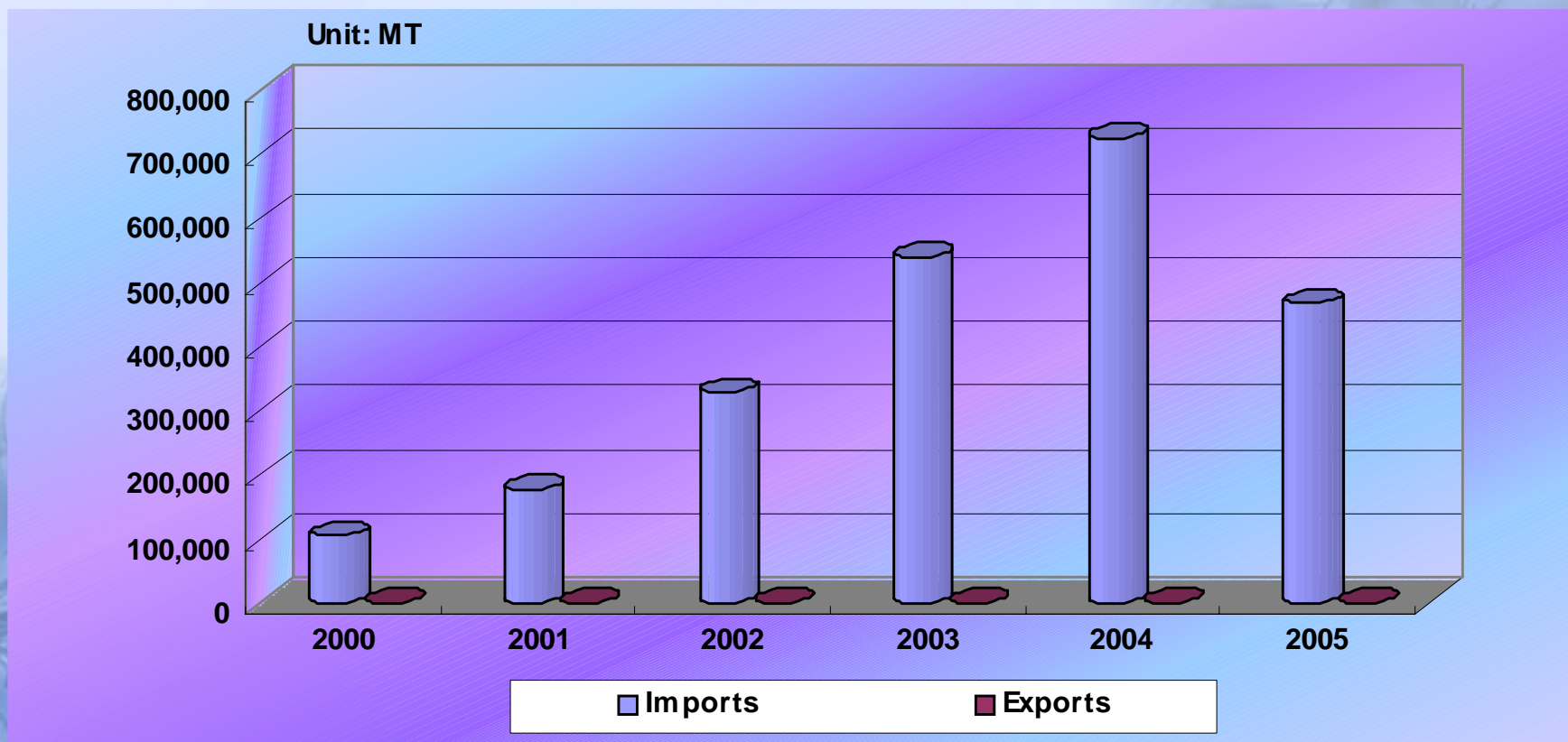
Tapioca Production

China's Dried Tapioca Imports & Exports in 2000~2005



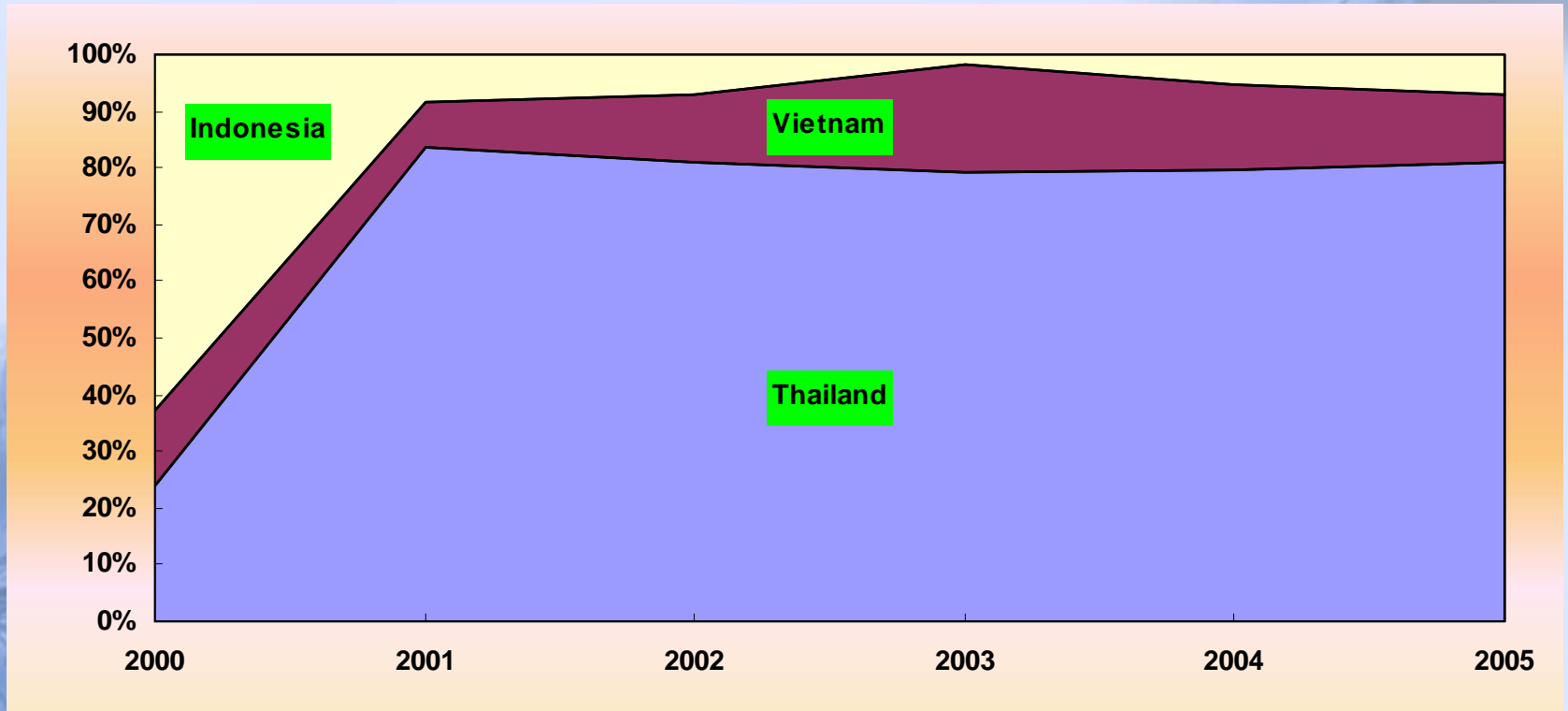
Imports & Exports of Tapioca & Tapioca Starch

China's Tapioca Starch Imports & Exports in 2000~2005



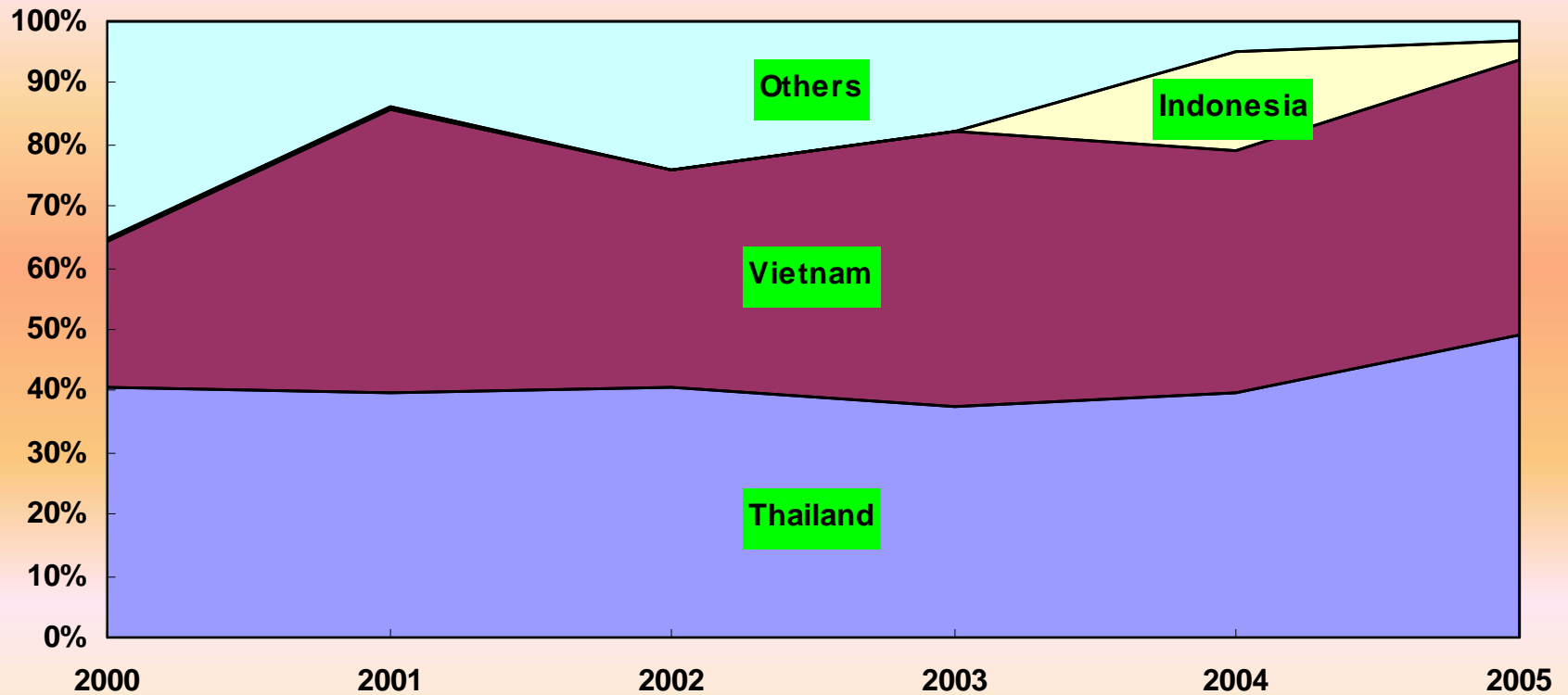
Imports & Exports of Tapioca & Tapioca Starch

Proportions of Dried Tapioca Imports by Original Country in 2000~2005



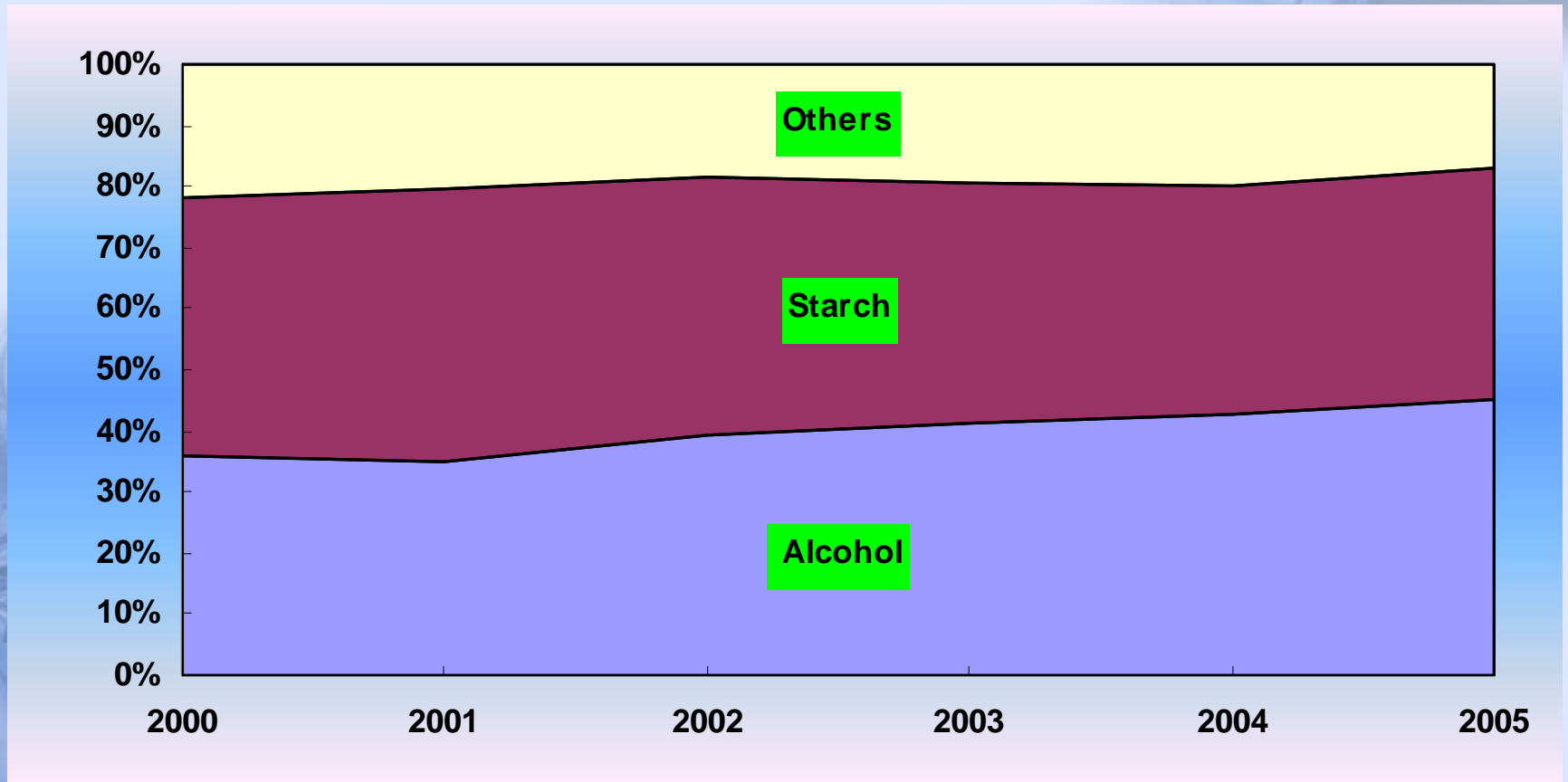
Imports & Exports of Tapioca & Tapioca Starch

Proportions of Tapioca Starch Imports by Original Country in 2000~2005



Imports & Exports of Tapioca & Tapioca Starch

Proportions of Tapioca Consumption for Various Purposes



Overview of Tapioca Processing Industry

Tapioca Starch Consumption for Various Purposes

Unit: 1,000MT, %

Year	2000		2005	
	Volume	Proportion	Volume	Proportion
Food Industry	78	30	251	35
Modified Starch production	52	20	215	30
Fermentation Industry	52	20	143	20
Pharmaceutical Industry	13	5	50	7
Other(fine chemical, adhesive, stuffing, etc.)	65	25	72	10

Overview of Tapioca Processing Industry

CHAPTER SIX Outlook of China's Starch Market

- Starch Market Trend
- Starch Raw Material Structure Trend
- Trend of Starch Imports & Exports
- Trend of Investment in Starch Industry

Estimates of China's Starch Production & Market in 2006~2010

Year	2006	2007	2008	2009	2010
Starch (1,000MT)	12,700	14,650	16,400	17,700	19,100
Incr. %	15	15	12	8	8
Sale (Billion USD)	3.3	4.1	4.9	5.7	6.6
Prices (USD/MT)	262.5	280.9	300.5	321.6	344.1

Starch Market Trend

Estimates of Modified Starch Demand in 2010

Unit: 1,000MT

Year	2010
Total	2,000
Paper Making	1,200
Food industry	300
Weave Industry	175
Aquatic Product Feed	100
Building material Industry	100
Petroleum Industry	50
Medicine Industry	30
Others	15

Starch Market Trend

Starch Raw Material Structure Trend

- Considering the changes in starch raw material structure and China's starch industry's development plan in the next few years, corn starch's share in total starch production may drop from the current 91~92% to 85% by 2010, tapioca starch's share may expand from 5~6% to 7~8% and potato starch's are may grow from 1% to 4~5%, leaving 2~4% for others.

Starch Raw Material Structure Trend

Trend of Starch Imports & Exports

- Starch imports and exports are predicted to reach 1.2 million MT and 500,000~600,000 MT respectively by 2010. Starch import products may remain to be tapioca starch and modified starch. Domestic modified starch production is estimated to be 1.5~1.8 million MT by 2010, but demand may exceed 2 million MT then. Corn starch may continue to dominate starch exports. Tapioca starch imports may see its import increase rate drop to 10~15% because some tapioca starch imports may be replaced by dried tapioca imports. Annual starch export increase rate may stay at 20% or so.

Trend of Starch Imports & Exports

Trend of Investment in Starch Industry

- Judging by planned starch projects and projects under construction, investment in starch industry is increasingly pumped into large projects, including potato starch and tapioca starch projects. 30 MT/hr. potato starch production line was developed before 2005. Mingyang Biochemical Technological Co. Ltd., located in Guangxi, kicked off a 100,000 MT/year tapioca starch project at the end of 2005.

Trend of Investment in Starch Industry

CHAPTER SEVEN China's Policy for Starch Industry

- Favorable Policies for Starch, Ethanol & Citric Acid Production
- Favorable Policies for Corn, Potato, Tapioca And Sugarcane Production
- Policies on Starch & Starch Raw Material Production, Imports & Exports

Favorable Policies for Starch, Ethanol & Citric Acid

Production

- The government encourages major grain-producing regions to engage in grain deep-processing. Corn processing should be pushed forward from starch production to comprehensive utilization and tuber crop processing from starch and vermicelli production to modified starch production.
- The state substitute energy strategic plan aims at 5 million MT ethanol production by 2010 and 15 million MT by 2020.
- The State Development Commission decided to set up special fund to promote renewable energy technology and industry during 2005~2007.
- The Ministry of Finance declares that it supports ethanol production from sugarcane, tapioca, sweet sorghum, etc.
- The state encourages the construction of biological energy production bases by utilizing waste mountains, waste land and saline-alkali soil; the state provides subsidy to such bases and adopts a preferential tax policy in such areas. In addition to financial support, the state grants a 50% reduction of VAT to reclaimable resource enterprises.

Favorable Policies for Corn, Potato, Tapioca And Sugarcane Production

China's Objectives of Major Farm Product Supply in 2000~2006

Index	2005	2010	Average Incr. %	Notes
Acreage (Mil Ha)	104.28	103.33	-0.18	Restricted
Grains Production (Mil MT)	484	500	0.65	Restricted
Cotton Production (1,000MT)	5,710	6,800	3.55	Expected
Oil Production (1,000MT)	30,770	32,000	0.78	Expected
Sugar Crops Production (Mil MT)	94.51	120.00	4.89	Expected
Meat Production (1,000MT)	77,430	84,000	1.64	Expected
Bird Eggs Production (1,000MT)	28,790	30,000	0.82	Expected
Milk Production (1,000MT)	28,650	42,000	7.95	Expected
Aquatic product Production (1,000MT)	51,060	60,000	3.28	Expected

Ministry of Agriculture stated that it would push forward industrialized tapioca production to facilitate biological energy development. The ministry plans to increase tapioca acreage and production to 1 million ha. and 30 million MT by 2015 by means of increasing yield with high-quality seeds and advanced cultivating methods.

Policies on Starch & Starch Raw Material Production, Imports & Exports

- In line with the Sino-ASEAN Free Trade Agreement, China's customs' duty rate for tapioca starch imports will be reduced to 8% in 2007, 5% in 2009 and zero in 2010 and the duty rate for the imports of dextrose and its syrup, fruit sugar and its syrup and invert sugar will be reduced to 12% in 2007, 5% in 2009 and zero in 2012.
- According to the document issued by the Ministry of Finance on Sept. 15, the preferential policies of VAT (13% tax rate) rebate and exemption of consumption tax for exports were abolished on Sept. 15, 2006; alcohol processing trade was banned, tax rebate for monosodium glutamate exports was withdrawn.

CHAPTER EIGHT Outlook of Tapioca & Its Starch Market in China

- Tapioca's Substitutability for Other Plants
- Outlook of Tapioca Demand in China
- Estimates of Domestic Tapioca Production
- Outlook of Tapioca & Tapioca Starch Imports

Tapioca's Substitutability for Other Plants

Comparison of the Property of Different Starch & Starch Paste

Starch Variety	Wheat	Corn	Sorghum	Glutinous Sorghum	Tapioca	Potato
Paste tem. ()	65-65.5	64-72	69-75	-	52-64	56-67
Min. pastetem.()	65	64	69	-	52	56
Coagulating & Precipitating Property	High	Moderately High	Moderately High	Low	Low	Low
Hot Stickiness	Low	Moderately High	Moderately High	Moderately High	High	Very High
Hot Stability Of Stickiness	Stable	Stable	Stable	Very Low	Low	Very Low
Gel Intensityafter Cooling	Very High	High	High	No gelling	Very Weak	Very Weak
Paste Fiber Length	Short	Short	Short	Long	Long	Long
Paste Transparency	No	No	No	Half Transparent	Good Transparency	

Comparison of Starch Production Cost With Different Material

	Material Cost (MT/MT)	Material Cost (USD) in 2005	Material Cost (USD) in 2010
Corn	1.5	285	320
Potato	7.0	330	360
Sweet Potato	7.0	260	300
Tapioca	3.5	185	235

Comparison of Ethanol Production Cost With Different Crops & Crops' Requirement of Soil

	Material Cost (MT/MT)	Land Requirement (ha.)	Material Cost (USD) in 2005	Material Cost (USD) in 2010
Corn	3	0.4 (fertile land)	570	640
Sugarcane	17	0.27	515	625
Tapioca	7	0.13	370	470
Sorghum	4.0		395	480
Molasses	20	0.28	320	380
Straw	6		300	350

Comparison of Starch & Ethanol Raw Material Supply

	Corn	Sugar Cane	Tapioca	Sugar Beet	Potato	Sweet Potato
Acreage, 2005	26,358	1,354	419	210	4,881	4,622
Average Incr. %, 2001-2005	2.1	2.1		-15.2	0.8	-6.9
Production, 2005	139,370	86,638	7,315	7,881	14,173	20,507
Average Incr. %, 2001-2005	5.1	3.4	7.2	-7.8	2.4	-4.6
Demand						
Feed	93,000		878			
Starch	15,250		3,658		1,280	960
Ethanol	5,400		2,780			
Sugar		82,306		7,093		
Edible & Waste	11,160	4,332		788	12,893	19,547
Balance, 2005	14,560	0	0	0	0	0
Acreage, 2010	27,700	1,725	700	305	5,000	4,000
Average Incr. %, 2006-2010	1.0	5.0	10.8	7.7	0.5	-2.8
Production, 2010	150,000	110,500	11,000	11,400	16,000	18,000
Average Incr. %, 2006-2010	1.5	5.0	8.5	7.7	2.5	-2.6
Demand						
Feed	118,600		1,000			
Starch	22,500		5,130		6,500	5,000
Ethanol	10,000		4,870			
Sugar		88,400		10,260		
Edible & Waste	12,000	22,100		1,140	9,500	13,000
Balance, 2010	-13,100	0	0	0	0	0

Outlook of Tapioca Demand in China

- With the rapid growth of starch and ethanol industry, China's demand for tapioca is estimated to reach 32~34 million MT (in terms of fresh tapioca), or 11~11.5 million MT dried tapioca, by 2010, tantamount to an annual increase of 12~15%.
- China's tapioca ethanol production is expected to increase at an annual rate of 40% in the next five years.
- the demand for tapioca starch is estimated to increase 7% a year in the next five years.
- the demand for tapioca from other industries, such as fermenting and feed mills, is estimated to increase 5% a year in the next few years.

Estimates of Domestic Tapioca Production

- In view of the booming demand in the tapioca market, a demand created by China's biological energy development policy, China's tapioca acreage and production may increase 8~10% a year in the next five years, reaching 650,000~700,000 ha. and 10.5~11 million MT by 2010 respectively.

Outlook of Tapioca & Tapioca Starch Imports

- It is estimated that the gap between tapioca demand and supply be as large as 21~23 million MT (fresh tapioca), or 7~7.5 million MT dried tapioca, which may have to be filled with dried tapioca or tapioca starch imports.

Wish for Successful Cooperation

