East Meets West: Bridging the Cultures with Innovative Food Solutions
Dr. Sharon Shoemaker + Dr. Karen Lapsley, Moderators
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Dow AgroSciences
East Meets West: Bridging the Cultures with Innovative Food/Almond Solutions

Presenters:

Dr. Roger Clemens, USC School of Pharmacy

Lawrence Allen, Senior China business expert and author of *Chocolate Fortunes: The Battle for the Hears, Minds and Wallets of China’s Consumers*

Dr. Sharon Shoemaker, UC Davis
USA market highlights

2003: FDA Nut Health Claim
↓ Total Cholesterol and LDL

2005: Almonds Added to USDA MyPyramid

Portion Control Tin First Suggested by Subject in ABC Study
## China - growing economic sectors

### Industries in which China ranks #1 or #2 in the global market context

<table>
<thead>
<tr>
<th>Industry</th>
<th>China Percentage of Global Market</th>
<th>China Market Rank in Global Market</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automotive</td>
<td>~20%</td>
<td>No. 1</td>
</tr>
<tr>
<td>Machine Tool</td>
<td>22%</td>
<td>No. 1</td>
</tr>
<tr>
<td>Domestic Appliance &amp; Components</td>
<td>~20-30%</td>
<td>No. 1</td>
</tr>
<tr>
<td>Semi-conductor</td>
<td>~30%</td>
<td>No. 1</td>
</tr>
<tr>
<td>Elevator</td>
<td>~40%</td>
<td>No. 1</td>
</tr>
<tr>
<td>Construction</td>
<td>~12%</td>
<td>No. 2</td>
</tr>
<tr>
<td>Food Retail</td>
<td>~10%</td>
<td>No. 2</td>
</tr>
</tbody>
</table>
How will both nut processing and consumption expand throughout China 2010-2020???

Snackex/INC Beijing Congress, May 2010
China – snack distribution is evolving

Distribution: a major challenge
‘Traditional Trade’ accounts for > 50% of retail revenues

<table>
<thead>
<tr>
<th>Retailer Type</th>
<th>Revenues (RMB Billion)</th>
<th>Number (Million Outlets)</th>
<th>Av. Revenues (RMB Million)</th>
<th>Av. Size (SqM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Retailers</td>
<td>710 100%</td>
<td>3.7 100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traditional Trade (TT)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type D: Small Stores Or Kiosks</td>
<td>106 15%</td>
<td>3.46 93%</td>
<td>0.1– 0.5</td>
<td>10-50</td>
</tr>
<tr>
<td>Type C: Small Independent Supermarkets</td>
<td>284 40%</td>
<td>0.148 4%</td>
<td>0.5–5</td>
<td>50-800</td>
</tr>
<tr>
<td>Type B: Convenience Stores Chains</td>
<td>71 10%</td>
<td>0.074 2%</td>
<td>0.5–2</td>
<td>50-800</td>
</tr>
<tr>
<td>Type A: Hyper/ Supermarket Chains</td>
<td>248 35%</td>
<td>0.022 0.6%</td>
<td>10–400</td>
<td>800-6,000 Or bigger</td>
</tr>
</tbody>
</table>

Modern Trade (MT)
onto the speakers!!
Food Industry Priorities in the USA and China
Dr. Roger Clemens, USC School of Pharmacy
Objectives

- Assess and compare food science & technology education between USA and China
- Discuss the food science-related challenges to entering the China market
- Identify USA-China partnership opportunities in academe and food industry
IFT Membership

- Founded in 1939
- More than 18,000 members worldwide
- 18% of IFT members are international in more than 100 countries
- 59 Sections and Sub-Sections, 28 Divisions
- Members come from industry (81%), academia (15%), and government (4%)
IFT on Higher Education

- 47 undergraduate food science programs
  - 41 USA
  - 5 Canada
  - 1 Mexico

B.S. Degrees (1990-2005)

Chikthimmah & Floros, Food Tech 2007;61:38-44
# Education

## Field of Highest Degree (%)*

<table>
<thead>
<tr>
<th>Field</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food Science/Technology</td>
<td>47</td>
</tr>
<tr>
<td>Agriculture</td>
<td>11</td>
</tr>
<tr>
<td>Business/Marketing</td>
<td>8</td>
</tr>
<tr>
<td>Chemistry</td>
<td>6</td>
</tr>
<tr>
<td>Biological Sciences</td>
<td>5</td>
</tr>
<tr>
<td>Nutrition</td>
<td>4</td>
</tr>
<tr>
<td>Microbiology</td>
<td>3</td>
</tr>
<tr>
<td>Chemical Engineering</td>
<td>2</td>
</tr>
<tr>
<td>Food Engineering</td>
<td>2</td>
</tr>
</tbody>
</table>

* Emerging areas include, but not limited to, regulatory science, food safety, dietetics, packaging, food security, food sustainability; critical training in communications, leadership development, interdisciplinary facilitation, international supply chains

## Highest Degree

<table>
<thead>
<tr>
<th>Degree</th>
<th>Women (%)</th>
<th>Men (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor’s</td>
<td>44</td>
<td>34</td>
</tr>
<tr>
<td>Master’s</td>
<td>31</td>
<td>23</td>
</tr>
<tr>
<td>Doctorate</td>
<td>17</td>
<td>32</td>
</tr>
<tr>
<td>MBA</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>None/other</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

Kuhn ME. Food Tech 2010;64:20-37
Salaries

Median Salary for Food Scientists

Kuhn ME. Food Tech 2010;64:20-37
Agriculture and Food Scientists

Projections for 2011

• Rapid growth as agriculture and food scientists develop technology and products using biotechnology, nanotechnology while limiting environmental impact

• Bachelor’s degree in agriculture science adequate for most product development positions; Master’s or doctorate preferred for research

http://www.bls.gov/oco/ocos046.htm#projections_data
Accessed December 1, 2010
Employment Projections

- Insufficient graduation rate in food science and technology to meet projected demands.

http://www.bls.gov/oco/ocos046.htm#projections_data
Accessed December 1, 2010
## Occupation Projection (2018)

<table>
<thead>
<tr>
<th>Industry</th>
<th>2008→2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food manufacturing</td>
<td>7.7</td>
</tr>
<tr>
<td>Animal food</td>
<td>4.7</td>
</tr>
<tr>
<td>Confections</td>
<td>-1.9</td>
</tr>
<tr>
<td>Fruit/vegetable</td>
<td>-3.2</td>
</tr>
<tr>
<td>Dairy</td>
<td>6.5</td>
</tr>
<tr>
<td>Seafood</td>
<td>18.6</td>
</tr>
<tr>
<td>Animal (processing)</td>
<td>14.9</td>
</tr>
<tr>
<td>Other (food)</td>
<td>13.7</td>
</tr>
</tbody>
</table>

http://www.bls.gov/oco/ocos046.htm#projections_data
Accessed December 1, 2010
Dietary Guidelines: Agriculture Implications

- 8.9 million more acres of cropland would be needed to support vegetable production (2002 statistic); 10.3 million more acres (2015 projection)

- 4.1 million more acres of cropland would be needed to support fruit production (2002 statistic); 4.7 million more acres (2015 projection)

- In general, need nearly 2% increase in total US cropland (2002 statistic); more than 2.3% increase in total US cropland (2015 projection) or about 3% increase in harvested cropland (about 320 million acres; 1997 acreage)

- 107.7 billion additional pounds of fluid milk and milk products are needed (an increase of 66% - impact on number of dairy cows, feed grains, and “grazing” acreage); 124.6 billion additional pounds (2015 projection), nearly 80% increase (cows, feed grains, grazing acreage)

References (for the agriculture calculations)
The rising costs for food and energy distort China’s consumer price index, whose methodology has long been criticized.
Fresh tomatoes, after washing, breaking, pulping and removing peels and seeds, etc, are concentrated, sterilized, filled and sealed, which keeps the fresh taste.

Fat free instant noodles, vegetable/beef flavor package: Product Description: Noodles: Wheat flour, shortening, modified potato starch, salt, sugar, seasoning

Pollution-free Frozen Corn Quick Frozen Boiled Sweet Corn Vacuum Corn Frozen Corn Kernel Canned Sweet Corn Canned Corn Kernel Our factory integrates R&D, processing and produce frozen corn.
• Food industry importance sector in Chinese national economy
• Food science and technology enjoys continuous growth
• China established goal to provide world-class education, especially in food science and technology (>180 institutions, 31 provinces, > 500 FT professors, > 100 guest lecturers and adjunct professors)
• 5-year plan > RMB 600MM (~$90MM) investment + RMB 700 MM (~$105 MM) in agriculture + RMB 100 MM (~$15 MM) in food-related projects
• China established joint research centers with > 10 international universities (USA, Canada, UK, France, Japan, Korea) + scholar and student exchanges

http://www.worldfoodscience.org/cms/?pid=1004862
Accessed December 1, 2010; IFT & IUFoST, 2009
The Chinese food industry is a dynamic and evolving industry with a wide range of opportunities.

Economics and food safety pose enormous pressures.

Consumers question whether Chinese products are safe, meet their sensory expectations, whether their costs are too high.

Most Chinese companies lack a technical infrastructure and a connection with the marketing activities.

Food scientists need to be more broadly educated vs. focusing on narrow disciplines to better function in this environment.

The demand for qualified food scientists in China is large and will continue to expand.

Stone H et al., IFT AMFE 2009
http://www.msnbc.msn.com/id/18078824/

A farmer picks rape blossoms at a farm on the outskirts of Shanghai, China.
Food Beverages in China

Developments:

• China joined World Trade Organization (2001)
• China has growing disposable income (Urban, ~$2400/capita; 2008)
• China imports nearly $80 MM in food and beverage products per month with exports on the average of $35-40 MM
• Total agricultural USA exports to China were $1.1 B (1999)
• China is Asia’s largest citrus producer, their poor transportation infrastructure and lack of cold storage facilities prevent many regions from receiving fresh, high-quality citrus products after the harvest
• USA has opportunity to export to these regions during the winter harvest season and during the spring season, after the Chinese harvest has peaked
• Current USA exports of citrus products to China (mainly oranges) is nearly $100 MM per year
• Success in this market relies on relationships and the symbiosis of Chinese marketing and American technology

California Navel Orange

Manley C. IFT AMFE 2009
Food Service in China

- There are many forms of the institutional food services: military, academic institutions, communes.
- China opened possibilities in the late 70's and early 80's (e.g., initial companies were Kentucky Fried Chicken, McDonald's).
- Challenges included banking rules, currency issues, basic infrastructures, duties and taxes, raw material sourcing, labor regulations → slow business development.
- China has established policies to attract foreign investments.
- China created business opportunities for all companies with 1.3 million potential customers.
- Prevailing issues include currency convertibility, layers of government approval procedures, lack of supporting industries, transportation industries, low cost reliable raw materials and tax structures.

Ma R. IFT AMFE 2009
Accessed December 1, 2010
New Food Ingredients in China

- China represents a growing point for the food industry
- China has about 500 ingredients and 1250 flavor substances approved and included in Hygienic Standards for Use of Food Additives
- Food ingredient development cannot meet the need of rapidly growing China food industry
- Ingredient needs include, but not limited to, flavors, yeast extract, sweeteners, sugar alcohols, oligosaccharides, preservatives, antioxidants, texturizers for bakery
Food Regulations in China

- China's food laws continue to increase in complexity
- Foodborne disease is a concern of consumers and public health authorities
- China’s food system: 78% food processors < 0 employees and most farms being 2 acres or less.
- China’s small farms combined with a cash-based and very large and fragmented food production system make traceability difficult
- China’s WTO membership was a driving force that stimulated public health authorities
- China’s awareness of the food control legislation and standards in other countries → a prerequisite in the international harmonization of food regulations
- Chinese system of food regulation is based on Food Standards and the National Hygiene Standard, and Standards for Food Additives
- State Food and Drug Administration (2003)

Schrankel KR, Song C. IFT AMFE 2009
http://www.leatherheadfood.com/food-regulations-china
IFT Partnership with Chinese Institute of Food Science & Technology (CIFST)

Nanoscience
Nanotechnology
Nanoscale
Iron Bioavailability
IFT Partnership with Chinese Institute of Food Science & Technology (CIFST)

- Collaboration for 10+ years
- Bi-annual educational summit
- Collaborative partnership symposia at IFT annual meeting
- We would love to replicate Almond Board support for CIFST to IFT to further cement collaboration and foster innovation in product development
- For more information about IFT’s activities, please contact Amanda Perl aperl@ift.org
Chocolate Fortunes in China

Lawrence L. Allen, Author of Chocolate Fortunes
Chocolate Fortunes In China

Lawrence L. Allen
1978: **CHINA WAS A CRUCIBLE**

*(Isolation & Cultural Revolution)*

- **CHOCOLATE** (totally foreign product)
- **BRANDS** (-0- brand awareness)
- **CONSUMERS** (-0- product experience)

...were mixed together to create

*an entirely new chocolate market!*
Chocolate’s China Journey

CHOCOLATE INDUSTRY’S CHALLENGE

- Establish **culinary & cultural** bridge
- Navigate the **complexities and ambiguities** of emerging China
- Understand consumers and **meet their expectations**
Chocolate’s China Journey

ANY PLAYER COULD HAVE BECOME #1

• Emerging chocolate market **A LEVEL PLAYING FIELD** for all companies

• Consumers viewed chocolate as exotic foreign product - all enjoyed the **SAME PRESTIGE AND CREDIBILITY**

• Retail prices relatively high / manufacturing costs relatively low **NO FINANCIAL BARRIERS TO ENTRY**

• Not a strategic industry, so **NO REGULATORY BARRIERS**

• **EACH WAS FLYING BLIND** with lack of consumer & market information, and **BY THE SEAT OF THEIR PANTS** with China’s mercurial economic and regulatory environment.

• **NO LOCAL PLAYERS TO SPEAK OF**

**WHICH WOULD ESTABLISH THE CHOCOLATE TASTE PROFILE IN CHINA?**
The Emerging China Market
Accessible Consumers: Defined

21ST CENTURY (50 million)

20TH CENTURY (300 million)

19TH CENTURY

Approximately 100+ million Accessible Consumers

- Physically (Can access Chocolate)
- Culturally (Right Palate)
- Financially (Disposable Income)

Accessible Consumers:
1980s: 10~20 Million
1990s: 20~60 Million
2000s: 60~100+ Million

NOTE: Wrigley Estimates that it only reached ~ 700 Million with its RMB 1.0 5-Stick pack of Double Mint
Accessible Consumers: Location

Consumers:
- Physically (Can access Chocolate)
- Culturally (Right Palate)
- Financially (Disposable Income)
China’s Little Emperors

- ONE CHILD PER FAMILY policy
- Over 100 MILLION strong
- Demanding & wielding “PESTER POWER” - control spending power of six adults
- TASTE FOR WESTERN foods / snacks - an economic force of their own.
- Lead chocolate CONSUMPTION PATTERN to mirror DEVELOPED MARKETS

--- within the space of their lifetimes.

4 Grandparents

2 Parents

Little Emperors

PALATE TRAINED TO:

Vegetables, Rice, Noodles, Dumplings, Meat as Garnish

Vegetables, Rice, Noodles, Dumplings
more Meat, as main course
Accept most western foods

Fast Food: KFC, McDonald’s, Pizza Hut
Baked goods (bread), Sweet packaged snacks,
Vegetables, Rice, Noodles, Dumplings: Occasionally
Supply Chain: Pyramid

20TH + CENTURY (350 million)

19TH CENTURY

1.3 Billion People

Chilled Supply Chain

e.g. 5% of Trucks Chilled
Supply Chain: Gauntlet

9 Weeks *at best*!
Chocolate Market: Evolution
Multi-Tier Market
Chocolate Competitors
Competitor: Market Entry

2010: APPROXIMATELY US$ 1 BILLION (retail value)
APPROXIMATELY 120,000 TONNS


1978
China Opens Doors

1982~85
Spill-over from HKG

1990
Beijing Asian Games

1993
Begin Production

1996
Begin Molding in China

1995

1998

2000

2007
Hershey - Lotte Manufacturing JV

2010
APPROXIMATELY US$ 1 BILLION (retail value)
APPROXIMATELY 120,000 TONNS
Newcomer to retail chocolate, the wild card, with one of the most expensive and exotic chocolate

• Created in 1982
• Hand carried into China as gift - Lunar New Year
• Created the first impression of chocolate - 1980s
• Consistently invested in brand building with consumers
• Hasn’t changed a 4 P’s formula that has worked for 25 years
Hershey: Kissed Market Leadership Goodbye

U.S. domestic-oriented, and did not have a proven track record in more diverse and varied international marketplace.

- Stepped entry = flexibility: started with bars, shifted to Kisses
- #1 in Shanghai, #2 in most other key cities

But...

- Organizational chaos in China and International Division
  (Total in-country team change in 2001, 4 International Division Heads in 4 years)
- China organization collapsed in 2004 – disappeared for 2 seasons
Selling chocolate worldwide since turn of 20th century, great depth and perspective to approach China market.

- Only 1 viable chocolate product: Kit Kat
- Compound chocolate / low price strategy
- Overbrand Strategy: little investment in Sub-Brand building
- A 3-year ROI on plant drove short-term investment decisions

Note: KitKat is manufactured by Hershey under license in the United States.
American company, with established international presence and broad base of experience to apply in China.

- 1st To proactively market / 1st With In-Country Manufacturing

And...

- Consumer Responsive: from M&Ms to Dove when consumers demanded
- Imported block chocolate & molded in-country: manufactured later
- Used master distributor for first 7 years
- Invested heavily in building brands
- A 15-year investment horizon
Cadbury: Catastrophe

Also selling chocolate worldwide from turn of 20th century

• 2nd With In-Country Manufacturing / Invested in brands

But…

• Did own distribution from start: mired in delivery & collection issues
• Manufactured with local ingredients from the start = taste variance
Cadbury: '95-'97 Taste Crisis

1998 Survey Results:
Shanghai Chocolate Consumers

Have You Ever Eaten

---

Have Eaten in Past 3 Months
September 2008:

The Chinese government reported that over 50,000 people sickened, nearly 13,000 hospitalized, and four infants had died from drinking milk and milk-based infant formula contaminated with the industrial chemical melamine...

September 29, 2008:

Cadbury announced that it was recalling its China-made Dairy Milk Chocolate because it had tested positive for trace amounts of melamine. Its announcement explained that the tests “cast doubt on the integrity of a range of our products manufactured in China.”
Also sold chocolate worldwide from turn of 20th century

- 2nd With In-Country Manufacturing / Invested in brands

But...

- Did own distribution: mired in delivery & collection issues
- Manufactured with local ingredients from the start = taste variance
- Limited investment “pain” threshold vs. Mars (Corp vs. Family business)
- Organizational chaos (6 China Country Heads in 7 years, after 2000)
Opportunities For the Almond Industry

Strategies for Growing the Ingredients Market
Be Available, Be Visible…

Emerging Consumers

- 21st Century
- 20th Century
- 19th Century
- 1.3 Billion People

Evolving Palate
- 4 Grandparents
- 2 Parents
- Little Emperors

Evolving Market
- Premium
- Bars
- Gift
- Bite-Size
Be Desirable

* Accessible Chinese Consumers are Aspirational Consumers!
What is of critical importance to ingredients buyers?

Food Safety

Cadbury Melamine Crisis: 2008

September 2008:
The Chinese government reported that over 50,000 people sickened, nearly 13,000 hospitalized, and four infants had died from drinking milk and milk-based infant formula contaminated with the industrial chemical melamine…

September 29, 2008:
Cadbury announced that it was recalling its China-made Dairy Milk Chocolate because it had tested positive for trace amounts of melamine. Its announcement explained that the tests “cast doubt on the integrity of a range of our products manufactured in China.”
What is of critical importance to ingredients buyers?  

Freshness  

Superior shelf-life under ambient conditions…
Customer: Marketers & BU’s

What is of critical importance to marketers & BU Heads?

Consumption

california almonds®
EXACTLY WHAT IT REQUIRED IN THE PAST:

Visionary LEADERS

Sustained long-term COMMITMENT the market AND CONSUMER

Unrelenting focus on meeting expectations of China’s emerging CONSUMER
Thank You
Capitalizing on China’s Rapid Food Industry Development

Dr. Sharon Shoemaker, UC Davis
East Meets West:
Bridging the Cultures with Innovative Food/Almond Solutions

Capitalizing on China’s Rapid Food Industry Development

a perspective by
Sharon Shoemaker, Ph.D.
苏 梅 博士
California Institute of Food and Agricultural Research
University of California, Davis
Globalization Shifting from 70’s—21st Century

East Asia

China in Year 2009:
GDP reached $4.8 Trillion
GDP ranked second in the world
Largest creditor to United States
Foreign Reserve (Dec.) $2.4 Trillion

4 Tigers:
Thailand, Malaysia, Indonesia, Philippine: 1990s

4 Dragons:
Singapore, Korea, Taiwan, Hong Kong: 1980s

Japan: 1970s

The real dragon: Coastal cities of China: in the middle of 1990s

China in Year 2009:
GDP reached $4.8 Trillion
GDP ranked second in the world
Largest creditor to United States
Foreign Reserve (Dec.) $2.4 Trillion

Courtesy of Edward Zhu, CEO, CHIC Group
Domestic consumption policy facilitates the shift in economic growth pattern, which pushes the percentage of domestic consumption up during current economic development.

Courtesy of Edward Zhu, CEO, CHIC Group
Urbanization is the Driver Behind Growth in Domestic Consumption

The projected China’s urban population will expand from 572 million in 2005 to 926 million in 2025. This increase of more than 350 million Chinese city dwellers is larger than the entire population of the United States today.

By 2030, China’s urban population is on track to reach 1 billion.

Courtesy of Edward Zhu, CEO, CHIC Group
(source: McKinsey Global Institute China All City Model, McKinsey Global Institute Analysis)
Migration will be the Driving Force of Future Urbanization

Rapid urban development coupled with surplus populations in rural areas generated by gradually increasing productivity in the countryside will together act to boost the mobile population to about an additional 240 million people in the next 20 years.

Source: McKinsey Global Institute China All City Model, McKinsey Global Institute Analysis

Courtesy of Edward Zhu, CEO, CHIC Group
New Megacities will Emerge by 2025

<table>
<thead>
<tr>
<th>City Size</th>
<th>2005 Number</th>
<th>2025 Number</th>
<th>% of GDP 2005</th>
<th>% of GDP 2025</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mega (10M+)</td>
<td>2</td>
<td>8</td>
<td>11</td>
<td>24</td>
</tr>
<tr>
<td>Big (5–10M)</td>
<td>12</td>
<td>15</td>
<td>22</td>
<td>14</td>
</tr>
<tr>
<td>Midsized (1.5–5M)</td>
<td>69</td>
<td>115</td>
<td>28</td>
<td>34</td>
</tr>
<tr>
<td>Small (0.5–1.5M)</td>
<td>173</td>
<td>280</td>
<td>20</td>
<td>19</td>
</tr>
<tr>
<td>Big town (&lt;0.5M)</td>
<td>602</td>
<td>521</td>
<td>19</td>
<td>9</td>
</tr>
</tbody>
</table>

• From the MGI model, the number of new cities between 2000 and 2005 was nine, accounting for about half a percent of total urban population.

Eight megacities in 2025:
• Beijing
• Shanghai
• Tianjin
• Shenzhen
• Wuhan
• Chongqing
• Chengdu
• Guangzhou

Courtesy of Edward Zhu, CEO, CHIC Group
Source: McKinsey Global Institute China All City Model, McKinsey Global Institute Analysis
Urbanization is a Major Driver, Leading to a Massive Middle Class in China

China Urban and Rural Population (millions)

China’s Emerging Middle Class (percentage)

70.4%

99.3 92.9 77.3 49.7 59.4

9.4 12.6 21.2 23.2 19.8

5.7

0.4

3.3

7.7

Urban  Rural

Poor  Lower Middle Class  Upper Middle Class

Mass Affluent  Global Affluent

Courtesy of Edward Zhu, CEO, CHIC Group (source: UN Population Division, McKinsey & Co.)
What will Urban Chinese Buy?

<table>
<thead>
<tr>
<th>Product category</th>
<th>Projected change in absolute consumption, billion renminbi</th>
<th>Absolute growth, 2004–25, billion renminbi</th>
<th>Projected compound annual growth rate, 2004–25, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food</td>
<td>1,223</td>
<td>4,786</td>
<td>3,562</td>
</tr>
<tr>
<td>Recreation, education</td>
<td>507</td>
<td>3,415</td>
<td>2,908</td>
</tr>
<tr>
<td>Transportation, communication</td>
<td>452</td>
<td>2,920</td>
<td>2,468</td>
</tr>
<tr>
<td>Apparel</td>
<td>369</td>
<td>1,322</td>
<td>953</td>
</tr>
<tr>
<td>Housing, utilities</td>
<td>321</td>
<td>3,313</td>
<td>2,992</td>
</tr>
<tr>
<td>Health care</td>
<td>257</td>
<td>2,582</td>
<td>2,325</td>
</tr>
<tr>
<td>Household products</td>
<td>223</td>
<td>857</td>
<td>634</td>
</tr>
<tr>
<td>Personal products</td>
<td>119</td>
<td>771</td>
<td>652</td>
</tr>
</tbody>
</table>

1 Base case forecast, Q1 2006; 1 renminbi = $0.12.
2 Figures do not sum to total, because of rounding.

Courtesy of Edward Zhu, CEO, CHIC Group
In 2008, the total food industry output in China reached RMB 4.2 trillion, and ranked No. 2 industry (No.1 for 16 consecutive years before 2007).
Regional Comparison of Food Industry

2007 (3300 billion)
- Shandong: 678
- Henan: 279
- Guangdong: 236
- Jiangsu: 202
- Sichuan: 183
- Liaoning: 143
- Hebei: 140
- Zhejiang: 131

Shandong (5368 companies)
- 1000 / 0.1 billion
- 70 / 1 billion
- 4 / 5 billion
- 2 / 10 billion

Henan (2232 companies)
- 365 / 0.1 billion
- 19 / 1 billion
- ? / 5 billion
- 2 / 10 billion

Data from Jian Chen, President of Jiangnan University
The Rapid Pace of Development of the Chinese Food Industry

2005 → 2010 → 2015 → 2020

- **2005**: Ag: 3.7 trillion
- **2010**: Ag: 4.5 trillion
- **2015**: Ag: 5.5 trillion
- **2020**: Ag: 6.7 trillion

In 2010: Output of the food industry will be equal to that of agriculture

Courtesy of Jian Chen, President of Jiangnan University
At present, China has 448,000 enterprises engaged in food production and processing. Among them, 26,000 enterprises of designated scale occupy 72% of the market, taking the leading role in terms of output and sales revenue.

Large and Medium-sized Producers Dominate China’s Food Industry

Percentage of food companies based on scale

Market shares of food companies

- Companies of designated scales
- Companies with more than 10 employees
- Small business with less than 10 people

Courtesy of Jian Chen, President of Jiangnan University
Modern Supermarkets in China

Shanghai

Beijing
Education is the Key Driver to Innovation and Growth of China’s Food Industry

- 235 colleges and universities in China have food science programs

<table>
<thead>
<tr>
<th>Universities with Food Science undergraduate Program</th>
<th>Universities with Food Science master program</th>
<th>Universities with Food Science doctoral program</th>
</tr>
</thead>
<tbody>
<tr>
<td>235</td>
<td>&gt;100</td>
<td>24</td>
</tr>
</tbody>
</table>

Data from Jian Chen, President of Jiangnan University

- An annual enrollment of more than 20,000 food science undergraduate students
- Many campuses in China are newly constructed
- Jiangnan University in Wuxi (new campus in 2007) has top and largest program in China. Collaborations and exchange with UC Davis (largest program in USA) since 1980’s
Almond Board Student Competitions in China

engages, excites, captures new ideas, spreads the word

• Began in 2004 at Jiangnan University and now is across China

• Perfect format for interaction, education, and dissemination of the taste and health message of Almonds in new product and packaging concepts, tailored to local markets

• Engages and rewards students in ‘creative’ product development

• Excites and Educates – It’s All about Almonds!

• So successful that other organizations have copied the format

• For example, some of the winning product concepts are
  • Funny Almond Roll (2004)
Acknowledgements

*In grateful appreciation for assistance received,*

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Guangwei Huang and Karen Lapsley, Almond Board of California
Thank You
Wrap-Up, Discussion and Q&A
ABC honors Dr. Shoemaker

In recognition of your steadfast commitment and contributions in building bridges between California almonds and Asian food science communities.

December 2010
Wednesday Lunch Speaker

Dr. Ernesto Poza
Thunderbird School of Global Management

The Continuing Spirit of Enterprise: Lessons from Centennial Family Companies

Please check with the registration desk for ticket availability.
Session at 11:40 am:

Treevix Herbicide, a New Innovation for Broadleaf Weed Control in Almonds from BASF in Grand Ballroom
Sessions at 1:40 pm:

Coming Down From On High in Arbor Theater

Harvesting: Clean + Safe in Grand Ballroom
Turn in your **2010 Research Update** ticket at the ABC booth (#143) in the Exhibit Tent for the 2010 Research Update.
Rustler Giveaway

Growers: Win a New Holland Rustler from Garton Tractor and SmartCube Packaging System. Complete your entry form and return to booth #81 or #82.