The Quest for Protein: Challenges and Opportunities
Key Themes for Global Protein

- PEDv learnings two years in
- PRRS
- Bird Flu a global issue with varying implications

- Who is Rabobank?
- What is the Rabobank Food & Agri Research team?

- Feed costs are key long-term
- FX is causing important short-term shifts

- Shifting drivers of animal protein consumption growth
- Animal protein production surplus in the America’s

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What is the Rabobank Food & Agri Research team?

Rabobank

Global Overview

Competitiveness and Trade

Disease

PEDv learnings two years in
PRRS
Bird Flu a global issue with varying implications
Rabobank’s Food & Agri Research (FAR) team with global animal protein research coverage
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Rabobank Global Overview
Global Animal Protein Consumption Growth: Poultry to Overtake Pork by 2020

Source: OECD-FAO
Animal Protein Consumption Growth Globally and in China

**Global animal protein demand excl. China (000s of MTs)**

- **Beef**: CAGR: -0.3%
- **Pork**: CAGR: +0.3%
- **Chicken**: CAGR: +2.2%

**China animal protein demand (000s of MTs)**

- **Beef**: CAGR: +2.8%
- **Pork**: CAGR: +1.1%
- **Chicken**: CAGR: +0.5%

Source: USDA
The new reality: Emerging markets drive global growth

Change in Poultry Consumption from 2010 to 2014

x 1,000 tonnes

First tier: BRIC + EU 43%

Second tier: 38%

Other: 19%

Source: Rabobank/USDA, 2015
In developed markets: more cluck, less chuck

On an indexed basis, chicken consumption in these developed markets is up 8-15% since 2007 while beef consumption is down 9-13%.

We attribute this trend to the rapid rise in beef costs relative to chicken and the health and wellness perception of chicken over beef.

Source: USDA
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**PEDv Has Been a GLOBAL Outbreak**

- **Canada**
  - Few cases but pockets of Ontario have been hard hit

- **Ukraine**
  - First cases in spring of 2014 and the outbreak seems to be small.
  - Raises the risk of spreading to the EU

- **Japan**
  - Has lost 200K pigs to PEDv or about 1.2% of annual production

- **US**
  - Discovered in the summer of 2013 and PEDv cases are still happening

- **Mexico**
  - Outbreak in the fall of 2013 with likely the largest losses in the world

- **Peru and Colombia**
  - Few cases identified but it has raised fear in the minds of consumers

- **Korea**
  - Significant outbreak in 2013/14 through about a quarter of the industry
PEDV took the US Pork Industry by storm in 2013 and 2014, but far fewer cases so far in 2015.
Hog Prices More Than Offset the Short Supply Bringing Profit Margins to Historic Highs

**Lean Hog Futures, USD per CWT**

**Hog Production Profit Margins, USD per Head**
In Dealing With PEDv . . . Don’t be Dense!

HIGH RISKS AREAS
- Iowa
- Central Indiana
- Oklahoma Panhandle
- Eastern North Carolina
Global Poultry Consumption Growth

Consumption CAGR Historical (2010-2015) and Forecast (2015-2020)

Source: USDA for Historical, Rabobank Forecast
Bird Flu Spreading in the Midwest, But Primarily in Turkey

PACIFIC FLYAWAY: A number of chicken and turkey farms affected in December and January

MISSISSIPPI FLYAWAY: Bird flu has spread into the Midwest but nearly all cases are in turkey farms
China’s chicken consumption has been stalled by AI outbreaks, food safety - producers are curbing growth

Chicken consumption grew steadily from 2000 through 2012 but the severe outbreaks of AI over the last 18 months has caused poultry consumption in China to stagnate.

We expect consumption to continue to grow once the disease issues in China can get under control.

Chicken producers have slowed their rate of breeder imports to address the more challenging environment.

Source: USDA

Per capita chicken consumption (lbs per annum)

Imports of white feathered bird breeders (MM sets)

Source: USDA
Bird flu was worse last year than in 2013, what about this year?
Sales Trends at YUM China and Local Producer Profitability Reflect the Challenging Consumption Environment

Average EBIT Margins of Public Companies in Relevant Markets

Sources:
US: Tyson chicken, Pilgrim US, Sanderson Farms
China: DaChan, Fujian Sunner, Henan Huaying
China’s Imports of Chicken Have Stalled as Beef Exploded

**000s of metric tons on a CWE basis**

- **Chicken**
- **Pork**
- **Beef**

<table>
<thead>
<tr>
<th>Year</th>
<th>Chicken</th>
<th>Pork</th>
<th>Beef</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>441</td>
<td>311</td>
<td>97</td>
</tr>
<tr>
<td>2006</td>
<td>586</td>
<td>330</td>
<td>99</td>
</tr>
<tr>
<td>2007</td>
<td>697</td>
<td>483</td>
<td>102</td>
</tr>
<tr>
<td>2008</td>
<td>1,055</td>
<td>635</td>
<td>124</td>
</tr>
<tr>
<td>2009</td>
<td>639</td>
<td>1,055</td>
<td>177</td>
</tr>
<tr>
<td>2010</td>
<td>762</td>
<td>581</td>
<td>194</td>
</tr>
<tr>
<td>2011</td>
<td>1,190</td>
<td>648</td>
<td>181</td>
</tr>
<tr>
<td>2012</td>
<td>1,144</td>
<td>554</td>
<td>340</td>
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<tr>
<td>2013</td>
<td>1,169</td>
<td>885</td>
<td>1,110</td>
</tr>
<tr>
<td>2014</td>
<td>1,160</td>
<td>1,160</td>
<td>495</td>
</tr>
<tr>
<td>2015f</td>
<td>480</td>
<td>1,360</td>
<td>1,265</td>
</tr>
</tbody>
</table>

*Source: Rabobank*
Short to Medium Term Outlook for China Chicken

Consumption to Grow

- China reviewing options to reduce grain inventories and lower grain prices
- While slower than in the past, economic growth is robust

Consumption to be Flat or Decline

- Image of poultry dented in eyes of consumers
- Food safety scandals
- Perennial outbreak of bird flu
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Favorable Feed Costs Favors the America’s
Global Currency Wars Challenging US Exports

USD Index | Brazilian Real | Euro | Mexican Peso | Canadian Dollar

Post PEDv, the US Has Regained Its Price Competitiveness with the EU Despite the Stronger Dollar
## US Pork Exports Boosted by PEDv in 2014? What about in 2015?

### US Pork Exports by Destination

<table>
<thead>
<tr>
<th>PEDV Markets</th>
<th>000s of lbs</th>
<th>2013</th>
<th>2014</th>
<th>YoY Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>1,230,585</td>
<td>1,137,030</td>
<td>-7.6%</td>
<td></td>
</tr>
<tr>
<td>Mexico</td>
<td>1,102,667</td>
<td>1,243,447</td>
<td>12.8%</td>
<td></td>
</tr>
<tr>
<td>Canada</td>
<td>533,173</td>
<td>497,485</td>
<td>-6.7%</td>
<td></td>
</tr>
<tr>
<td>Korea</td>
<td>243,099</td>
<td>342,392</td>
<td>40.8%</td>
<td></td>
</tr>
<tr>
<td>China (including Hong Kong)</td>
<td>603,420</td>
<td>432,057</td>
<td>-28.4%</td>
<td></td>
</tr>
<tr>
<td>Russia</td>
<td>17,230</td>
<td>102,633</td>
<td>495.7%</td>
<td></td>
</tr>
<tr>
<td>Colombia</td>
<td>89,264</td>
<td>122,988</td>
<td>37.8%</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>719,664</td>
<td>586,027</td>
<td>-18.6%</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>4,539,103</td>
<td>4,464,059</td>
<td>-1.7%</td>
<td></td>
</tr>
<tr>
<td><strong>ex PEDv countries</strong></td>
<td>3,104,072</td>
<td>2,755,231</td>
<td>-11.2%</td>
<td></td>
</tr>
</tbody>
</table>
Challenges in US Chicken Trade

2014 US Chicken Exports by Volume

Banned all US meat imports in August 2014 for one year, at least

In a protectionist move, Angola has revoked import licenses for chicken sharply curbing imports

Limited chicken imports to areas outside of infected counties and only product into the further processing sector
Russia’s Meat Ban Has Hurt the Russian’s Most

Russia’s Banned Meat Imports

- Of Russian Imports: 72%, Poultry; 73%, Pork
- Of Russian Consumption: 12%, Poultry; 14%, Pork; 3%, Beef
- Of Global Trade: 4%, Poultry; 7%, Pork; 1%, Beef

Russia’s 2013 Pork Imports

<table>
<thead>
<tr>
<th>Country</th>
<th>Quantity (tons)</th>
<th>Share of Imports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total imports</td>
<td>619,765,142</td>
<td>100%</td>
</tr>
<tr>
<td>Brazil</td>
<td>128,552,532</td>
<td>21%</td>
</tr>
<tr>
<td>BANNED Denmark</td>
<td>89,062,640</td>
<td>14%</td>
</tr>
<tr>
<td>BANNED Germany</td>
<td>82,723,369</td>
<td>13%</td>
</tr>
<tr>
<td>BANNED Canada</td>
<td>79,360,469</td>
<td>13%</td>
</tr>
<tr>
<td>BANNED Spain</td>
<td>35,487,629</td>
<td>6%</td>
</tr>
<tr>
<td>BANNED Netherlands</td>
<td>30,085,134</td>
<td>5%</td>
</tr>
<tr>
<td>BANNED France</td>
<td>27,283,194</td>
<td>4%</td>
</tr>
<tr>
<td>BANNED Poland</td>
<td>22,897,414</td>
<td>4%</td>
</tr>
<tr>
<td>BANNED Ireland</td>
<td>19,905,816</td>
<td>3%</td>
</tr>
<tr>
<td>BANNED Belgium</td>
<td>18,754,818</td>
<td>3%</td>
</tr>
<tr>
<td>Chile</td>
<td>17,201,024</td>
<td>3%</td>
</tr>
<tr>
<td>BANNED Belarus</td>
<td>16,714,355</td>
<td>3%</td>
</tr>
<tr>
<td>BANNED Hungary</td>
<td>15,152,254</td>
<td>2%</td>
</tr>
<tr>
<td>BANNED Austria</td>
<td>10,503,957</td>
<td>2%</td>
</tr>
<tr>
<td>BANNED USA</td>
<td>5,936,736</td>
<td>1%</td>
</tr>
<tr>
<td>BANNED Finland</td>
<td>4,426,348</td>
<td>1%</td>
</tr>
<tr>
<td>BANNED Ukraine</td>
<td>4,191,228</td>
<td>1%</td>
</tr>
</tbody>
</table>
US Leg Quarters at a Deep Discount to Mexico Prices Despite Appreciation of US Dollar

**US leg quarters a deep discount to Mexico chicken prices**

**Peso/dollar appreciation and impact on US leg quarter prices**

Source: GCMA, USDA

Source: Bloomberg, USDA
West Cost Pork Blockage Pressuring US Meat Prices

Long Beach Port Before the Work Stoppage

After Work Stoppage
Key Conclusions for Global Protein

- A global leader in Food and Ag banking
- Poultry consumption continues to outpace other proteins but AI is a risk
- Feed costs are key long-term
  FX is causing important short-term shifts
- Disease adding volatility to supply and prices

Rabobank

Global Overview

Competitiveness and Trade

Disease
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Vice President, Animal Protein

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