

China's Potential Future Imports of Feedgrains and Oilseeds

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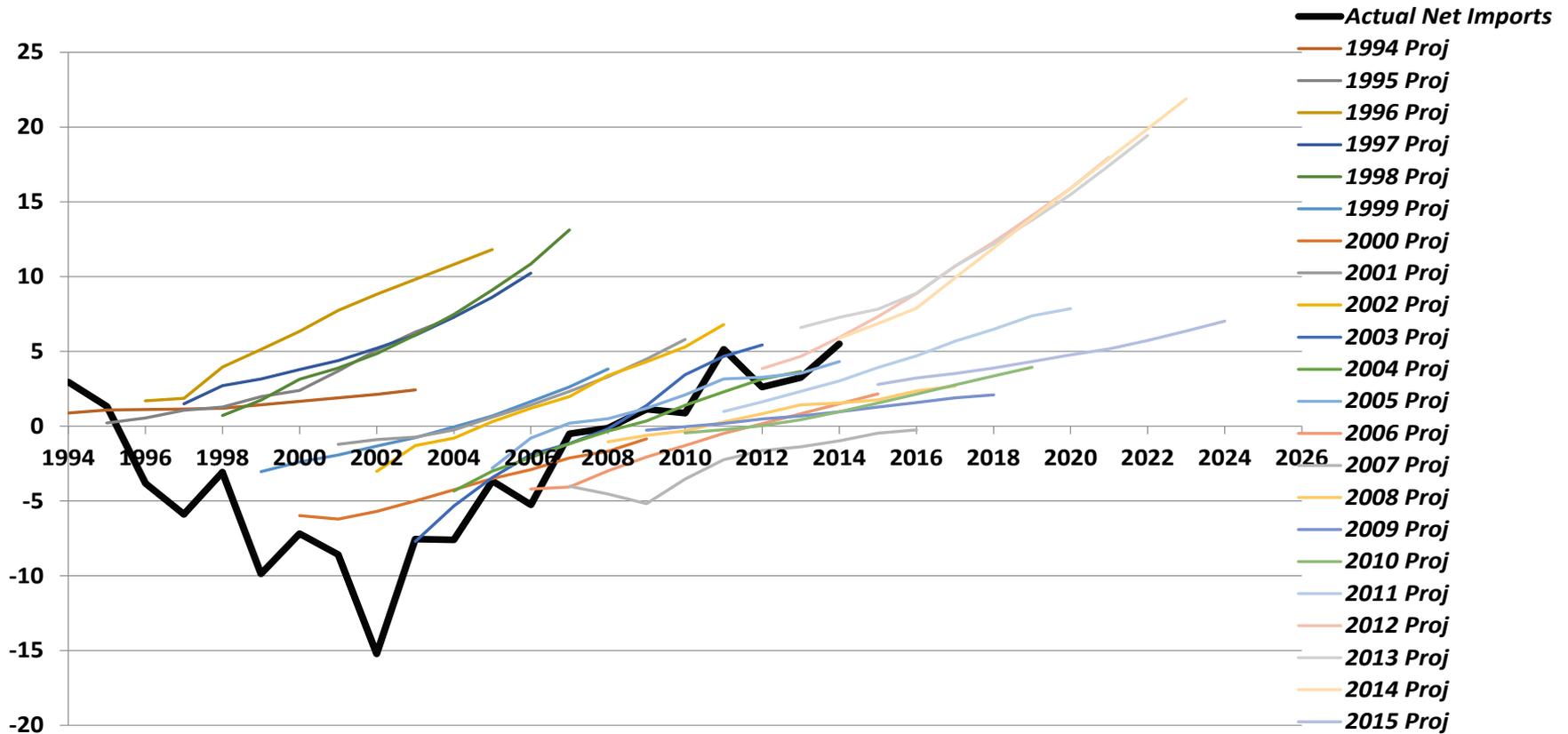


U.S. GRAINS
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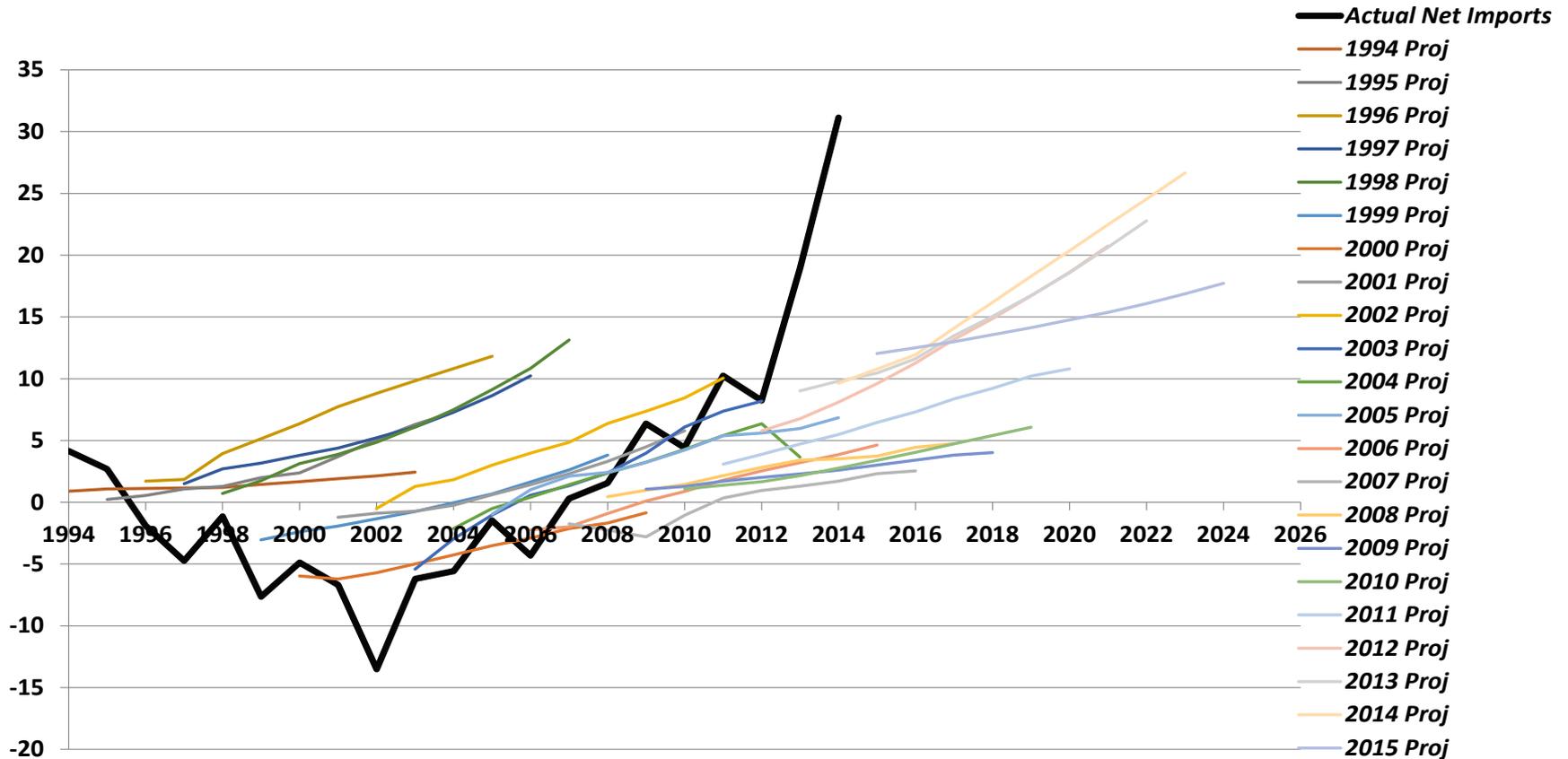
USDA Agricultural
Outlook Forum
Feb 25-26, 2016

Developing markets. >> Enabling trade. >> Improving lives.

China Corn Net Imports and Projections USDA Baseline: 1994-2015

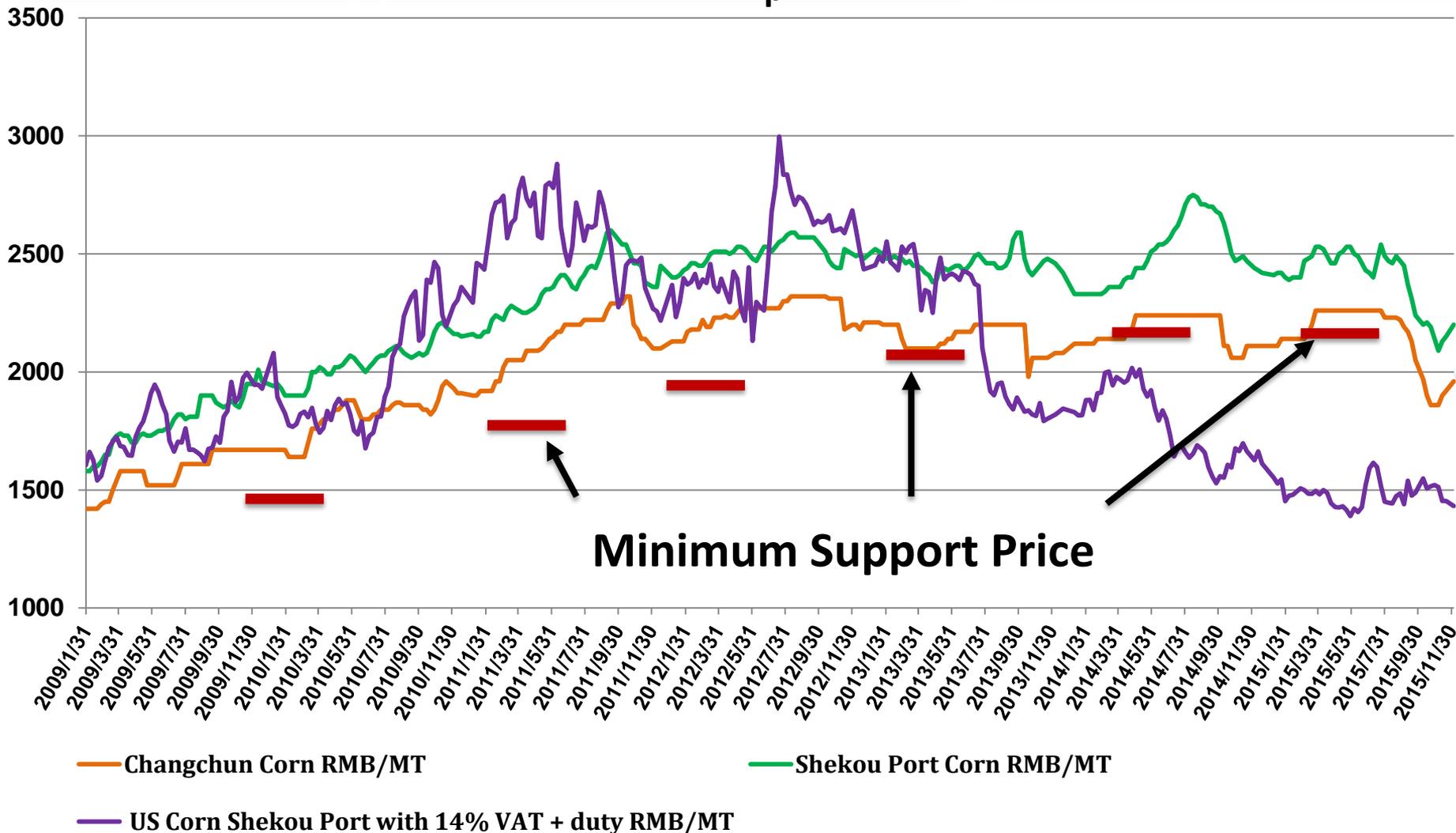


China Corn, Sorghum, Barley, and DDGS Net Imports and Projections USDA Baseline: 1994-2015



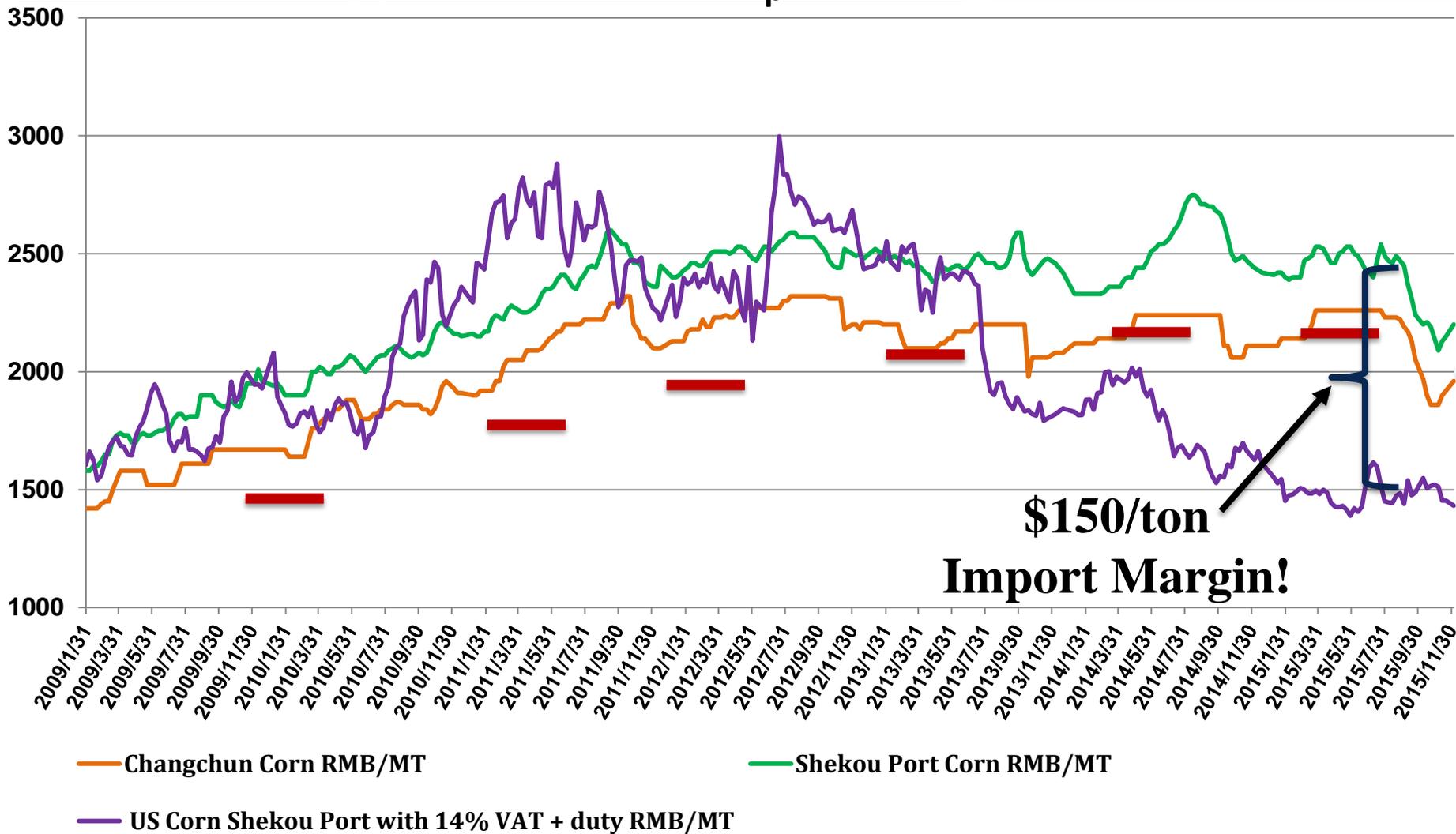
Large Import Margins Due to Minimum Support Prices

USDA Agricultural Outlook Forum
Feb 25-26, 2016, Arlington VA

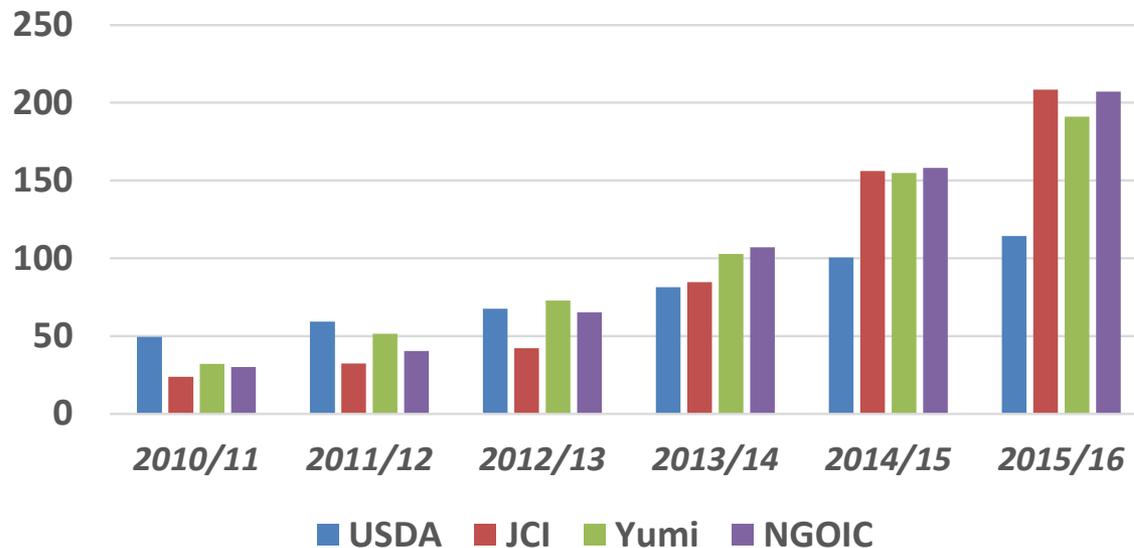


Large Import Margins Due to Minimum Support Prices

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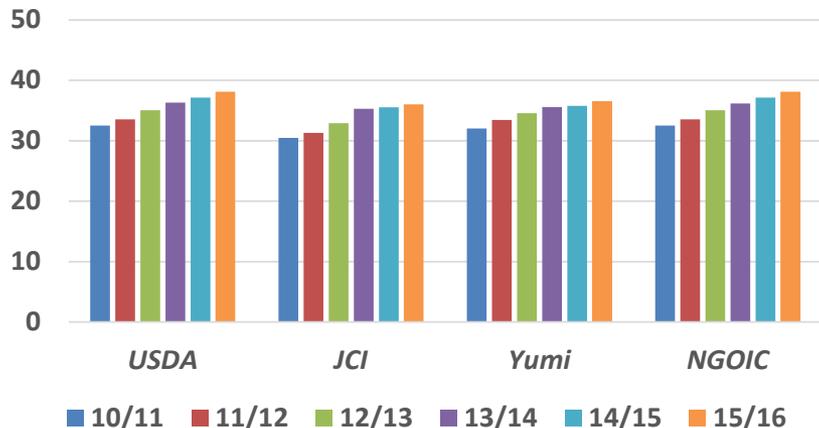
Estimates of China's Corn Stocks



Agreement among China information services and government that corn Carryout in 2014/15 was 150 mmt.

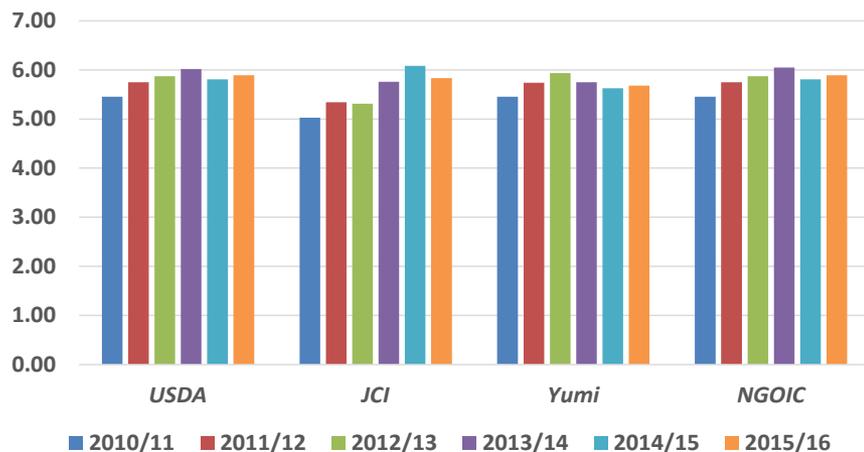
Both independent services revised S&Ds to match government estimates in spring, 2014.

Corn Sown Area Estimates



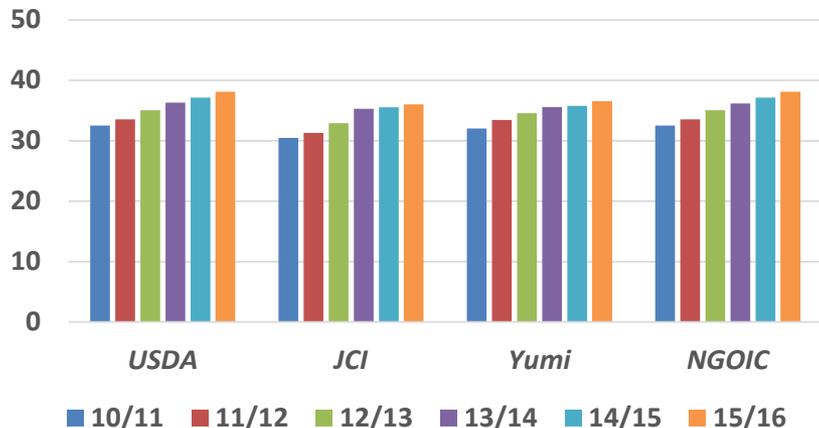
*Corn sown area has gone up
(2010-2015)
Up 5-6 mha, or 14-18 percent*

Corn Yield Estimates (mt/ha)



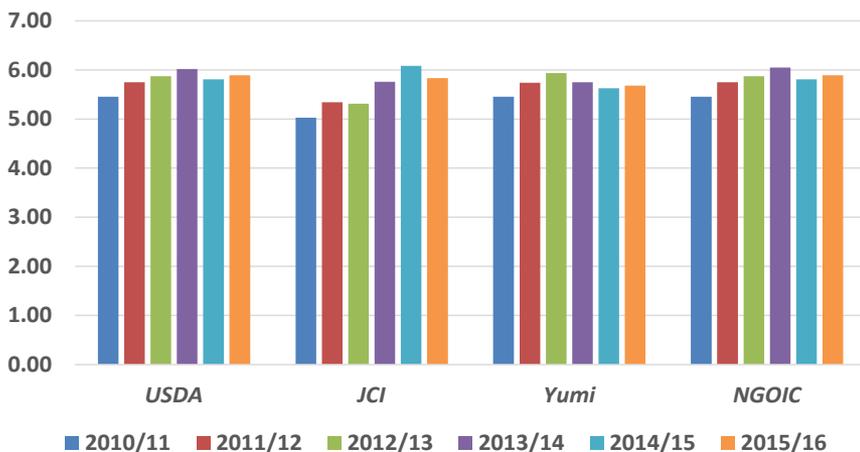
*Corn yields have gone...
(2012-2014)
JCI – up!
Yumi – down!
NGOIC & USDA – up and down!*

Corn Sown Area Estimates

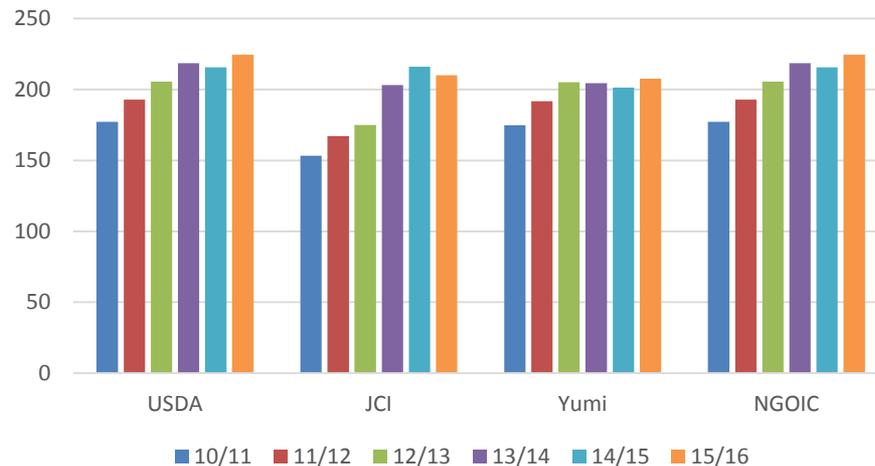


All together, corn production has gone up by 19 to 37 percent (or 33 to 57 mmt) since 2010 => Due mostly to increased sown area

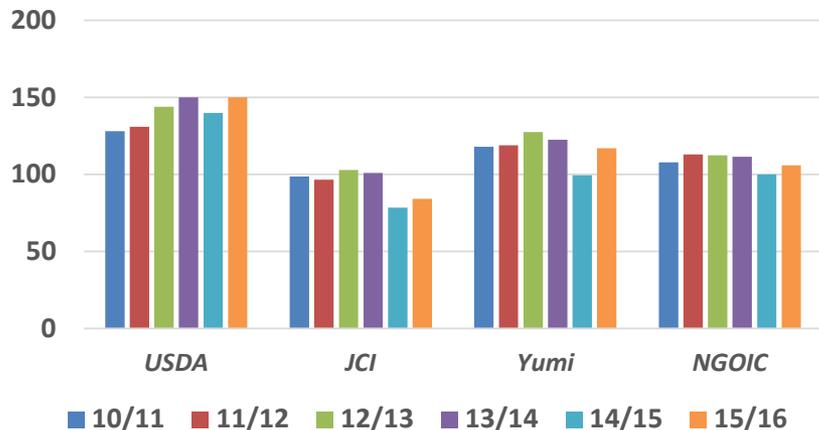
Corn Yield Estimates (mt/ha)



Corn Production Estimates (mmt)



Corn Feed Demand Estimates



Feed demand estimates vary widely

JCI – less than 100 mmt

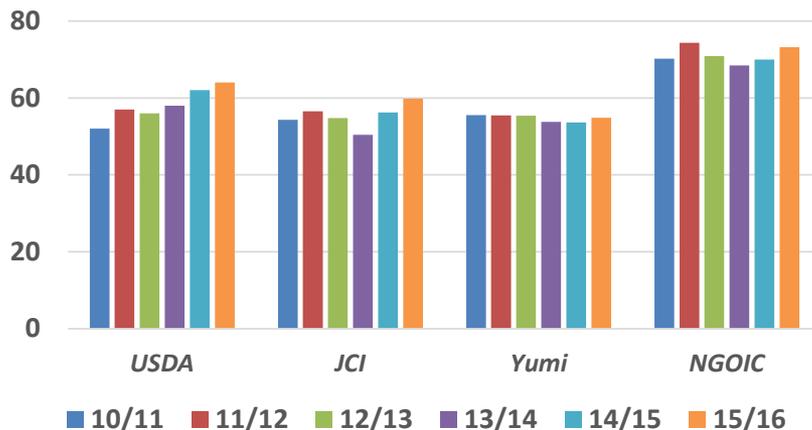
USDA – up to 150 mmt

Feed demand went down in 14/15

Yumi and JCI – by 23 mmt

NGOIC and USDA – by 10-11 mmt

Corn FSI Demand Estimates



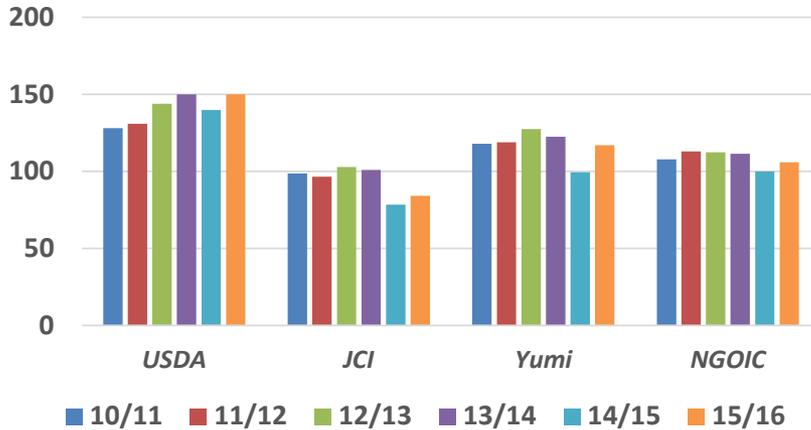
FSI demand estimates vary widely

NGOIC – over 70 mmt

Yumi – closer to 50 mmt

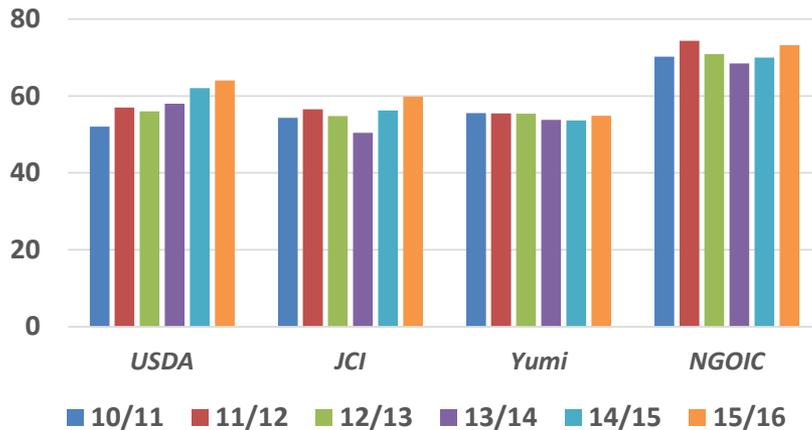
No clear trends

Corn Feed Demand Estimates

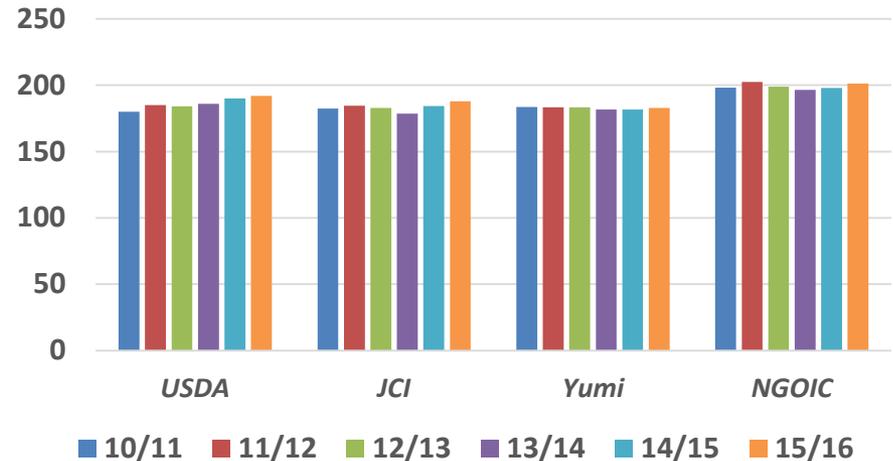


All together, corn demand appears stable, despite 30-40 mmt imports of corn substitutes in 14/15!

Corn FSI Demand Estimates



Total Corn Demand Estimates



There is very little consensus on corn supply and demand in China (except for carry out!)

How do the feed demand estimate compare with animal production estimates?

How do animal production estimates compare with animal product consumption estimates?

**2014 Official
Pork Production:
56.7 mmt
⇒ 42 kg/year
per capita consumption**

**China's official
2014 consumption
estimate is only
20 kg/year**

**Rural consumption estimate
raised significantly in 2013**

Official 2014 Pork Consumption Estimates and Revisions for Food Away From Home (kg/year)

	Official Per Capita Consumption	Consumption Away from Home	Total Per Capita Consumption
<i>Urban</i>	20.8	11.2	32
<i>Rural</i>	19.2	4.8	24
<i>Average</i>	20.0	8.0	28.0
	Population (bln) =>		1.35
	Total Implied Pork Consumption (mmt)		37.8

China's 2014 Commercial Swine Feed Production, Total Implied Feed, and Total Implied Pork (mmt)

	<u>Official Production</u>	<u>Implied Feed</u>
<i>Compound Feed</i>	69.4	69.4
<i>Concentrate Feed</i>	13.0	52.1
<i>Feed Premix</i>	3.7	58.8
<i>Total Feed</i>	86.2	180.4

The China Feed Industry Association publishes commercial feed production estimates for

- i) Compound feed,*
- ii) Concentrate feed,*
- iii) Feed premix*

Adjusting the concentrate and premix to estimate "Total Implied Feed" results in 180.4 mmt total swine feed produced in 2014

	<u>Official Production</u>	<u>Implied Feed</u>
<i>Compound Feed</i>	69.4	69.4
<i>Concentrate Feed</i>	13.0	52.1
<i>Feed Premix</i>	3.7	58.8
<i>Total Feed</i>	86.2	180.4
<i>Total Implied Pork Production =></i>		<u>33.4</u>

Using a feed to meat conversion ratio of 5.4, the 180.4 mmt of feed would produce 33.4 mmt of pork.

This feed production estimate further corroborates the low pork production estimate

Official Ministry of Commerce monthly slaughter estimates, added up over the year, come to about one third the official swine slaughter estimate

Yu and Abler (2013) use the MOA's Research Center for Rural Economy household survey data to estimate pork production and conclude production is about 35.7 mmt in 2009

It just doesn't "seem" right. China, with roughly one tenth the per capita income of EU, has about the same per capita pork consumption?

DRAFT

China's Current Corn Feed Demand is Likely 150 mmt or More

	<i>Per Capita Cons (kg/yr)</i>	<i>Total Demand (mmt)</i>	<i>Convert to Feed</i>	<i>Total Feed Demand (mmt)</i>	<i>Percent Corn</i>	<i>Total Corn Demand (mmt)</i>
<i>Pork</i>	28	37.8	5.4	204.1	42%	85.8
<i>Poultry Meat</i>	12	16.2	3.0	48.6	45%	21.9
<i>Poultry Eggs</i>	15	20.3	2.5	50.6	45%	22.8
<i>Dairy</i>	17	23.0	2.0	45.9	20%	9.2
<i>Beef</i>	3.6	4.9	10.7	51.8	20%	10.4
				401.1	37%	150.0

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				401.1	37%	150.0

Feed Ingredients (mmt)

Corn	150
Bran	60
Wheat	15
Rice	4
Food Waste	30
SBM	62
Other Meal	22
Forage	58
	401

109 mmt of other energy feed →

Total energy feed is 259 mmt

Protein meal is 84 mmt

Protein meal inclusion is 24.5%

DRAFT

China's Potential Corn Feed Demand is Over 280 mmt

	<i>Per Capita Cons (kg/yr)</i>	<i>Total Demand (mmt)</i>	<i>Convert to Feed</i>	<i>Total Feed Demand (mmt)</i>	<i>Percent Corn</i>	<i>Total Corn Demand (mmt)</i>
<i>Pork</i>	40	54.0	4.6	248.4	55%	136.6
<i>Poultry Meat</i>	30	40.5	2.8	113.4	60%	68.0
<i>Poultry Eggs</i>	17	23.0	2.2	50.5	60%	30.3
<i>Dairy</i>	40	54.0	1.8	97.2	25%	24.3
<i>Beef</i>	6	8.1	9.3	75.6	30%	22.7
				585.1	48%	281.9

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<i>Beef</i>	6	8.1	9.3	75.6	30%	22.7
				585.1	48%	281.9

90 mmt of other energy feed →

Total energy feed is 371 mmt

Protein meal is 114 mmt

Protein meal inclusion is 23.5%

Feed Ingredients (mmt)

Corn	281
Bran	55
Wheat	5
Rice	2
Food Waste	28
SBM	94
Other Meal	20
Forage	100
	<u>585</u>

CAGRs for Individual Feed Ingredients Under A 10-Year and 20-Year Scenario

	Current (<i>mmt</i>)	Potential (<i>mmt</i>)	10-year CAGR	20-Year CAGR
<u>Total Feed</u>	401	585	3.8%	1.9%
<u>Enrgey Feed</u>	259	371	3.7%	1.8%
<i>Corn</i>	150	281	6.5%	3.2%
<i>Other</i>	109	90	-1.9%	-1.0%
<u>Protein Meal</u>	84	114	3.1%	1.5%
<i>Soybean</i>	62	94	4.2%	2.1%
<i>Other</i>	22	20	0.0%	0.0%
Meal/Total	24.5%	23.5%		
<u>Forage</u>	58	100	5.6%	2.8%

Total feed demand exhibits an annual average growth rate of: 3.8 percent if achieved in 10 years 1.9 percent if achieved in 20 years

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Meal/Total	24.5%	23.5%		
<u>Forage</u>	58	100	5.6%	2.8%

*Corn feed demand grows faster
6.5 percent annually if in 10 years
3.2 percent annually if in 20 years*

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Meal demand growth will slow but soybean demand for crush rises to nearly 120 mmt

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Meal demand growth will slow but soybean demand for crush rises to nearly 120 mmt

Even while protein meal inclusion softens a little

Additional corn production growth will likely be slow

- ⇒ *Nearly 70 percent of corn production growth in past 20 years is due to expansion of sown area, not yield growth*
- ⇒ *Yields are 60-75 percent U.S. yields with much of this due to plant population, which are roughly 75 percent U.S. levels*
- ⇒ *But even at this low plant population, corn has “tip back,” and indication that plant population exceeds soil nutrient levels*



China's Ministry of Agriculture plans to reduce corn sown area by 10 million mu/year for the next 5 years

=> Just under 2 percent/year, for a total of 10 percent

Some policy advocates are even suggesting set aside programs to allow land to recover from many years of intensive cultivation

The U.S. set aside 25 percent of its farmland at the height of the large commodity stocks in the 1980s

China has always sought food or grain self-sufficiency

- => Recent policies to keep corn prices high are generating increasingly large ending stocks by encouraging production while discouraging demand.*
- => The 2013 “Grain Security Policy” removes corn from being held to the “95 percent self-sufficiency” standard of the last 20 years.*
- => The 2013 policy is expected to be embodied in the 13th 5-year plan (2016-2021)*

Looking at the implications of the above arguments on China's long-term corn supply, demand, and trade, we can start with:

	(CAGR)	<u>2015</u>
<i>Feed Demand (3.2%)</i>		150.0
<i>Industrial Demand (1.5%)</i>		70.0
<i>Total Demand</i>		220
<i>Imports (inc substitutes)</i>		40
<i>Carry In</i>		100
<i>Production (mmt)</i>		230
<i>Area (mha)</i>		37.1
<i>Yield (1.5%)</i>		6.20
<i>Carry Out</i>		150

Corn feed demand = 150 mmt, grows at 3.2 percent/year

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Corn feed demand = 150 mmt, grows at 3.2 percent/year

Corn industrial demand = 70 mmt, grows at 1.5 percent/year

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<i>Area (mha)</i>		37.1	<i>Area goes down 2 percent/year for 1st 5 years, then stable</i>
<i>Yield (1.5%)</i>		6.20	<i>Yields grow by 1.5 percent/year</i>
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Carry Out		150	

With the exception of feed demand, this is close to official S&D

First 5 years: Carry out goes up then down to where it started, roughly 150 mmt

(CAGR)	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>
<i>Feed Demand (3.2%)</i>	150.0	154.8	159.8	164.9	170.1	175.6
<i>Industrial Demand (1.5%)</i>	70.0	71.1	72.1	73.2	74.3	75.4
<i>Total Demand</i>	220	226	232	238	244	251
<i>Imports (inc substitutes)</i>	40	15	10	10	10	10
<i>Carry In</i>	100	150	168	174	172	163
<i>Production (mmt)</i>	230	229	228	226	225	224
<i>Area (mha)</i>	37.1	36.4	35.6	34.9	34.2	33.5
<i>Yield (1.5%)</i>	6.20	6.29	6.39	6.48	6.58	6.68
<i>Carry Out</i>	150	168	174	172	163	146

After that, strong import demand begins to emerge

(CAGR)	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2025</u>	<u>2030</u>	<u>2035</u>
<i>Feed Demand (3.2%)</i>	150.0	154.8	159.8	164.9	170.1	175.6	205.5	240.6	281.6
<i>Industrial Demand (1.5%)</i>	70.0	71.1	72.1	73.2	74.3	75.4	81.2	87.5	94.3
<i>Total Demand</i>	220	226	232	238	244	251	287	328	376
<i>Imports (inc substitutes)</i>	40	15	10	10	10	10	10	10	10
<i>Carry In</i>	100	150	168	174	172	163	92	-129	-473
<i>Production (mmt)</i>	230	229	228	226	225	224	241	260	280
<i>Area (mha)</i>	37.1	36.4	35.6	34.9	34.2	33.5	33.5	33.5	33.5
<i>Yield (1.5%)</i>	6.20	6.29	6.39	6.48	6.58	6.68	7.20	7.75	8.35
<i>Carry Out</i>	150	168	174	172	163	146	57	-187	-559

Yield growth of 2 percent/year would put imports off a few years, but still generates the same general outcome

(CAGR)	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2025</u>	<u>2030</u>	<u>2035</u>
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<i>Imports (inc substitutes)</i>	40	15	10	10	10	10	10	10	10
<i>Carry In</i>	100	150	169	177	179	174	103	-110	-473
<i>Production (mmt)</i>	230	230	230	230	230	230	253	280	309
<i>Area (mha)</i>	37.1	36.4	35.6	34.9	34.2	33.5	33.5	33.5	33.5
<i>Yield (2%)</i>	6.20	6.32	6.45	6.58	6.71	6.85	7.56	8.34	9.21
<i>Carry Out</i>	150	169	177	179	174	163	80	-149	-530

Increasing industrial demand growth to 2.5 percent/year consumes the additional yield growth

(CAGR)	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2025</u>	<u>2030</u>	<u>2035</u>
<i>Feed Demand (3.2%)</i>	150.0	154.8	159.8	164.9	170.1	175.6	205.5	240.6	281.6
<i>Industrial Demand (2.5%)</i>	70.0	71.8	73.5	75.4	77.3	79.2	89.6	101.4	114.7
<i>Total Demand</i>	220	227	233	240	247	255	295	342	396
<i>Imports (inc substitutes)</i>	40	15	10	10	10	10	10	10	10
<i>Carry In</i>	100	150	168	175	174	167	59	-139	-448
<i>Production (mmt)</i>	230	230	230	230	230	230	253	280	309
<i>Area (mha)</i>	37.1	36.4	35.6	34.9	34.2	33.5	33.5	33.5	33.5
<i>Yield (2%)</i>	6.20	6.32	6.45	6.58	6.71	6.85	7.56	8.34	9.21
<i>Carry Out</i>	150	168	175	174	167	151	27	-191	-525

Some policy insiders in China claim China only needs to draw down stocks by 50 mmt

(CAGR)	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2025</u>	<u>2030</u>	<u>2035</u>
<i>Feed Demand (3.2%)</i>	150.0	154.8	159.8	164.9	170.1	175.6	205.5	240.6	281.6
<i>Industrial Demand (2.5%)</i>	70.0	71.8	73.5	75.4	77.3	79.2	89.6	101.4	114.7
<i>Total Demand</i>	220	227	233	240	247	255	295	342	396
<i>Imports (inc substitutes)</i>	40	15	10	10	10	10	10	10	10
<i>Carry In</i>	50	100	118	125	124	117	9	-189	-498
<i>Production (mmt)</i>	230	230	230	230	230	230	253	280	309
<i>Area (mha)</i>	37.1	36.4	35.6	34.9	34.2	33.5	33.5	33.5	33.5
<i>Yield (2%)</i>	6.20	6.32	6.45	6.58	6.71	6.85	7.56	8.34	9.21
<i>Carry Out</i>	100	118	125	124	117	101	-23	-241	-575



Policies to address the environmental implications of large livestock operations are causing producers to build municipal waste treatment facilities, and wasting the nutrients in the manure

Many prominent policy advocates are calling for China to import animal products instead of expanding domestic production due to the environmental effects.

Corn Industrial Demand Growth Likely Greater than 1.5 Percent/Year

USDA Agricultural Outlook Forum
Feb 25-26, 2016, Arlington VA

Industrial corn users get more policy support than the feed industry

An enforceable and expanded E10 program would not only help address air quality issues, but also boost industrial corn demand



China's consumption of animal products will continue to grow for many years

This will likely generate continued growth in soybean imports

Because corn will be used for any additional feed grain demand on top of a significant base, corn demand will grow much faster than total feed demand.

At some point the demand for corn, or other feed grain, will outstrip China's domestic production of these grains

Industrial corn demand may well grow at a substantial pace too

When demand for grain exceeds domestic production, China will either import animal products, import feed grains, or both

=> But global demand for feed grains will increase either way!

Policy preference is to import feed grains and produce animal products domestically, but several issues need to be addresses to make animal production more efficient in China



The U.S. Grains Council

- *Developing Markets*
- *Enabling Trade*
- *Improving Lives*

Supporting the Modernization of China's Livestock and Feed Industries

- Establishing one of China's first modern feed mills in 1984
- Sponsoring seminars and U.S.-China technical exchanges involving hundreds of participants



Supporting China's Food Security through Trade and Information Exchanges

- Providing reliable information on U.S. production capacity, market conditions, and grain quality
- Sponsoring study and market assessment teams to the U.S. involving hundreds of participants