

Feedstuffs

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Fear not, China aims for corn self-reliance (commentary)

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LESTER Brown, president of the Earth Policy Institute, has done it again with his March 11 *Washington Post* Armageddon scenario titled "Can the United States Feed China?"

This is not the first time Brown has presented crisis-oriented, "back-of-the envelope" allegations about China's need to drastically increase grain and oilseed imports to feed itself, but this time, he has gone too far in disregarding science-based evidence and vilifying the principles of critical thinking and critical analysis.

Brown wrote that the center of China's government in "Beijing is losing a long battle to feed its growing population on its own. ... Just as China is America's banker, America could become China's farmer. ... The evidence of China's plight is clear."

Well, his evidence is not clear and, in fact, is as silly as the back-of-the-envelope calculations presented in his 1995 book *Who Will Feed China: Wakeup Call For a Small Planet* in which he wrote that in 2030, China's grain import deficit "would reach 369 million tons, nearly double current grain exports."

Why? Because, as incredulous as it may seem, grain production would actually *decline* over that period.

Brown's story is that the U.S. government faces a choice: "If we limit grain sales to China, might the Chinese limit their monthly purchases at treasury securities auctions?"

The kicker, he said, is "like it or not, we will probably have to share our harvest with the Chinese, no matter how much that raises our prices." There is no indication of when catastrophe will emerge.

The culprit for Brown is rapidly increasing demand for livestock and aquaculture commodities (the same listed in his 1995 book). A natural critical question is how demand can increase so dramatically that it will suddenly overwhelm increases in crop yields and technological advances in livestock productivity.

Science-based research

So, what's going on? The answer is that Brown simplistically thinks that significant income growth, coupled with population expansion, will lead to vast consumption increases. This led *Feedstuffs* Washington Editor Sally Schuff to title her March 28 column "China abandoning grain self-sufficiency?"

That's a good critical question. The answer: This will not happen. Why?

One reason is that science-based research reveals that consumption of meat and aquaculture products in

China will increase only modestly in the next two decades, from 82 kg currently to 101 kg in 2030, about the same amount currently consumed in Germany and the U.K. The U.S. is a remote outlier at 146 kg (*Feedstuffs*, Sept. 27, Oct. 4 and Oct. 11, 2010).

On the protein side, one reason China has become a significant soybean importer is dramatic growth of its value-added, export-oriented aquaculture sector that now consumes one-fifth of all of China's energy- and protein-based feedstuffs.

My projections reveal continued significant increases from imports of about 56 million metric tons in 2011 until reaching about 80 mmt in 2030 as the population, diet and aquaculture growth stabilize and crop and livestock technological adoptions kick in.

On the animal side, technological change and adoption are the reasons China's production of energy-oriented crops and animal feedstuffs (such as corn) can keep up with requirements.

For example, projections using historically proven calculation methods reveal that pork productivity will increase from 106 kg currently to 137 kg in 2030, enough so that the number of pigs required will decline from current inventories. Meat output per chicken in inventory will double, as will egg output. Milk production per cow will more than double, resulting in the need for fewer cows in 2030.

Another aspect of detailed research on the production side highlights differences in cropping and livestock systems. For example, while crop residues comprise a negligible part of animal feedstuffs in the U.S., they make up 38% of energy requirements for livestock and aquaculture and 28% of protein requirements in feedstuffs in China.

Structural change in the swine industry is another reason pundits sometimes give for China's corn imports dramatically surging by 2015. This is another case of back-of-the-envelope thinking.

The story goes that China's shift from backyard pig production to commercial operations, now widely being promoted by the government, will lead to great increases in corn use. After all, "everyone" knows that backyard pigs are mainly fed table scraps, non-conventional feed sources like vines, etc.

I recently returned from a three-week research trip in China, one part of which involved evaluating this issue. It turns out that backyard (less than 10 head on feed) and small (11-50 head) hog operations feed corn-based rations, and the amount of corn is about 30% less than on medium-size (51-499 head) and large (more than 1,000 head) operations.

The government target in its five-year plan (2011-15) of a 15% decrease in operations of 1-50 head by 2015 to stimulate modernization of the swine industry would result in the need for about 1.2 mmt more corn, a relatively small amount considering that production will likely increase at least another 12 mmt or so by 2015.

China's new plan

It is a myth to believe that the U.S. has the lock on agricultural systems and production, and it is a misconception that China will not become a powerhouse of agricultural knowledge and production so it can continue to be more than 95% self-sufficient in food needs, as targeted in its five-year plan.

China's five-year plan also calls for 100% self-sufficiency in corn, rice and wheat. It has been either a net exporter or essentially self-sufficient in rice and wheat for a decade, so meeting the plan's targets for those two should not prove to be problematic.

What about corn? China had net exports of 3-8 mmt between 2003 and 2006, with lesser amounts in 2007 and 2008. It had net imports of about 1 mmt in 2009 and 2010.

Big headlines in mid-October screamed that China made one of its largest corn purchases ever -- 900,000 mmt -- and that this was just the beginning of a trend toward more imports. Is this the harbinger of the 15 mmt of imports by 2015 that are regularly bandied about in the media, or will China's five-year plan prove to be right?

There are a number of additional production-side factors. The vagaries of climate are a consideration. Another is that China allowed its corn reserves to decline during the large export years from 2003 to 2007 (35-45 mmt). Those were built back up to about 50 mmt during 2009-10, but this is somewhat of a diversion.

The real issue has been very low corn yields of just 4.7-4.9 mt per hectare all through the 1990s until 2004, when China's yields reached 5.1 mt. The government's previous five-year plan put considerable emphasis on increasing yields and was moderately successful as they increased to 5.26 mt in 2009 and 5.45 mt in 2010. Increases in corn area and a yield of 5.52 mt this year led to a record crop of 182 mmt, compared with 164 mmt and 177 mmt in the previous two years.

What about the future? China's very low corn yields -- about half that of the U.S. -- have not been lost on policy-makers. They are well aware that, for example, Pioneer Hi-bred is targeting a 40% yield increase globally in corn and soybeans over the next 10 years, and Monsanto projects corn and soybean yields to double by 2030. It has been reported that Monsanto and China are taking steps to launch drought-resistant corn. Also, there are extensive corn yield improvement field trials in all of China's microclimates.

Most important is that China, as an agricultural genomics leader, already has an array of genetically modified (GM) crops awaiting government approval, and that is now in motion.

China's State Council Information Office reported in a Sept. 29 press release that the Ministry of Agriculture has granted a security certificate for Bt corn varieties and is now in the final throes of testing them as well as other new varieties of GM crops. The announcement also said China's development of GM crop technology is an important strategic choice and that its principles and policies are firm on the matter.

Make no mistake about it: China is, indeed, an agricultural superpower. It does have the ability to reach its target of 100% self-sufficiency in corn, rice and wheat by 2015 and to maintain 95% food self-sufficiency well into the future.

The message: Beware of simplistic, back-of-the-envelope thinking, media hype and deceptive and self-serving reasoning and pronouncements.