



A Mandate For MANKIND

It's a daunting order to produce enough food to feed 9 billion people. But agriculture's big challenge also offers big opportunity for farmers.

BY CHARLES JOHNSON

An Internet video keeps replaying in Dean Folkvord's head, reminding him of the precarious nature of the world's food supply.

"This guy had an apple in his hand and he said, 'This is the world.' Then he cut out one-fourth of it and threw the rest away. He said, 'What's left is the land.' He cut that slice in half and said, 'The one-eighth that's left is arable land.'

"Then he peeled it and held up the peel and said, 'This is the topsoil. That's what feeds the world.' It was pretty dramatic. Shocking. I use that as an example when I talk to people," says Folkvord, a Three Forks, Mont., wheat grower who started the Wheat Montana brand, marketing his own product through flour and bread.

A HUNGRY WORLD. With world population projected to hit 9 billion by 2050, food supplies will have to increase at least 70% in order to feed everyone, USDA economists say. Most of that population growth will occur in developing nations with low per-capita income, according to trendline data from the Population Reference Bureau (PRB).

As of 2010, developed nations averaged about 39,000

Montana farmer Dean Folkvord stands ready to supply a hungry world with more wheat. PHOTO: WHITNEY BIRD

births per day, while less-developed nations totaled 345,000. That adds up to 384,000 new folks arriving on the planet daily, measured against about 156,000 deaths.

Folkvord, along with many other farmers and ranchers who roll the dice on Mother Nature's whims every year, views those numbers as both somewhat alarming and an opportunity.

"There's a lot of capacity to increase production in the world, but I don't know what it will be," he continues. "A wheat farmer may not benefit that much because the growth might not be in wheat. The fastest-growing populations consume other things like beans and rice. I think wheat may turn into a feedgrain competing with corn."

Birthrates sprinting upward are just one sign of impending change. Tastes are changing as well, and more people around the world want Western-style convenience. Just because they're eating rice today doesn't necessarily mean they'll consume as much rice a decade later.

The best example of how quickly status can change: China. Food market analyst Phil Lempert, the self-styled "Supermarket Guru," notes the Asian giant is now the world's largest grocery market.

"China surpassed the U.S. with sales of \$979 billion in the last fiscal year compared to \$919 billion in the U.S. That gap will grow rapidly. By 2015, China's grocery market will be 36% larger than the U.S., at \$1.475 billion," Lempert says.

That's a compounded annual growth rate of 15% through 2015, he says, while the U.S. rate will be a more humble 4%.

"The BRIC nations—Brazil, Russia, India and China—will be in the top five grocery markets by 2015," Lempert says.

To no surprise, the increase in grocery sales reflects population growth. Twenty-five million babies are now born yearly in India alone, along with 17 million in China. U.S. births run about 4.3 million a year, Lempert says.

FOOD INSECURITY. Other developing nations face potentially greater food risk than either India or China. (See "An Index For Global Food Security.") The PRB says nine of the world's top 10 countries with the youngest population are in Africa. The other: Afghanistan. Niger leads the group, with 50% of its people under the age of 15, with Uganda, Burkina Faso, Congo, Zambia and Malawi approaching that percentage. Japan, on the other hand, leads the rapidly aging nations, with 22.8% of its people older than 65, followed closely by Germany, Italy, Sweden and Greece.

"The social issues involved in feeding the world's growing population are huge," says Clark Gerstacker, who grows corn, soybeans, dry beans and sugar beets at Midland, Mich., and serves on the National Corn Growers Association's (NCGA) Corn Board.

"If those people in developing countries can't control their population, there's no way we can get them enough food. If they do not have resources to ▶

Fewer Places To FARM

Worldwide, agriculture makes up 38% of land use. As global population increases, existing acres will need to become even more productive ... new land will have to be opened up for agriculture ... or both. But despite the perceived potential for millions of new acres to come under cultivation around the world, much of this potential land will likely be unavailable or diverted to other uses.

Arable and Permanent Cropland



World Total of Arable Land:
3,596,615 thousand acres



PHOTOS: THINKSTOCK, BOYD KIDWELL

feed themselves or money to pay for it, what are they going to do? We're really not benefiting those people by giving them food and making them dependent on our generosity. They've got to have some kind of recourse of their own. It's not just giving them food that they need; it's developing ways to pay for it. It's building infrastructure to handle it," Gerstacker says.

He voices no doubt the U.S. can produce considerably more food than it does today. Gerstacker bases his analysis on corn yields during the past 30 years, when yield nearly doubled.

"Growers are just starting to get the benefits of biotech on the agronomic side. There's stuff in the pipeline that's going to move us to the next level. If you take a step back and look at where we've been and where we're going to be, it's pretty amazing," he says, citing statistics from British-based consultant PG Economics Ltd.

"Land use per bushel is down 37% since 1987. Soil loss is down 69%, mainly due to using herbicide-tolerant crops. Energy use per bushel is down 37% since 1987. Insecticide use is down 65% since then," Gerstacker says.

"We've come a long way on agronomics, but I truly believe we've just scratched the surface. Where are we going with narrow-row corn? Random-spaced corn? We hear about a lot of interesting things being researched. I think a national average of 200-bushel corn by 2020 is doable. And, yes, I think we can double corn yield by 2050."

INFRASTRUCTURE CHALLENGES. More than agronomics and favorable weather come into play, however. Spend a few hours observing the slow, tortuous progression of grain barges through an antiquated Upper Mississippi River lock



If U.S. farmers are successful in doubling yields of major commodities, it will require a huge investment to upgrade infrastructure, especially on the nation's rivers to handle higher barge traffic.

PHOTO: AGSTOCK IMAGES / DANA DOWNIE

An Index For Global Food Security

Which countries are the least and most vulnerable to food insecurity? Answer: the United States and the Congo (Democratic Republic), respectively. The rankings are the result of a new Global Food Security Index that was launched in July. It was designed by the Economist Intelligence Unit, part of the Economist Group—the leading source of analysis on international business and world affairs, and commissioned by DuPont.

The groundbreaking tool measures the drivers of food security across 105 developed and developing countries. The model looks beyond hunger to the underlying factors affecting food insecurity and considers the core issues of food affordability, availability, access and quality. As part of the index, countries are scored in each of these three core issues.

For example, the U.S. scores a 93 on affordability, 87 on availability, and 87 on quality and safety. The Congo, however, scores a 13, 24 and 16, respectively. According to the index, a score of 75 to 100 is considered Best Performance; 75 to 90, Good Performance; 25 to 50, Moderate Performance; and 0 to 25, Needs Improvement.

The index employs an adjustment factor for food price fluctuations

to examine the risk countries face. Food security is defined as the state in which people at all times have physical, social and economic access to sufficient, nutritious food that meets dietary needs for a healthy, active life.

Other key findings from the index include:

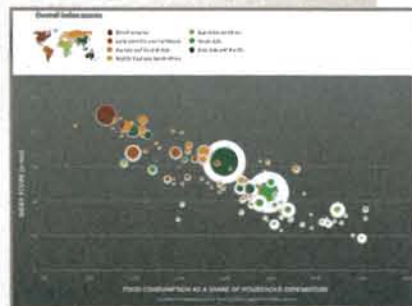
- ▶ The United States, Norway and France are the most food-secure countries in the world.

- ▶ The food supply in advanced countries averages 1,200 calories more per person, per day than in low-income economies.

- ▶ Sub-Saharan African countries in the bottom third of the index, including Mozambique, Ethiopia, Rwanda and Nigeria, will be among the world's faster-growing economies during the next two years.

- ▶ Several policy- and nutrition-related indicators, including access to financing for farmers, the presence of food safety net programs, protein quality and diet diversification are highly correlated with overall food security.

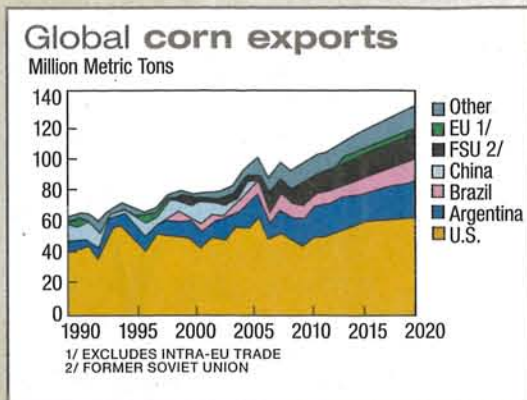
For more information, visit foodsecurityindex.eiu.com.



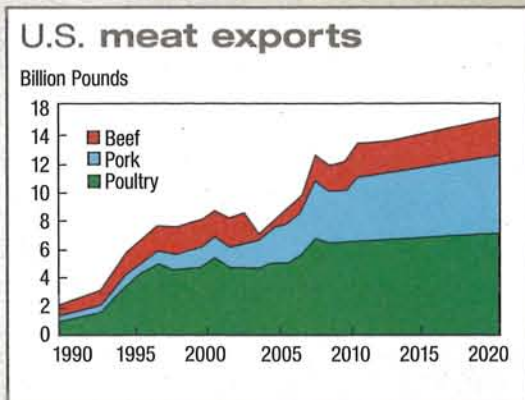


Exporting to the World

U.S. farmers will continue to be a food-producing powerhouse for the foreseeable future.



U.S. corn exports are projected to grow during the next decade and approach record levels by 2021. The U.S. share of world corn trade declines slowly from an average of about 55% to around 47% by 2021, as exports rise more rapidly from countries from the former Soviet Union (FSU), Brazil, the EU and other European countries.



The projected rise in U.S. meat and poultry exports during the next decade reflects the resumption of global economic growth, a depreciation of the U.S. dollar and continued foreign demand for selected cuts and parts from the large U.S. market. SOURCE: USDA

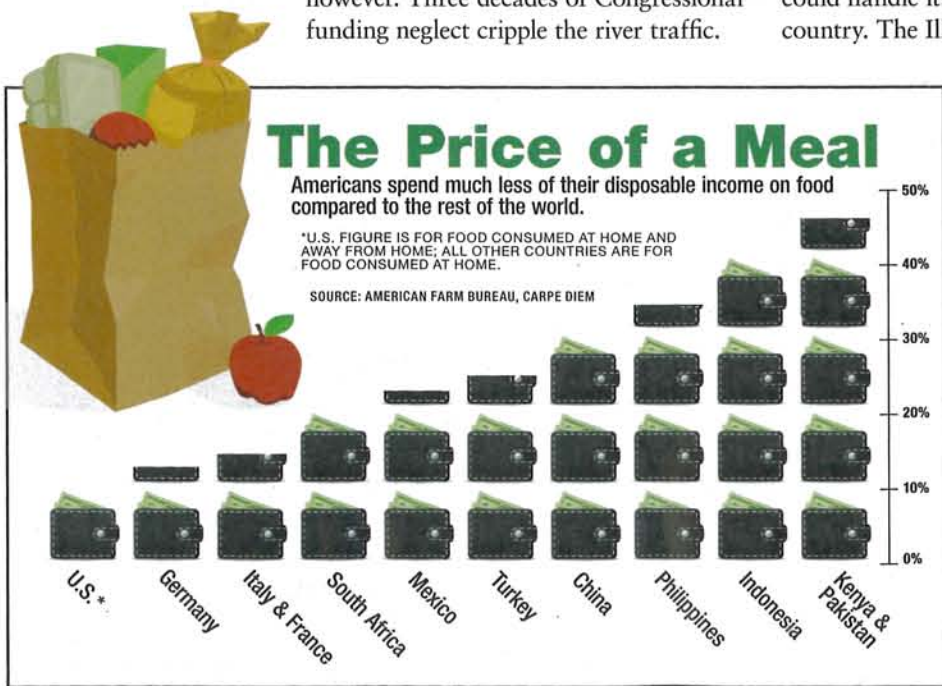
and dam, and you get an inkling of the infrastructure problems facing the U.S. New rail shuttle partnerships between grain companies, buyers and shippers might expedite grain traffic heading from the western Corn Belt to Pacific ports. Cheaper barge shipment remains the top option for our bigger grain-growing areas, however. Three decades of Congressional funding neglect cripple the river traffic.

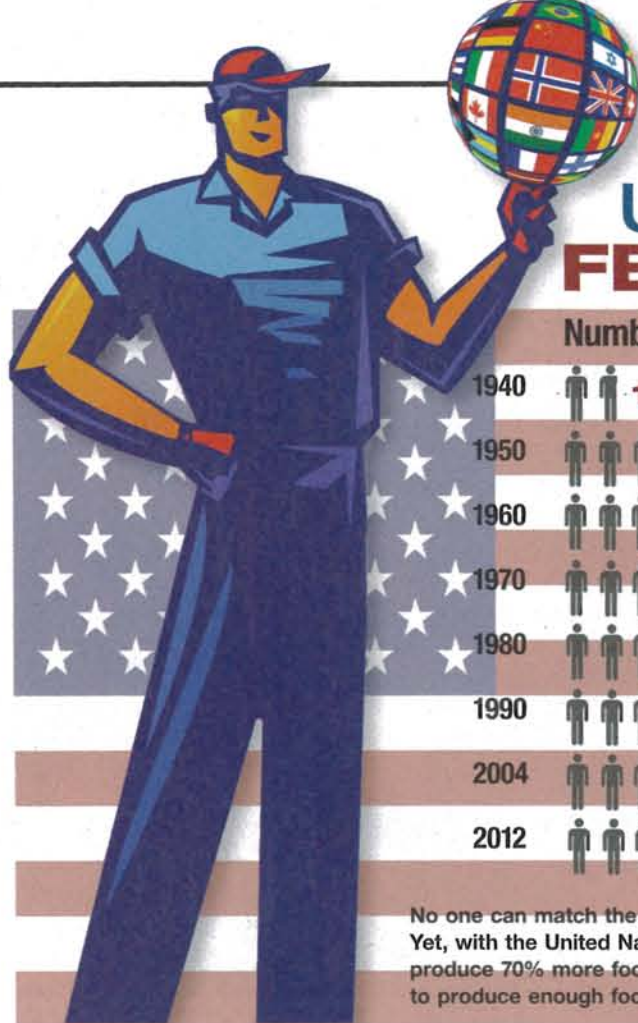
“We in agriculture think about that, but do others?” asks Rob Elliott, who farms at Cameron, Ill., and sits on the NCGA board. “I absolutely think we will double yields by 2030. If we grow a 20- or 30-billion-bushel corn crop, how are we physically going to move that? If we put it on the roads, I don’t think roads could handle it. We’ve let infrastructure go in our country. The Illinois Corn Growers Association has

spent a considerable amount of time on that issue. It’s really frustrating not getting it made a higher priority.”

Not everyone agrees that spending money on lock-and-dam projects is wise, however. In a recently published paper, Julia Olmstead, Institute for Agriculture and Trade Policy, Minneapolis, Minn., takes the opposite stance.

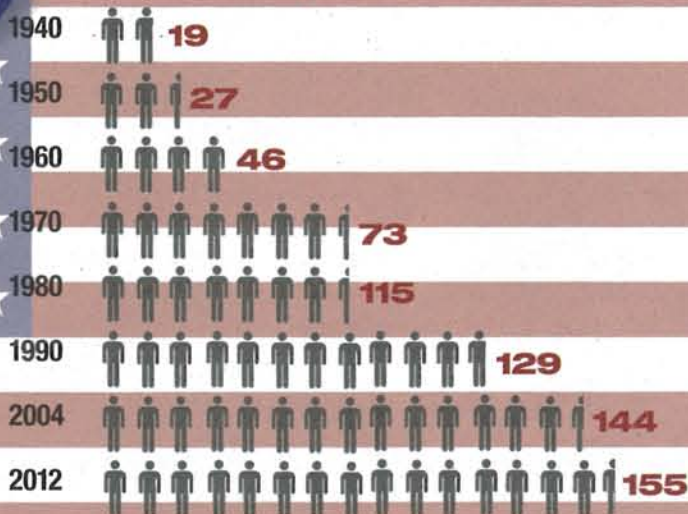
“The ‘feeding the world’ argument has been used by agribusiness to justify private and public investment into everything from lock-and-dam expansion on the UMR [Upper Mississippi River] to genetically modified crops, to taking agriculture out of federal conservation programs,” she points out. “But if global hunger alleviation were the





U.S. Farmers **FEED** the **WORLD**

Number of People Fed by One U.S. Farmer



No one can match the awesome productivity of the American farmer. Yet, with the United Nations estimating the world's farmers will have to produce 70% more food over the next 40 years, one U.S. farmer will need to produce enough food for 264 people. SOURCE: AMERICAN FARM BUREAU

goal, those investments—\$1.9 billion federal dollars for lock construction alone—would be better spent helping small-scale farming flourish around the world,” Olmstead says.

SHARING THE BOUNTY. U.S. farmers can't assume they will shoulder all the responsibility and reap all the rewards of feeding the world's growing population. Fish is now the fastest-growing animal protein source, according to the Food and Agriculture Organization of the United Nations, with about half coming from aquaculture. Small Asian farms turn out about 90% of the world's aquaculture production, a boom expected to continue to grow.

Ukraine is now the world's largest barley exporter, and USDA projects it will remain in that position through at least 2022. Ukraine, Brazil and Europe will likely step up corn production and corn exports over the coming decade, USDA economists point out. By 2021, the U.S. share of world corn exports will decline from the 55% averaged during the past five years to less than 47%, even as the value of the dollar continues to depreciate, according to USDA's latest agricultural projections report.

Increasing total grain supply might be even tougher than some suspect. Dean Coleman, Humboldt, Iowa, farmer and president of the Iowa Soybean Association,

says, “We're concerned because not only do we need to increase yield, but we're losing tillable land at an alarming rate to blacktops and developments. It seems consumption is growing faster than yields. Things are going to be tight. The weather problems the past couple of years put a strain on food production in this country. Things look good going forward, but it all depends on weather and the economic situation of our customers.”

Commodity prices will be key for farmers' decision-making. Folkvord says until wheat's recent price run-up, the plastic bags for his bread cost more than the wheat to make the bread.

“If we're concerned about feeding the world, there are some obvious things we can work on,” says Folkvord. “Every year, 30% of the wheat is wasted due to harvesting, elevator, mill and bakery losses. Stales at the store run 10%. Nobody eats the heels, so there are three or four slices wasted in every loaf. All that tells me wheat doesn't cost enough yet.”

Much rides on how our society handles these philosophical and moral questions during the next few decades. “A lot of the countries with food problems are unstable. Involvement with unstable countries is very dangerous. What risks will we take to support those people and at what costs?” Gerstacker wonders. ●