

# Feed more profitable, but disease breeds uncertainty

BY CLAYTON GILL

**M**ost of the world's feed manufacturers had a better business year in 2005 than in 2004, mainly due to lower feedstuffs costs and economic resurgence in many countries. However, many in Asia—both commercial feed companies and food companies with integrated feed manufacturing—suffered lost tonnage due to the H5N1 strain of human-pathogenic avian influenza, now popularly known as 'bird flu'.

Probably no industry-wide trauma has done as much to reconfigure the region's poultry feed market since the Asian economic crisis of the late 1990s. With hundreds of millions of birds culled—but removed disproportionately from backyard operations—uncounted thousands of small producers are now supplementing their incomes in other ways than traditional poultry farming. As has been the case in previous years, some of these formerly independent producers have continued in poultry production as contract growers for the larger poultry producers and integrated food companies. Relatively few have been able to convert their operations to other commercial livestock production. In effect, there has been a culling of poultry producers as a result of bird flu, such that the Asian poultry industries are increasingly concentrated, vertically integrated, and better equipped to meet the challenges of biosecurity in poultry production.

Among the leading feed manufacturing countries, there were several—including China, Brazil, Mexico, Russia, India, and USA—which helped to expand global manufactured or industrial feed output in 2005 by nearly 2% over 2004. This expansion maintained the momentum of the past three years, despite animal disease and high feedstuff costs in 2003-04, to bring total output to more than 625 million metric tons for 2005. With global population growth in the range of 1.2-1.3% per year, per capita

feed remained around 97 kg/person/year in 2005, which has demonstrated a flat trend since 2000 (Figure 1).

Given the increased harmonisation of the national feed industries of the European Union's 25 Member States, it was appropriate in FEED INTERNATIONAL's 2005 ranking to count them as a single 'feed country', with industrial feed output nearly as great as the USA. Other top countries included China, Brazil, and Mexico, which overtook Japan in industrial feed production in 2005. With the new ranking, both Korea and India entered the group of 'top 10' industrial feed manufacturers (Figure 2).

Considering industrial feed use by animal species, both poultry and swine industries advanced significantly in 2005. Currently, FI estimates that more than 40% of global manufactured or industrial feed goes for poultry production, while products for pigs make up about 32% of total tonnage. The global industrial feed mix also includes manufactured products for dairy cattle (16% of total tonnage), beef cattle (6%), finfish and shellfish (4%) and other species (3%). Aquafeed continues to be the fastest growing sector of industrial feed production, but expansion in the major high-value species of salmon and shrimp appears to be slowing to an estimated 6-8% per year. However, there is growth in diversity of species receiving aquafeed and improving technology for completely closed aquaculture systems that require com-

plete manufactured rations. Also, there is a growing preference for formulated dry feeds for fry and larval stages, which are high-value products for which there is an expanding export market.

## **Bird flu coping skills**

In 2004, both small producers and integrators in Southeast Asia lost significant proportions of their live inventory to bird flu—mostly through preventive culling. During 2005, many of the hardest hit zones in Thailand, Malaysia, Indonesia and Vietnam came back into production strongly, thanks to biosecurity measures enforced by integrated poultry companies. Thailand's integrators—led by Charoen Pokphand or CP Group, one of the world's largest feed manufacturers—showed the way into a future that takes bird flu into account as a risk, not a disaster. The integrators introduced an even stricter disease prevention regimen throughout the breeding, feed, live production, and processing chain and lobbied against proposed poultry vaccination programmes which would compromise its poultry meat export capability. They also greatly expanded cooked poultry production capacity and refined their approach to international marketing. Some integrators also had the advantage of being able to reallocate feed manufacturing capacity towards integrated pig production, which grew significantly in Thailand during 2005.

Thai broiler exports had dropped by

nearly 60% in 2004 and the country was striving by every means to regain its competitive advantage as a poultry meat exporter into the most lucrative markets of Asia and Europe. By contrast, countries that opted for vaccination—including China, the world's second largest broiler producer—faced additional challenges in marketing their poultry products abroad. Only recently was China allowed to begin exports of cooked poultry meat to Japan. In the interim, bird flu-free Brazil became Japan's leading supplier of broiler meat.

With consumers frightened and fewer producers in business, poultry feed demand in China and some Asian countries appeared to have contracted for a brief period—as much as 20% in some countries by some estimates. However, the actual impact of H5N1 virus on poultry meat and feed production has remained an open question. For example, analysts at the Foreign Agriculture Service of the US Department of Agriculture (USDA-FAS) have forecasted an increase of more than 1% for 2005 broiler meat production in China, currently the world's second largest producer. Nonetheless, with the northward and westward migration of H5N1 virus into Siberia, Central Asia, and Eastern Europe, poultry products in Europe were somehow associated with the disease, although proper cooking eliminates the disease-causing organism, as it does for pathogenic bacteria like salmonella. Nonetheless, there were brief but dramatic drops in broiler chicken meat and egg consumption—along with dips in feed production—in a few European countries, most notably the UK.

### Despite bird flu, global poultry feed still rising

The proportion of poultry feed going into poultry production worldwide continues to rise, mainly at the expense of beef feed, despite the disruption caused by bird flu in Asia. A few Western Hemisphere and European Union countries provide most of the impetus. The USDA-FAS, for example, forecasts poultry meat production in major producing countries to increase nearly 4% in 2006, predicting significant growth in Brazil, China, India, and the USA: “Despite higher oil and energy prices

### Per capita feed use up with global tonnage rise

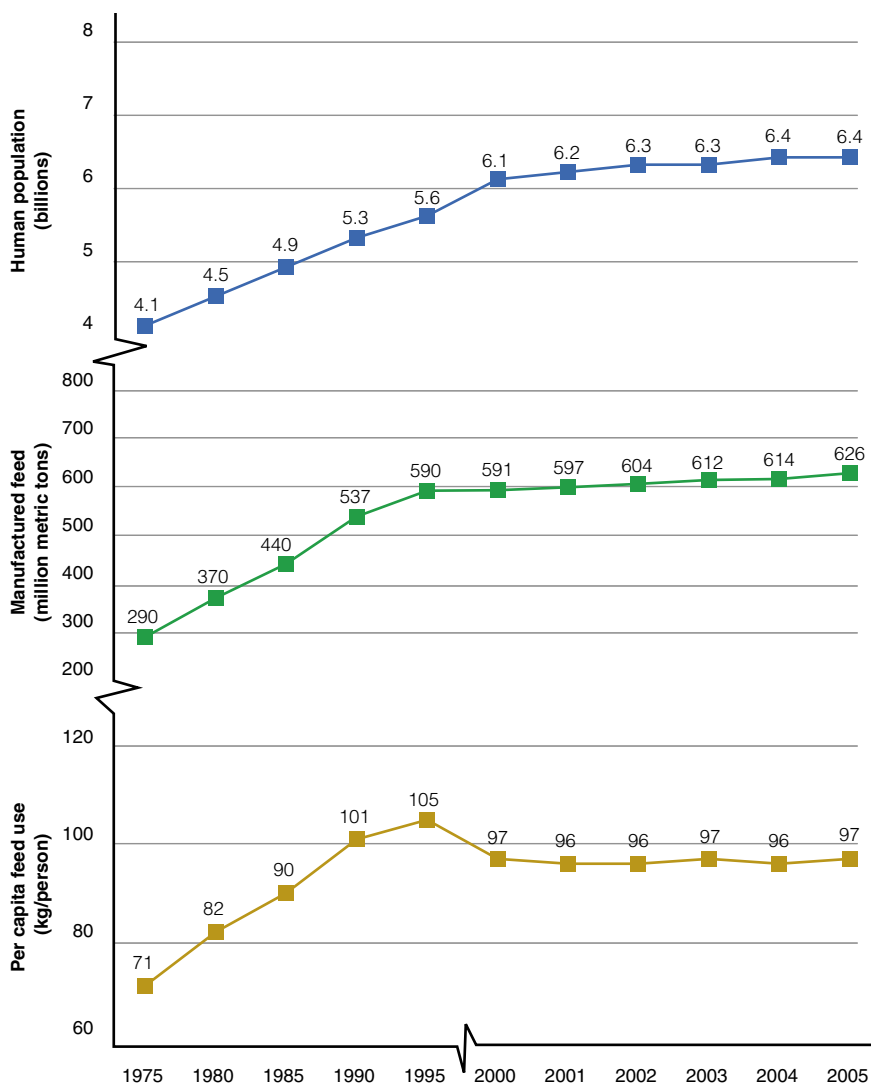


Figure 1. At the beginning of 2006, world population is growing beyond 6.4 billion, even as the rate of increase continues to slow to 1.2-1.3% per year. The global migration from rural to urban areas continues, with the farm population in decline worldwide. However, urbanisation generates greater demand for meat, milk, and eggs from those fewer but larger farms, thus increasing demand for manufactured or industrial feed. In 2005, lower feedstuffs costs helped to boost feed output, although the persistence of outbreaks of H5N1 avian influenza in Asia and the spread of this human-pathogenic ‘bird flu’ to Europe dampened the increase in poultry feed output. Nonetheless, world per capita feed use increased by roughly 1 kg per person per year.

in 2006,” states the agency’s November 2005 report, “moderate feed prices and continued integration and concentration will facilitate world poultry production.... The USA accounts for the largest proportion of the increase in broiler meat production forecast for 2006.”

However, broiler production in Brazil and Mexico also plays a major role in global growth of poultry feed output. The USDA-FAS expects Brazilian broiler output to increase 5% to nearly 9 million metric tons (mmt), within a million tons or so of China’s total output. Currently,

China and Brazil are ranked numbers two and three, respectively, in the *Executive Guide to World Poultry Trends* published by FI publisher Watt Publishing Co. These countries follow the USA, which the USDA-FAS forecasts to produce around 15.8 mmt. The rapid rise of Brazilian export broiler production is striking, as the South American country surpassed the USA as the leading broiler chicken meat exporter in 2005.

Mexico’s broiler industry is playing a significant global role also, expanding at an annualised rate of more than 5%,

based on USDA-FAS estimates. Mexican broiler output is ranked fourth in the world by the *Executive Guide*, at less than half the output of the total from the 25 Member States of the European Union. Nonetheless, USDA and other analysts expect that Asian markets are likely to determine long-term growth in broiler meat production and consumption as markets in North America and Europe experience the slower growth of mature food markets. The developing countries of Asia, the Americas, the Mid East and Africa represent the greatest growth potential, where in certain countries growth in broiler production could approach the expansion rate of a decade ago—5% or greater.

### **Beef export opportunities, but little feed gain**

Although highly pathogenic avian influenza continued to directly impact poultry and feed production in 2005, it appeared the greatest risk was in lower consumer demand due to the threat of a human flu pandemic. Other animal diseases had a similar effect on meat consumption, but less effect on the feed trade in 2005. For example, the discovery of bovine spongiform encephalopathy (BSE) in Canada and the USA in recent years had not greatly affected domestic beef production or consumption but had affected exports. In one year, American beef exports plummeted 82% and Canadian exports fell 37%. Prior to these ‘mad cow’ discoveries, beef exports had amounted to nearly 10% of US production and more than 47% of Canadian production. By 2005, the proportions had come back to more than 2% in the US and 43% in Canada.

The lost beef trade affected manufactured feed output in North America because it is a much greater input to beef production than in other major beef producing countries. For example, while the 2005 foot-and-mouth disease outbreak in Brazil affected the country’s beef export status, it did not impact the country’s manufactured feed output, which mainly serves poultry and swine production. A similar scenario took place among other beef exporters free of BSE, where production is grass-based, including Argentina, Australia and New Zealand.

### **Pork preferred in Asia, boosting feed need**

In many Asian countries, both integrated and commercial feed manufacturers have been able to shift production from poultry into pigs as poultry feed demand softened in the wake of the H5N1 virus. Thus, bird flu has appeared to contribute to the accelerating industrialisation of the Chinese pork industry, which grew from nearly 42 mmt in 2001 to nearly 49 mmt in 2005. The USDA-FAS analysts predicted that China would add another 2 mmt of pork output in 2006, roughly equivalent to Canada’s entire production.

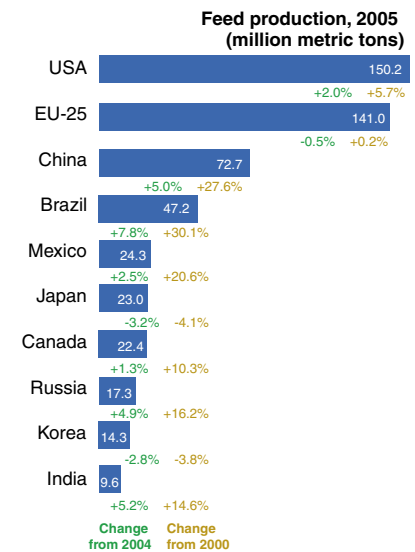
Pig feeds account for more than a third of industrial feed output in the EU-25, where pig meat production reached 20.7 mmt in 2005 with about 1% growth anticipated in 2006. Pig production in the USA continues to expand, but with most of the growth going toward the export markets, particularly Japan. Brazilian pig production likewise is increasingly export-oriented, and as yet unhindered by the 2005 FMD outbreak which impacted cattle production in Mato Grosso do Sul.

### **Dairy output increasingly reliant upon industrial feed inputs**

Global dairy production—measured as fluid milk output—is growing at about 1.5% per year. The top five producers consist of the EU-25 (131.7 mmt estimated for 2005), USA (79.6 mmt), India (38.5 mmt), Russia (32.0 mmt), and Brazil (24.0 mmt). However, China is catching up very rapidly and soon is likely to surpass Brazil as the fifth-ranked milk producer.

Although feed industry observers typically focus on China’s expansion of poultry, pig, and aquaculture production, the country’s growth of milk output in the past five years is extraordinary. The rise from 8.3 mmt of fluid milk production in 2000 to about 23.7 mmt estimated for 2005 amounts to annualised growth of 7%. The demand supporting this rapid growth involves rising Chinese incomes, better perishable food logistics and refrigeration capability, more product offerings, and the impetus of a rapidly

### **Top feed makers**



**Figure 2. Top 10 countries in industrial feed production during 2005, including the 25 member states of the European Union as a single entity. China, Brazil, India, and Russia show significant gains over 2004. These countries and Mexico also show strong five-year growth trends.**

growing urban population. Greatly improved dairy cow genetics and nutrition are enabling larger dairies to develop to serve urban areas. One Shenyang dairy, for example, has an inventory of 2,500 milking cows receiving ‘total mixed rations’ or TMRs based on harvested forages, maize silage, maize, soyameal and co-product ingredients comparable to large, intensive dairy operations in other parts of the world.

### **Lower feedstuff costs ahead**

The USA’s 2005 maize crop was significantly larger than expected—the second largest on record—which boosted global production by 5 mmt to 677 mmt for the year. In November 2005, the UK-based International Grains Council forecasted increased maize consumption for 2005, particularly noting increased use for ethanol production in the USA. Likewise, in December, the USDA projected global coarse grains supply and consumption—including yellow maize or corn, sorghum, barley, and oats—to increase for 2005-06 with higher carryover stocks compared to 2004-05. Outside the USA, the largest increases in stocks were reported to occur in China, Canada, Australia, Romania, and

Ukraine. Stock declines were projected for South Africa, Morocco, India, and several other countries.

Global oilseed production for 2005-06, was projected by the USDA at 387 mmt, with an increasing trend based on increases for rapeseed (including canola), sunflowerseed, and soybeans more than offsetting reductions for cottonseed. Canadian rapeseed or canola production rose to a record 9.7 mmt, while Ukraine sunflowerseed production also advanced, with an estimated production of 4.6 mmt. As with the coarse grains, the USDA projected global oilseed ending stocks for 2005-06 at higher levels, primarily due to increased soybean stocks in the USA and increased rapeseed stocks in Canada.

Chinese economic growth—along with that of India, Brazil, and other relatively robust developing countries—continues to add to meat demand and resulting feed demand that puts pressure on global feed grain and oilseed supplies. A decade ago, observers point out, the global grain stocks-to-use ratio was 35% and now it is a little over half that amount. The stocks-to-use ratio for oilseed shows a similar trend, although not so extreme. Increases in Chinese soybean meal consumption continue to represent a significant portion of the total growth in global consumption.

### **'Food scares' prompted international feed standards**

As the international trade in foodstuffs and food has grown, so has the international impact of 'food scares', such as from feed contamination with salmonella, dioxin, PCBs, etc., or association with disease agents as from BSE and bird flu. Feed inevitably has played a key role as cause or vector in many of the most alarming incidents. In 2005, advocates for the diverse and disparate global feed industry achieved critical mass for the first time in São Paulo, Brazil, where nearly 600 delegates from more than 30 countries came together for the first Global Feed & Food Congress. The three-day conference—hosted by the UK-based International Feed Industry Federation, the United Nations' Food and Agriculture Organisation, and the

## **About the 'World Feed Panorama' Survey**

Sources for FEED INTERNATIONAL's estimates of industrial feed tonnage by country include industry association reports and interviews, and published animal inventory and animal product data, particularly from the United Nation's Food and Agriculture Organisation and the U.S. Department of Agriculture's Foreign Agricultural Service and Economic Research Service. FI's annual 'World Feed Panorama' Survey collects data from feed professionals and correspondents in more than 60 feed producing countries.

The Survey's estimates derive from feed plants producing at least 2,500 metric tons per year and attempts to count all feed products by actual weight. That is, the Survey counts a ton of feed premix or a ton of complete feed simply as a ton of industrial feed and does not attempt to extrapolate tons of 'complete feed equivalence' of premixes or concentrates.

It has been a challenge to find common units of measure in the feed industry worldwide—not just in China, the EU, or the USA! The challenge has resulted from unique and historical national and regional conditions as well as the rise of integrated animal production in which the manufactured feed product has become an integral part of the food production process and therefore more difficult to count by those outside the company.

Feed industry leaders and professionals worldwide are encouraged to participate in FI's annual 'World Feed Panorama' Survey and are welcome to offer advice to improve it. Now in its 18th year, the Survey remains a unique industry reference. Please contact the editor: Clayton Gill, FEED INTERNATIONAL Magazine, Watt Publishing Co, 122 South Wesley Avenue, Mount Morris, Illinois 61054-1497, USA, tel +1 815 734 5642, fax +1 815 734 5649, gill@wattmm.com, www.feedindustrynetwork.com. ■

Brazilian feed manufacturers association Sindiracoés—focused on feed safety. Delegates explored the science and practical considerations necessary to achieve safe feed for safe food in international trade, addressing a range of pressing issues, including antibiotics, hormones, contaminants, animal welfare, and biotechnology. Their fundamental precept: All consumers should be able to rely on safe food, and safe food requires safe feed.

That feed is an essential link in the human food chain gained the force of law through the recent promulgation of the UN-authorized Codex Alimentarius Code of Good Animal Feeding Practice, which the World Trade Organisation now relies upon in arbitrating international trade of feed, feedstuffs, and foodstuffs. Codex directly affects feed manufacturers who export feed products or whose products are used to produce human food for export. The FAO is now developing a 'feed manual' to guide feed manufacturers in meeting the Code and protecting the food chain.

In São Paulo, Joel Newman, president of the American Feed Industry

Association, told delegates that consumer confidence in food supply must be maintained regardless of where food is produced. The Codex feed code would aid the global industry in fulfilling its obligation to consumers while enabling feed manufacturers around the world to capitalise on future opportunities. He noted that the Codex document represented a venue for consensus on global acceptance and adoption of new technology, and aimed to maintain consumer confidence in industry and government, while enabling feed manufacturers and animal producers to meet future global food needs. But, he cautioned, each country or region would have to establish how to implement Code standards in conjunction with regulations and industry practices, with the ultimate objective of "global equivalency" in feed safety standards. The process was well-advanced in many countries, Mr Newman suggested, but that no single regulatory process was exclusively correct: "The implementation of a single and equal process would block the development and adoption of new technologies."

## Overview by region

Counting the EU-25 as a single entity, together with the nine other top feed makers, shows the high concentration of industrial feed production as they produce more than 83% of the global total (Figure 2). The USA, EU, and China together produce well over half. Among these top feed makers, the share of the global total held by the developed countries—such as the USA, EU, Japan, and Canada—continues to shrink, while that of the developing countries—especially China, Brazil, and Mexico—continues to grow.

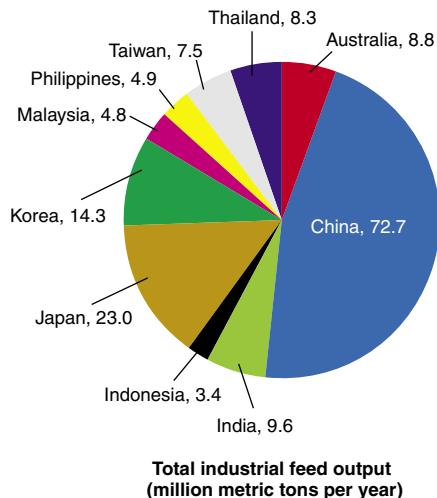
However, the tendency in the global view is to focus overmuch on those largest feed manufacturing countries, while scores of smaller feed manufacturing countries offer much of interest for the whole global industry. For this reason, in order to view the global industry in greater detail, FI's annual 'World Feed Panorama' divides the feed world into six regions—Asia-Pacific, European Union (now 25 Member States), Non-EU Europe, Mid East-Africa, South America, and North and Central America and Caribbean. Within each region, the 'Panorama' focuses on the top 10 feed manufacturing countries (Figures 3-8).

Much of the development of the global feed industry in the past two decades has taken place in the Asia-Pacific region. In 2005, for example, bird flu continued to exert a braking effect on both poultry and feed production. However, both FAO and USDA reported that although H5N1 virus outbreaks in China and Southeast Asian countries had caused market disruptions, they had not reversed the ongoing growth in global poultry meat output.

The extraordinary high performance of the Chinese economy over the past two decades correlates with the rapid growth of the country's industrial feed output as well as feed production on-farm and from small grind-and-mix operations. In connection with China's feed industry performance, it is important to note that FI estimates of industrial feed output are conservative compared to figures from Chinese government authorities and industry sources (see box). For 2005, FI's 'Panorama' Survey estimated industrial feed output of China at around 73 mmt for 2005.

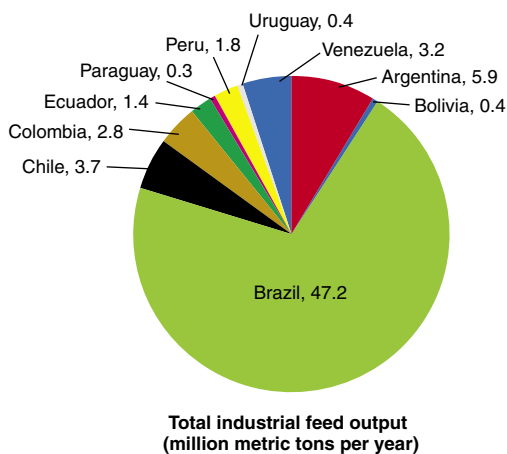
By contrast, Zhao Lihua of the China

### Asia-Pacific



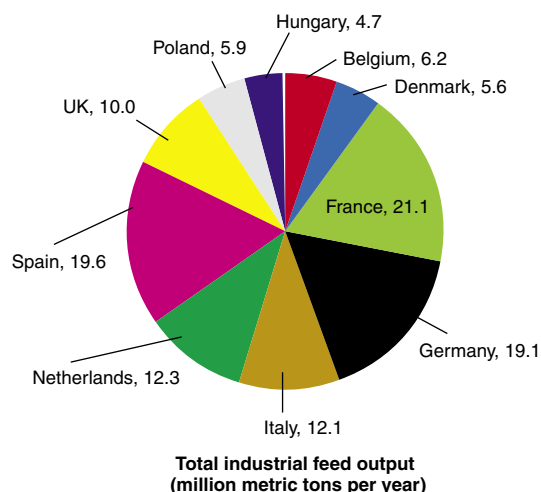
**Figure 3. Asia-Pacific region: Industrial feed production in top 10 countries, totaling 157.0 million metric tons (2005 estimate), up from the previous year with flock rebuilding after culling from high pathogen avian influenza. Despite 'bird flu', increasing Chinese feed output for all commercial species brings average annual growth in tonnage to around 3% for the region over the past five years.**

### South America



**Figure 4. South America region: Industrial feed production in top 10 countries, totaling 67.1 million metric tons (2005 estimate), averaging more than 5% annual growth over past five years. Brazil dominates feed output in South America with more than 70% of total regional tonnage, supporting low-cost poultry and pig meat production largely directed towards export markets.**

### European Union



**Figure 5. European Union region: Industrial feed production in top 10 countries, totaling 116.6 million metric tons (2005 estimate), down about 3% from 2004 and averaging more than 1% annual contraction over the past five years. Spain remained the bright spot by expanding pig production.**

Feed Industry Association reported the CFIA's estimate of the country's total feed output at more than 103 mmt. Also, Dr Robert Swick of the American Soybean Association in Singapore noted

in early 2005 that the China Food and Agriculture Service estimated total feed output for the country at nearly 150 mmt in 2004. In any case, statistical reporting from China's increasingly sophisticated

feed industry has improved greatly in recent years and is likely to continue to improve with greater industrialisation of animal production. Industrial feed output of China already has risen as a proportion of total feed output.

Despite the ban during most of 2005 on meat imports from BSE-infected countries, particularly the USA and Canada, livestock numbers in Japan continued to decrease. National sales of industrial feeds also have continued to drop with output now estimated at about 23 mmt.

With the American and Canadian beef exporters out of the market until December last year, Japan's beef import quota was quickly filled by other suppliers, particularly Australia, which again enjoyed an increase in its feed output during 2005 as it had in 2004.

The third-ranked country in the region, Korea, has demonstrated a pattern of structural change for types of feed produced over the past eight years, against a background of rising and falling total output. Back in 1997 approximately 32% of all feeds from plants in Korea were for pigs, 24% for poultry, and 41% for dairy or beef cattle. Preliminary 2004 figures reported in 2005 point to a breakdown of 37% pig, 26% poultry and 32% cattle. Moreover, Korean production of livestock feeds had decreased in 2004 to 14.751 million metric tons, from 15.257 million tons in 2003, and 15.6 million tons in 2002. Reductions since 2003 affected dairy cow diets (down 5.4% to 1.63 million tons), pig feeds (off by 4.3% at 5.42 million tons) and poultry rations (1.8% lower at 3.84 million tons). The 'Panorama' Survey has estimated 2005 industrial feed production continuing to decline to 14.3 mmt.

In South America, Brazil's strong feed industry growth has largely depended upon increasing meat exports, which result from largely unsubsidised, low-cost poultry and pig production that takes advantage of some of the world's lowest cost feedstuffs. Brazil has risen to ranks third in global poultry meat production, closing in on China, and fifth in pig meat production. Argentina has emerged from economic doldrums and has the resources of low-cost grain and oilseeds to dramatically expand broiler chicken production, targeting export markets as Brazil has done.

The European Union, now consisting of 25 countries Member States, has not seen significant changes in regional industrial feed output, although there has been a longer term downward tendency in tonnage. Only Spain has shown a consistent rate of feed industry expansion with annual growth of more than 4.5%, thanks to the expansion of integrated poultry and pig integration. In Non-EU Europe, there has been continued growth of commercial and integrated industrial feed manufacturing in Russia with adequate grain supplies, expanding economy, and investment and expertise from foreign feed companies, especially Netherlands-based Provimi.

In the Middle East and Africa, South Africa has been the largest industrial feed producing country, although Saudi Arabia has made huge gains in recent years, especially in poultry and dairy feed production. In the region of North and Central America and the Caribbean, Mexico has grown most rapidly, continuing five-year annualised

### Non-EU Europe

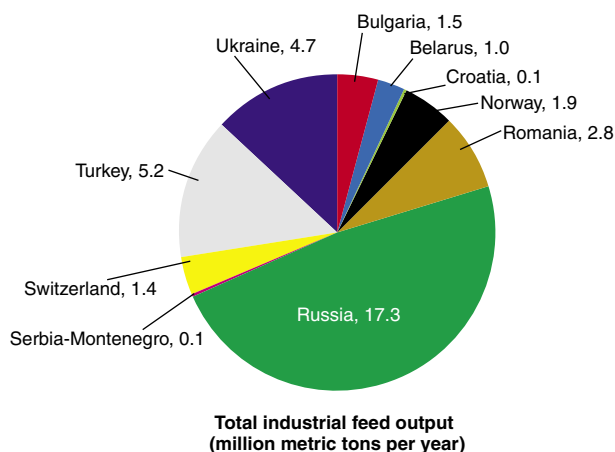


Figure 6. Non-EU Europe region: Industrial feed production in top 10 countries, totaling 36.0 million metric tons (2005 estimate), showing regional decline because of movement of Baltic countries into the EU-25. There has been low growth for the region as a whole over the past five years, except for private-sector feed industry expansion in Russia.

### Middle East & Africa

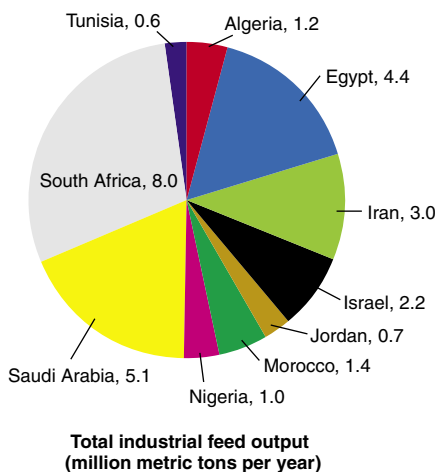


Figure 7. Middle East & Africa region: Industrial feed production in top 10 countries, totaling 27.6 million metric tons (2005 estimate), averaging more than 3% annual growth over the past five years due mainly to expansion in North Africa and Saudi Arabia.

### North America, Central America & Caribbean

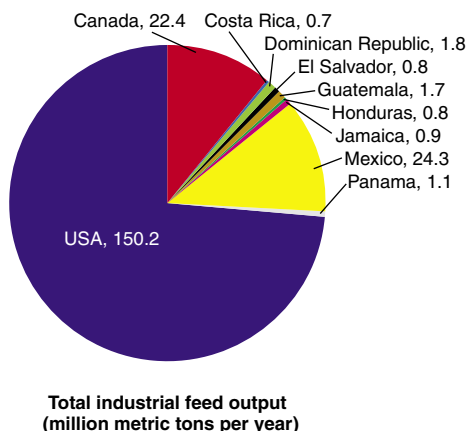


Figure 8. North America, Central America and Caribbean region: Industrial feed production, totaling 204.7 million metric tons (2005 estimate), averaging more than 2% annual growth over the past five years. Strongest expansion in the region continues in Mexico, particularly to support broiler chicken production.

growth of 6% per year. The USA has remained the region's largest and the world's largest industrial feed manufacturing country, but with an increasing proportion of feed output oriented towards meat products for export markets. This has become more of a challenge for USA feed manufacturers, especially following the discovery of the country's first BSE cow in late 2003. Only last month—December 2005—was the ban

lifted on beef exports to the USA's top customer, Japan.

The future remains bright for the expansion of industrial feed as meat consumption in the developed world is expected to continue to increase in developing countries, with poultry meat leading this growth. China's continued economic expansion, however, is likely to provide impetus for continued expansion of pork production, too. **fi**

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