Global feed issues affecting the Asian poultry industry

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SUMMARY
The global poultry industries have traditionally faced competition for feed ingredients from other animal industries such as pork and aquaculture. To this should be added the prospect of future competition from ethanol production. This situation gives rise to a need to search for alternative feed ingredients. In this paper it is argued that the use of by-products, and in particular the use of fibre, as an energy source in poultry diets will be an important means to meet future feed requirements. Technologies such as solid state fermentation complex enzyme systems hold the key to closing the feed-availability gap and providing the additional feed ingredients much needed by the poultry industry.

Key words: poultry, feed, competition, future, technologies

1 INTRODUCTION
Will ethanol displace gasoline or simply take food off our plates and feed from our animals? That was the question posed by Dr Lyons (Alltech President) to delegates at a recent feed industry symposium. To all involved in the poultry industry, this question has great significance and should perhaps sound a few alarm bells. Competition for feed ingredients will become even more pressing given the already increasing pressures that poultry industries globally are encountering from other animal industries such as pork and aquaculture, which in many cases are vying for the very same feed ingredients. In this paper we look at meat consumption, its growth trends, and the feed required to sustain this growth. In particular, we examine the competition for feed grains between the poultry and pork industries and their respective feed-ingredient requirements. We briefly look at the impact of the “ethanol for fuel movement” on maize production and availability. Finally, we look at ways to alleviate the present and future pressures on poultry feed grains and ingredient availability.

2 MEAT PRODUCTION AND CONSUMPTION
The relationship between affluence and meat consumption is well established, showing a clear increase in meat consumption with increased per capita income. As a consequence, today’s feed production has tended to be concentrated in Europe and North America. For example, the Netherlands produces approximately 0.81 million tons of feed per million people, while China and India produce approximately 0.07 and 0.01 million tons of feed per million people, respectively. Asia accounts for a larger portion of the global population than any other region; China and India together account for over 2 billion people. Given this large population, there is a significant imbalance in feed production in Asia. In tomor-
row’s world, we will be confronted by significant increases in per capita consumption by an ever increasing global population. This situation is hugely magnified in the Asia–Pacific region, with annual meat consumption in China alone predicted to increase from about 50 kg per capita today to approximately 70 kg per capita by 2030.

It is sobering to look at this increase in meat consumption in light of the animal feed needed to deliver the required increase in production. Currently, approximately 720 million tons of feed produced globally. It is estimated that the feed required to produce 20 kg of extra meat for China’s 1.5 billion people in 2030 will represent an extra 320 million tons of feed, and that this will bring global feed production to 1.3 billion tons (Lyons, 2007). As a whole, Asia in 2015 will represent more than 60 percent of the global population, more than 70 percent of global pork consumption, and more than 35 percent of global chicken consumption, requiring approximately 391 million tons of pig and poultry feed. Even if the largest producers of grains such as Brazil, Argentina, the United States of America and Ukraine could double grain production, there would still be insufficient feed available to deliver the extra 20 kg of meat to China, let alone to meet the needs of Asia as a whole. The question is then: where will this extra feed come from? And, more importantly: where will the raw materials for these feeds come from?

3 ETHANOL PRODUCTION

The push towards biofuels is partly explained by a desire to be energy independent – to reduce dependency on the 140 billion gallons of gasoline consumed annually in the United States of America alone. It is also driven by the Kyoto Protocol, which mandates greenhouse gas reduction. In the United States of America, a target of 7.5 billion gallons of ethanol by 2012 has already meant that there are 111 dry mill ethanol plants in operation, with a further 80 or more being built, which will consume 60 million tons of grain and produce 20 million tons of distillers dried grains with solubles (DDGS) annually (Lyons, 2007). Increasing this target five-fold means 400 more ethanol plants. The “ethanol for fuel movement” has led to the single largest construction and investment programme ever in United States agriculture, with over US$ 70 billion invested in 2006 alone. Iowa: the heart of the country’s “Corn Belt” has dozens of distilleries, with many more under construction. Ultimately, this will mean that globally about 3 million more tons of DDGS will be produced than soy (116 million tons DDGS vs. 113 million tons of soy). Where is all this grain going to come from? There are 2,000 million tons of grain scattered around the world, a quantity which while large, is very finite (Lyons, 2007).

Can we increase maize production? The answer is yes, but at a cost. In fact, in 2007 there will be a shift away from soy acreage planted towards maize (some 3–4 million acres of soy) thus driving up the price of soy. In Asia, not only will we be confronted by ever increasing grain prices, but very soon we will have major problems sourcing the grain needed to sustain increased meat production and meet the growing demands of Asian consumers.

4 GLOBAL CHALLENGES TO POULTRY FEED PRODUCTION TODAY

As previously stated, Asia in 2015 will represent more than 60 percent of the global population, more than 70 percent of global pork consumption, and more than 35 percent of
global chicken consumption, requiring approximately 391 million tons of pig and poultry feed. If current trends continue, pork will be the most consumed animal protein, globally, and most certainly in Asia. What does this mean for poultry production and from where will the poultry industry in Asia get its “share” of feed grains and ingredients?

The Asian poultry industry will have to look to history for the feed solutions of the future. For tomorrow’s feed solutions lie in by-product utilization. The use of vegetable by-products (from rice and wheat), oilseed meals (soy, rapeseed, coconut, palm), starch/distilling by-products (DDGS, cassava residue, sweet potato, wheat/sorghum) and other novel plant materials and by-products will become paramount in ensuring that the poultry industry has adequate feed ingredients to meet increased demand.

5 Poultry Solutions for the Future

A typical poultry diet, contains approximately 70 percent cereal grains and 25 percent soybean meal, and has a digestibility of only 75 percent. This means that, in effect, 25 percent of the feed is being wasted. Can we use soy as an energy source rather than just as a protein source? Do we think of soy as a protein source, but overlook the fact that it also contains 35 percent carbohydrates – including various fibres and non-starch carbohydrates? We sometimes fail to consider these facts, and in many cases take for granted the amount of fibre we waste in both poultry and pork production. With world cereal production (soy and grain) at some 2.5 billion tons, nearly 800 million tons are wasted. When copra meal, palm kernel meal, and the myriad of fibrous by-products are added to the equation, we realize that with limited grains, animals in the future will have to use fibre in their diet. In a recent review, Lyons (2007) noted that some 4 000 years ago, the Chinese faced similar problems to those we face today – limited protein and poor digestibility of raw materials. They developed what is called the “koji” process – or solid state fermentation (SSF) – in which the organism does the digesting for us.

The role of SSF enzymes as a means to utilize the fibre component in poultry diets has been gathering significant momentum, and much has been done to demonstrate the efficacy of such technologies. Rutz et al., (2007) report that a natural SSF enzyme complex is extremely effective in releasing energy and reducing gut viscosity, both of which are important considerations when utilizing by-products such as wheat bran in animal diets while maintaining performance. The future, however, will see next-generation SSF products that will be tailored to the by-product used. Different micro-organisms and strains will be screened and selected for maximum fibre utilization for particular by-products.

6 Conclusion

Feed is the major (65–70 percent) cost in pig and poultry production, so it is essential to minimize feed costs. The search for alternatives to maize and soybean as sources of feed ingredients, and hence of a means to reduce feed costs, is not a new matter for nutritionists. However, the situation has recently been significantly aggravated by the fact that much of the maize formerly used in animal diets will be diverted to ethanol production. In addition, in Asia we see a significant increase in poultry consumption; this will mean that we face a large gap in the availability of feed grains to sustain poultry meat production. The use of by-products, and in particular the use of fibre as an energy source, in poultry
diets will be the key to meeting the increased need for feed ingredients. Technologies such as solid state fermentation complex enzyme systems hold the key to closing the feed-availability gap and providing the much needed “extra” feed ingredients to take the Asian poultry industry to 2015 and beyond.

REFERENCES