



SPESFEED NEWS

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General News

At this time last year, I wrote, "the demand for animal feed has nearly exceeded our capacity to manufacture and deliver it". A boom in animal production brought this about, which has meant that the feed industry has had a good run over the past 18 months. We all know that our industry is cyclical, but who would have foreseen how quickly things would change. Animal producers have had a hard time of it and increasing ingredient prices have eaten into feed company margins. The feed industry is now beginning to feel the pinch. High levels of management and innovative problem solving will be required for our businesses to continue to thrive.

Current trends in the intensive animal production are interesting. The number of pigs slaughtered year to date have decreased by 15%. The number of laying hens in production has increased from about 17 mil three years ago, to about 23 mil currently. It is hard to know exactly what is happening in the broiler industry, but it is true that feed prices have increased dramatically. It is also true that broiler prices have gone up, but not nearly enough to compensate for the increase in input costs.

Why is this and how is it all going to turn out?

The short answer is economic forces are at work. I suspect that the pork industry has already started a "corrective" cycle. Judging from the number of egg farms being advertized for auction currently, the egg industry is about to enter the same phase. Poultry meat will continue to be cheap for as long as the fridges are full. Either the cost or volumes of imported product will need to change (world poultry prices are increasing), or local production will need to decrease. This means that some companies will have to place fewer birds and other companies may well cease production.

The figures at my disposal would indicate that companies listed on the JSE produce about 70% of local poultry meat. It is less likely that the cash flow issues that beset smaller firms, will impact upon these companies. Smaller, privately owned firms produce the remaining 20 to 30% of poultry meat. Those with sound markets for their products will be in a stronger position, but sadly, I expect to see some casualties in this sector.

SPESFEED Staff

We have had two staffing changes at SPESFEED. Firstly, Charlotte Venter took over as Office Manager at the beginning of July. Charlotte has worked for the SABS for many years and is a very experienced administrator and I am sure that she will whip me into shape. Secondly, Walter (Wally) Joseph has taken over the day-to-day bookkeeping function. Wally is Michelle's father. He retired after a lifetime of working for Colgate Palmolive as an auditor, but still feels the need to be busy. He will divide his time between SPESFEED and the bowling green. We wish them both well at SPESFEED.

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Courses

We held a successful SPESFEED EXPRESS training session on the 22nd of July, and plan to hold another session on the 16th of October. Please let Charlotte know should you wish to attend this event.

Nutritionists are in short supply

There is a worldwide shortage of qualified and experienced nutritionists, evidenced by the fact that many of our most capable and/or promising people are being head hunted by overseas companies. This has been exacerbated by the demand for skilled people in other African countries, where new agri-business ventures are flourishing.

It is hard to say if the number of new graduates is declining or not. While a decline may have been the trend for the past few years, currently it has reversed itself at Pretoria University where undergraduate classes are large.

Ideally, one would expect a nutritionist to have a postgraduate qualification in nutrition combined with appropriate experience. Sadly, young graduates without experience find it hard to find work. Gaining this experience is the thing that most young nutritionists find to be the most difficult. One obvious solution to the problem is for companies to "bring on" young graduates. The other option would be for companies to make better use of the people that they do indeed have in their employ.

On one of my recent trips, I was reading a copy of Martin Creamer's Engineering News to idle away the time at the airport. Columnist Terry McKenzie-Hoy has written an article on how to make better use of the engineering skills that a company has and it occurred to me that much the same would apply to nutritionists. Some of the suggestions are a bit cheeky or impractical, but I have included an edited version (modified) of them here none the less.

We must encourage nutritionists not to emigrate. It is the right of any citizen, of course, to choose where to stay, but I do not think that this right extends to choosing to be educated using taxpayers money of the country that he or she intends to leave. To plan to leave

straight after varsity is not necessarily morally reprehensible, but is slightly sneaky and unfair.

We need to increase the efficiency of nutritionists many fold. There are a number of ways to do this. The simplest one is to get the nutritionist to be more productive by reducing all those time-wasting things that happen to them. Thus, the first thing I would suggest is that every nutritionist, no matter how old, must get at least one secretary and/or assistant to help him or her. We want an old-time secretary - that is to say, one who can do shorthand, can still speak English correctly, knows how to set out letters, arrange appointments and generally organise the sorts of things that nutritionists are quite useless at doing. Then, at least, the nutritionist can concentrate on nutrition.

Next, we must stop the time-wasting activities of people in the agri-business, who waste nutritionist's time as if it is worth nothing. Thus, I would tell all accountants, engineers, the Department of Agriculture, the Department of Health and the stranger within our gates, that, from now on, if nutritionists have to come to their offices for meetings, they are going to have to pay a fee.

The next thing I would suggest is that a firm message be sent out that, when the nutritionist tells you something, it is generally right, not generally wrong, and it is not the beginning of some debate on the subject. Just leave it off the agenda.

The next thing, of course, is the matter of reward. When bananas are in short supply, the price goes up. Nutritionists are in short supply, so the price should go up too. But, if the price goes up, so must the price that companies charge for feed. South African nutritionists should be allowed to charge in US dollars - at the same rates as our American counterparts. This will then certainly bring in enough income to pay the nutritionist to stay in the country and certainly encourage people not to waste the time of nutritionists.

Then (oh, happy days), perhaps, we can have a law that forbids the unqualified from using the term 'nutritionist'. Then, at least, the public will start appreciating the fine nutritionists we have in this country. One day, some day.

These are probably just idle thoughts of an idle fellow, but behind this somewhat flippant approach to the problem, I assure you, there are some elements of truth.

Rick Kleyn

World's Poultry Congress

As mentioned in the last edition of SPESFEED NEWS, I attended the 23rd World's Poultry Congress in Brisbane, Australia in July. Literally hundreds of papers and posters were presented at the meeting. There was no theme for the congress as such, but a number of areas that were of interest to me. I have given a brief account of these below. Should you want copies of the original papers, I can provide them all on a CD.

Global Trends

Many of the speakers in the various sessions addressed the issue of global trends in agriculture in general and in the poultry industry in particular. The points that I found to be of interest included the following:

- The increase in world commodity prices is being driven to some extent, by the demand for grain to produce ethanol. The steady increase in demand for resource from China in particular and India to a lesser extent are perhaps playing a far bigger role. Most of the price increases that we are experiencing are underpinned by the increase in the oil price.
- What was not mentioned, is that many financial institutions have been moving money out of poorly performing equities, and into commodities, which explains the volatility in the market.
- Poultry is the form of animal agriculture that has the lowest impact on the environment in terms of greenhouse gases and carbon footprint.
- By the year 2015, it is anticipated that poultry will be the largest source of meat for the human population. World meat consumption will increase by 2.2% while poultry meat consumption will increase by 4% per year.
- Most of the growth in poultry production will

occur in the developing world. Brazil still has a huge capacity for expansion.

- The availability of suitable agricultural land to produce the feedstocks for the poultry industry, along with adequate quantities of fresh water could become a problem.
- The poultry industry in China continues to intensify, and in time, they may well become the largest poultry producers in the world. A shortage of land to produce feedstocks may well be a limiting factor.
- Dr Pearse Lyons of Alltech gave a brilliant talk. The gist of his message was that in difficult times opportunities exist. A technology in which he is particularly interested, is the conversion of cellulose to ethanol, using solid-state fermentation.

Animal Welfare

Unlike any other conference I have ever attended, animal rights and welfare issues were covered in some detail. The importance of this topic was put into perspective by the animal rights protesters (who I only saw on TV the evening after the protest) who were active in the road outside the conference centre.

I do not intend to go into a lot of detail on the various presentations, but it was interesting to see just how seriously the scientific community are taking the issue. One of the keynote speakers, Prof. John Webster of the University of Bristol gave an excellent talk on how animals should be managed in order to maintain the correct welfare status. However, he then made a comment along the lines of how he "would like to see future agricultural subsidies being paid only to those farmers who maintained the correct welfare standards". This opinion clearly illustrated just how far apart farmers and scientists from developed and undeveloped countries are, and perhaps explains why the Doha round of trade talks has just failed for the umpteenth time.

Bio-technology

An area of great interest to me was how important biotechnology is likely to become. Dr Rob Etches of Origen Therapeutics presented a paper entitled *Progress in the production of transgenic chickens*. Although very technical and difficult to follow, Dr Etches described a cell-based approach to modifying the genome of chickens. This

methodology has the advantage of relying on the screening of cells in culture (as opposed to using live birds), which greatly enhances the scope and speed of the process. This technology for the modification of the chicken genome "provides new approaches to poultry breeding that are limited only by the imagination".

A paper entitled *Innovative biotechnologies in the poultry industry* by Dr Tim Doran of the Australian Animal Health Laboratory, was to my mind, the best presentation that I attended. Although highly technical, Dr Doran was able to explain how he and his team inserted genetic material (sRNA) into the genome of rats. This small piece of RNA effectively inhibits the multiplication of a virus in the cell (in this case Avian Influenza). Tests showed that these genetically modified rats were resistant to AI. The next step in this research is to do the same with chickens, and having done this they could obviously explore a host of other viruses.

I have always said that when the biotechnologists really get going, it is probably time for me to retire. I can assure you that I caught a glimpse of our future, and it is very different from the one with which we are familiar. I had a chat to Dr Doran after his talk, and mentioned to him that he may just have made us (my generation) obsolete. He replied by asking if I played golf - because if so, I would have a lot of time to practice in the not too distant future.

Broilers

Although the work presented on broiler management and nutrition was not all that wide ranging, from a nutritional perspective a number of papers on a similar theme were presented. These all had to do with feeding increasing level of protein to different strains of broilers. It was found that both the Ross 308 and the Ross 708 performed optimally on a similar protein level - which was close to the breeder companies' recommendations. In the case of the Cobb 500 it was found that higher protein levels led to increased mortalities. The final recommendation made is that the protein levels in Cobb diets should be about 7.5% lower than the breeding company recommendation.

Broiler Breeders

It was a refreshing change to attend a conference where there was a lot of discussion about broiler breeders: both management and nutrition. I have laid out the points of interest below. The first paper that I will report on is a review article presented by Rob Renema of Alberta University.

- Even small degrees of over and underfeeding have been shown to negatively impact on egg and chick production. The most critical period for avoiding sudden increases or excessive feed allocation appears to be 2 to 4 weeks after photo stimulation. This period is a time of flux in the management of nutrients, as the bird switches from primarily growth to a reproductive state. The reproductive and metabolic hormone pathways do not appear to be mature enough to withstand the challenge of a sudden increase in nutrient intake. Avoid changing feed allocations by more than 5 grams per day if possible.
- Modern broiler strains, which have been intensively selected for lean tissue deposition, have a reduced ability to store fat. However, if the abdominal fat pad is too small, there will be a drop in egg number. Modern strains have been shown to have fat pads that are 40% smaller than a 1977 strain. Maintaining the correct body composition is likely to become increasingly important.
- The testes also require adequate nutritional support. Feed restriction has been shown to negatively impact on absolute testes weight in male breeders. Males should not be allowed to lose body weight as this has an immediate effect on testes size and hence fertility, while at the same time excessive fleshing reduces mating activity and leads to reduced testes size. In a recent experiment, 40% of males that died during the production cycle had regressed testes (Robinson, unpublished data). Male on male behavioural interactions are believed to affect the ability of some males to access feed and likely contributes to the testicular regression occurring prior to mortality in these birds.
- The amount of feed allocated to broiler breeders during rearing and early lay can change frame size and breast muscle fleshing

in the birds. When you feed breeder pullets aggressively from a young age, frame size increases and an increased proportion of breast muscle is deposited. However, by sexual maturity, even aggressively fed birds had a similar proportion of breast muscle to birds reared normally.

- Low protein levels during rear were found to have a negative impact on ovary development and hence caused a drop in lifetime egg production. The opposite - too much protein during rear, causes excessive follicular development.

Dr John Brake of North Carolina presented a short paper demonstrating that if the feed space allocation changed between the rearing phase and the egg production phase, production declined. Where feeder space was maintained at 10 cm per bird, the hens produced significantly more eggs per hen housed than where feeder space was decreased from 10.6 cm to 6.1 cm, or where space was increased from 7.1 cm to 10.0 cm. The increased feeder space combination, normal in typical brood-grow and lay housing systems used in the USA and elsewhere significantly increased laying period mortality.

In a poster presentation, Brake investigated the impact of male breeder nutrition on fertility and its impact on the progeny (commercial broiler). Males that received less than adequate nutrition, they were found to exhibit a reduced rate of body weight gain and reduced broiler progeny performance. The largest males apparently exhibited reduced fertility in such circumstances - meaning that commercial birds (offspring) were fathered by smaller broilers. Inadequate feed intake at the onset of lay or after 25 weeks of lay significantly decreased fertility and 42-d broiler body weight by 97 grams and 58 grams, respectively. Effects on progeny were present only in the presence of significantly decreased fertility. The male feeding program must be positioned relative to the existing male body weight to meet daily maintenance requirements and keep males growing continuously.

In similar work, one of Brake's students questioned the fact that low protein male diets lead to improved fertility. Rather, it is those

males that are slightly heavier and on a positive growth plane that are more fertile.

In a crossover style paper, Dr Elke Heyn of Germany looked at the welfare of broiler breeders. She reared breeders fed on either an *ad libitum* basis, or on a restricted feeding regime. The *ad lib* fed birds weighed 6.5 kg at the end of rear as compared to 3.6 kg for the restricted birds. The mortality rate in the *ad lib* group averaged at 29%, with Cobb males reaching 48%. In the restricted group mortality was less than 5%. The restrictively fed birds showed a completely different behavioural profile to those fed *ad lib*. They were very active and showed almost no resting and feather cleaning behaviour during video observation. Nevertheless, they had the best plumage quality. *Ad-lib*-fed birds were occupied mostly with eating, resting and walking. The restrictively fed birds showed almost no "eating behaviour" and with advancing age an increase of abnormal behaviour such as pecking at the empty trough. Dr Heyn ended her talk with the statement (sadly I did not write it down) along the lines of "it is a conundrum, the *ad lib* fed birds lived a more "normal" life in welfare terms, but clearly this was not an option in practical terms as there would be very few survivors". For this comment, she was vigorously criticised by a member of the audience, who implied that she was wrong to give such importance to what she considered to be "normal" behaviour.

Practical Ideas to Address High Feed and Production Costs

Pork producers are facing a period of rapidly increasing feed and production costs. The following management tips, gathered from experts and producers across academia and industry, have been compiled by the Pork Checkoff. We have included a summary of this comprehensive article, which can be found at:

http://www.porkgateway.com/html/spotlight_images/PracticalIdeastoAddressHighFeedandProductionCosts.pdf

Producers should keep in mind that decreasing feed and production costs is very complex and should be considered carefully. However, small gains in several areas will produce significant savings. By only decreasing the cost of feed per ton, the cost of feed per pound of gain or total feed cost per pig to market weight may actually decrease profitability. Improving feed efficiency may also decrease profitability if actual feed costs increase more than the return received on the increase in efficiency. Producers need to focus on production practices that optimize feed costs and efficiencies while maximizing profitability.

Feed Processing and Manufacturing

Decrease feed particle size: For every 100 micron change in particle size, feed efficiency is impacted by 1.2%. Decreasing particle size from 750 microns to 600 microns will result in substantial savings per pig. In most cases, this particle size is not fine enough to worry about ulcer problems, but feed dust will be increased.

Improve pellet quality: Fines cause feed wastage and reduced efficiency. Ensure less than 20% fines at the feeder. Research at Kansas State University shows that pelleted diets result in more highly available nutrients, less dust, less feed wastage, better feed conversion and lower incidence of ulcer problems.

Maintain equipment for optimal efficiency: Rotate or replace hammers in the hammer mill to ensure consistent particle size. Also, make sure that rolls on the roller mill are properly maintained for the desired particle size. Make sure that mixing equipment is maintained so that distribution of nutrients is ensured throughout the entire volume of feed. Also, calibrate and maintain the scales for weighing pigs and feed at least twice per year.

Consider use of wet-dry feeders: Wet-dry feeders may reduce feed wastage and dust as pigs can wet the feed to the consistency they desire. Palatability is also improved over dry diets increasing consumption and performance.

Repair or replace broken feeders: Broken or damaged feeders can result in excess costs due to feed wastage or inadequate feed provisions for the pigs resulting in poor performance. Consider replacing older or inefficient feeders with well designed, efficient feeders that minimize feed wastage and promote maximum performance.

Adjust feeders to reduce waste: Adjusting feeders to reduce feed wastage should be a routine

practice. Minor adjustments of feed bins and transport systems can also result in big savings. Kansas State University recommends the following steps for proper feeder adjustment:

- Close feeder completely after cleaning before putting any feed into it.
- Open feeder just enough to start small feed flow.
- Shake feeder to increase amount of pellets or meal in pan (to cover 1/3 of pan).
- Clean corners daily instead of increasing feeder adjustment to increase feed flow.
- Prevent moisture damage and spoilage in feed systems and storage.
- Eliminate all rodents, birds and other pests.

Feed Management

Monitor feed ingredients for potential mycotoxin contamination: Several mycotoxins may cause detrimental health and performance problems in pigs, when fed contaminated plant based feedstuffs. Fungal infestation and subsequent mycotoxin production can occur during plant growth, maturity, harvesting, storage and processing of grains. It is influenced primarily by moisture level, temperature, and availability of oxygen. In addition, grain that is damaged, immature, drought stricken or otherwise stressed is more susceptible to mould growth.

Monitor feed allocations or budgeted amounts and utilize least-cost formulations: Follow feed budgets aggressively to ensure accurate compliance for each class of pig. Inaccurate rations or incorrect budgets decrease efficiencies and increase costs. For example, diets that are wrong because of inaccurate weighing or mixing, or diets that are formulated for the incorrect class of animal are inefficient and increase costs. Formulating diets with economic costs in the equation, as well as modelling input requirements, will allow the development of diets at optimum performance and the least cost of ingredients. There are always trade-offs, so it is important to be aware of any detrimental effects of diet formulation on overall cost and/or performance.

Re-evaluate phase feeding and options for split sex feeding: Review all protocols for each ration phase. Make sure your weight categories and genetic description fit your current rations for each phase as closely as possible. Consider split-sex feeding to further increase feed efficiency. Both of these techniques can improve the accuracy

of your rations and increase your production efficiencies. Consider finishing rations that limit or eliminate excess nutrients just prior to slaughter to lower feed costs on your heaviest weight hogs just prior to market.

Target sows' nutrients: Improve sow productive lifetime by targeting diets for different parity ranges. Diets should have higher protein and energy levels for replacement gilts through their second parity to prevent excess mobilization of body reserves during lactation. As sows become older, micronutrients (zinc, copper, iron, etc.) become critical nutrients that need to be maintained at high levels in order to maximize production efficiency. Consider the added costs of adding additional feed storage and delivery equipment in gestation and lactation and strategies to sort and feed sows accordingly against the benefits of targeting sow nutrition more accurately.

Decrease/eliminate feed outages: Feed outages significantly impact the efficiency of feed utilization in pigs. The frequency and duration of feed outages needs to be assessed and should be minimized or eliminated whenever possible.

Make measuring of feed intake/wastage part of the work routine: Pen feed intake should be monitored continually to quickly recognize feed wastage, pen health problems, water quality/availability or ventilation challenges.

Check water flow and quality often: Inadequate flow or availability of water or poor water quality can seriously impact performance or even cause death. Check drinkers furthest from the well head as this is the point at which pressure is likely to be the poorest. Excessive water use is also inefficient because it has to be hauled or pumped as manure.

Practise proper feed withdrawal prior to marketing hogs: Consider withdrawing feed from pigs to be marketed for up to 12 hours prior to when the pigs are scheduled to be processed to save on feed consumed, lighten the live weight of the pigs marketed and to enhance average carcass quality. For medicated feed, follow recommended withdrawal times for feed additives to prevent costly carcass condemnations, disruption of market channels, bad publicity for the pork industry or costly rejections of pork in foreign markets. Inadvertently including an ingredient that requires a withdrawal period may force a producer to feed a group of hogs longer than desired, which adversely impacts on feed efficiency.

Feed Formulation

Look for alternative feed ingredients. There are alternative feedstuffs and by-products available in many areas. Accurately, determine the nutritional profile of an alternative feedstuff and its feeding value at the price quoted before you decide to use it. Also, make sure to understand the form in which it will be delivered so that extra labour or machinery is not required.

Reduce traditional animal protein sources in starter diets for pigs: Animal protein sources should be strictly budgeted in starter diets. Research from North Dakota State University suggests that lower cost, nutrient-dense, high performance, transition pig starter diets can be effectively prepared using reduced levels of spray-dried animal plasma, soy protein concentrate, spray-dried blood meal and dried whey. The nutrient-dense ingredients to use in pig starter formulations will depend largely on availability and current economics.

Review animal requirements for both energy and amino acid levels: Historically, protein has been the most expensive component of a swine ration. Today energy costs are higher in many rations than protein. Consequently, producers should pay close attention to both the energy and protein costs in the diet to meet the nutritional requirements of their pigs. Diets should be reformulated as often as ingredient prices change.

Evaluate the use of non-nutritive additives: Feed grade antimicrobials have been used for many years in numerous production systems to improve growth and efficiency in nursery and grow-finish hogs. Always follow the label requirements and monitor withdrawals closely. Certain enzymes, when added to the ration may, help to enhance efficiency. Acid blends and feed medications fall in this category as well. These opportunities should be evaluated for value in each operation. Understand the biological activity to best match the enzyme to your production system and watch for consistency and nutritive value issues with any enzyme or additive. Consider that these compounds may produce the largest return on your feed dollars invested if they produce even a small improvement in growth and/or efficiency in your rations. Now is the time to use all reasonably

priced products that have a proven positive effect on feed efficiency.

Ensure correct evaluation of ingredients: Assays of ingredients should be done routinely for nutrient levels and digestibility values so that diet formulation is accurate. Purchasing ingredients from a single source to ensure consistency, as this will provide more uniform diets for efficient production. Standard operating procedures for product handling will result in a more consistent feed product.

Management

Review stocking densities in all phases: Optimal stocking densities will result in the greatest economic gain with the least negative impact on performance or animal behaviour. Consider the end weight of the pigs at typical marketing times and adjust the number of pigs per pen accordingly.

Identify and sell non-select replacement gilts early: Marketing females earlier will remove them before their growth curves change significantly resulting in lower feed efficiencies and more costly feed for the gain realized. Marketing these animals early also lowers the risk of injury or loss.

Reduce mortality/morbidity: Losses of pigs or sows at all stages of production is costly. For instance, by increasing the number of pigs weaned per sow, the amount of sow feed needed to produce each pig is reduced. Sow death loss also figures into the total pigs per sow per year. Additionally, sows are costly to replace with gilts. Focus your attention on heavy pig management and care. Pig losses at market weight are costlier than losses in the nursery or during lactation.

Avoid changes which could affect safety and/or quality: Inadvertent contamination of feed and sudden changes in source could result in reduced performance (pigs off-feed). Pork quality may be compromised by changes in the type or source of feed ingredients or additives. Special considerations should be given to feed safety as it can impact product safety.

Maintain correct ambient temperature: Consideration should be given to providing an optimal room temperature for each stage of production. Colder pigs will consume more feed at a loss in feed efficiency in order to generate heat because their maintenance requirement is increased.

Reduce environmental stressors: Many factors can impact on pig comfort and performance. Overcrowding, poor air quality (in terms of ammonia levels), poor ventilation or air flow, humidity and

extreme ambient temperatures at the level of the pig can negatively impact pig comfort and performance. **Ensure that employees have proper stockmanship skills:** Encourage effective and humane handling of all animals in a production system to improve efficient pork production. Research has consistently shown that pig performance is improved through positive and humane handling.

Review the workload and responsibilities of employees: Improved labour efficiencies result in reduced costs and will result in improved production efficiencies. Training employees thoroughly, facilitating the necessary support and continuing education improves morale and loyalty while ensuring optimal performance and efficiency.

Understand your equipment and operate it efficiently. Make sure all equipment is running at maximum efficiency and is appropriate for the job.

SPESFEED (Pty) Ltd.

Animal Nutrition Consultants

The consultants at SPESFEED (Pty) Ltd. publish SPESFEED NEWS. The purpose of the newsletter is two fold. It serves both as a source of information for those involved in animal agriculture as well as a means for us to maintain contact with our clients.

SPESFEED provides a professional technical service to the livestock and animal feed industries. Our aim is to ensure that our clients use optimal production and feeding systems in order to maximise the return on investment. The company has no affiliation to any particular product or supplier.

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