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## How Feed Millers Can Optimise Feed Cost And Improve Feed Performance

by

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# How Feed Millers Can Optimise Feed Cost And Improve Feed Performance

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## Introduction

Feed milling is a very competitive industry in most countries. Broiler farmers demand the best feed but do not want to pay a lot for it. Modern broiler breeds are capable of very high performance but need good nutrition. Most of the time feed millers find it hard to make profits while providing feed at competitive prices. Inevitably they will try to use the cheapest raw material that can provide the minimum nutrient levels to satisfy customers. Unfortunately the quality of most of these cheap raw materials vary and since most of the feeds are formulated without much safety margins, feed performance will also vary. Many feed millers have accumulated much experience over the years on how to balance cost with performance and most can achieve a reasonable level of performance while maintaining a reasonable cost. Furthermore many feed millers have contract farming, hatcheries and slaughterhouses. These upstream and downstream activities together with contract farming can de-emphasize feed performance since the contract farmers will be happy if they can achieve a reasonable profit from the contract and will not complain too much if the feed performance is not too good. As a result, the FCRs and weight gains of broilers in most South East Asian countries are still way below the breed standards. Weights of about 2 kg and FCRs of 1.8-2.0 at 42 days is the norm while the standards for these breeds at 42 days calls for weights of 2.25-2.4 kg and FCRs of 1.67-1.77 which can easily be achieved or exceeded in many other countries. Our own trials with >20,000 birds in open houses used starter feeds with ME of 3150 kcals/kg, protein of 21.5 , and grower feeds of 3250 kcals/kg and protein of 19%. Other nutrient levels were normal. Using Ross 308 birds, we could achieve an FCR of 1.47 and body weight of 1.89 kg at 35 days. This proves that when using feed produced from good quality ingredients, the breed standards can easily be met or exceeded under normal tropical rearing conditions.

Recently some smaller Malaysian feed millers have been using our High Efficiency Soybean Meal and Full Fat Soybean Meal to produce feed capable of high performance and are able to gain substantial market share from the traditional feed milling industry. The situation in contract farming is still basically unchanged but many of these feed millers producing better feed are trying to entice contract farmers with the promise of better feed. Sooner or later the contract farming sector will also be demanding better feed.

## How To Save Cost In Feed Formulation

The cost of feed is very dependent on nutrient levels, metabolizable energy (ME), protein and amino acid levels and they are the main cost determinants. Since all feed millers have to add additional energy into broiler feed in the form of oil (usually palm oil in Malaysia and Indonesia), reducing ME will dramatically reduce the cost of the feed. The cost of ME is approximately 18 sen per kcal (April 2003). Therefore reducing ME by 100 kcal/kg will save RM18 per ton of feed or about 2.5%. Similarly, the main protein contributor is from soybean meal and reducing the protein by 1% in the feed will save RM7 per ton of feed; reducing lysine by 0.1% will save RM8 per ton of feed. Therefore, the total saving per ton of feed obtained by reducing ME by 100kcal/kg, protein by 1% and lysine by 0.1% is RM33 ton of feed. When substituting our High Efficiency Soybean Meal and Fullfat Soybean Meal in a normal broiler feed mainly based on corn and soybean meal, many of our feed mill customers are able to reduce their ME, protein and lysine levels up to the above extent yet could produce a feed that can out-perform their regular feed using other equivalent soybean meals. Therefore, if we assume that an average of 30% soybean meal is used in the feed, the extra value created by our soybean meal is RM33 divided by 0.3 = RM110 per ton of soybean meal which will more than offset the price premium of our soybean meal. In addition to the financial benefits, the performance of the feed will be better and more consistent despite lower nutrient levels, the birds will have better conformation and eviscerated yields will be higher.

## How To Improve Feed Performances

In this very competitive environment many feed millers would like to improve the quality of their feed to gain market share or sell their feed at a higher price since many farmers are willing to pay a slightly higher price for a better feed. By substituting our High Efficiency Soybean Meal and Full Fat Soybean Meal directly in a one for one substitution will increase the performance of the feed by 5-10% while increasing cost by about 2.5% or less than RM1 per 50kg bag. However, in cases where very high nutrient levels are already being used such as 23% protein and ME of 3200 in broiler starter feed, there may be little improvements since our soybean meal will then provide too much nutrients to the broiler. This will result in the bird having to get rid of the excess nutrients such as amino acids which in turn requires energy. In these cases the feed millers can reduce nutrient levels, hence saving cost and yet have a new feed which performs 5-10% better.

## Recommendations

The above sections indicated that by using our High Efficiency Soybean Meal and Fullfat Soybean Meal in broiler feed, it is possible to save up to RM33 per ton of feed by reducing ME by 100 kcal/kg, protein by 1% and lysine by 0.1% without compromising feed performance or raising performance of the feed by 5-10% through direct substitution. However in order to achieve this level of performance or cost saving, certain guidelines have to be followed:

- Use corn or sorghum that has low mycotoxin content as the main energy source. If wheat is used it must be supplemented with a good Xylanase.

- The use of good quality high protein meals such as corn gluten meal or Peruvian fishmeal is recommended for starter feeds but at inclusion levels of less than 5% in order to raise the protein of the mix allowing more corn/sorghum to be used for energy, replacing some of added oil (especially palm oil or tallow). Young chicks do not have sufficient lipase to digest a lot of oil especially stearic and palmatic acid. Starch digestion is good due to adequate levels of amylase.

- The use of High Efficiency Dehulled Full Fat Soybean Meal is highly recommended for both starter and grower rations. Broilers are able to use the soybean oil in the Full Fat Soybean Meal for energy purposes better than palm oil or tallow especially for young chicks. Due to reasons not fully understood, the energy value of oil in properly processed Full Fat Soybean Meal is higher than the equivalent quantity of added soybean oil. We recommend only using our Dehulled Full Fat Soybean Meal partly because proper processing is critical for the production of Full Fat Soybean Meal and dehulling is very important for improved broiler nutrition. Our recommended inclusion levels are 8-10% for starter feed and 10-15% for grower feed. At this inclusion level the soybean oil in the Full Fat Soybean Meal will be able to replace 2.25 to 3.5 % of palm oil in the finished feed resulting in a much better utilization of the added oil as energy.

- Wheat pollard can be used to reduce feed cost, but it is important to use pure wheat pollard since virtually all wheat pollards are contaminated by fine wheat bran. Usage levels should be less than 8%, preferably 5% or less. The soluble NSP in wheat pollard and particularly wheat bran increases the viscosity of the digesta thus reducing nutrient absorption.

- Except for soybean meal, do not use other processed meal or raw material exceeding 5%. This is because most processed meals such as meat and bone meal, canola meal, fishmeal etc have undergone excessive heat treatment and the availability of certain amino acids are greatly reduced and by-products produced by heat treatment are toxic.

- The quality of soybean meal is extremely variable, and will have a big impact on the quality of the feed since soybean meal is the main source of protein contributing 60-70% of the total amino acids in most broiler feed. (Especially in countries using mainly corn and soybean meal.). However, present testing methods cannot accurately predict the actual performance of soybean meal. Soon Soon Oilmills have produced a new type of soybean meal by using a new technology whereby the natural anti-nutritional factors of soybeans are deactivated without damaging the nutrients such as amino acids. This High Efficiency Soybean Meal has been proven in animal trials to increase animal performance by 5-10% when compared with other soybean meals. To achieve optimum performance, it is important to use only this High Efficiency Soybean Meal, without adulteration from other soybean meal which contain lower levels of essential amino acid especially lysine, cysteine and threonine and possibly toxic by-products due to over processing.

- All raw materials must be as fresh as possible and if necessary it must be stored under cool and dry conditions. Most raw materials store badly especially under tropical conditions, for example corn of 14.5% moisture cannot be stored for more than one month at 30°C without serious quality deterioration. Similarly, soybean meal quality will drop rapidly when stored at 30°C. High humidity and temperatures typical of tropical conditions will cause rapid mold growth in stored grain and oilseed meals.

- We do not recommend excessive heat treatment for the finished feed, although starch digestion may improve, heating will generally decrease protein availability. So, post mixing heat treatment should be adjusted to a minimum to ensure a hygienic feed but not at the expense of protein availability.

If the above guide lines are followed, feed millers will have more flexibility and will be able to produce low cost feeds of reasonable performance with low nutrient density or high performance feed with normal nutrient levels at slightly higher cost using the same basic ingredients. This will allow them to have a wider range of products to cater for the different needs of their customers. Other benefits will be that better quality feed will result in healthier chickens, reducing mortality and the need for medication. This will be important in the near future, as the use of antibiotics in broiler feed will be eventually banned in all countries. Broilers fed with better quality feed will also have better conformation and eviscerated yields will be higher.

## Conclusions

Although currently broiler performances in South East Asian countries cannot usually meet the standards set by the broiler breeders, it will be a matter of time before competition drives the industry to higher levels of performance. Hot and humid conditions and open houses rearing impose heat and disease challenges to broilers. By using good quality ingredients including our High Efficiency Soybean Meal and Full Fat Soybean Meal in a proper manner, a good quality low cost feed can be produced with relatively low nutrient densities, yet able to give satisfactory performance. However when the situation warrants, by using these good quality ingredients, feed millers will be able to produce feed that will enable broilers to achieve performances exceeding the breed standards but with normal nutrient densities as per the broiler breeders recommendations.