

Latest trends in feeding modern broilers

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The genetic progress made by the modern broiler has been truly spectacular over the last 30 years and even more so in recent years with rapid weight gains, efficient utilisation of nutrients and changes in proportion of muscle tissues.

In broiler nutrition, the concept of ideal protein has been widely accepted with growth rate and breast meat yield increasing with balanced protein intake.

It has also consistently been shown that if an adequate quantity of essential nutrients is maintained in relation to metabolic energy (ME), increasing concentrations of energy for broilers result in a more rapid weight gain and an improvement in feed conversion.

Another well accepted concept is that feeding good quality pellets results in better feed consumption, with higher weight gain and a reduction in feed wastage.

In addition to amino acid supply, energy concentration and physical feed form, many other factors such as nutrition, environment, health, management and the cost of raw materials can affect broiler performance and profitability.

New countries

Broilers can be grown successfully in many different geographical areas to provide consumers a low cost complete protein diet.

Many 'new' countries in South America, Eastern Europe, Middle East, Asia and Africa are now also appearing on the poultry production world map.

They have their own specific environment and local constraints which are far different from those in North America and Europe where most nutritional research has been undertaken in the past.

In many of these new areas, broilers are subject to environmental temperatures that are above their thermo-neutral zone which makes the loss of body heat more difficult.

Methods to reduce the ambient temperature such as insulation, fans, evaporative cooling and reduced stocking density, can be



Hubbard broiler trial facilities in Thailand.



used. However, in many cases it is not possible to control the temperature in the broiler house effectively.

Therefore, a valuable nutritional strategy at high temperatures is to reduce any unnecessary metabolic heat production of the bird. This avoids seeing a depressed feed intake resulting in poorer technical performances, especially caused by a reduced growth of lean tissues.

One strategy for maintaining the right nutrient intake under these circumstances could be to increase the nutrient density of the diets.

As feed intake is driven by ME, increasing the nutrient/energy-ratio or improving the amino acid balance in general might be of benefit to a certain extent.

Fat, as an energy source, has been shown

to have nutritional benefits in feed formulation for hot climates as it produces less metabolic heat than carbohydrate during metabolism.

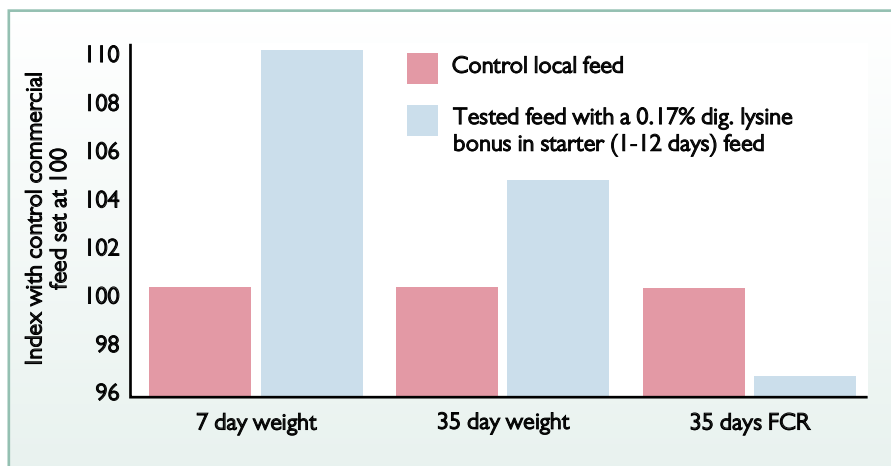
However, many other factors besides the nutrient to energy ratio and type of energy sources need to be reviewed in such hot environments. More nutritional research is still necessary in hot conditions including the use of specific feed additives and the fight against mycotoxins.

A better understanding of how modern broilers perform in hot climates allows the primary breeders to give a better support to the broiler producers in these regions and to optimise their management techniques.

This is why Hubbard operates broiler test houses in countries like Bangladesh and

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Fig. 1. Example of Hubbard broiler trial results in commercial conditions.



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Thailand where broilers are grown under full commercial conditions and are fed with various types of feed to maximise performance.

Fig. 1 is an example of an improved performance in the Hubbard Bangladesh pen trial facilities achieved just by using more digestible lysine (+ 0.17%) in the starter diets from day one to day 12.

The 10% improvement in the seven day weight results in an improved 35 day body-weight of 5% and a FCR saving of 3%.

The advantage of such an approach is that birds are grown in large groups rather than in the usual small 20-50 bird pens used for standard scientific trials. The bird behaviour,

particularly for feeding under high temperature conditions, is much more representative of commercial practice. This gives much better information which is easy to understand and to apply to the local conditions.

Many nutritionists in new poultry operations in these countries are still looking for results obtained in their own specific conditions in order to find the most cost effective local nutritional strategy.

New consumer expectations

This is not a new situation for broiler producers around the world, but the external pressures on the poultry industry are con-



Hubbard JA 757 broilers.

stantly changing. In particular, more consumers expect safe and welfare friendly grown products to feed their families.

Strong public concern and pressure resulted in new legislation such as in Europe with the 2006 ban of antibiotic growth promoters (AGPs) or the new EU welfare directive with a tight control on broiler livability and density per m².

The poultry industry, in particular in the EU, today must respond to these new demands of both producers and consumers looking for a combination of predictability and robustness on one side and taste, a natural image and authenticity on the other.

This balance has led to the development of 'alternative' broilers such as the Hubbard JA with a slower broiler growth rate associated with ease of management, good litter quality, a low incidence of hock dermatitis and foot pad lesions and an excellent carcass quality.

These relatively new broiler strains in the field together with the ban of AGPs lead to new nutrition patterns focusing on gut health and litter quality.

For instance, positive results observed in some northern European farms raise interest to use coarse mash or whole cereals distributed with a protein concentrate as broiler diets. In the last few years, pre-biotics, pro-biotics, acids and phytogenic compounds have also gained considerable interest in the feed industry.

Another increasing consumer demand is for further processed products. This leads the way to higher final bodyweights and also to new feeding strategies.

Hubbard broiler trial facilities in Bangladesh.



Changing the focus of the production objectives has an impact on the optimum dietary amino acid concentrations. Many published papers show that lower estimates of amino acid intake are needed for optimising the economics of bodyweight gain.

In order to minimise the feed conversion ratio, clearly higher amino acids levels are needed, whereas especially for lysine and threonine, and even higher digestible amino acid intakes are needed to optimise breast muscle production.

These findings demonstrate that the optimum amino acids concentrations are strongly determined by production goals which are in a constant evolution.

Least cost formulation

The poultry industry's focus used to be mainly on growth rate and feed conversion, but now and even more so in the future, this focus must be on the cost per kg live weight or kg of (breast) meat depending on the type of market. Feed is about 70% of the total cost and any review of input cost and profitability will include a review of feed cost as a primary component in the exercise.

Broilers are capable of thriving on widely varied types of diets but usually are fed diets composed of low fibre grains and highly digestible protein sources.

Broiler diets in many countries are based principally upon maize as an energy source and soybean meal as a source of amino acids. The expected volatility in raw material prices in the future will most likely put an increasing pressure on nutritionists to limit increases in costs. The use of more local feedstuffs may be a critical factor for least cost formulation and for the sustainability of poultry production in many regions of the world.

Sorghum, wheat and cereal by-products such as Distiller's Dried Grain with Solubles (DDGS) are used as partial replacement for maize in areas where they are available.

Some other plant protein sources such as canola meal, sunflower meal, lupines and some others are utilised in countries where soya bean meal is in limited supply or production is minimal or not feasible.

Most of these alternative protein sources are lower in amino acid digestibility than soya bean meal; show variability of gross composition according to suppliers and often contain anti-nutritive factors that may limit the quantity used in broiler diets.

Nutritionists should be familiar with the physical and nutritional attributes of raw materials common to their region and to solutions such as enzymes that may help to effectively use locally available feedstuffs.

More complex nutrition

Depending on the environment in which the broilers are grown, the management of the operation and the composition of the feed it

should be possible to realise results close to the genetic potential of the broiler.

In this respect, the continuous improvement in broiler genetics requires a regular evaluation of nutrient specifications in raw materials as well as in compound feeds to exploit the modern broiler's potential.

In addition to this regular nutritional follow up, a careful adaptation of diet specifications according to many factors is needed including climate (high temperature), regulations (permitted feed additives, welfare), production goals (target body weight, feed efficiency, product type) and volatility of raw material costs.

Broilers are now grown to various ages or weights for different types of products, from

birds weighing approximately 1kg to be sold whole to birds weighing 4-5kg grown for the deboned meat markets.

Changing regulations and new consumer expectations in so called 'developed countries' and with more broilers grown in hot climate conditions have resulted in an increase of specific environments and production goals compared to 30 years ago.

And with the increased pressure on cost, feeding modern broilers in such various environments makes nutrition probably more complex than it was a few years ago.

It obliges the poultry nutritionist to take all these changing factors into account before formulating balanced and least cost broiler diets. ■