



Philippine layer trial saves 10% on feed

by DR DAVID CRESSWELL*

Trials in South East Asia have confirmed that the addition of enzyme Avizyme 1500 can significantly improve performance or lower feed cost.



Dr David Cresswell

The vast majority of enzyme research with poultry has been with broiler chickens. It was previously thought that laying and breeding hens were less responsive than the younger bird to enzyme effects, due to a more mature digestive system. This has been shown to not be the case with wheat and barley based diets however. Xylanase and beta-glucanase based enzymes are being increasingly used to improve the value of these grains in layer diets. A logical extension to this work has been to test enzymes in corn-based diets for layers.

The product tested in this work was Avizyme 1500, a xylanase, amylase, and protease combination from Finnfeeds International Ltd. There are two approaches for the incorporation of enzymes into layer feed formulations. The simplest is the 'over the top' addition to an existing formulation to cost-effectively improve layer performance. In a trial at the University of Queensland Gatton College, Australia, this approach gave 7.7% improvement in egg production and 9% increase in daily egg mass when added to a sorghum-based diet thought to be marginal in energy and available amino acids.

The alternative option, when egg production is already high, is to change the feed formulation to reduce cost per tonne of feed. Through the addition of Avizyme 1500, the nutritional value of the

feed can be restored, resulting in performance similar to the normal feed formulation. A large scale commercial trial in Italy compared a high spec corn-soy diet (2810 kcal/kg ME, 18% Protein) with the same diet reduced in energy by 3.5% (to 2710 kcal/kg) and with added Avizyme 1500. Results showed no evidence of any reduced performance from the modified diet; thereby demonstrating improved energy utilisation due to the enzyme (table 1).

A reasonable question to pose is whether any enzyme responses can be expected in diets based on corn and soybean meal. Such diets would appear on the surface to form a perfect diet, with high levels of available energy and amino acids. It has recently been shown however that corn and soybean meal can pose digestive problems to poultry and that these

Table 1: Effects of Avizyme 1500 in an energy reduced corn-based diet on layer performance, 36-40 weeks of age* (Commercial trial, Italy).

	Control	-3.5% ME + Avizyme 1500
Egg production, %	90.3	91.0
Egg weight, g	61.7	62.3
Egg mass, g/d	55.7	56.7
Feed intake, g/d	116.0	115.2
FCR, g feed/g egg	2.083	2.032

*25,000 Hyline brown layers in each treatment. Unreplicated trial.

*Dr David Cresswell, a nutrition consultant working throughout South East Asia, wrote this article on behalf of Finnfeeds International Ltd. Further details can be obtained from Finnfeeds +65 224 8600.



diets can be enhanced with enzymes.

Corn starch is expected to have a high digestibility in birds (>98%), but recent data revealed a surprisingly low ileal starch digestibility of 82% in young broiler chicks fed a corn-soybean meal diet, with no evidence of any increase as the birds got older. Therefore a significant portion of corn starch might reach the hindgut and undergo fermentative breakdown, resulting in poor energetic utilisation.

Similarly it has been shown that soybean meal can be quite a variable ingredient. Variability is present not only in the protein and amino acid content, but also in the content of antinutritional factors such as trypsin inhibitors and lectins. Lectin levels of 20 to 40% of the levels found in raw soybeans were quite common in commercial soybean meals, which indicates the limits of current soybean processing techniques.

A series of trials were conducted at several research institutes and commercial farms in 1996 and 1997. At the Queensland Poultry R&D Centre, Australia, Avizyme 1500 was tested in a medium spec corn-soy-wheat pollard diet, which had been formulated with 5% lowered ME,

Table 2: Effect of Avizyme 1500 added to a corn-based layer diet in older layers, 74-86 weeks of age (Qld Poultry Research & Development Centre, Australia).

	High spec	Med spec	Med spec +Avizyme 1500
Egg production, %	77.6a	70.7b	75.6a
Egg weight, g	67.2a	64.6b	67.1a
Egg mass, g/d	52.1a	45.7b	50.7a
Feed intake, g/d	114.7a	115.0ab	117.3b
FCR, g feed/g egg	2.20a	2.52b	2.31a

ab P<0.05.

protein and amino acid minimums. The high specification control diet was 2750 kcal/kg ME, 17% protein, 0.94% lysine and 0.65% m+c. Older hens of the ISA Brown strain, aged 74-86 weeks were used in this trial. Reducing the nutrient specs resulted in large reductions in egg production and egg weight. It is apparent that modern layer genetics have difficulties to compensate for reduced diet density through increasing their feed intake. Addition of Avizyme 1500 to the medium spec diet, however, restored performance to the levels of the high spec control, with an 11% increase in daily egg

mass (Table 2).

Preliminary data are available from a trial in the Philippines, which had a very similar design to that of the Australian trial above. In this case the diets were based on corn-soy-egg mass, g/d fishmeal-rice bran and copra meal, and the high spec control was 2775 kcal/kg, 18.8% protein, 1.05% lysine and 0.69% m+c. The medium spec diet was formulated with 5% lower energy, protein and amino acid minimums. Babcock white egg strain was used, and these data are for 15 weeks of production, from 24-39 weeks of age (Table 3). In this case, only small reductions in production occurred with the reduced density diet. However the addition of Avizyme 1500 allowed full recovery of all production parameters. Feed costs, including the cost of the enzyme, were reduced by 10% in this trial.

Consistent trial results show that the nutritional value of corn-based layer diets can be improved through the application of appropriate enzyme combinations. Avizyme 1500 may be used either to assist the bird to achieve its genetic potential by addition to an existing feed, or to reduce feed costs by the modification of dietary nutrient levels. |

Table 3: Effects of Avizyme 1500 in restoring production from a modified corn-based diet, 24-39 weeks of age* (University of the Philippines, Los Banos).

	High spec	Med spec	Med spec +Avizyme 1500
Egg production, %	92.1	90.6	92.6
Egg weight, g	57.5	57.2	57.7
Egg mass, g/d	52.9	51.8	53.4
Feed intake, g/d	108.0	108.5	106.9
FCR, g feed/g egg	2.042	2.095	2.001

* Statistics not yet available.