# Feed Enzymes For Layers And Breeders

A new range of feed enzymes, the Avizyme 2000 Series', similar to those widely used for improving the nutritional efficiency of wheat and barley-based broiler diets, has been introduced for use in feed rations for layer and breeder hens.

In a number of experimental trials carried out in Spain, Scotland, Ireland and Canada, layer diets with added enzymes have been shown not only to improve egg production but also to reduce the diet cost by increasing the AME value and by making it possible to increase the proportion of wheat and barley in the formulation.

Because of the beneficial effect enzymes have on reducing the viscosity of feed during its passage through the gut, the moisture content of excreta is lower, which means that the volume of manure produced is less with a proportional reduction in manure disposal costs. The drier faeces produced by birds on enzyme-added diets also resulted in fewer dirty and contaminated eggs. Additionally, another important benefit is a consequence of improved dietary pigment absorption giving a deeper yolk colour, a vital consideration for most table egg markets and for many egg product applications.

These beneficial effects come about because dose-optimised levels of the enzymes xylanase and beta-glucanase, improve the digestibility of wheat and barley based diets for commercial layers or breeder hens. The reduction in digesta viscosity is especially significant in improving fat digestion and the availability of fat-soluble vitamins like vitamin D as well as improving the efficiency of absorption of natural pigments in the diet - carophylls and xanthophylls essential for good yolk colour.

The addition of these enzymes typically results in a 10% uplift of AME for barley and 6% on wheat. Using more of these cheaper alternatives to maize in dietary formulations permits the reduction of ration cost.

The Avizyme 2000 Series is marketed in four product forms, Avizyme 2100 (granulate) or 2110 (liquid) for barley diets, or Avizyme 2300 (granulate) or 2310 (liquid) for wheat based diets.

In a trial at the Parafield Poultry Research Institute, South Australia, a total of 180 individually fed ISA Brown layers, with 30 replicates/treatment were given mash diets with barley, wheat and both wheat/barley, with or without Avizyme (2100 and 2300), ad libitum from 30-42 weeks of age.

The addition of enzymes tended to increase the percentage lay ($P<0.08$) and reduce excreta moisture ($P<0.06$). The reduction in excreta moisture was the result of reducing the digesta viscosity, which in turn reduced the incidence of dirty eggs. The increase in bodyweight with the enzyme-added treatments could improve the persistency of lay. The improvement in yolk colour was attributed to reduced digesta viscosity improving fat digestion. -

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**Table 1. Avizyme 2000 Series Product Range**

| Brand | Name | Target Species | Target Substrate | Product Form |
|---|---|---|---|---|
| Avizyme | 2100 | Laying/Breeding Hens | >20% Barley | Granulate |
| Avizyme | 2110 | Laying/Breeding Hens | >20% Barley | Liquid |
| Avizyme | 2300 | Laying/Breeding Hens | >30% Wheat (<20% Barley) | Granulate |
| Avizyme | 2310 | Laying/Breeding Hens | >30% Wheat (<20% Barley) | Liquid |

**Table 2: Experimental Diets Used**

| | Barley Diet | Wheat Diet | Wheat/Barley Diet |
|---|---|---|---|
| Wheat | - | 67 | 507 |
| Barley | 724 | - | 250 |
| Soybean meal | 60 | 30 | 39 |
| Meat meal | 140 | 120 | 124 |
| Sunflower oil | 9 | 5 | 4 |
| Vitamins, amino acids & minerals | 67 | 78 | 76 |
| Avizyme | 0/1 | 0/1 | 0/1 |
| ME (MJ/kg) | 10.9 | 11.5 | 11.3 |
| ME (Kcal/kd) | 2600 | 2750 | 2700 |
| Crude protein (%) 1 | 17.0 | 17.9 | 17.5 |
| Lysine (%) | 0.70 | 0.77 | 0.76 |
| Calcium (%) | 3.56 | 3.75 | 3.67 |
| Av.phosphorus (%) | 0.67 | 0.58 | 0.60 |

**Table 3: Summary of Results 30-42 Weeks**

| | Lay % | Gain (g) | Egg wt (g) | Yolk Colour (Roche Scale) | Excreta Moisture (%) |
|---|---|---|---|---|---|
| Barley | 82.8 | 11.9 | 64.5 | 5.2 | 69.4 |
| Barley + Avizyme | 82.0 | 75.6 | 63.5 | 6.3 | 67.3 |
| Wheat | 86.o | 31.6 | 63.3 | 8.9 | 69.6 |
| Wheat + Avizyme | 89.7 | 129.9 | 63.3 | 9.3 | 67.8 |
| Wheat/Barley | 82.1 | 56.2 | 62.2 | 8.7 | 70.8 |
| Wheat/Barley + Avizyme | 90.3 | 106.5 | 64.6 | 9.3 | 69.2 |
| Avizyme P Value | 0.08 | 0.005 | >0.1 | 0.001 | 0.06 |

**Key words**: Avizyme 2100, Avizyme 2300, Avizyme 2110, Avizyme 2310, xylanase, beta-glucanase, barley, wheat, layer, excreta moisture, yolk colour, egg production, egg weight,